
MUSGRAVE PWA

POLDA LENS

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 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 Polda lens is situated in the north-east 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 Polda 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 Polda lens has provided groundwater for the Eyre Peninsula reticulated water supply system since 1963. Prior to 2000, this contribution averaged about 15% of the total supply. Due to continued low effective recharge, increasing groundwater salinity and the characteristics of the extraction infrastructure, groundwater extraction by SA Water (the main user of groundwater in the lens) from the Polda lens ceased in mid-2008 and is currently prevented by a Notice of Prohibition. This Notice also significantly restricts extractions by other licence holders. Metered extractions from the Polda lens in 2011–12 totalled 1.9 ML, a 16% increase from the previous water-use year (Fig. 1). This volume of extraction exceeds the total allocation limit of 1.6 ML for the Polda lens by 18% and is 2% of the total licensed extractions from the Musgrave PWA.

The sustainability of the groundwater resources in the Musgrave PWA is highly dependent on recharge from rainfall. The historical 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 Terre Winds rainfall station (number 18165) is located south of the Polda lens and recorded 301 mm of rain in 2012. This is more than 70 mm less than the long-term average annual rainfall for that station. The month of June received rainfall significantly above its long-term monthly average, but July through to December recorded significantly below-average rainfall (Fig. 2).

A long-term decline in groundwater levels of up to 3 m from 1980 to 2009 has been recorded in the Polda lens. This decline has a very close correlation with below-average rainfall recorded in the area. Higher rainfall in 2009 and 2010 corresponds with a rise in groundwater levels throughout most of the lens. These levels however, are still lower than those recorded prior to the early 1990s. In 2012, 16 wells recorded declines in the maximum recovered groundwater level of up to 0.4 m when compared to 2011 water level data (Fig. 3). Another 16 wells recorded increases of up to 0.15 m and one well recorded no overall change in water level. As the known saturated thickness of the Polda lens is generally 2 to 5 m, the beneficial uses of the resource are unlikely to be negatively impacted for at least 15 years if these conditions were to continue.

The majority of observation wells show a rise in salinity from 2005 when compared to the previous measurements taken in the mid to late 1990s. This widespread increase in groundwater salinity coincided with a prolonged period of below-average rainfall, reduced recharge and declining groundwater levels. After June 2009, observation wells within the Polda lens reveal signs of freshening occurring, which may be in response to the increased recharge caused by above-average rainfall received from 2009 to

2011. In 2012, five observation wells within the current extent of the Polda lens recorded salinities over 1000 mg/L (Fig. 4), but salinity is typically between 400 and 900 mg/L. An increase in salinity was recorded in 78% of monitored wells.

The Polda lens of the Musgrave PWA 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 the resource status have been observed over the reporting period. Continuation of these trends is unlikely to negatively impact the beneficial uses, such as drinking water and irrigation, of the resource for at least 15 years. The 2012 status for the Polda lens is supported by:

- an overall decline in groundwater levels when compared to 2011 water level data
- an overall increase 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 and relevant groundwater-dependent ecosystems, [visit WaterConnect](#).

