

## Appendix 2 – Glossary

### *Aeolian*

Applied to landforms or sediment materials which are formed or transported due to the action of wind.

### *Airborne Electromagnetic Survey (AEM)*

A geophysical survey method which measures the electromagnetic properties of a rock. Electric conductivity and magnetic susceptibility are calculated, and since these properties vary depending on the nature of the rock, water saturation, salinity and other parameters, the resultant maps are used for estimation of the nature of underground rock formations, ground water, contamination and other geological / environmental changes.

### *Alluvium*

Sand, silt, clay, gravel, or other matter deposited by flowing water, as in a riverbed, floodplain, delta, or alluvial fan. Alluvium is generally considered a young deposit in terms of geologic time.

### *Aquifer*

A geological formation, group of formations or part of a formation which is sufficiently porous and permeable to store, and allow the movement of, groundwater. Aquifers may yield quantities of groundwater for consumptive use.

### *Aquifer Storage and Recovery*

A process where by surface water is harvested and stored underground in an aquifer for later use. The surface water is introduced to the aquifer by either injection under pressure via a bore or through gravity fed infiltration ponds.

### *Aquifuge*

An impervious bed that cannot store or transmit water (also known as a 'hydraulic basement').

### *Aquitard*

Saturated geological unit that can store large volumes of water but cannot transmit significant quantities of water to production wells. Also called a 'confining bed'.

### *Arkose*

A type of sandstone which contains 25% or more feldspar grains, usually derived from granitic sources.

### *Artesian Aquifer*

An aquifer containing groundwater under pressure, that rises to a level above the surface, when tapped by a bore, without need for pumping.

### *Artesian Pressure*

Hydrostatic pressure of artesian water, typically exceeding atmospheric pressure.

***Bank Filtration***

The naturally occurring influx of surface water to a groundwater store, via the bed and banks of a surface water body. Takes advantage of existing geological formations adjacent to water bodies to filter drinking water.

***Basic Intrusive Rock***

Igneous rocks characterized by low silica content, generally less than 45 % SiO<sub>2</sub>, e.g., basalt.

***Bioturbation***

The displacement and mixing of sediment particles by plants and/or animals.

***Bore***

A narrow hole drilled into the ground, through which groundwater is extracted. Synonymous with terms such as borehole, waterbore, water well and well.

***Bore Yield***

The amount of water which can be abstracted from a bore (either by pumping or natural artesian flow) over a specific time interval frame. Bore yields are usually measured in litres per second, although imperial measurements such as gallons per hour are also commonly used.

***Calcarenite***

A mechanically deposited carbonate rock made up of fragments of organic carbonate or pre-existing limestone rock, with a grain size between 0.625mm – 2mm.

***Clast***

A rock fragment or grain resulting from the breakdown of larger rocks.

***Colluvial***

A poorly consolidated deposit of rock debris which has accumulated through the action of gravity near the base of a cliff or slope. Colluvial rock fragments are commonly angular, reflecting minimal transportation from source, and may have a wide size distribution.

***Confined Aquifer***

An aquifer which is overlain and underlain by impervious layers (such as aquitards or aquifuges), and is not associated with the water table.

***Craton***

A major structural feature of the Earth's crust, consisting of a large stable mass of rock.

***Curnamona Province***

A 300km by 300km block of shallow to outcropping basement rocks that extends from Olary, in the northeast of South Australia, 450 kilometres north east of Adelaide, to east of Broken Hill across the New South Wales border.

### ***Darling Geological Basin***

The composite name given to a group of at least 7 sedimentary sub-basins (troughs) in central-western NSW which cover an area of over 100,000 km<sup>2</sup>. The sub-basins are infilled with up to 8000 metres of mainly Devonian age clastic sedimentary rocks which were originally deposited in a wide range of environments, ranging from alluvial to deep marine

### ***Embayment***

Of, or similar to, a bay or bay-like shape.

### ***Ephemeral Stream***

A stream that has flowing water only during, and for a short duration after, precipitation events.

### ***Epicratonic***

Relating to basins which lie on the edge of continental crust; by definition, they tend to be embayed toward the adjacent ocean basin.

### ***Ferruginised***

Geological material which has gained iron following its original method of formation. Commonly, iron-rich groundwater solutions may precipitate iron under favourable hydrochemical conditions.

### ***Fluvial***

Of, or referring to, a river, including the organisms within a river or the landforms produced by river action. Fluvial deposition comprises material worked or deposited by rivers, fluvial geomorphology is the study of the morphology of river landforms, and fluvial processes include flow processes and sediment and solute transport in rivers. Fluvial erosion consists of: the destruction of bedrock on the sides and bottom of the river; the erosion of channel banks; and the breaking down of rock fragments into smaller fragments.

### ***Fold Belt***

A region in which rocks have been subject to similar phases of deformation resulting in folding and faulting.

### ***Fractured Rock Aquifer***

Aquifers which store groundwater in the fractures, joints, bedding planes and cavities of the rock mass. Water availability is largely dependent on the nature of the fractures and their interconnection.

