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# MUSGRAVE PWA

## BRAMFIELD LENS

Groundwater Level and Salinity Status Report

2012

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# 2012 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 1000 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 2011–12 totalled 90 ML, a 4% decrease from the previous water-use year (Fig. 1) and 98% of the total licensed extractions from the Musgrave PWA. This volume of extraction equates to 7.5% of the total allocation limit of 1201 ML for the Bramfield lens.

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 373 mm of rain in 2012. This is nearly 60 mm less than the long-term average annual rainfall for that station. Both May and June received rainfall significantly above their long-term monthly average, but July through to December recorded significantly below-average rainfall (Fig. 2).

Observation wells monitoring the Bramfield lens within the Quaternary limestone aquifer 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. In 2012, two wells recorded an increase in the maximum recovered groundwater level of up to 0.15 m, while three wells recorded a decrease of up to 0.25 m, which is less than 10% of the known saturated thickness of the Bramfield lens, when compared to 2011 water level data (Fig. 3).

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 1000 mg/L were recorded in 2012, 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 2012:

## 2012 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 2012 status for the Bramfield lens is supported by:

- no significant change in the maximum recovered groundwater level when compared to 2011 water level data
- significant change in salinity when compared to 2011 salinity data.

To view the *Musgrave PWA groundwater level and salinity status report 2011*, which includes background information on hydrogeology, rainfall stations and relevant groundwater-dependent ecosystems, [visit WaterConnect](#).

To view descriptions of all status symbols, [click here](#).

For further details about the Bramfield lens, please see the [Water Allocation Plan for the Musgrave Prescribed Wells Area](#).

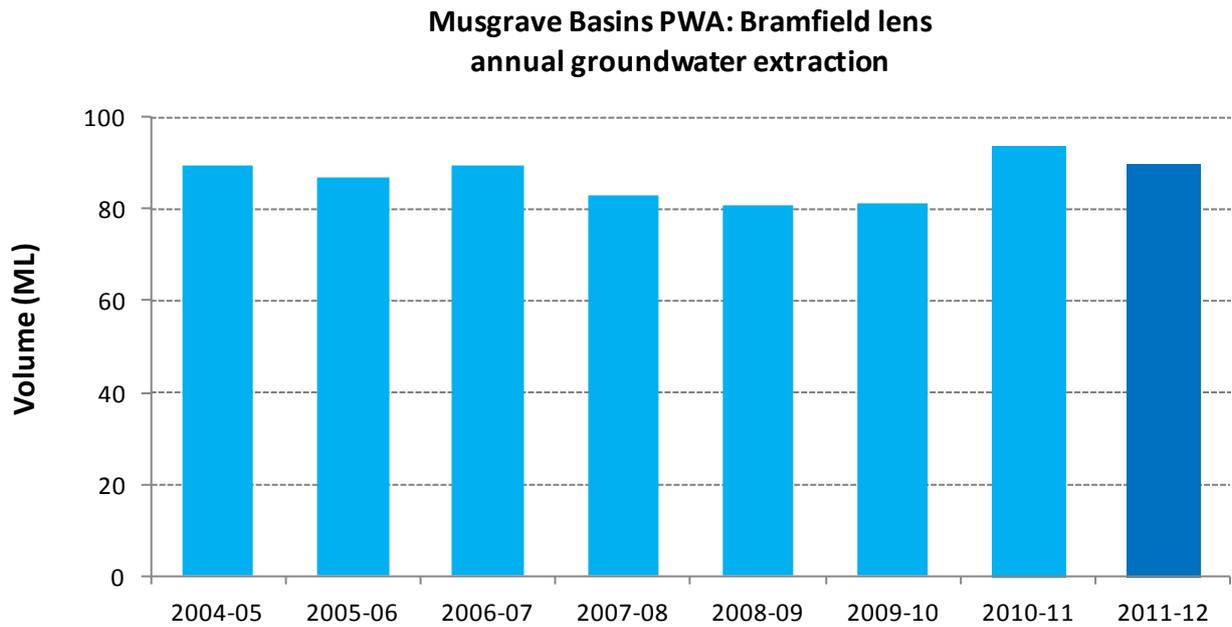


Figure 1. Historical licensed groundwater use for the Bramfield lens of the Musgrave Prescribed Wells Area

