MALLEE PWA

MURRAY GROUP LIMESTONE AQUIFER

Groundwater Level and Salinity Status Report

2012

Government of South Australia
Department of Environment,
Water and Natural Resources

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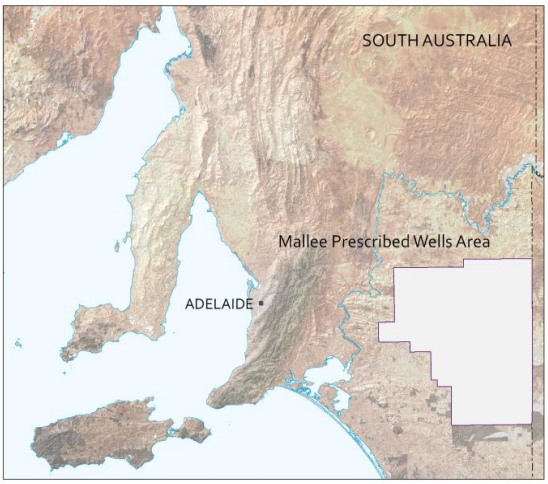
2012 SUMMARY



The Mallee Prescribed Wells Area 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 Prescribed Wells Area are from the Murray Group Limestone aquifer, primarily where the aquifer is confined in the northeast of the Prescribed Wells Area. 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 Prescribed Wells Area. 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 higher rainfall resulting in decreased groundwater pumping, which in turn may lead to a recovery in groundwater levels.

Metered extractions in the 2011–12 water user year totalled 31 736 ML, a 30% increase in use compared to the previous year (Fig. 1). This may reflect the below average rainfall during late-autumn and early-winter of 2012 (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 2012. In Figure 2 the long-term monthly average rainfall is graphed in orange with the total monthly rainfall graphed in blue. In 2012, the total annual rainfall was 215.7 mm, well below the long-term (1889-2012) annual average of 336.6 mm.

Long–term monitoring has recorded drawdowns as a result of irrigation withdrawals from the Murray Group Limestone aquifer. Drawdowns 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. A comparison of the maximum recovered groundwater levels of the Murray Group Limestone aquifer recorded in 2011 and 2012 indicates that the majority of observation wells (63 out of 75) experienced a decline in groundwater level ranging from <0.02–2.4 m. The rise recorded for 11 of the wells ranged from <0.02–0.43 m (Fig. 3).

Salinity concentrations were monitored in 17 of 61 monitoring wells in 2012, most in the eastern confined portion of the Mallee Prescribed Wells Area (Fig. 4). Observed salinity concentrations show continued long-term stable trends with few notable changes from previous readings.

The Murray Group Limestone aquifer in the Mallee Prescribed Wells Area has been assigned a yellow status for 2012:

2012 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 2012 status for the Murray Group Limestone aquifer is supported by:

- 84% of observation wells show a decline in the maximum groundwater levels recorded in 2012 when compared with 2011, however these declines are typical of a below average rainfall year, and does not pose an immediate risk to the resource
- Little observed change in salinity concentrations in the 17 wells that were monitored

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, visit WaterConnect.

To view descriptions of all status symbols, click here.

For further details about the Mallee PWA please see the *Water Allocation Plan for the Mallee Prescribed Wells Area*.

