

## SCIENTIFIC GLOSSARY

This is a list of words and their meanings that relate to water.

*Sources: The list and definitions were sourced from 'The Streamwatch Manual (3rd edition)', produced by Sydney Water Corporation (reprinted June 2004) and 'We All Use Water' manual produced by the Australian Water Association (2002).*

**Absorb:** to physically or chemically assimilate a substance and include it in another; to take up gases, water, nutrients or other substances, eg. by soils or plants.

**Absorption trench:** the disposal field of a conventional domestic on-site effluent disposal system; an excavated area, filled with gravel with a light cover of soil from which water from a perforated pipe from a septic tank can evaporate and percolate into the surrounding soil.

**Acid:** a substance containing more  $H^+$  ions than  $OH^-$  ions in solution; a condition where the pH is below 7, where the activity of the  $H^+$  ion exceeds that of hydroxyl  $OH^-$  ions.

**Activated carbon:** high porosity, high surface area carbon obtained by burning organic matter in the absence of air, used to remove impurities causing odour and undesirable taste from drinking water by absorbing gases and various organic and inorganic molecules. Also used for removing cyanobacterial toxins from drinking water.

**Adsorb:** attach a substance to the surface of a liquid or solid, eg. cations to a negatively charged clay or other colloidal material; retain water, ions or exchangeable bases on a colloidal surface.

**Aeration:** exposure of a material to air so that dissolved gases may be removed; the process by which air is added to a substance or exchanged with an existing atmosphere.

**Aerobic:** adapted to the presence of oxygen; growing or occurring only in the presence of molecular oxygen; having molecular oxygen as part of the environment; bacteria that require oxygen in order to survive and multiply.

**Aerosol:** a colloidal system of solid or liquid particles dispersed in a gas; very fine particles in the atmosphere, eg. smoke, fog, smog.

**Algae:** simple photosynthetic aquatic or moist habitat plants, semicellular or in colonies or filaments, some free-floating or having motile cells with flagella, others attached to various substrates or having symbiotic relationship with plants or animals.

**Algal bloom:** a rapid increase in the mass of one or more algae or cyanobacteria (blue-green algae) in a water body, usually in response to a change in its flow, light, temperature or nutrient status.

**Alkaline:** containing or releasing an excess of hydroxyl ( $OH^-$ ) ions over  $H^+$  ions; capacity to reduce or neutralize acidity; a soil or solution with a  $pH > 7$ .

**Alum:** hydrated double salt of aluminium and potassium sulphates; a general term used for aluminium sulphate, used as coagulant in water treatment; the reaction product of sulphuric acid and alumina or bauxite.

**Ammonia:** a colourless alkaline gas  $NH_3$ , produced synthetically in a modified Haber process from nitrogen in air and hydrogen from methane (natural gas) using catalysts at high temperature and pressure.

**Anaerobic:** lacking air or molecular oxygen; living or functioning in the absence of air or free oxygen; capable of survival only in the absence of oxygen; bacteria living in such conditions.

**Anaerobic digestion:** decomposition of oxygenic materials under conditions of low air or oxygen supply.

**Anoxic:** lacking dissolved oxygen; a condition in which oxygen is deficient or absent or exists only in a combined form.

**Aquifer:** a layer of porous rock that both stores water and allows it to percolate through; underground rocks, gravels or coarse sediments capable of storing water, which may be recovered for irrigation or other consumptive uses.

**Aquifer recharge:** build up of the water level in a natural underground storage.

**Australian Drinking Water Guidelines:** portion of the National Water Quality Management Strategy (1996) dealing with the physical, chemical and biological components of water for human consumption.

**Back flow:** movement of a liquid in a contra-direction to that intended, due to a reversal of pressures.

**Back-washing and flushing:** by reversing the flow, to remove accumulated sediment particles from the sand filter in a water treatment plant.