### ***Gaining Stream***

A stream or river-reach into which groundwater flows via the stream bed and/or banks.

### ***Geological Basement***

Rock mass below a sedimentary platform or cover; or more generally, any rock below sedimentary rocks or sedimentary basins that are metamorphic or igneous in origin.

### ***Geologic/Geomorphic Province***

A spatially distinct entity with common geologic/geomorphic attributes. A province may include a single dominant structural element such as a basin or a fold-belt, or a number of contiguous related

elements. Adjoining provinces may be similar in structure but be considered separate due to differing histories. The concept of a geologic province may also be transferred to a hydrogeologic province.

### ***Geological Time Scale***

A subdivision of time based on rock types and the fossils found within each one.

### ***Gigalitre***

1000 megalitres

### ***Gneiss***

A banded or foliated metamorphic rock, typically of the same composition as granite

### ***Granitoid***

Of, or pertaining to, a granitic rock type.

### ***Great Artesian Basin***

A multi-layered, confined aquifer system with aquifers occurring in continental quartzose sandstones deposited during the Triassic, Jurassic and Cretaceous periods (225- 65 million years ago). Underlying an area of approximately 1.7 million km<sup>2</sup>, the GAB extends beneath the arid and semi arid regions of Queensland, New South Wales, South Australia and the Northern Territory to depths of up to 3000m

### ***Groundwater***

Water stored below ground within the pore spaces or fractures of a rock mass.

### ***Groundwater Management Unit***

A hydraulically connected groundwater system that is defined and recognised by State and Territory agencies. This definition allows for management of the groundwater resource at an appropriate scale at which resources issues and intensity of use can be incorporated into groundwater management practices.

### ***Head***

A measurement of water pressure representing the total energy at the entrance of a piezometer. Usually measured as a water surface elevation. Differences in Head between two or more points can be used to determine hydraulic gradient and direction of groundwater flow. Synonymous with Hydraulic Head.

### ***Hydraulic Conductivity(K)***

Hydraulic conductivity is the volume of water flowing through a 1 m. x 1 m. cross-sectional area of an aquifer under a hydraulic gradient of 1 m/1 m (100%) in a given amount of time (usually a day).

### ***Hydraulic Gradient***

With regard to an aquifer, the rate of change of pressure head per unit of distance of flow at a given point and in a given direction.

### ***Infrabasin***

An older sedimentary basin situated beneath a younger sedimentary basin.

### ***Isopach***

A line joining points of equal bed thickness, usually pertaining to bedded sedimentary rocks.

### ***Isotope***

A different chemical species of a chemical element with a different atomic mass. Used in hydrogeologic applications to date and understand the origin evolution of groundwater.

### ***Lacustrine***

Of, or referring to, lakes, especially in connection with sedimentary deposition. Lacustrine plains result from the in-filling of a lake, while lacustrine terraces result from the formation of beaches along the shoreline of a former lake.

### ***Losing Stream***

A stream or river reach along which surface water leaks through the stream bed into an underlying aquifer.

### ***Lower Greenschist Facies***

Greenschist, as a rock type, is defined by the presence of the minerals chlorite + actinolite +/- albite +/- epidote. Greenschist Facies is determined by the particular T-P conditions required to metamorphose basalt to form the typical greenschist facies minerals chlorite, actinolite, and albite. Greenschist facies results from low temperature, moderate pressure metamorphism. Lower temperatures (forming 'lower greenschist facies' metamorphic rocks) are transitional with and overlap the prehnite-pumpellyite facies.

### ***Lunette***

A wind-formed (aeolian), crescent-shaped dune, commonly formed around the margins of lakes.

### ***Marl***

A calcareous mudstone.

### ***Megalitre***

1,000,000 litres

### ***Metamorphic Rock***

Rocks which have been altered from their original form by pressure, heat or chemical processes beneath the Earth's surface.

### ***Metavolcanic Rock***

A rock which originally formed by volcanic processes (e.g., volcanic eruption), but has subsequently undergone metamorphic alteration to the primary crystals and rock fabric.

### ***Migmatite***

A rock of both metamorphic and igneous origin that exhibits characteristics of both rock types. Migmatites probably form through the heating (but not melting) of rocks in the presence of abundant fluids.

### ***Mound Springs***

Unique artesian water discharge features of the Great Artesian Basin in arid areas of Australia, which have, over the course of millennia, formed by the deposition of water-borne minerals.

### ***Murray Geological Basin***

A saucer-shaped intracratonic sedimentary basin infilled with up to 550 metres of flat-lying sediments. Sediment deposits are of variable Cenozoic age (< 65 million years old) and include sands, silts and gravels. Importantly, the boundaries of the Murray Geological Basin do not correspond with the present-day boundary of the Murray-Darling surface water drainage basin.

### ***Normal Fault***

A fault characterised by the downward movement of the hanging wall relative to the footwall, generally occurring in places where the lithosphere is being stretched (also called an 'extensional dip-slip fault').

