BAROOTA PWRA

Groundwater Level and Salinity Status Report

2013

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

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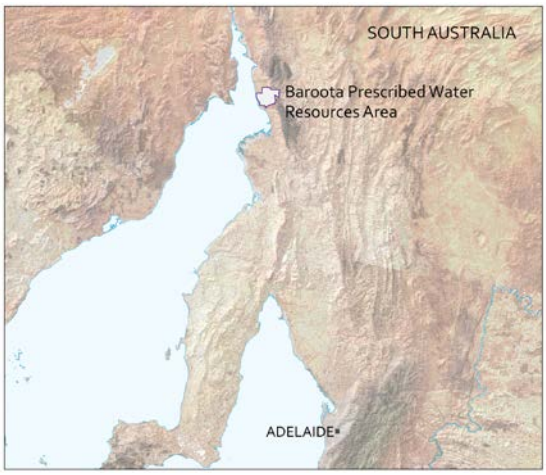
2013 SUMMARY



The Baroota Prescribed Water Resources Area (PWRA) lies on the western side of the Flinders Ranges in the Mid-North of South Australia, approximately 25 km north of Port Pirie. It is a local scale resource for which surface water and groundwater is prescribed under South Australia's *Natural Resources Management Act 2004*. Groundwater extractions are limited under a Notice of Prohibition, pending development and adoption of a Water Allocation Plan that will provide for sustainable management of the resource.

Groundwater extractions in the Baroota PWRA occur from Quaternary clay and gravel sediments (Q), which can be up to 100 m thick, deposited as outwash from the Flinders Ranges. This is underlain by a deeper Tertiary sand aquifer (T). Stream flow and leakage from the Baroota Reservoir has contributed recharge to the groundwater system, but due to several years of below average rainfall since 2002 and lower inflows into the reservoir, the contribution to the aquifer has been reduced.

Metered extractions from the Baroota PWRA totalled 931 ML* in 2012-13, a 6% increase from the previous water use year (Fig.1)

The climate of the Baroota PWRA is characterised as Mediterranean with hot dry, dry summers and cool, wet winters. Data from the Port Germein rainfall station (number 19037) were chosen for analysis of rainfall in 2013 (Fig. 2). In 2013, rainfall was above average for five out of the 12 months, with significant rainfall occurring throughout the months of June, July and December. However rainfall was significantly below average from August through to November. The total annual rainfall was 340 mm, slightly above the long-term (1889-2012) annual average of 324 mm.

Despite slightly above-average rainfall and only slightly increased groundwater extractions, water levels continue to decline (Fig. 3). Groundwater levels in the Quaternary aquifer have declined by up to 10 m across the area since 2002. The majority of wells display declining long-term trends over the past 30 years.

In 2013, there were nine wells monitoring the Quaternary aquifer which had sufficient information to be able to compare the change in maximum recovered water level when compared to water levels observed in 2012. Six wells recorded a decline in water level of up to 0.5 m, and three had an increase in water level of up to 0.3 m. Due to the saturated thickness of the Quaternary aquifer (up to 100 m), it is not anticipated that this rate of reduction will affect the ability to access water over the next 15 years. The water level in observation well BTA 9 has risen by 3 m since 2011. As the well is located in close proximity to a watercourse, this rise could be possibly due to recharge during intermittent streamflow. There was insufficient data available to report on the trends in the Tertiary aquifer for 2013.

Groundwater of the Baroota PWRA is relatively fresh with most wells recording salinity levels between 1000 and 1500 mg/L. In 2013, the salinity measured in 6 wells installed in the Quaternary aquifer was mostly less than 1200 mg/L with one well located to the west of the resource recording a value of 3967 mg/L (Fig. 4). Within the Tertiary aquifer, salinity levels ranged from 921 mg/L in BTA 30 located below the mass of Quaternary sediments, and 3967 mg/L in BTA 32 located to the west of the PWRA. Seven out of nine observation wells that have sufficient data for both 2012 and 2013 recorded an increase with an average change of 4%.

** The licensed groundwater use for the 2012–13 water-use year is based on the best data available as of March 2014 and may be subject to change, as some extraction volumes are in the process of being verified.*

The Baroota PWRA has been assigned a yellow status for 2013:

2013 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 of the resource for at least 15 years. The 2013 status for Baroota PWRA is supported by:

- an overall decrease in the maximum recovered water level in 2013 when compared to 2012 data
- an overall increase in salinity levels in 2013 when compared to 2012

To view the *Baroota PWRA groundwater level and salinity status report 2011*, 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 *Baroota PWRA*, please see an update on the development of the *Baroota Water Allocation Plan* on the Northern and Yorke Natural Resources Management website.

