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# MARNE SAUNDERS PWRA

## FRACTURED ROCK AQUIFER

Groundwater Level and Salinity Status Report

2012

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Water and Natural Resources

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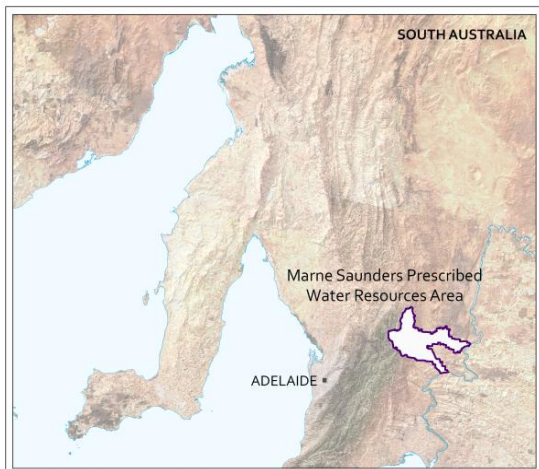
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# 2012 SUMMARY

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The Marne Saunders Prescribed Water Resources Area is located on the eastern side of the Mount Lofty Ranges about 60 km northeast of Adelaide. It is a regional scale resource for which surface water and groundwater are prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan provides for sustainable management of the water resources.

The Marne Saunders Prescribed Water Resources Area consists of two tributary catchments for the River Murray which can be divided into two distinct groundwater regions: the Hills Zone and the Plains Zone. The Hills Zone comprises the consolidated basement rock of the Mount Lofty Ranges which form Fractured Rock aquifers consisting of micaceous and feldspathic sandstones and siltstones of the Kanmantoo Group of Cambrian age. The metamorphic rocks are generally tight and impermeable with few

fractures and joints to store and transmit groundwater, consequently boreholes produce low well yields (2 L/s). The movement of groundwater within the catchment follow topographic contours flowing from high points to low points where discharge into streams occurs. Groundwater also moves eastward from the Range and discharges to the sedimentary aquifers in the Plains Zone. Recharge to the Fractured Rock aquifer of the Hills Zone occurs by rainfall percolation through the soil profile.

Metered extractions from the Fractured Rock aquifer declined from 2006-07 to 2010-11 in response to increased rainfall. In 2011-12 the total extraction was 307 ML which represents an increase of 124 percent from 2010-11 (Fig.1). This volume is still substantially less than the extraction in 2006-07. Extraction volumes are considered too low and dispersed to affect regional trends. Extraction from the Fractured Rock aquifer accounts for 21 percent of the total groundwater used in the Marne Saunders Prescribed Water Resources Area.

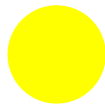
The climate of the Marne Saunders Prescribed Water Resources Area is characterised as Mediterranean with warm to hot, dry summers and mild, wet winters. Rainfall is highest in the Hills Zone at the western edge of the Prescribed Water Resources Area declining rapidly towards the east in the rain shadow of the Mount Lofty Ranges. Data from the Mount Pleasant rainfall station (number 23737) was chosen for the analysis of rainfall trends (Fig.2). The long-term monthly average rainfall is graphed in orange with the 2012 total monthly rainfall graphed in blue. In 2012, the total annual rainfall was 591 mm, below the long-term (1889-2012) annual average of 668 mm.

Due to the nature of the unconfined Fractured Rock aquifer water level responses can be highly variable. Over the past 5 years groundwater level trends have been stable to slightly declining. When comparing maximum recovered groundwater levels in the 22 observation wells across 2011 – 2012, water levels declined in 13, increased in one and eight had insufficient data for comparison.

Salinity is not monitored in the Marne Saunders Fractured Rock aquifer and therefore it has not been assessed.

The Fractured Rock aquifer in the Marne Saunders Prescribed Wells Area has been assigned a yellow status for 2012:

## 2012 STATUS



"Gradual adverse trends, indicating a 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 Fractured Rock aquifer is supported by:

- 93% of those wells which were observed showed a decline in maximum recovered water level when compared to 2011 data.

To view the *Marne Saunders PWRA Groundwater Level and Salinity Status Report 2011*, 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 Fractured Rock aquifer please see the [Water Allocation Plan for the Marne Saunders PWRA](#).

