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# MUSGRAVE PWA

## BRAMFIELD LENS

Groundwater Level and Salinity Status Report

2013

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Water and Natural Resources

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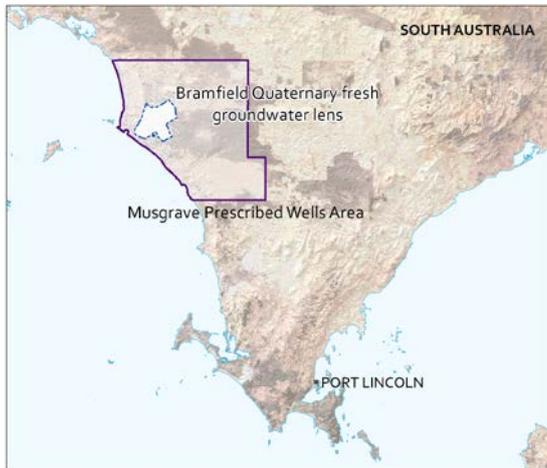
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# 2013 SUMMARY

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The Musgrave Prescribed Wells Area (PWA) is situated in central Eyre Peninsula, approximately 120 km north-west of Port Lincoln. It is prescribed under South Australia's *Natural Resources Management Act 2004* and a Water Allocation Plan provides for the sustainable use of the groundwater resources. The Bramfield lens is situated in the west of the Musgrave PWA.

Within the Musgrave PWA there are two main sedimentary sequences containing groundwater that overlie basement rocks: the Quaternary limestone aquifer and the underlying Tertiary sands aquifer. The Quaternary limestone aquifer comprises a generally thin veneer of aeolianite sediments of the Bridgewater Formation and is continuous across the PWA. Areas within the Quaternary limestone aquifer defined by salinity of less than 1 000 mg/L, such as the Bramfield lens, are described as a fresh groundwater lens in the current Water Allocation Plan. The main source of recharge to the Quaternary limestone aquifer is the direct infiltration of rainfall and groundwater flow is predominantly in a westerly to south-westerly direction towards the Southern Ocean.

Licensed groundwater extractions occur predominantly from the fresh groundwater lenses within the Quaternary limestone aquifer and the Bramfield lens has provided groundwater for the town water supply of Elliston since 1974. Metered extractions from the Bramfield lens in 2012–13 totalled 67 ML, a 26% decrease from the previous water-use year (Fig. 1). The actual extraction from the resource is likely to be slightly higher as use data for the one of the three licensed users was not collected in 2012-13 (in the previous year the use was 7.1 ML). This volume of extraction equates to 5.6% of the total allocation limit of 1 201 ML for the Bramfield lens and forms 99% of the total licensed extractions from the whole Musgrave PWA.

The sustainability of the groundwater resources in the Musgrave PWA is highly dependent on recharge from rainfall. Historical rainfall data has indicated that trends of above or below-average rainfall can last for up to 25 years and greater recharge responses have been observed when rainfall occurs in high-intensity events. The Elliston rainfall station (number 18069), located to the south-west of the Bramfield lens in the township of Elliston, recorded 486 mm of rain in 2013. This is 56 mm above the long-term average of 430 mm for this station. In 2013, rainfall was significantly above average in April and throughout winter with below-average rainfall recorded in other months (Fig. 2).

Wells monitoring the Bramfield lens show a steady decline in groundwater levels of 2 to 3 m over the past 20 years. Above-average rainfall in 2009 and 2010 resulted in a rise in water levels, particularly in the south of the lens. Water levels gradually declined in 2011 in response to average rainfall levels before recovering in 2012 following significantly above-average winter rainfall in the region. In 2013, this trend has continued with five out of six wells recording a rise in the maximum recovered groundwater level of up to 0.18 m when compared to 2012 water level data (Fig. 3). The one well recording a slight decline in levels (0.05 m) is located near the edge of the lens.

Observation wells show a variety of salinity trends over the historical record, with signs of freshening occurring after June 2009 in response to the increased recharge caused by the above-average rainfall received from 2009 to 2011. Salinities of between 500 and 1200 mg/L were recorded in 2013, though not all observation wells were sampled (Fig. 4). There was no significant change in salinity.

The Bramfield lens of the Musgrave PWA has been assigned a green status for 2013:

## 2013 STATUS



“No adverse trends, indicating negligible risk to the resource”

This means that the groundwater status was observed to be stable (i.e. no significant change) or improving over the reporting period. Continuation of these trends favours a very low likelihood of negative impacts on beneficial uses such as drinking water, irrigation or stock watering. The 2013 status for the Bramfield lens is supported by:

- an overall increase in the maximum recovered groundwater level in 2013 when compared to 2012 water level data
- no significant change in salinity in 2013 when compared to 2012 salinity data.