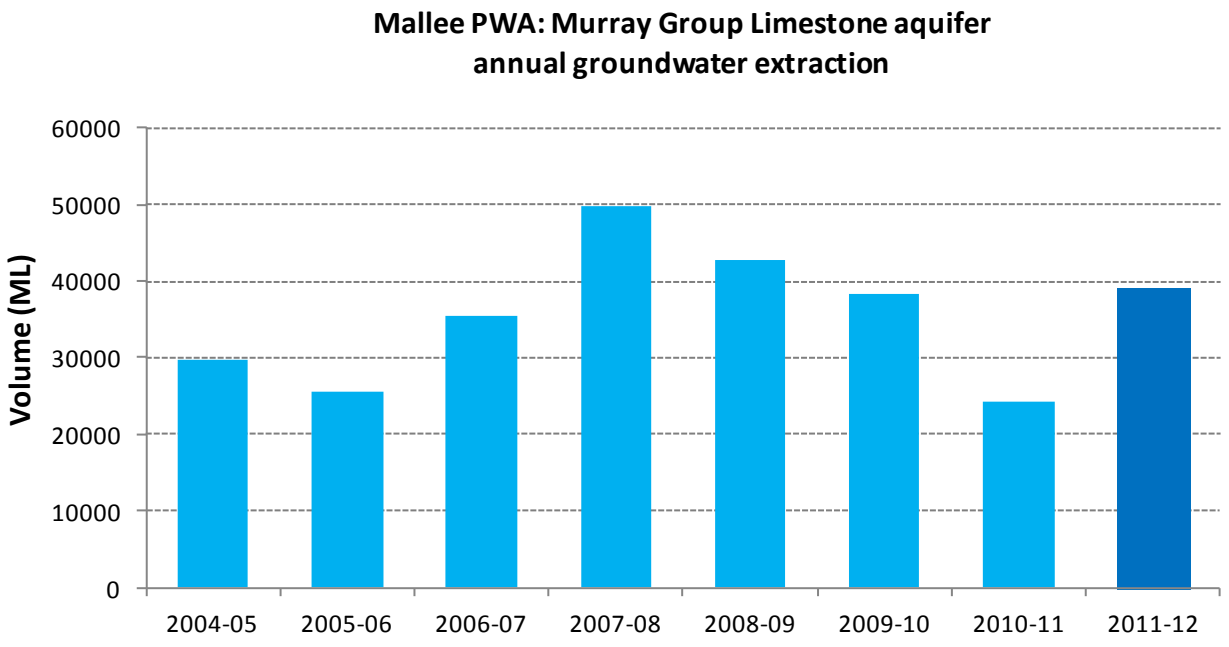


Figure 1. Historical licensed groundwater use for the Murray Group Limestone aquifer in the Mallee Prescribed Wells Area

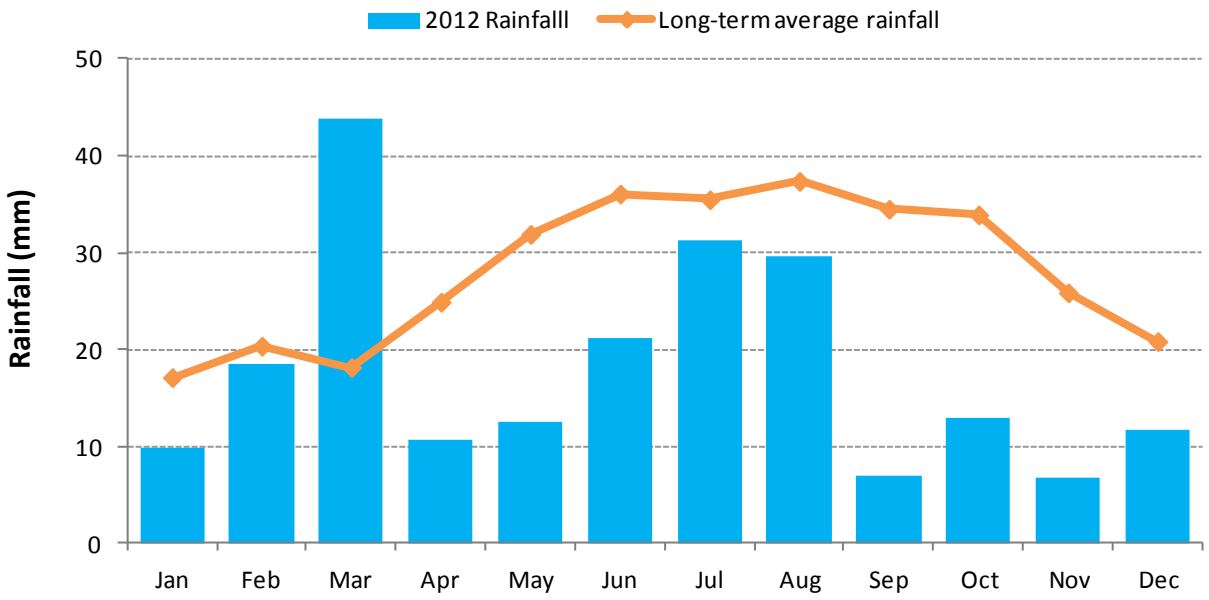


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at Pinnaroo (number 25015) in the Mallee Prescribed Wells Area