**Bacteria:** all living organisms with procaryotic cells; a large group of single-celled micro-organisms, lacking chlorophyll, responsible for fermentation, organic matter decomposition, nitrogen fixation and various diseases of plants and animals.

**Barrage:** an artificial weir or barrier, constructed to prevent tidal water flowing upstream, allowing an increased volume of fresh water to be collected for consumptive uses.

**Bicarbonate:** the monovalent  $\text{HCO}_3^-$  ion; salts such as sodium bicarbonate (bicarb soda), calcium and magnesium bicarbonate occur in temporary hard water, the hardness being removed by boiling, which precipitates the carbonates.

**Biodegradable:** capable of conversion by chemical or biological processes to simple chemical substances, not harmful to the environment.

**Biochemical Oxygen Demand ( $\text{BOD}_5$ ):** a measure of the amount of oxygen needed by microorganisms to decompose organic matter in an effluent sample determined during a 5 day period in a reaction vessel at  $20^\circ\text{C}$ . Untreated wastewaters may have a  $\text{BOD}_5$  of 350 mg/L, septic tank effluents 150 mg/L, sewage treatment plants 20 mg/L falling to 2 – 5 mg/L with modern treatment methods.

**Biological diversity (Biodiversity):** all the forms of landscape and its components, including landforms and land uses, soils, climate, water, plants and animals and their functional relationships that affect environmental conditions – includes regional ecosystem species and genetic diversity.

**Biological Activated Carbon (BAC):** a form of carbon with high porosity and surface area used in water treatment to absorb pollutants, to allow their biological degradation.

**Biological Nutrient Reduction (BNR):** an advanced form of the activated sludge process wherein some types of bacteria utilize the oxygen from phosphates in sewage as their energy source, reducing the P content of the effluent from 10 – 15 mg/L to 1 – 5 mg/L.

**Biota:** the combined fauna and flora of an area or region (or geological period).

**Blackwater:** influent to or effluent from a septic tank or sewage system, containing water and excreted organic materials, especially urine and faeces.

**Blue-green algae:** an archaic name for Cyanobacteria, a large group of photosynthetic bacteria, originally classified as algae because of their similar size and structure – see Cyanobacteria.

**Buffering:** resisting a change in pH when acids or bases are added to a solution, due to the presence of colloidal clay or organic matter, or carbonate or phosphate anions. In water treatment, the addition of carbon dioxide to increase alkalinity and reduce the likelihood of corrosion of pipes and plumbing fittings.

**Carbon dioxide ( $\text{CO}_2$ ):** a colourless, odourless gas, utilized by plants in photosynthesis and produced during respiration by plants and animals, used in water treatment to reduce corrosion potential.

**Catchment:** the area of land drained by a creek or river system; an area appropriated for the collection of runoff water from a natural drainage system; a watershed or basin.

**Chemical coagulation:** formation of a floc using chemical additives to treat water containing colloids in suspension.

**Chemical nutrient reduction:** the use of a chemical, eg. aluminium sulphate, ferrous chloride, to reduce the phosphorus content of effluent by chemical precipitation of phosphates and filtration.

**Chemical Oxygen Demand (COD):** the amount (mg/L) of oxygen required to react with chemicals present in effluents to convert them to their oxidised state.

**Chloramine:** a reaction product of ammonia and chlorine used as a disinfectant in water treatment.

**Chlorine (Cl<sub>2</sub>):** A greenish-yellow, poisonous gas with an offensive odour, used for the control of pathogens in water treatment.

**Chlorinated hydrocarbons:** a large group of organic chemicals, formed by reacting chlorine with various classes of hydrocarbons.

**Chlorine disinfection:** treatment of waste or contaminated water with various forms of chlorine to reduce bacterial hazards or to prevent septicity. The amount required varies with pH, organic matter content, the level of contamination and unoxidised iron and manganese contents.

**Chlorophyll:** a green pigment in chloroplasts of plants and in algae, essential for the photosynthesis of carbohydrates.

