
MALLEE PWA

MURRAY GROUP LIMESTONE AQUIFER

Groundwater Level and Salinity Status Report

2013



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2013 SUMMARY



The Mallee Prescribed Wells Area (PWA) is located about 150 km east of Adelaide and is underlain by sediments of the Murray Basin. It is a regional-scale resource for which groundwater resources are prescribed under South Australia's *Natural Resources Management Act 2004*. A water allocation plan provides for the sustainable management of the groundwater resources.

There are three main aquifer systems in the Mallee Prescribed Wells Area, namely the Renmark Group confined aquifer, the semi-confined Murray Group Limestone aquifer and the unconfined Pliocene Sands aquifer. All licensed groundwater extractions in the Mallee PWA are from the Murray Group Limestone aquifer, primarily where the aquifer is confined in the northeast of the PWA. The Murray Group Limestone aquifer comprises a consolidated, highly fossiliferous fine to coarse bioclastic limestone which

has an average thickness of 100 m. The Murray Group Limestone aquifer is recharged in southwest Victoria, with groundwater movement from this area towards the north, northwest and west of the Mallee PWA. Metered extractions in the 2012–13 water user year totalled 36 941 ML, a 16% increase in use compared to the previous year (Fig. 1). This may reflect below the long-term annual average rainfall in 2013 (Fig. 2).

The climate of the Mallee region is characterised by hot, dry summers and cool, wet winters. Data recorded at Pinnaroo rainfall station (25015) was chosen for analysis of rainfall trends in 2013. In Figure 2, the long-term monthly average rainfall is graphed in orange with the total monthly rainfall graphed in blue. In 2013, the total annual rainfall was 296 mm, 12% below the long-term (1889-2013) annual average of 336 mm. The large depth to the watertable (40–60 m) means that there is little direct correlation between groundwater levels and variations in rainfall. However, there can be an indirect correlation, with lower rainfall resulting in increased groundwater pumping, which in turn may lead to a decline in groundwater levels. Rainfall data used in this report is sourced from the SILO Patched Point Dataset, which uses original Bureau of Meteorology daily rainfall measurements and is available online at www.longpaddock.qld.gov.au/silo.

Long-term monitoring has recorded declines as a result of irrigation withdrawals from the Murray Group Limestone aquifer. Declines are greater in areas of concentrated pumping which primarily occurs in the Border Groundwater Agreement Zones 10A and 11A (Fig. 3). Between 2000 and 2006 equilibrium was reached, indicated by stable water level trends. However, this was followed by an increase in seasonal drawdowns from 2007 to early 2009 in response to drought-induced increases in extraction. Although an overall rise in groundwater level was recorded between 2009–2011, the area recorded a general decline in 2012.

A comparison of the maximum recovered groundwater levels of the Murray Group Limestone aquifer recorded in 2012 and 2013 indicates that the majority of observation wells (46 out of 55) have experienced a decline in groundwater level of up to 3.31 m (Fig. 3). The observation wells in the Paruna area in the northern part of the PWA registered the largest water level declines. A localised area of recovery was observed in the Pinnaroo area in the eastern part of PWA where rises recorded in nine wells ranged from 0.05 to 0.48 m. The median change observed in the monitoring well network over this period was a decline of 0.17 m. The overall decline in levels may be attributable to increased extraction from the resource.

As groundwater is an important source of water in the Mallee Prescribed Wells Area, increases in salinity represent the greatest risk to the resource. Salinity monitoring in the confined portion of the MGL aquifer where the majority of irrigation occurs has shown no significant changes over the past 20 to 30 years. In 2013, salinity concentrations were monitored in 163 wells, mostly in the eastern confined portion of the Mallee PWA (Fig. 4). Groundwater salinity ranged between 522 and 3788 mg/L, with 69 % of

monitored wells recording concentrations of less than 1500 mg/L. Of the 33 observation wells that have sufficient records, 17 observed an increase in salinity in 2013 when compared to 2012 data.

The Mallee PWA Water Allocation Plan has identified resource condition limits to determine if the taking of water has a detrimental effect on the quantity or quality of the underground water resource. The recent monitoring of groundwater confirms that the resource condition limits have not been reached or exceeded.

The Murray Group Limestone aquifer in the Mallee Prescribed Wells Area has been assigned a yellow status for 2013:

2013 STATUS "Gradual adverse trends, indicating low risk to the resource in the medium term"

This means that gradual adverse trends in resource status have been observed over the reporting period. Continuation of these trends is unlikely to negatively impact the beneficial use (i.e. drinking water, irrigation or stock watering) of the resource for at least 15 years. The 2013 status for the Murray Group Limestone aquifer is supported by:

- an overall decrease in the maximum recovered groundwater level when compared to 2012 groundwater level data
- no significant change in groundwater salinity when compared to 2012 salinity data.