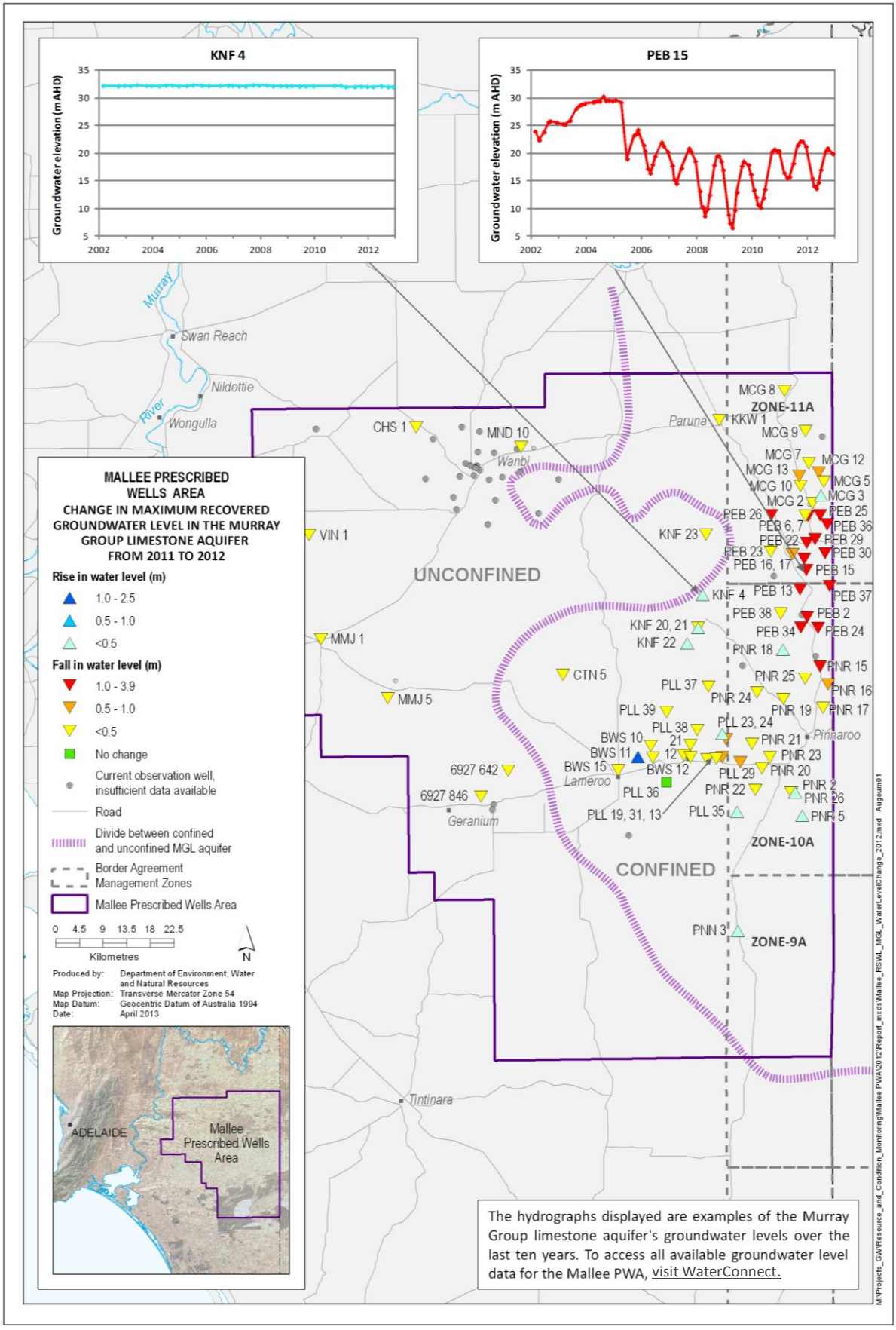


Figure 3. Changes in maximum groundwater levels in the Murray Group Limestone aquifer in the Mallee Prescribed Wells Area from 2011 to 2012