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

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

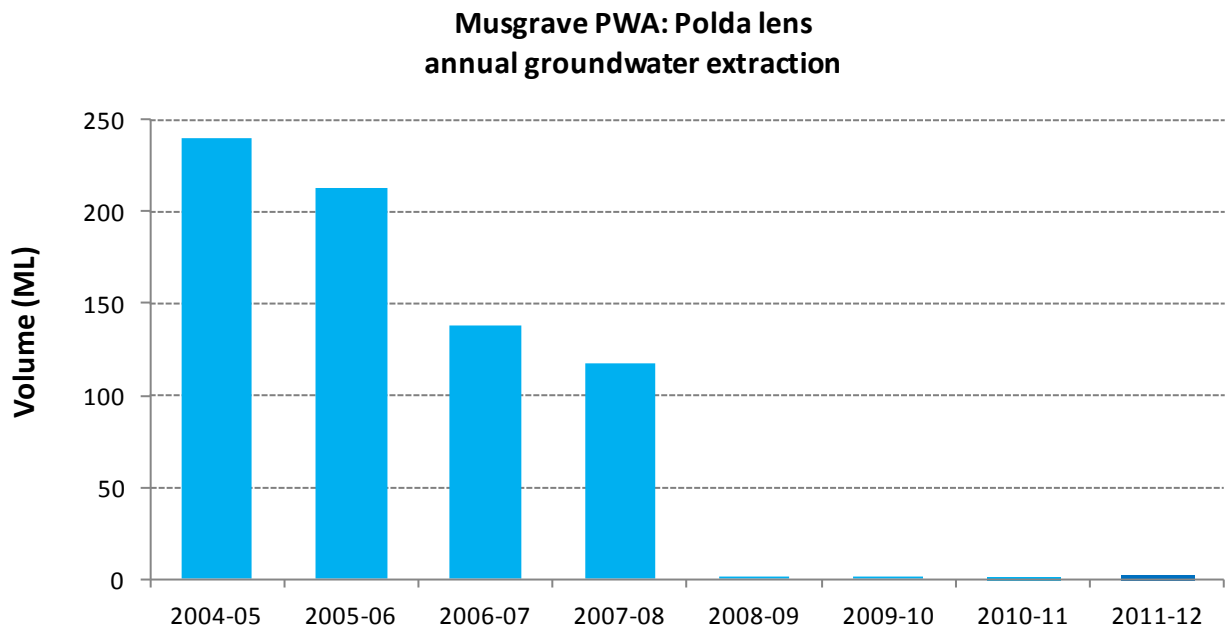


Figure 1. Historical licensed groundwater use for the Poldalens of the Musgrave Prescribed Wells Area

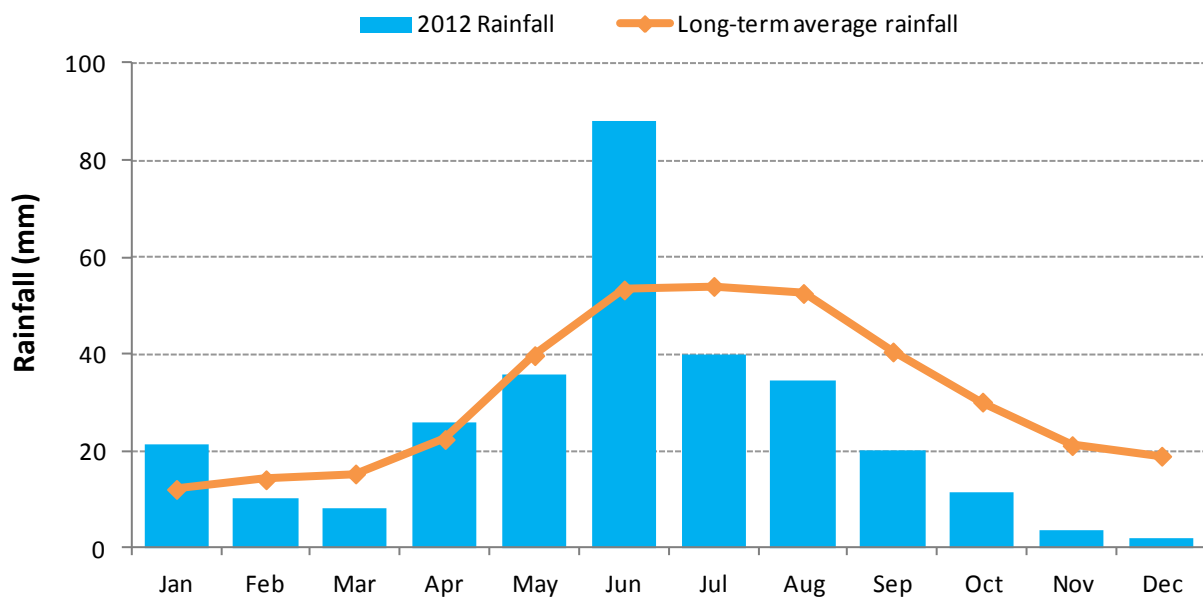


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Terre Winds rainfall station (number 18165) in the Musgrave Prescribed Wells Area