To view the *Musgrave PWA groundwater level and salinity status report 2012*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, and to view the descriptions of all status symbols, please visit the *Water Resources* page on [WaterConnect](#).

For further details about the Bramfield lens PWA, please see the *Water Allocation Plan for the Musgrave Prescribed Wells Area* on the Eyre Peninsula Natural Resources Management [website](#).

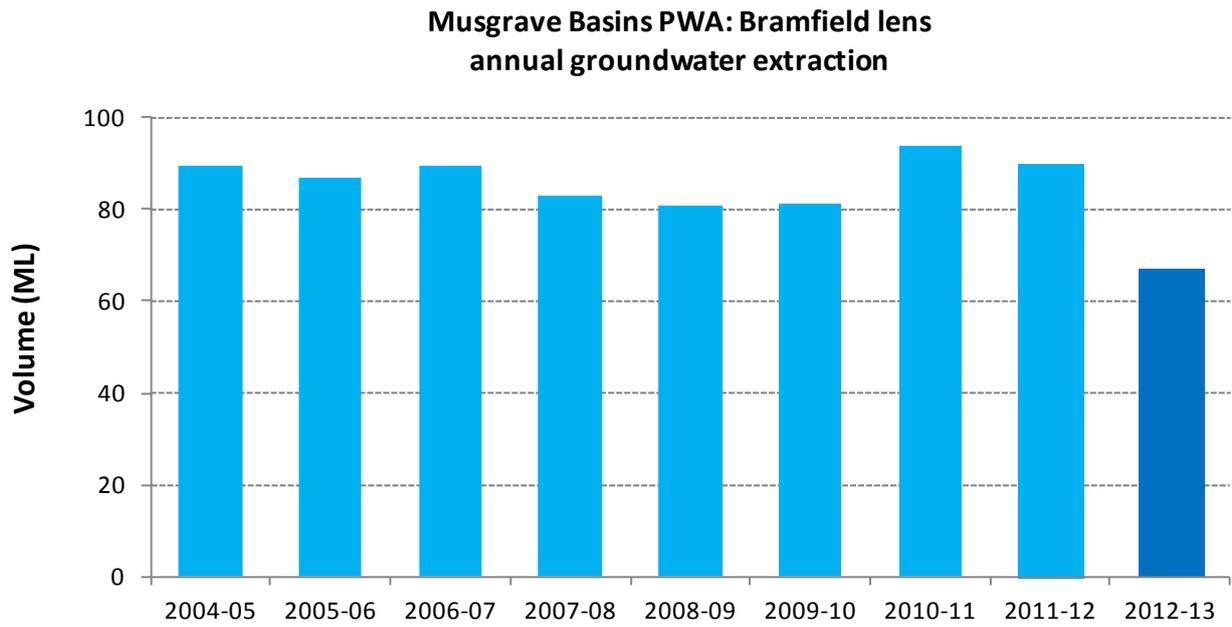


Figure 1. Historical licensed groundwater use for the Bramfield lens of the Musgrave Prescribed Wells Area