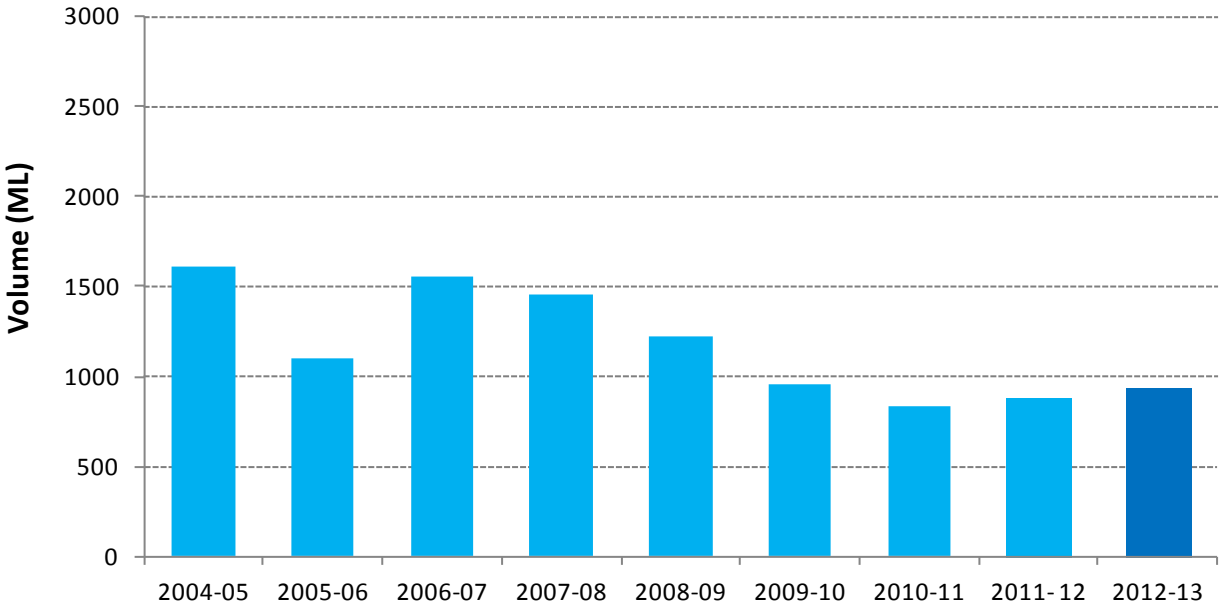


Figure 1. Historical licensed groundwater use in the Baroota Prescribed Water Resources Area