To view the *Mallee PWA Groundwater Level and Salinity Status Report 2009–10*, which includes background information on hydrogeology, location of rainfall stations and relevant groundwater dependent ecosystems, and descriptions of all status symbols, please visit the Water Resources page on the [WaterConnect website](#).

For further details on the Mallee PWA, please see the *Mallee Prescribed Wells Area Water Allocation Plan* on the SA Murray-Darling Basin Natural Resources Management [website](#).

Mallee PWA: Murray Group Limestone aquifer annual groundwater extraction

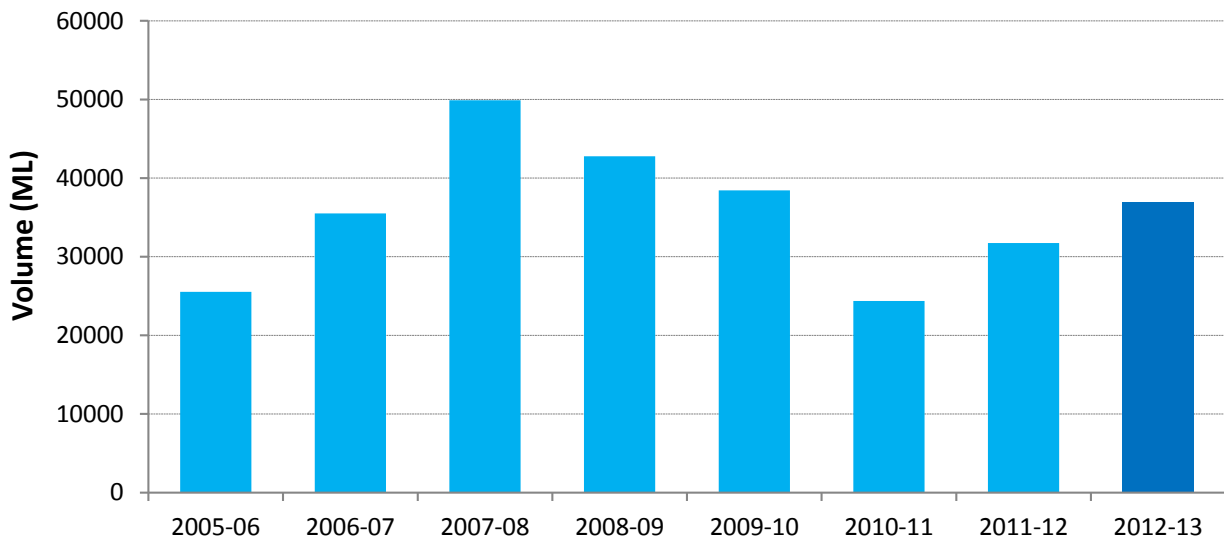


Figure 1. Historical licensed groundwater use for the Murray Group Limestone aquifer in the Mallee Prescribed Wells Area