**Marne Saunders Prescribed Water Resources Area: Fractured Rock aquifer groundwater extraction**

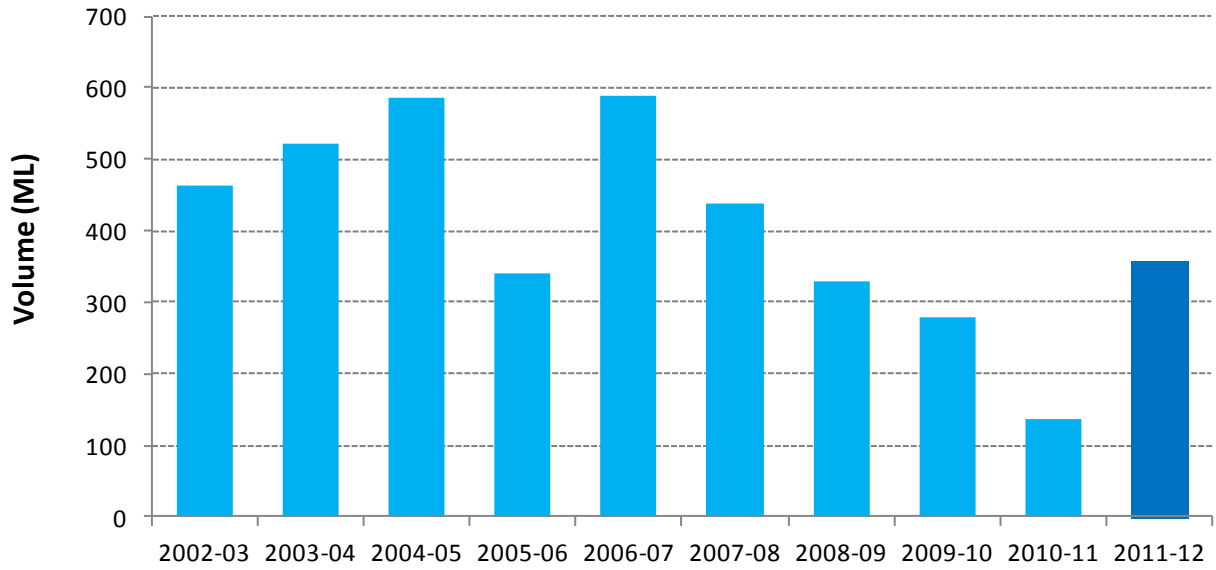


Figure 1. Historical licensed groundwater use for the Fractured Rock aquifer of the Marne Saunders Prescribed Water Resources Area

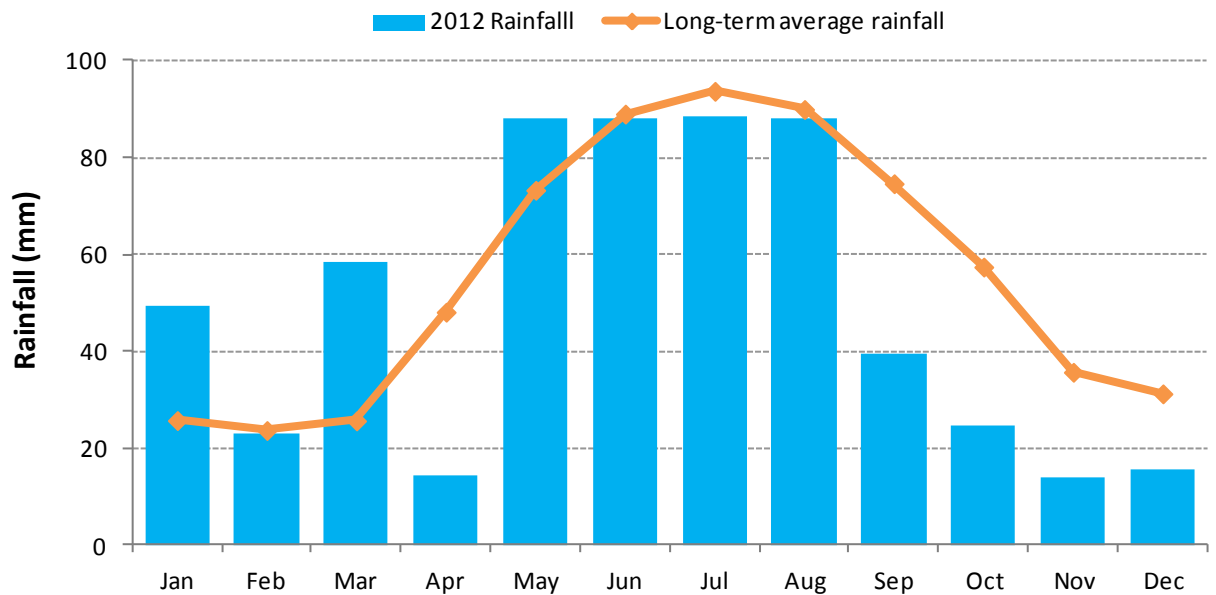


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Mount Pleasant rainfall station (number 23737) in the Marne Saunders Prescribed Water Resources Area

