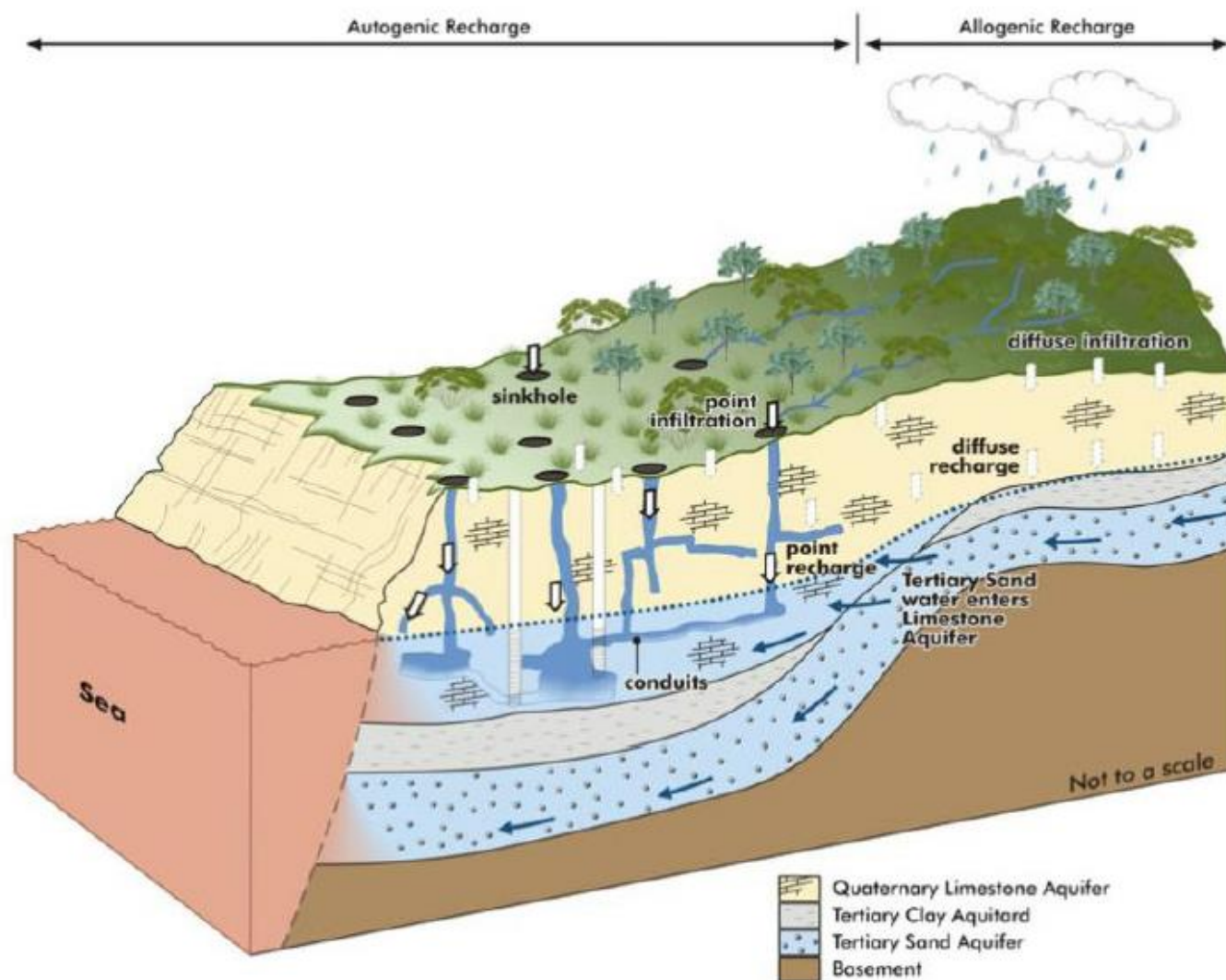




Uley South conceptual model.

Source: Environ Earth Sci DOI 10.1007/s12665-015-4038-y, pg6

HOW DOES GROUNDWATER WORK? (Conceptual model explanation)

Where the groundwater comes from

The groundwater resources in the Southern Basins (near Port Lincoln) and the Musgrave area (near Elliston) are fed by local rainfall.

They are not like the Great Artesian Basin in northern SA, which is fed by water that comes from as far away as Queensland.

Quaternary Limestone Aquifer (shown in yellow)

Local rainfall soaks into the soil and runs down smaller holes and larger sinkholes into a layer of porous calcareous and sandy material, which is called the Quaternary Limestone Aquifer.

This aquifer has good water quality (400 – 1,800 milligrams per litre or parts per million) and good well yields (flow rates) (5 – 50 litres per second).

Our drinking water comes from this aquifer, along with local stock and domestic water, and some other agricultural and industrial groundwater use.

Tertiary Clay Aquitard (shown as a grey layer)

The water is held up in the limestone aquifer by an underlying layer of clay, called the Tertiary Clay Aquitard.

Tertiary Sand Aquifer (shown in dotted blue)

Underneath the clay is the Tertiary Sand Aquifer, made up of quartz sand, silt, and clay.

This has saltier water (500 – 7,500 mg/L) and lower well yields (< 0.5 L/s). Water is taken from this aquifer, but the lower water quality and well yields limit its use.

Basement (shown in brown)

The lowest layer is the Basement, which is the underlying bedrock.

Some locations have carbonate rocks over quartzite, with holes in the carbonate rocks holding groundwater.

In other areas, granite bedrock can have fractures that also hold groundwater.

In both cases, the availability of any groundwater, as well as the well yields and salinity, are difficult to predict, due to the variable nature of these solution channels and fractured rock zones.

Saltier water affecting the Quaternary Limestone Aquifer

Seawater seeps inland, through porous material in aquifers and through holes in the limestone – this is a natural occurrence. The saltier water is denser, so it sits underneath the fresher water.

If too much water is pumped out of the limestone, the seawater can be drawn up into the Quaternary Limestone Aquifer, making it saltier.

This can also happen with the saltier water from the underlying Tertiary Sand Aquifer, which can leak upwards where the clay layer is absent.