**Clarifier:** a structure at a sewage treatment plant designed to separate sludge from clearer effluent; a chemical or the system in which it is used, to remove impurities from a polluted stream or chemical process.

**Coagulant:** a chemical used to convert liquids or suspensions into solids, a material such as alum, gypsum, ferric sulphate, etc. used to clarify water by clumping the negatively-charged suspended particles, which then settle as larger particles (floc); also flocculant.

**Coliforms:** a family of bacteria, eg. *Escherichia coli* occurring naturally in large numbers in the intestines and faeces of higher animals; if found in a water sample, indicates recent faecal contamination.

**Colorimeter:** laboratory apparatus used to determine the concentration of a substance in solution, based on the intensity of its colour and measured by the ability of the solution to absorb light of a certain band width and as compared with specified standards.

**Composting toilets:** devices through which excrement and domestic wastewaters are passed, with no added water, for subsequent decomposition into compost for garden use.

**Conductivity:** the ability of a solution to convey an electrical current, highly correlated with the ionic concentration, ie. the content of soluble salts

**Cryptosporidium:** a genus of water polluting protozoa, two of eight strains being infectious, causing gastroenteritis in humans

**Cyanobacteria (blue-green algae):** a diverse group of bacteria in which the photosynthetic pigments are not localized in definite chromatophores or the nuclear material localised in nuclei, as in algae. Mostly fresh-water species of microscopic size, mostly multicellular and filamentous (See *Anabaena*, *Lyngbya*)

**Cysts:** hard-coated dormant life forms of protozoa such as *Giardia*, produced asexually, resistant to harsh environments and some disinfectants, but capable of being removed from drinking water supplies by suitable filtration

**Demand management:** use of methods aimed at reducing the quantity of water required for irrigation and direct consumption, including the reduction of waste and the use of fittings to increase efficiency of water use.

**Destratification:** reduction of layer formation in water storages by producing turbulence with aerators or mechanized mixers or by withdrawing water from treatment from different depths.

**Dewatering:** removal of water from sludge, usually following addition of a polyelectrolyte, using a filter press.

**Diatoms:** microscopic, mostly semicellular, free-floating, yellow-brown algae with overlapping silicified cell walls.

**Diffuse source:** originating from many sites or derived from many processes; a source that cannot be pinpointed because the problem occurs over a wide area (Also called **non-point source**).

**Digester:** a vessel or tank in which organic or chemical reaction processes take place within controlled conditions.

**Disinfection:** any process that destroys, inactivates or removes pathogenic micro-organisms; treatment of polluted or contaminated water to kill disease-causing organisms such as viruses, bacteria or protozoa; the destruction of infectious disease-causing organisms at their sources.

**Dissolved Air Flotation (DAF):** a stage in sewage treatment whereby air is bubbled through alum and polyelectrolyte-treated water to collect the floc so that it forms a scum on the surface which overflows into a trough for removal.

**Dual reticulation:** a system of piped water reticulation in which treated effluent is provided for industrial, household or garden use, via a separate delivery system to that for potable use.

**Ecosystem:** a regime involving the interactions between living organisms and their environment; a biotic community of organisms and their relationship with the physical, chemical and biological components of their environment.

**Effluent:** a general term for 'clean' water that leaves a sewage treatment plant, the liquid part of sewage; the outflow from a sewage tank; partially treated black water which exits a septic tank; water discharged following a waste-water treatment process; waste material discharged into the aquatic environment.

**Environmental flows:** water provided from a storage reservoir to create a downstream flow pattern similar to that of the natural environment, so as to maintain in-stream habitat, water quality, steam-building processes, floodplains, wetlands, etc.

***Escherichia coli (E coli):*** a species of faecal coliform bacteria formed in large numbers in the gastrointestinal tract and in faeces of warm-blooded animals; an indicator of recent faecal contamination of a water resource, mostly benign but some pathogenic strains cause severe gastroenteritis.