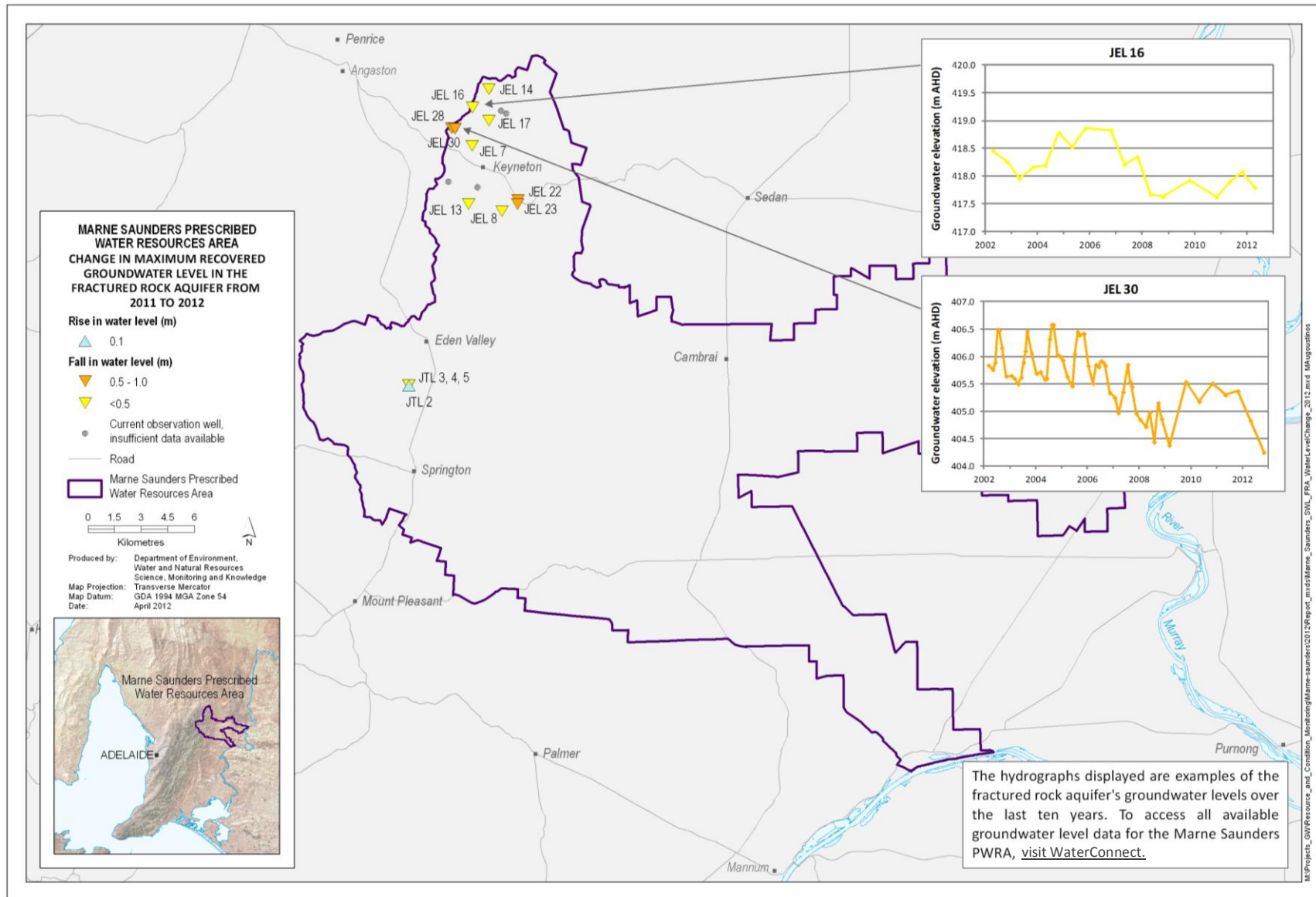


Figure 3. Overall changes in maximum groundwater levels in the Fractured Rock aquifer of the Marne Saunders Prescribed Water Resources Area from 2011 to 2012

Marne Saunders Prescribed Water Resources Area

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