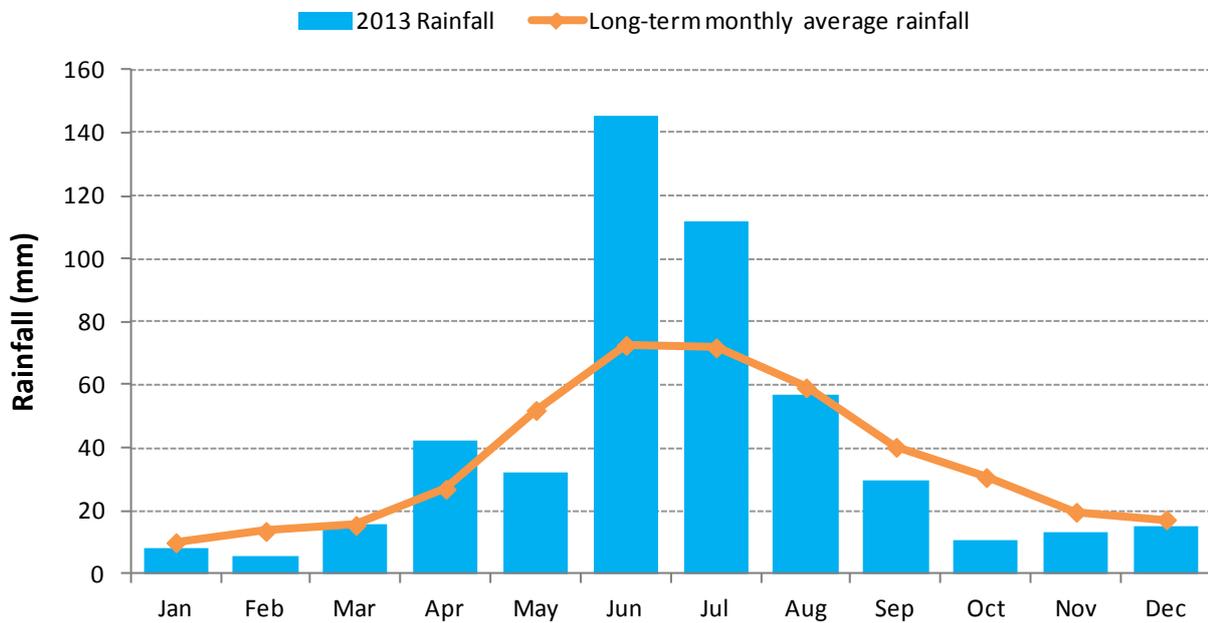


Figure 2. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Elliston rainfall station (number 18069) in the Musgrave Prescribed Wells Area

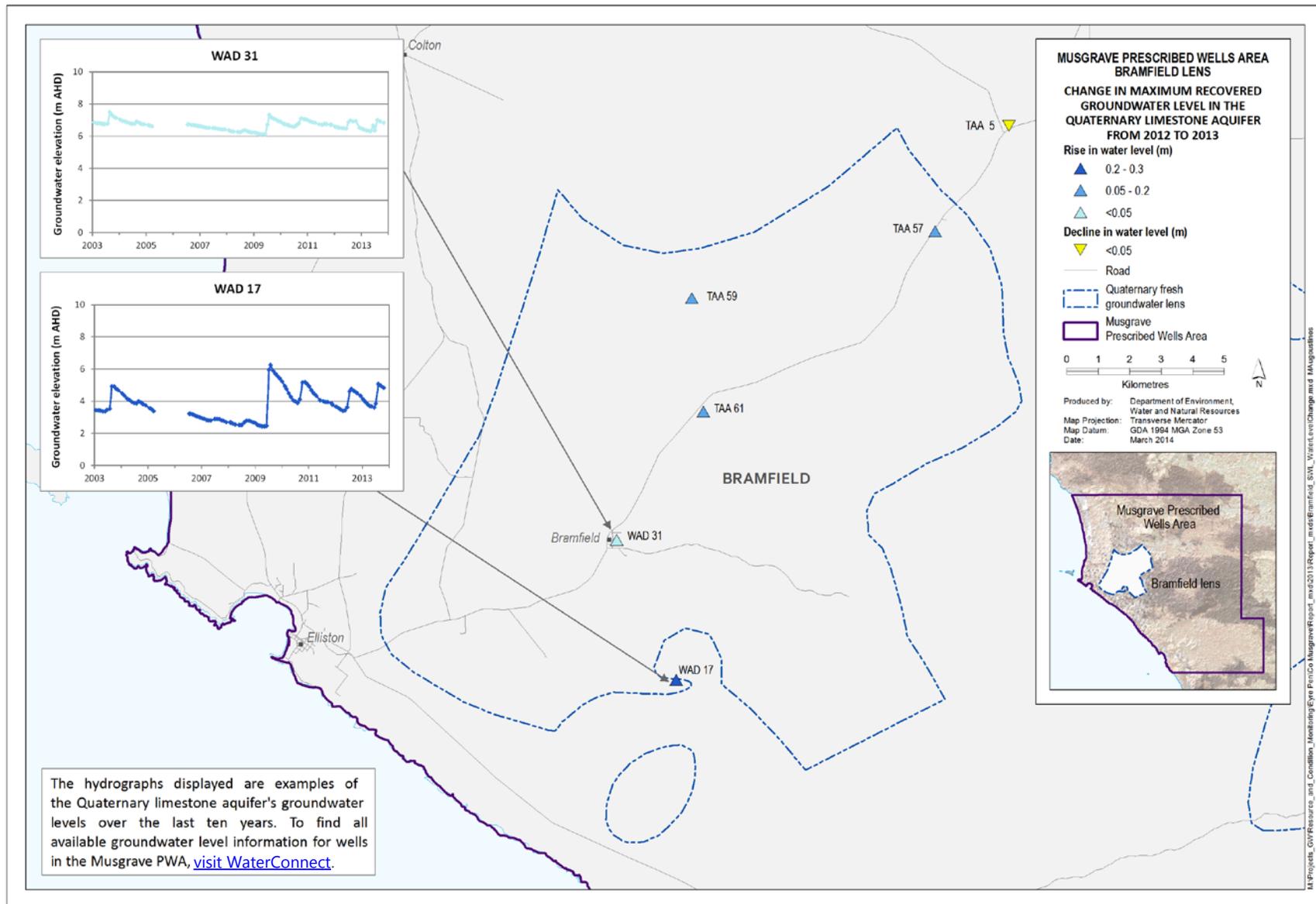


Figure 3. Overall changes in maximum recovered groundwater levels in the Bramfield lens of the Musgrave Prescribed Wells Area from 2012 to 2013