**Estaurine:** relating to that part of an inlet or river mouth where there is a tidal influence on the fresh or brackish current, affecting water height, salinity and nutrient levels, erosion and drainage channels on a daily basis.

**Eutrophic:** well nourished; containing high levels of nutrients and biomass, high rates of productivity frequently resulting in oxygen depletion, low biodiversity and generally poor water quality as a result.

**Eutrophication:** accumulation of excessively high levels of nutrients, leading to abundant growth of aquatic plants and bacteria. The accelerated nutrient enrichment may lead to oxygen-deficient conditions in lakes, streams and waterways.

**Evaporation:** the process by which water changes its physical state from a liquid to a gas, so that vapour is lost from soil or water directly into the atmosphere, due to increased temperature.

**Evapotranspiration:** the combined loss of water from an area during a specified time by surface evaporation and transpiration by plants, water loss by these two processes as vapour from the water, soil, plant system.

**Faecal streptococci:** a group of bacteria whose presence in water indicates faecal pollution.

**Filtration:** the separation of suspended material from a liquid by passing the liquid through a porous substance, a filter or other membrane which will retain insoluble matter or particles large in size than the pores in the membrane.

**First flush:** the initial flow of stormwater runoff that often contains high concentrations of contaminants that have built up during intervening dry periods, a mechanical device used to reject and discard the initial runoff from a roof catchment, so as to reduce contaminant loading to a storage tank.

**Fish ladder:** a structure on a dam or weir designed to allow fish to move upstream to fresh water or downstream to the estuary or sea, to allow their life cycle to continue.

**Floc:** an aggregation of colloidal particles or insoluble material, with a density similar to or slightly higher than that of the liquid so that it remains in suspension. In water treatment, the floc produced by adding a coagulant can be filtered.

**Flocculation:** the aggregation of individual colloidal particles of clay, organic matter or chemical precipitate in water, into small clumps or clusters by using a chemical coagulant.



**Flood flows:** excess water from an on-stream reservoir passing through a spillway to re-enter the waterway, during a flood event in the catchment.

**Flood mitigation:** reduction of the severity of physical and economic losses caused by floodwater inundating land or damaging structures, such as by constricting levee banks or off-stream storages or relocating infrastructure to higher ground.

**Floodplain:** the low-lying land adjacent to the riparian zone, over which floodwaters pass during periods of high catchment runoff; the areas of alluvial deposition during periods of flooding.

**Fluoride:** a compound of fluorine with another element such as sodium or calcium, used either in fluoridation of drinking water, or directly, to reduce the incidence of dental caries where natural fluoride levels are low.

**Giardia:** a protozoan, eg. *G. lamblia* causing giardiasis, with symptoms of diarrhoea, abdominal cramps and weight loss in humans.

**Greenhouse gases:** vapours in the lower atmosphere which reflect escaping solar radiation back to earth, so increasing air temperature. Such gases include water, carbon dioxide, nitrous oxide, methane, fluorocarbons these vary greatly in their warming potential and atmospheric resistance time, and hence their individual contributions to global warming.

**Greywater:** effluent from kitchen, bathroom and laundry used earlier for washing household utensils and clothes, in cooking, showering and bathing.

**Groundwater:** water occurring below the soil surface in an aquifer or within the water table; subject to withdrawal and recharge; water that supplies springs and wells.

**Hard water:** water which, due to the presence of calcium and magnesium salts in solution, reduces lathering after soap or detergent addition, reduces the efficiency of water-clarifying agents and flocculants, shortens the life of water heaters and pipes due to scale formation and the effectiveness of some pesticides. Hardness may be temporary (reduced by boiling) or permanent.

**Headwaters:** the upper reaches of a catchment.

**Helminths:** various kinds of nematodes, ground-worms and flatworms, some of which are parasitic. Untreated sewage may recycle their eggs to infect humans and other animals

**Heavy metals:** chemical elements with a density greater than five, such as cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, zinc which in high concentrations can exert a toxic effect or promote the growth of particular species to out-compete others.