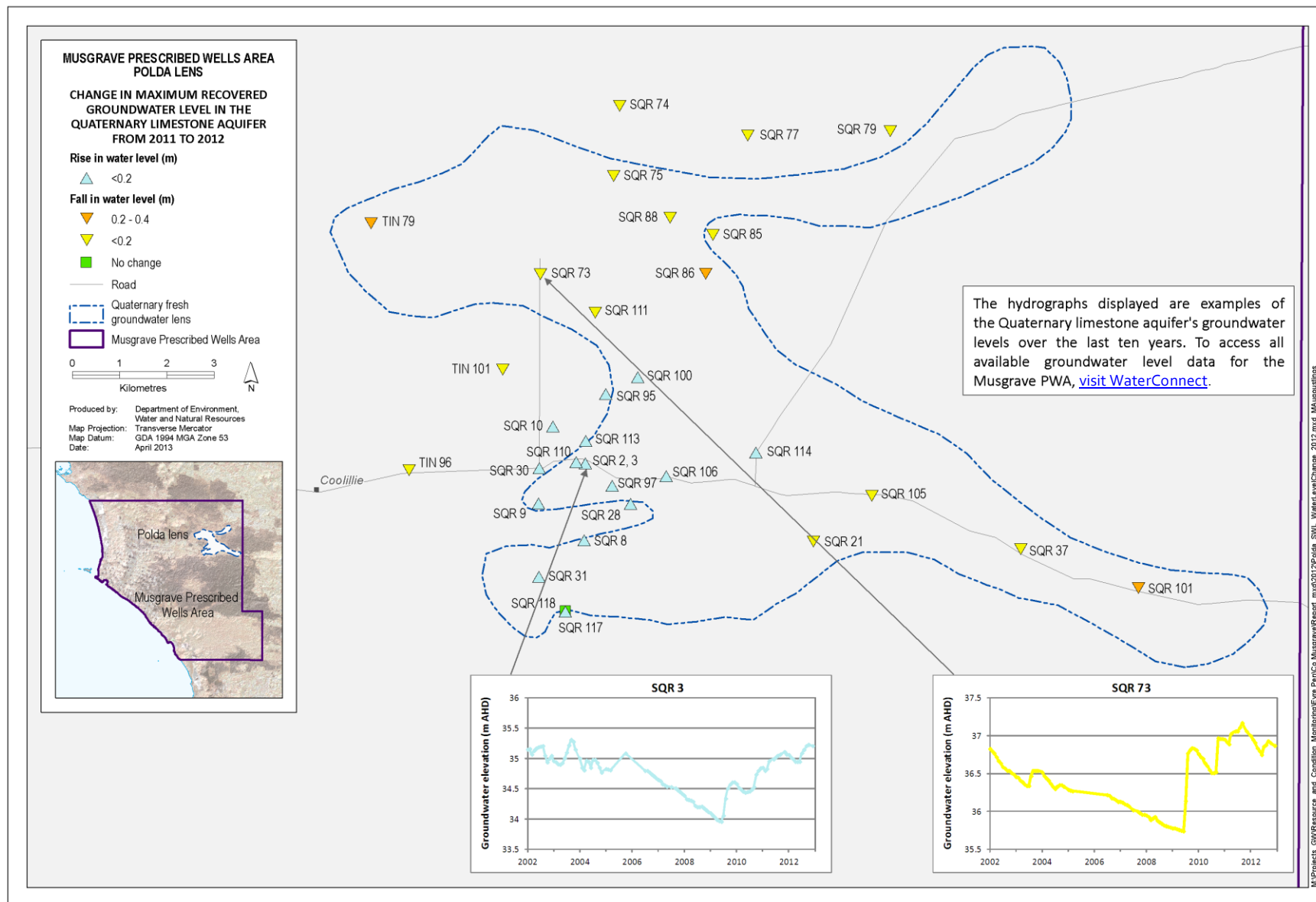


Figure 3. Overall changes in maximum recovered groundwater levels in the Poldal lens of the Musgrave Prescribed Wells Area from 2011 to 2012

