



## Sydney Environmental & Soil Laboratory

Specialists in Soil Chemistry, Agronomy  
and Contamination Assessments

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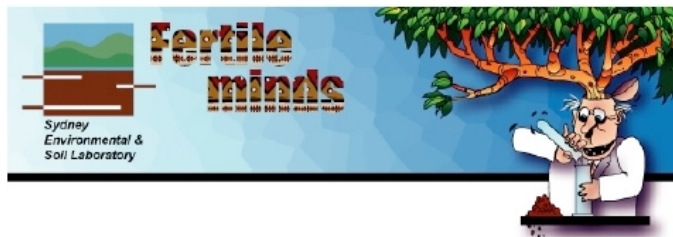
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### DID YOU KNOW ... ? – PARAFIELD STORMWATER HARVESTING FACILITY, SA

Being the driest inhabited continent on Earth, Australia has had to rely on groundwater for drinking, watering stock and irrigation. The Great Artesian Basin, underlying most of Queensland, south-eastern NT, north-eastern SA and northern NSW, is the largest and deepest artesian basin in the world, covering 1.7 million km<sup>2</sup>, or 23% of the continent. It is estimated to hold nearly 65 000 km<sup>3</sup> of groundwater. This groundwater is drawn up faster than it is replenished (mostly along the Great Dividing Range). The oldest water, found in the south-west of the basin, has been dated at about 2 million years.

Before white settlement, an estimated 1040 ML of water entered the Great Artesian Basin in Queensland alone each day. This, plus the inflow from other regions, discharged as surface springs. In contrast, the current total outflow from the basin is about 1500 ML a day. Consequently, the water of the basin is in effect being mined, and both flow rates and groundwater levels have declined.

But what if we could replenish groundwater as a reserve against drought?

#### GROUNDWATER RECHARGE IN ADELAIDE

An innovative project in Adelaide was begun in 1999 to recharge groundwater with stormwater runoff that was previously lost to sea. Stormwater is often polluted with human and animal wastes. The project aimed to prevent the loss of the fresh water to the sea, clean it, store it for industrial use and irrigation, conserve drinking water, and support wildlife.

The Parafield Stormwater Harvesting Facility, as it became, arose from concerns of G. H. Michell & Sons, Australia's largest wool processing company, over the rising costs of fresh water to wash its wool and of wastewater disposal. The company did not want to relocate, at the cost of 700 local jobs. Instead, the City of Salisbury Council created a series of weirs and wetlands to harvest the stormwater for use in place of fresh water.

#### WETLANDS

Stormwater is diverted from the main stormwater drain in Parafield to a 50-ML capture basin. From there, it is pumped to a similar-sized holding basin, from where it runs by gravity to a 2-ha reed bed, where bacteria are destroyed by sunlight and the plants take up the nutrients. These loads are typically reduced by up to 90%.

The stormwater is injected underground into porous rock for long-term storage through 2 bores, 180 m deep. When it is needed, it is pumped up again and used for watering parks and sporting fields and for industrial processes that don't need high-quality drinking water.

Additional stormwater is passed through a series of more than 30 wetlands to slow the flow and to allow pollution to settle out. The wetlands, covering 260 ha, provide habitat for wildlife and places for recreation.

In retaining the stormwater, the project prevents the transfer of pollutants into Barker Inlet, on the Gulf of St Vincent, which is noted for its mangroves, seagrass meadows and dolphins. The creation of the wetlands has helped to rehabilitate Barker Inlet while providing cheaper water to industry and others.

#### SYDNEY POTENTIAL

Sydney has a rainfall of around 1200 mm a year, or 1200 L/m<sup>2</sup>. In a concreted city, around 90% of rainfall runs off: say 1080 L/m<sup>2</sup> a year in Sydney. If we assume that central Sydney measures 2 km × 1 km, the runoff amounts to 2160 ML. This is about 1 1/3 days' use by the entire Sydney Metropolitan supply area. Given that the entire area of Metropolitan Sydney is about 12 000 km<sup>2</sup>, much of which is paved, runoff alone in Sydney could supply all of the city's needs.

#### FURTHER INFORMATION

City of Salisbury, SA. [Stormwater Harvesting and Utilisation in the City of Salisbury.](#)

City of Salisbury, SA. [Parafield Stormwater Harvesting Facility.](#)

Dept of Natural Resources and Water, Qld. 2008. [The Great Artesian Basin.](#)

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