**Household Sewage Treatment Plants (HSTPs):** four-stage treatment systems for household effluent disposal allowing the effluent to be used for garden or lawn irrigation.

**Hydrology:** the study of water occurrence, distribution, movement and balances in ecological systems, seasonal patterns of flow or a river, dealing with the properties and movement of water in the hydrologic cycle.

**Indicator organisms:** an organism whose presence in water, eg. *E coli* indicates recent faecal contamination and the possible presence of other, perhaps pathogenic organisms.

**Infiltration:** the movement of water through soil pores or other porous material, the entry of stormwater into the sewage system through faulty pipes.

**Inorganic chemicals:** mineral substances, eg. acids, bases, salts, lacking a structural C atom but including carbonates and cyanides.

**Ions:** electrically charged particles, atoms or groups of atoms; positively charged (cations) due to the loss of one or more electrons, or negatively charged (anions) following the gain of one or more electrons; charged molecules released by dissociation of a soluble salt or other material in an electrolyte (ionization).

**Ion exchange:** the process wherein electronically charged ions are absorbed on or desorbed from a substance of opposite charge, eg. a calcium ion exchanged with two hydrogen ions absorbed on a clay particle, or with sodium or a resin in a water softener.

**Iron (Fe):** a metallic element with an atomic mass of 56, essential for growth of plants and animals. Acts as an oxygen carrier and a catalyst in the formation of chlorophyll and in nitrogen fixation. Can be an impurity in runoff from eroded soils and may need to be removed from water supplies to prevent staining.

**Kjeldahl nitrogen:** a method of determining total nitrogen content wherein organic and mineral forms are first converted to ammonium sulphate by reacting the sample with sulphuric acid and a catalyst.

**Kilolitre (KL):** 1000 litres; the volume of a cubic metre.

**Macrophytes:** large water-plants, either rooted or floating (other than rafts of microscopic algae) such as water hyacinth, salvinia, water lettuce.

**Manganese (Mn):** a metallic element with an atomic mass of 55; an essential micronutrient for plants and animals, activating enzymes involved in the decomposition of water in photosynthesis. May need to be removed from water supplies, using potassium permanganate, otherwise will cause colour complaints.

**Megalitre (ML):** 1 million litres; the volume in 1,000 cubic metres.

**Membrane filtration:** reduction of pollutants in water by the use of membrane filters made of polymers or ceramics. Includes microfiltration, ultrafiltration, nanofiltration and reverse osmosis.

**Micro-organisms:** soil, air or water microbes such as bacteria, algae, fungi of microscopic size, may be harmful (pathogenic).

**Microfiltration:** the passage of a liquid containing fine suspended particles through a porous material, with pore size of 0.1 micron, so that these contaminants can be removed from, for example, a water supply.

**Natural flow:** water movement in accordance with gravitational forces, without artificial intervention.

**Nitrate (NO<sub>3</sub>):** a negatively charged ion containing one nitrogen and three oxygen atoms; a salt or ester of nitric acid, HNO<sub>3</sub>.

**Nitrogen (N):** A nutrient used primarily by plants and animals to synthesise protein. Nitrogen enters the ecosystem in several chemical forms and also occurs in other dissolved or particulate forms, such as tissues of living and dead organisms; a gas constituting 79% of the atmosphere.

**Nitrogen-limited:** an ecosystem in which a deficiency of bio-available nitrogen occurs, restricting growth; a biochemical charge which is dependent on and restricted by the supply of chemically available nitrogen.

**Non-pathogenic:** not harmful (organisms).

**Non-point source:** originating from many sites or derived from many processes; a source that cannot be pinpointed because the problem occurs over a wide area (Also called **diffuse** source).