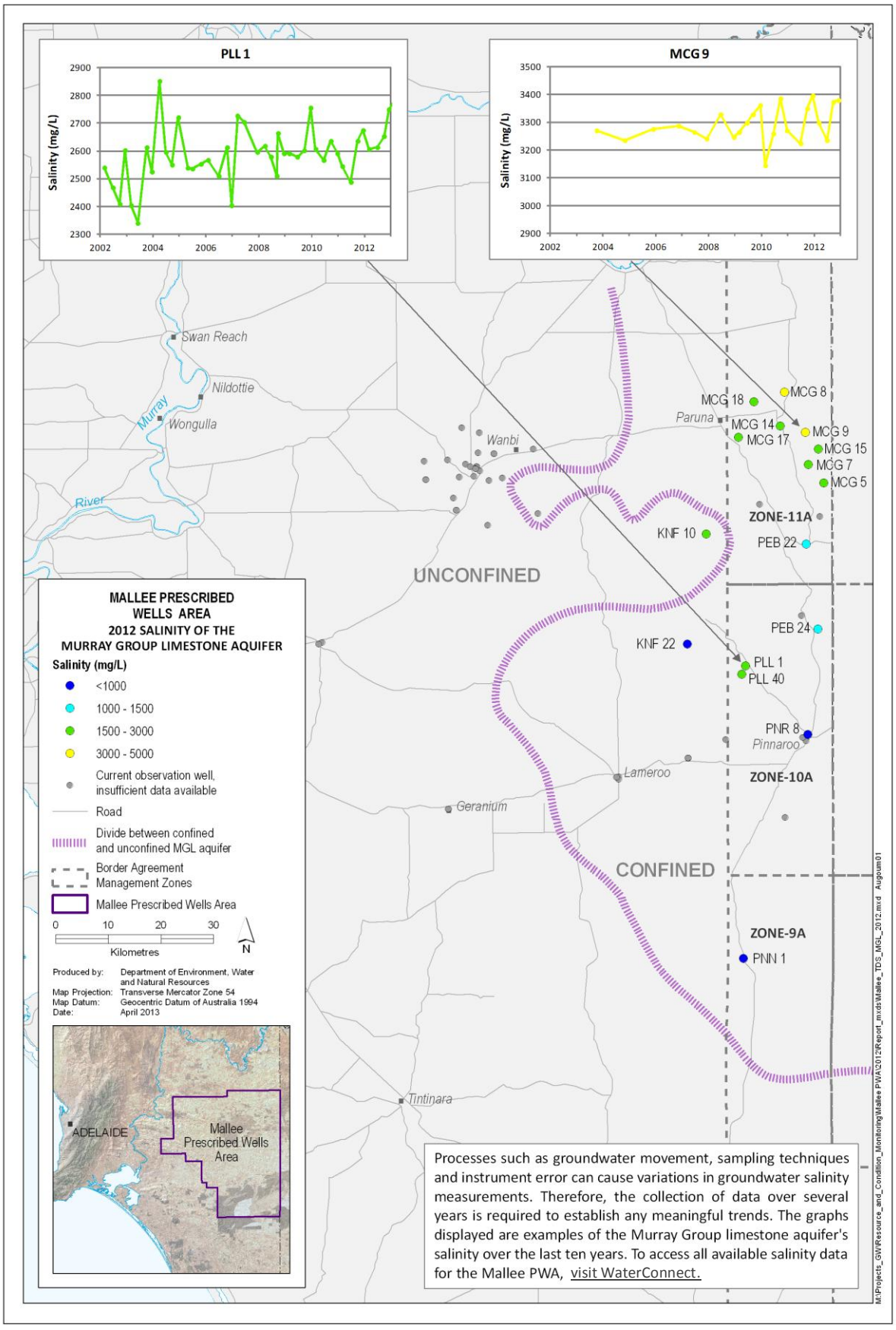


Figure 4. Groundwater salinity of the Murray Group Limestone aquifer in the Mallee Prescribed Wells Area for March 2012