Musgrave PWA

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Department of Environment, Water and Natural Resources

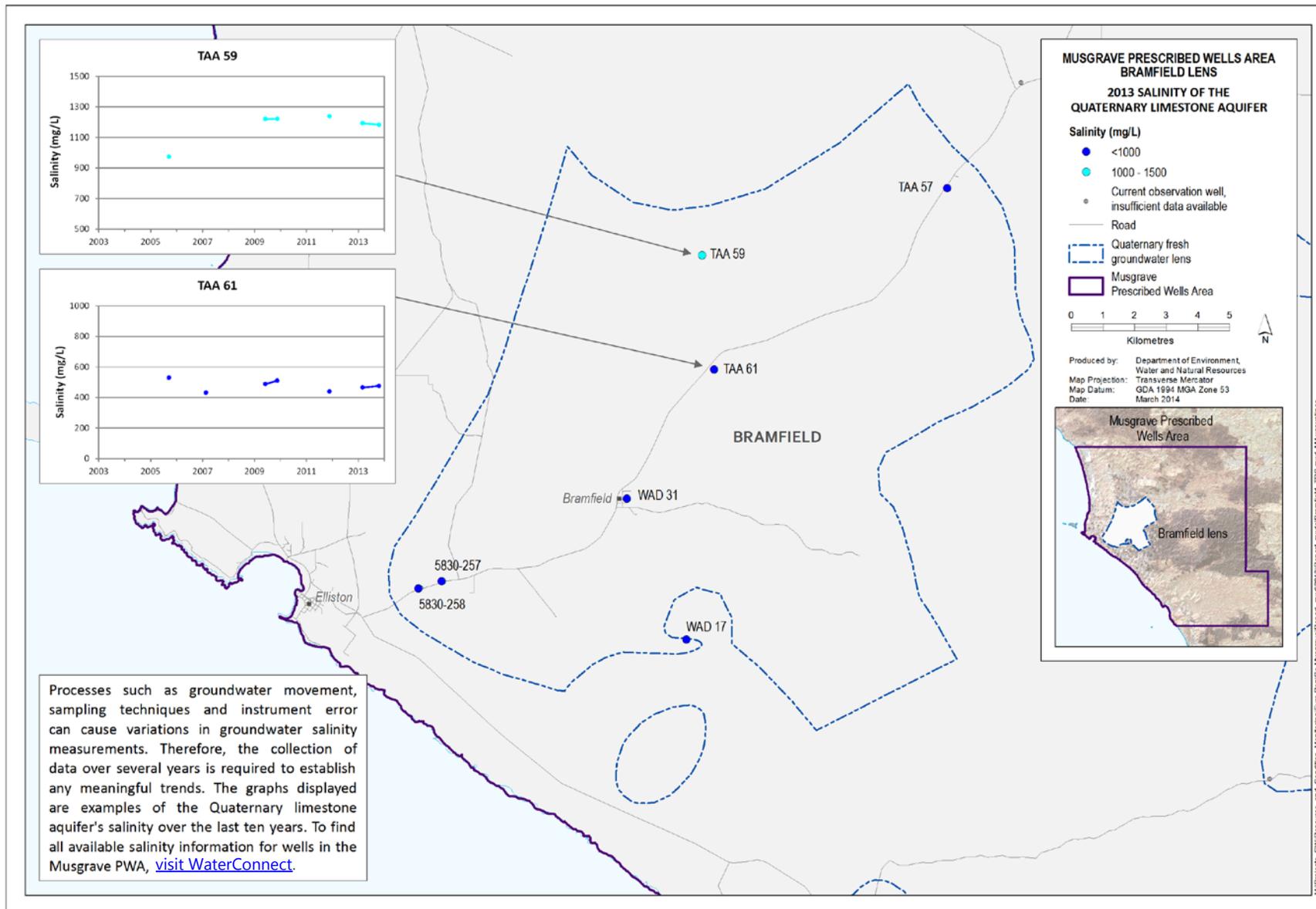


Figure 4. Groundwater salinity of the Bramfield lens in the Musgrave Prescribed Wells Area for 2013

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