**Non-potable:** unsafe or unsuitable for drinking or in food preparation, due to the presence of harmful chemicals or organisms.

**Non-potable recycling:** the distribution of recycled water where the intended uses do not include drinking or food preparation.

**Nutrients:** biological elements or substances required as raw materials for the normal growth and maintenance of plants, animals and micro-organisms, includes simple elements such as potassium, calcium, iron and radicals such as sulphate, phosphate, nitrate (for plants) through to more complex chemicals such as vitamins, carbohydrates, amino acids for animals.

**On-site systems:** sewage treatment equipment for converting household effluent to materials suitable for local disposal, eg. septic systems, grease traps, composting toilets and household sewage treatment plants.

**Oocysts:** hard-coated dormant life forms of protozoa such as *Cryptosporidium*, produced sexually, resistant to harsh environments and some disinfectants, but capable of being removed from drinking water supplies by suitable filtration methods.

**Organic chemicals:** compounds (other than carbonates) containing structural carbon, such as methane, sucrose, proteins, chlorophyll, vitamins, fats, oils.

**Osmosis:** the diffusion of liquids through a porous or semi-permeable membrane, from a higher concentration solution to a lower, to equalize conditions on either side of the membrane.

**Overturn (turnover):** an inversion process in water-bodies, where the cooler, deeper layers rise toward the surface.

**Oxidation:** combination of a chemical substance with oxygen removal of hydrogen by the action of an oxidizing agent; conversion of a chemical substance into a compound containing additional oxygen (opposite of reduction).

**Oxidising agent:** a substance able to provide oxygen atoms to other chemicals, which may aid decomposition processes, eg. ozone, hydrogen peroxide, potassium permanganate.

**Oxygen depletion:** reduction in the level of dissolved oxygen in a water body, usually due to it being utilized for the breakdown of organic matter or for respiration by water plants and aquatic organisms.

**Ozone (O<sub>3</sub>):** a blue gas with a pungent odour; a highly reactive oxidizing agent, produced by passing an electric discharge through oxygen or air, used in the disinfection and purification of polluted water.

**Parasites:** plants or animals dependent internally or externally on their host for nourishment and shelter.

**Pathogens:** organisms which may cause disease, ill health or parasite infection, including viruses, bacteria, protozoa, helminthes, some fungi, yeasts.

**pH:** The degree of acidity or alkalinity of a solution; the negative logarithm of the hydrogen ion concentration, a numerical designation of acidity and alkalinity; pH 7 is neutral.

**Phosphorus (P):** a nutrient essential for the growth and development of all organisms; mostly present in the orthophosphate (PO<sub>4</sub>) form in rocks, soils, plant and animals. Present in many organic and chemical fertilizers, detergents and may, through runoff, contribute to eutrophic conditions in water storages, resulting in algae blooms.

**Phosphorus-limited:** an ecosystem in which a deficiency of bio-available phosphate occurs, restricting growth; a biochemical change which is dependent on and restricted by the supply of chemically-available phosphorus.

**Photosynthesis:** the process by which cyanobacteria and plants utilize chlorophyll to convert light energy to chemical energy, by combining water and carbon dioxide to produce organic compounds and oxygen.

**Potable:** suitable for human consumption, whether used as drinking water or in the preparation of food.

**Protected catchment:** an area upstream of a water storage in which human activity is not permitted or is restricted so as to protect water quality values.

**Raw sewage:** untreated liquid waste entering a sewage treatment plant through a system of pipes, collected from domestic and industrial sources.

**Raw water:** untreated water from a storage, stream or aquifer destined for treatment for domestic and industrial uses.

**Recycled water:** wastewater that has been recently treated to a standard sufficient to enable it to be recycled for some specific use.

**Respiration:** the oxidation of organic molecules within a cell to release energy and carbon dioxide: breathing.

**Reticulated (water) supply:** treated water supplied through a system of pipes, mains, control valves, etc. for household or industrial use.