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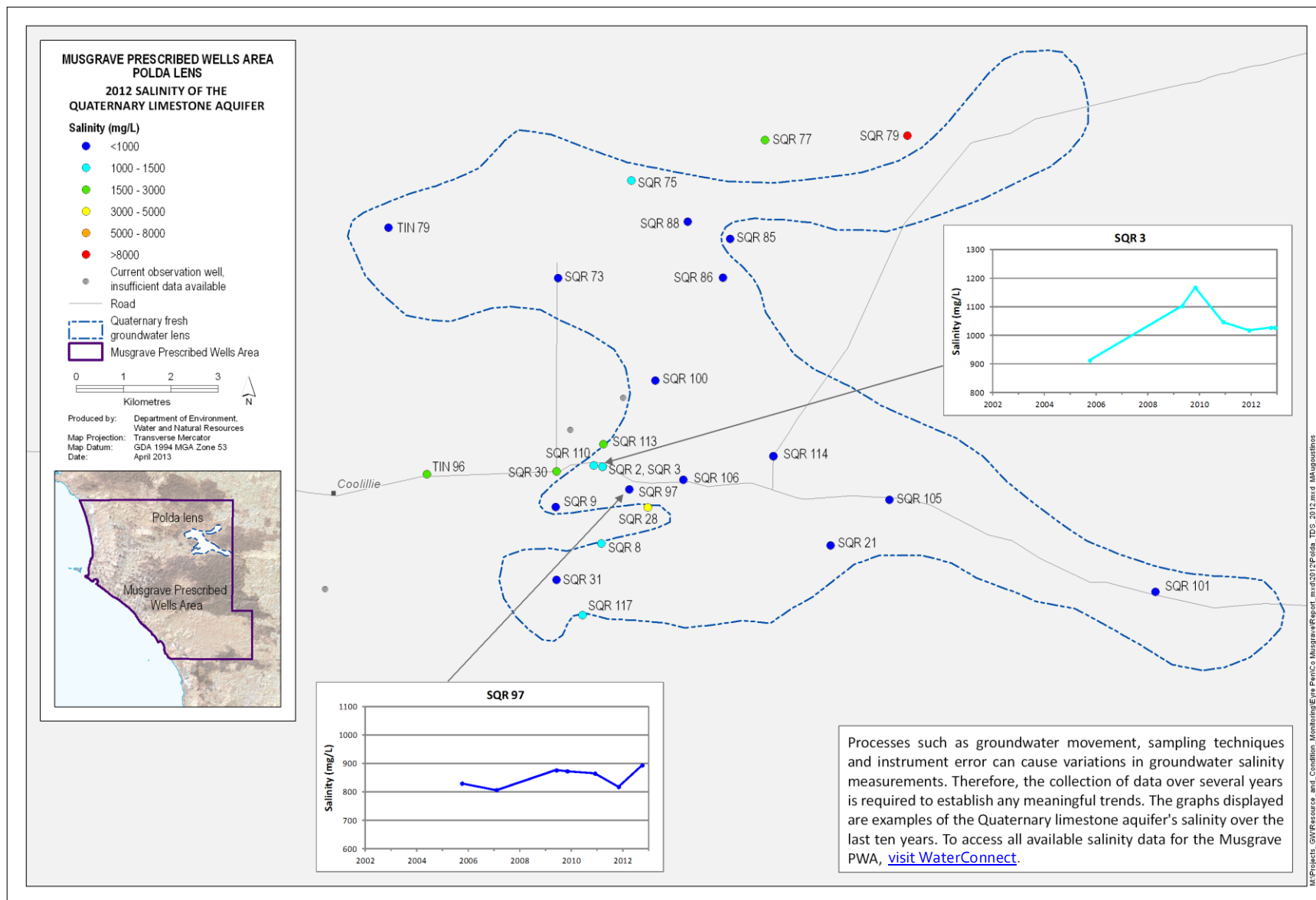


Figure 4. Groundwater salinity of the Poldal lens in the Musgrave Prescribed Wells Area in 2012

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