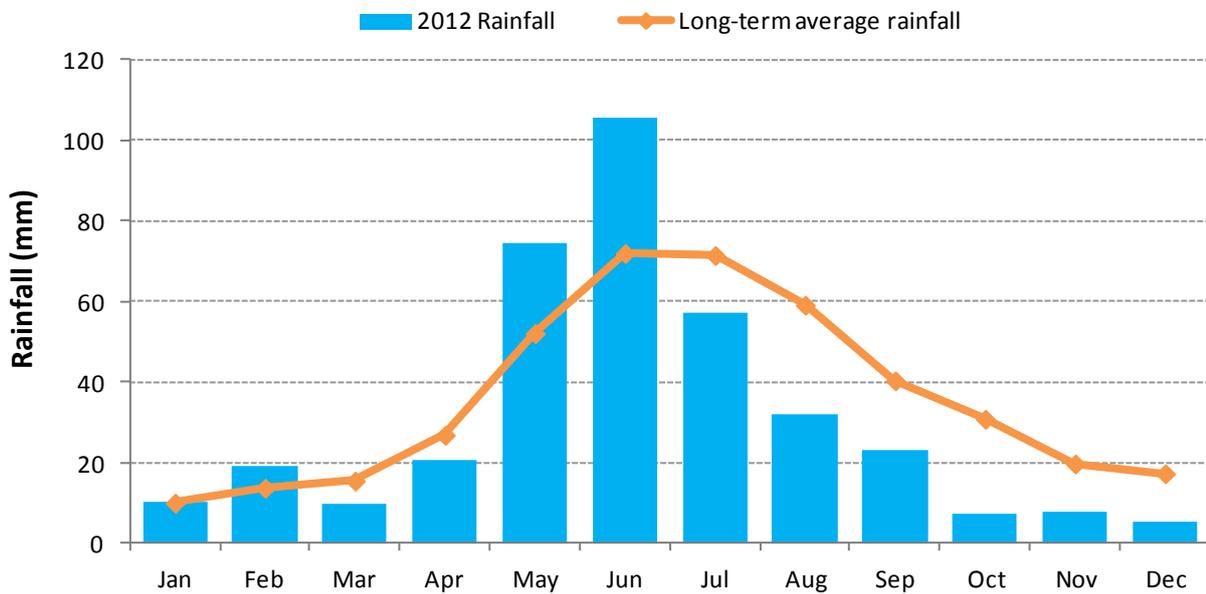


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Elliston rainfall station (number 18069) in the Musgrave Prescribed Wells Area