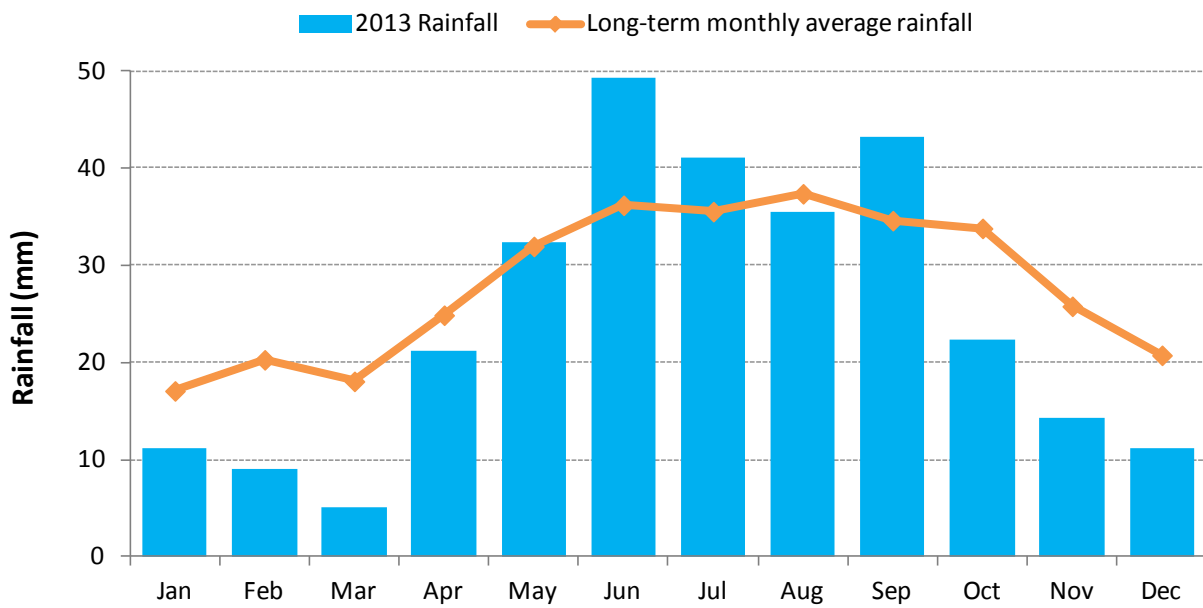
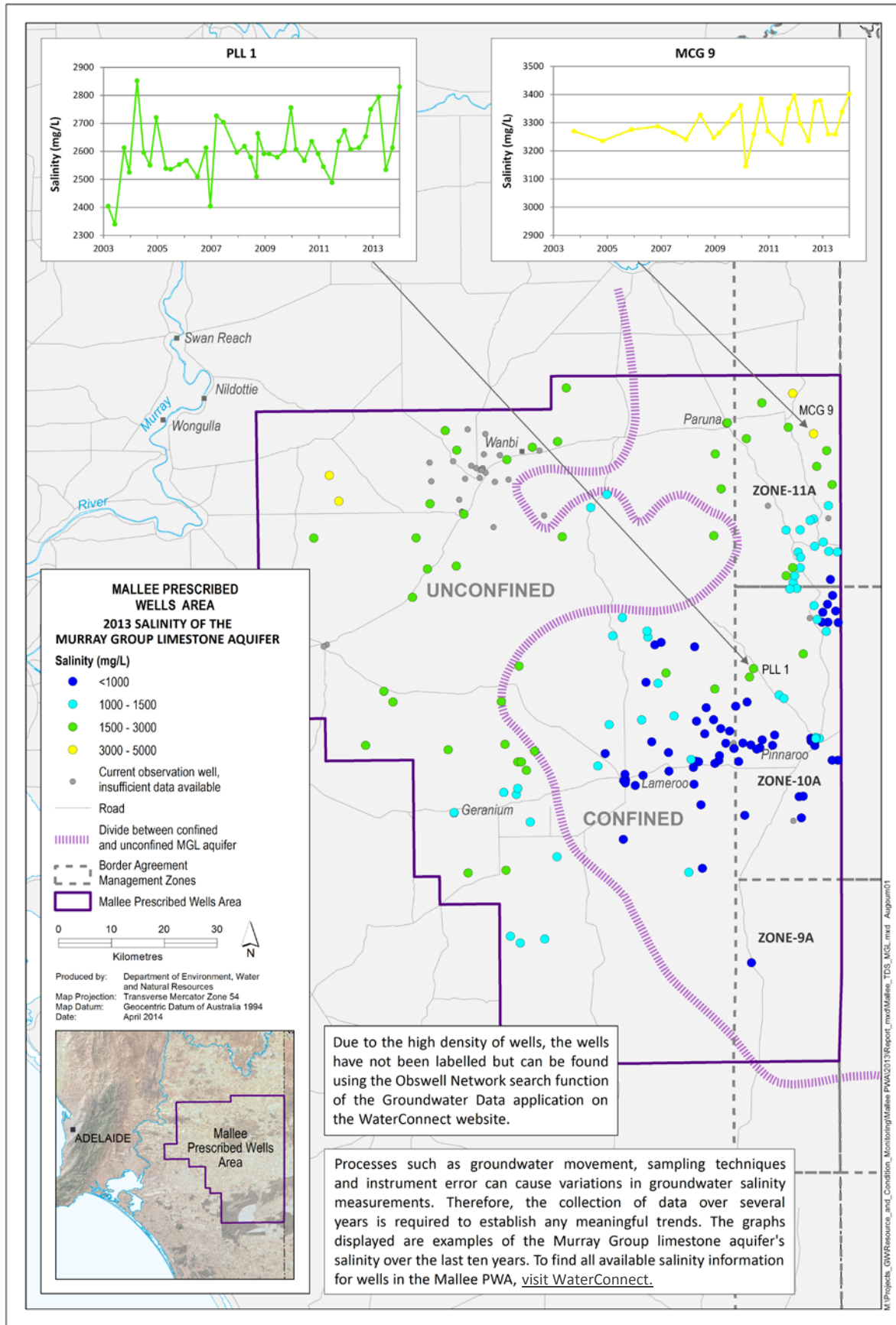


Figure 2. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at Pinnaroo (number 25015) in the Mallee Prescribed Wells Area



Mallee Prescribed Wells Area

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