**Riffle:** a fast flowing, turbulent portion of a stream or river, where the water is shallow, well-aerated and the surface broken by rocks, stones or gravel.

**Riparian:** an area or zone within or along the banks of a stream or adjacent to a watercourse or wetland, relating to a riverbank and its environment, particularly to the vegetation.

**Risk assessment:** a process for the qualitative or quantitative analysis and evaluation of the hazards associated with any particular action or inaction.

**Risk:** analytical determination of the nature of hazards, eg. their frequency, likelihood of contact; potency, infectivity, consequences, etc.

**Salinity:** the concentration of soluble salts in a solution (water) or other medium.

**Salts:** chemical compounds that dissolve in water to form a cation and an anion, eg. sodium chloride, potassium nitrate, calcium stearate.

**Sand filters:** metal or concrete constructions containing sand or fine gravel which collects sediment or floc passing through it, allowing water to pass through.

**Seasonality of flows:** the pattern of variation, during the year, of the volume of flow of water through an unimpeded catchment.

**Sediment(s):** insoluble or solid material(s), eg. organic matter, clay, silt either suspended in water or settling at the bottom of a water storage or during a water or effluent treatment process.

**Sedimentation:** the process whereby suspended particles settle from a water column; the disposition of soil materials as the end-process of erosion.

**Semi-permeable membrane:** an osmotic filter that separates a solvent (water) from a dissolved substance; the cell wall of plants and animals.

**Septic tank(s):** a system used to treat domestic organic wastes (blackwater) using bacteria in a concrete chamber in which the sludge settles and the nutrient-rich liquid flows on through a series of absorption trenches.

**Sewage:** wastewater of domestic or industrial origin to be treated at a sewage treatment plant.

**Sewerage:** the system of pipes and pumps used to collect and transport sewage to, and the equipment used to treat and discharge effluent from, a sewage treatment plant.

**Sludge:** settled solid matter in a liquid medium, the solid alum-rich material which settles in a sedimentation tank in a water treatment plant, recovered from the back-washing recovery tank; the watery solid material which settles during the primary and secondary treatment of wastewater, see bio-solids.

**Sludge thickening:** use of a chemical, eg. a polyelectrolyte, to de-water sludge to enable it to be more easily managed.

**Sodium hypochlorite (NaOCl):** an oxidizing and bleaching agent used for disinfection of water.

**Soft water:** water which contains less than 200 mg/L  $\text{CaCO}_3$ , lathers readily with soap or detergents.

**Spillway:** the construction beside or in the wall of a dam to allow overflow during periods when intake exceeds storage capacity.

**Stormwater:** Rainwater which runs off the land, frequently carrying various forms of pollution such as rubbish, animal droppings and dissolved chemicals. This untreated water is carried in stormwater channels and discharged directly into creeks, rivers, the harbour and the ocean.

**Stratification:** the formation of layers in a water body, showing differences in temperature, turbidity, pH, nutrients, salinity and light penetration at various depths, lack of mixing within a water storage.

**Suspended solids:** non-filterable residue (NFR); very fine colloidal clay or organic particles which do not settle readily in a liquid, causing increased turbidity.



**Sustainable loadings:** the level of potential contaminants in an aquatic ecosystem above which the components of the system are at risk or are polluted.

**Total coliforms:** the number of colonies of bacteria found in a plate count, following culturing from a water sample at 37°C.

**Total Dissolved Solids (TDS):** the amount of chemical substances in solution, usually estimated from a determination of electrical conductivity, also total soluble salts, total dissolved ions.

**Total nitrogen:** the amount of nitrogen in a system or material including all forms from elemental N to complex organic compounds.

**Total secure yield:** The secure yield of a water supply source refers to the volume of water that can be extracted on an annual basis at a particular level of reliability (including consideration of drought). The industry standard for determining secure yield in a water supply is based on the following: (a) water restrictions should not be introduced more often than on average once in 10 years during the period of analysis (b) water restrictions should not last for more than 5% of the time (c) demand should be reduced by 20% during a drought event. The total secure yield refers to the volume of water that can be reliably extracted annually from all water sources available to Rous Water.