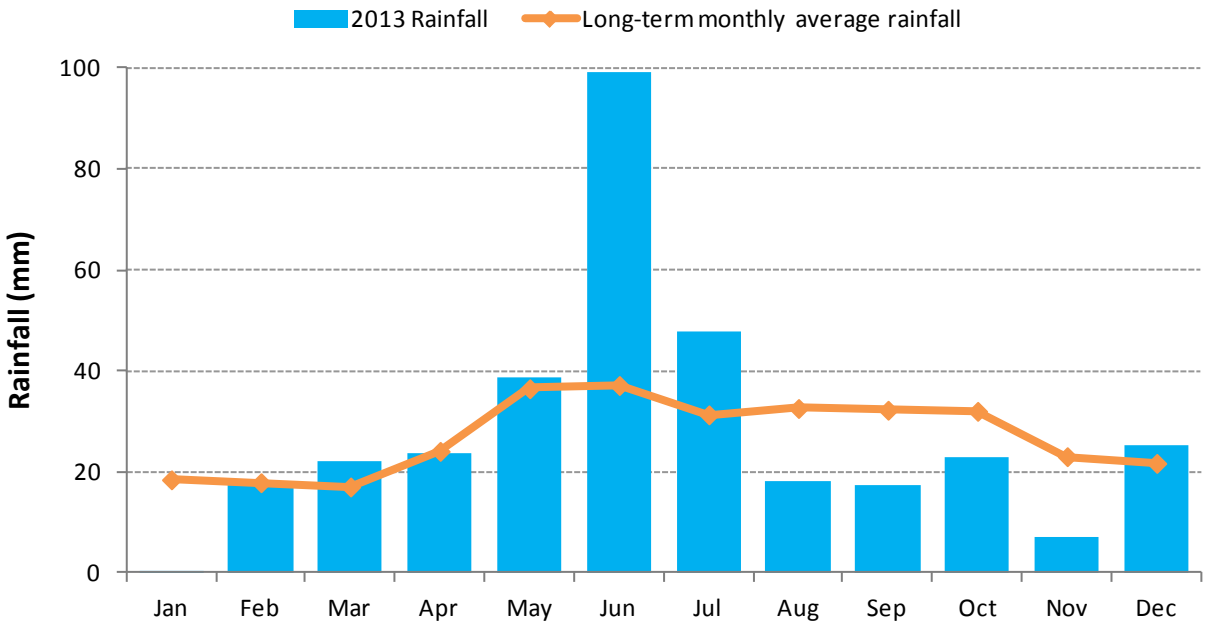


Figure 2. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Port Germein rainfall station (number 19037) in the Baroota Prescribed Water Resources Area

Rainfall data used in this report is sourced from the SILO Patched Point Dataset, which uses original Bureau of Meteorology daily rainfall measurements and is available online at www.longpaddock.qld.gov.au/silo.

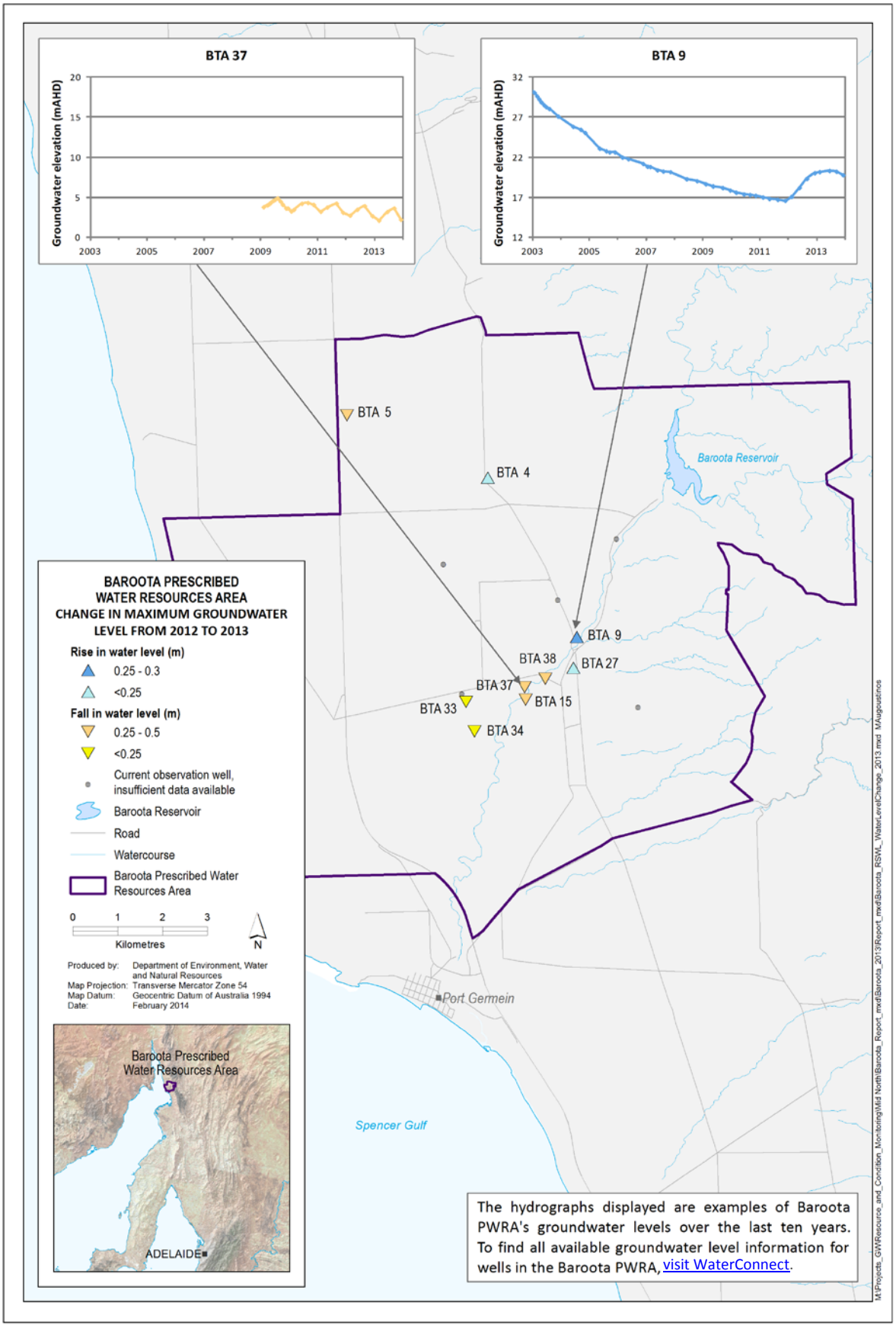


Figure 3. Overall changes in maximum groundwater levels of the Quaternary aquifer in the Baroota Prescribed Water Resources Area from 2012 to 2013