### ***Onlapping***

A type of overlap characterized by regular and progressive pinching out of the strata toward the margins of a depositional basin; each unit transgresses and extends beyond the point of reference of the underlying unit.

### ***Palaeovalley***

The preserved remnants of an ancient drainage system, now infilled with sediment and no longer forming an active surface drainage feature. Palaeovalleys are however commonly active groundwater systems.

### ***Palynology***

The study of palynomorphs and other acid-resistant microfossils usually produced by plants, protists, and fungi.

### ***Paralic***

A sedimentary basin developed in marginal marine environments e.g., lagoons.

### ***Pegmatite***

A coarse-grained, intrusive igneous rock (typically granitic) containing large crystals, formed from a water-rich magma.

### ***Pelecypod***

Marine bivalve mollusc (with two shells) related to clams, mussels and scallops.

### ***Permeability***

The ability of a material, such as rock or sediment, to allow the passage of a liquid, such as water. Permeable materials, such as gravel and sand, allow water to move quickly through them, whereas impermeable materials, such as clay, are effectively barriers to hydraulic flow.

### ***Piezometer***

A small diameter bore used specifically to monitor water levels or hydraulic head within an aquifer.

### ***Plutonic Rock***

An intrusive igneous rock believed to have solidified deep within the Earth.

### ***Porosity***

A measure of the water-bearing capacity of subsurface rock. With respect to water movement, it is not just the total magnitude of porosity that is important, but the size of the voids and the extent to which they are interconnected, as the pores in a formation may be open, or interconnected, or closed and isolated. For example, clay may have a very high porosity with respect to potential water content, but it constitutes a poor medium as an aquifer because the pores are usually so small.

### ***Potentiometric Surface***

A surface which represents the hypothetical level that water under pressure, within a confined aquifer, would rise to if tapped by a bore.

### ***Pump Test***

A hydrological assessment; undertaken when an aquifer is 'stressed' by pumping or injecting water and noting the water drawdown level over space and time.

### ***Quartzofeldspathic Metasedimentary Rock***

A type of metamorphic rock which was originally of sedimentary origin, and which contains mainly quartz and feldspar as the dominant mineral types.

### ***Recharge***

The entry into the saturated zone of water made available to the water table surface, together with associated flow away from the water table within the saturated zone.

### ***Regolith***

A broad term which describes the materials that occur above and adjacent to unweathered bedrock. This includes poorly consolidated to unconsolidated sediments formed by alluvial, colluvial or aeolian processes, fractured and weathered bedrock, evaporites, calcrete, silcrete and soil etc.

### ***Regression***

A term used in geology, to mean the withdrawal of the sea from a large area of land within a relatively short period of time (geologically speaking).

### ***Rock Matrix***

The solid rock material in which a fossil, crystal or clast is embedded.

### ***Shear Zone***

A planar zone of high strain and/or deformation compared to adjacent domains

### ***Sinistral fault***

A fault characterised by left-lateral movement between the opposing sides of the rock mass.

### ***Spring***

A naturally occurring groundwater discharge feature.

### ***Sub-Artesian Aquifer***

An aquifer containing groundwater under pressure, that rises to a level greater than that at which it is first encountered, when tapped by a bore, but does not reach the surface.

### ***Sustainable Yield***

The level of groundwater extraction measured over a specified planning timeframe that would, if exceeded, compromise key environmental assets, ecosystem functions or the productive base of the resource associated with the aquifer. Also referred to as the environmentally sustainable level of extraction.

### ***Talus***

A sloping mass of rock fragments at the foot of a cliff.

### ***Terrane***

A fragment or block of crust with an individual geological history that differs from the surrounding areas, representing a specific depositional or volcanic setting responding to a particular tectonic event. Terranes are typically bounded by faults.

### ***Terrigenous***

Shallow marine sediments consisting of material derived from the land surface.

### ***Total Dissolved Solids***

A measure of the amount of material dissolved in water (mostly inorganic salts). The common and synonymously used term for TDS is "salt". Usually expressed in milligrams per litre.

### ***Transgression***

A term used in geology, to mean the invasion of a large area by the sea within a relatively short period of geologic time.

### ***Transmissivity(T)***

The capacity of a rock to transmit water under pressure. Expressed as the volume of water flowing through a cross-sectional area of an aquifer that is 1m x the aquifer thickness under a hydraulic gradient of 100% in a given amount of time (usually a day). Transmissivity is equal to the hydraulic conductivity (K) times the aquifer thickness.

### ***Unconfined Aquifer***

A type of aquifer in which the upper boundary is defined by the water table. Unconfined aquifers are recharged directly from the ground surface.

### ***Unincorporated Area***

Groundwater resources located outside of groundwater management units within each jurisdiction. Unincorporated areas may be defined on the basis of a hydrogeological basin or aquifer type.

### ***Wonominta Block***

A geological feature located in western New South Wales consisting of poorly to moderately exposed Palaeozoic and older rocks, covering an area of over 20 000 km<sup>2</sup>.