**Toxic:** harmful, destructive or deadly to organisms.

**Toxin(s):** harmful substances which cause disability or death in high dosages; substance which, above a certain concentration, are poisonous to living things.

**Transpiration:** evaporation loss of water from the leaves of plants through the stomata; the flow of water through plants from soil to atmosphere.

**Turbidity:** measure of the cloudiness or muddiness of water. The degree of resistance to light penetration resulting from the presence of suspended solids, eg.; organic matter, clay particles, plankton, microscopic organisms, iron compounds. For drinking water, turbidity should be less than 5 NTU (nephelometric turbidity units).

**Ultrafiltration:** the use of polymer or ceramic membranes with a pore size of 0.01 micron to remove very fine colloidal particles from water.

**Unaccounted for water:** the difference between the volume of water entering a reticulated system and the recorded use, due to a system leaks and un-metered uses.

**Unprotected catchment:** the area upstream of a water storage where many types of land uses are allowed, without concern for potential harmful effects on water quality.

**UV disinfection:** the use of ultraviolet light to irradiate drinking water to kill pathogens such as bacteria and viruses, and to inactivate cysts and oocysts of harmful protozoa.

**Wastewater:** water which has been used at least once and hence regarded as unsuitable for immediate reuse for that purpose without treatment; water collected from domestic and industrial sources to be treated prior to discharge to the environment or for recycling for other uses.

**Water harvesting:** the off-stream storage of water obtained during peak flows or major run-off periods for later use for water supply or irrigation purposes.

**Water storages:** includes barrages, dams, reservoirs, turkey nests, tanks, weirs, constructed for or provided to contain water, regular flows, mitigate floods, for irrigation use, power generation or for domestic and industrial consumption.

**Weir:** a structure usually of concrete, across a stream to impound water, with any surplus flowing over the crest; in a water treatment plant, a concrete wall of a settling pond, over which clarified water flows into the next stage of the process.

**Wetlands:** areas of low-lying land covered with either fresh or salt water, whether irregularly or permanently, water habitats either natural, eg. billabongs, lagoons, lakes, creeks, weirs, estuaries, salt marshes, swamps, mound springs or constructed, eg. dams, canals, bore, drains, channels, rice fields.

**Zoo-parasites:** single-celled organisms, order Protozoa, living in a parasitic relationship with a host. While often not causing any symptoms of illness, some eg. *Cryptosporidium* and *Giardia* may cause infection through direct contact or through contaminated water.

## WIDJABUL DICTIONARY

### Animals and Plants

Carpet Python	<i>Gabul</i>
Cedar Tree	<i>Junbang</i>
Black Duck	<i>Mara</i>
Dragonfly	<i>Yala</i>
Fig Tree	<i>Boodgeragah</i>
Fish	<i>Jalum</i>
Fishing Bat	<i>Guyum mir</i>
Frog	<i>Jerrahnj</i>
Goanna	<i>Ngamal</i>
Pademelon	<i>Bundoon</i>
Platypus	<i>Djanbung</i>
Red-bill Coot	<i>Yihgan</i>
Scrub Turkey	<i>Gadjul</i>
Turtle (long-necked)	<i>Mujang</i>
Turtle (short-necked)	<i>Bing-ghing</i>
Water Dragon	<i>Magill</i>

### Other Words

The Creator	<i>Ngadjanggali</i>
Country	<i>Jogun</i>
Learn	<i>Wajela</i>
Look	<i>Nyalah</i>
Listen	<i>Ga ngah</i>
Respect, take care of, look after	<i>Garima!</i>
Walking Track	<i>Gurahr</i>
Water	<i>Nyabay</i>
Welcome	<i>Jingi walla</i>