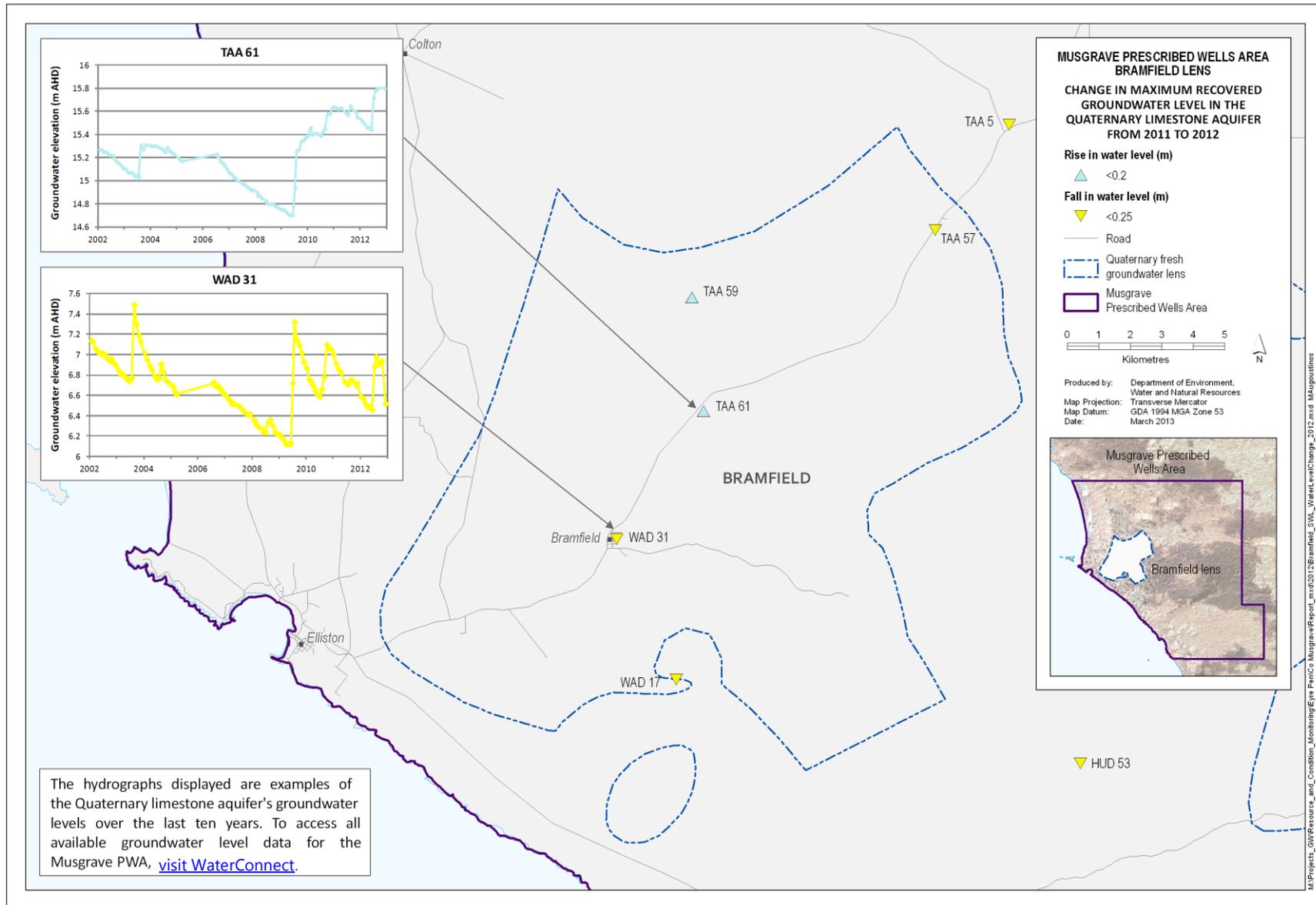


Figure 3. Overall changes in maximum recovered groundwater levels in the Bramfield lens of the Musgrave Prescribed Wells Area from 2011 to 2012

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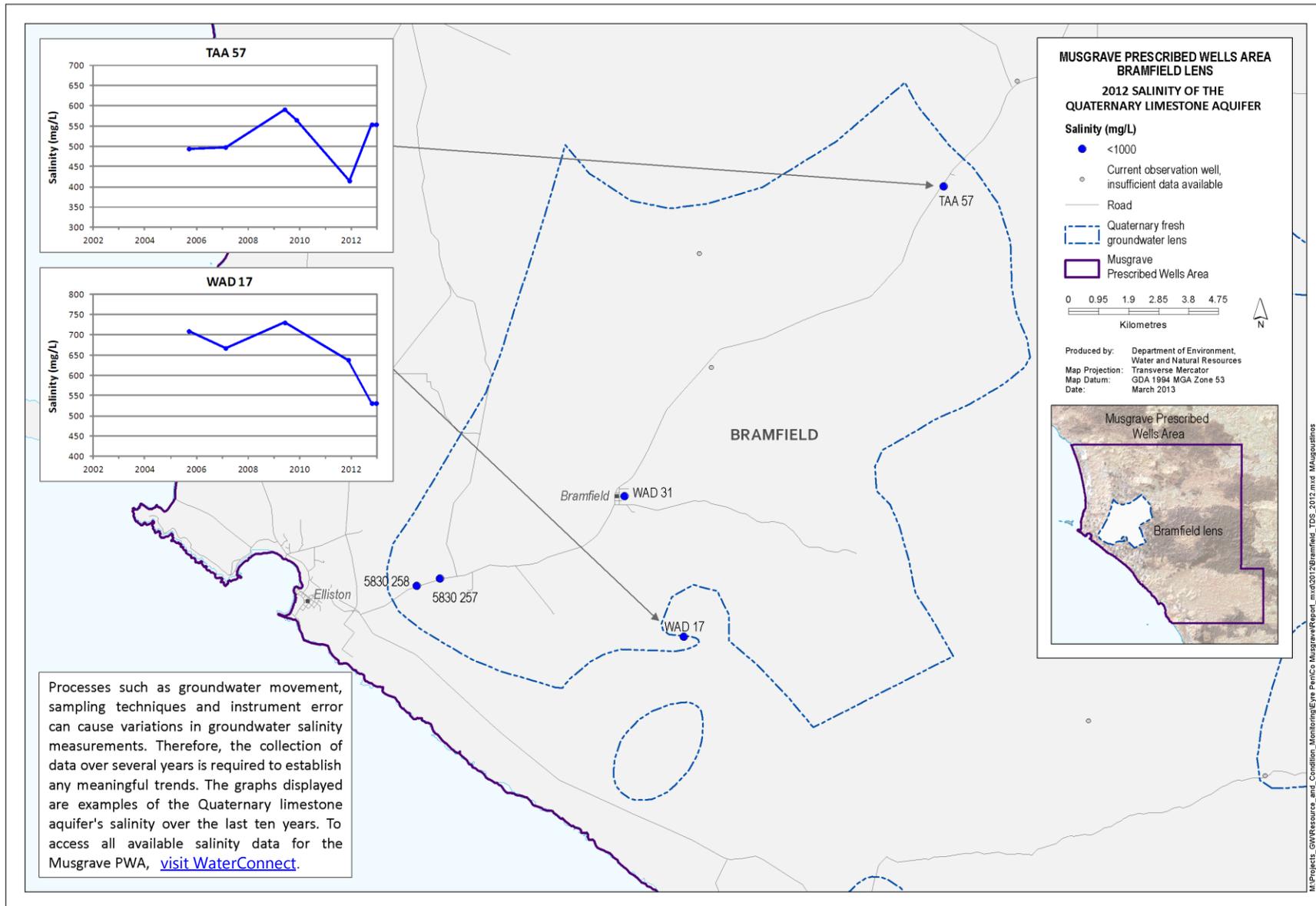


Figure 4. Groundwater salinity of the Bramfield lens in the Musgrave Prescribed Wells Area for 2012

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