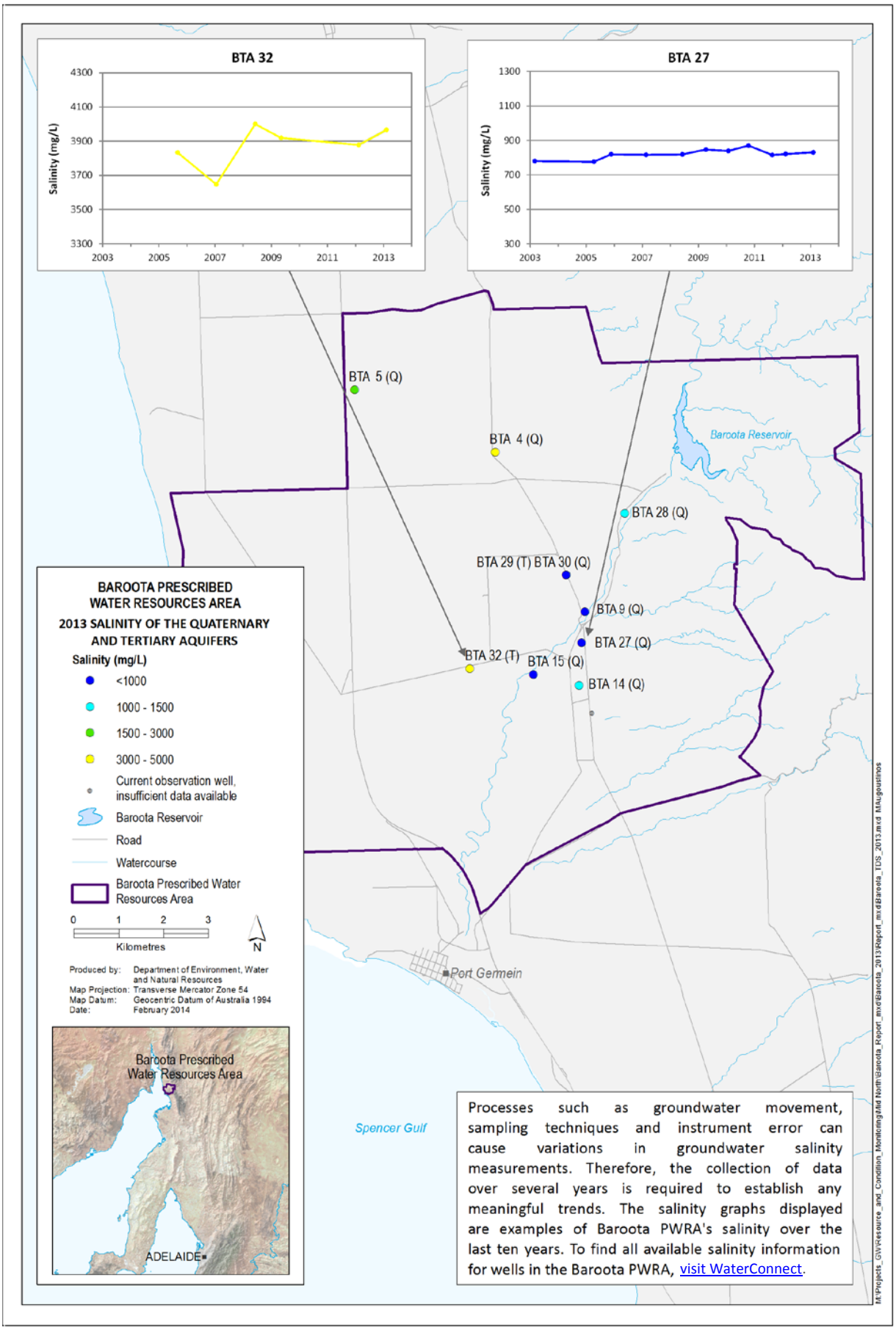


Figure 4. Groundwater salinity in the Baroota Prescribed Water Resources Area for February 2013