

Barossa PWRA

Upper Aquifer

2014 Groundwater level and salinity status report



Department of Environment, Water and Natural Resources
25 Grenfell Street, Adelaide
GPO Box 1047, Adelaide SA 5001

Telephone	National	(08) 8463 6946
	International	+61 8 8463 6946
Fax	National	(08) 8463 6999
	International	+61 8 8463 6999
Website	www.environment.sa.gov.au	

Disclaimer

The Department of Environment, Water and Natural Resources and its employees do not warrant or make any representation regarding the use, or results of the use, of the information contained herein as regards to its correctness, accuracy, reliability, currency or otherwise. The Department of Environment, Water and Natural Resources and its employees expressly disclaims all liability or responsibility to any person using the information or advice. Information contained in this document is correct at the time of writing.



This work is licensed under the Creative Commons Attribution 4.0 International License.

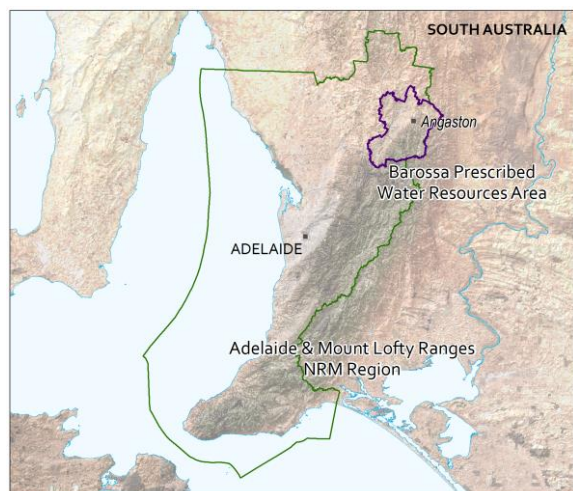
To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

© Crown in right of the State of South Australia, through the Department of Environment, Water and Natural Resources 2015

ISBN 978-1-922255-43-3

This document is available online at www.waterconnect.sa.gov.au/Systems/GSR/Pages.

2014 Summary



The Barossa Prescribed Water Resources Area (PWRA) encompasses both the highland areas of the Mount Lofty Ranges and the Barossa Valley. It is located approximately 60 km north-east of Adelaide, within the Adelaide and Mount Lofty Ranges NRM Region. It is a regional-scale resource for which surface water and groundwater have been prescribed under South Australia's *Natural Resources Management Act 2004*. A water allocation plan provides for the sustainable management of the groundwater resources.

The Barossa PWRA contains three major aquifer systems: two sedimentary aquifers (Upper and Lower) that are located within the valley, and fractured rock aquifers that crop out in the Mount Lofty Ranges to the east and west of the valley and underlie the sedimentary aquifers. This report focuses on the Upper Aquifer of the Barossa PWRA.

Groundwater flow within the Upper Aquifer is in a south-westerly direction in the northern part of the valley and in a northerly direction near Lyndoch. Recharge to the Upper Aquifer of the Barossa PWRA originates from rainfall, with contribution from streamflow in some areas.

Trends in groundwater levels and salinity in the Upper Aquifer of the Barossa PWRA are primarily climate driven: below-average rainfall results in a reduction in recharge to the aquifers. Below-average summer rainfall can also result in increasing irrigation extractions, and these two elements can cause groundwater levels to fall and salinity to increase. Conversely, increases in rainfall results in increases in recharge, decreases in irrigation extractions and groundwater levels may rise and salinity stabilise or decline. Seasonal responses to recharge are common, except where there is overlying Quaternary clay.

Data from the Angaston rainfall station (number 23300) were chosen for analysis of rainfall. The long-term average monthly rainfall is graphed in orange against the total monthly rainfall recorded. In 2014, the total annual rainfall was 552 mm, slightly above the long-term (1889–2014) annual average of 535 mm and 36 mm more than 2013 annual rainfall. Significantly below-average rainfall was evident in January, March and August through to October; however, well-above average rainfall was recorded in February, June and July (Fig. 1).

Metered extractions from the Upper Aquifer totalled 389 ML¹ in 2013–14, which represents a 17% decrease compared with the previous water-use year (Fig. 2) and totals 14% of the total extraction from the Barossa PWRA.

The Upper Aquifer observation wells exhibit a variety of long-term trends, ranging from stable to declining.

In 2014, there were 29 observation wells with adequate records to allow a comparison of maximum recovered groundwater levels with 2013 data. Rises of 0.1 to 0.65 m, with a median of 0.3 m were recorded in 34% of wells. Negligible changes in water level were recorded in 24% of the observation wells with sufficient data, where the change in the maximum recovered groundwater level between 2013 and 2014 was less than 0.1 m. Decreases ranging from 0.1 to 0.8 m, with a median of 0.2 m were recorded in the remaining 41% of wells. These wells are generally located around the Angaston and Lyndoch areas where intensive groundwater extraction occurs (Fig. 3).

Groundwater salinity in the Upper Aquifer is highly variable, from 960 to 12 000 mg/L, and the majority of wells have salinities above 3000 mg/L. For example, long-term salinity trends indicate that observation well MOR273 has experienced significant variations in salinity over the past 10 years while observation well NTP011 has shown little variability.

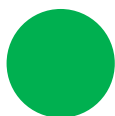
In 2014, the salinity concentration in observation wells ranged from 1030 to 11 558 mg/L, with the more saline groundwater found in the northern portion of the aquifer (Fig. 4). Eight out of nine monitored wells have salinity values higher than 1500 mg/L, the

¹ The licensed groundwater use for the 2013–14 water-use year is based on the best data available as of February 2015 and may be subject to change, as some extraction volumes are in the process of being verified.

maximum recommended salinity tolerance level for grape vines. Eight of nine wells also recorded a decline in salinity when compared to 2013 salinity values, but most were by 6% or less.

The Upper Aquifer of the Barossa PWRA has been assigned a green status for 2014:

2014 Status



“No adverse change, 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 12-month reporting period. If these conditions were to continue, there is a very low likelihood of negative impacts on the beneficial uses of the resource (e.g. drinking water, irrigation or stock watering).

The 2014 status for the Upper Aquifer is supported by:

- most wells recorded either an increase or negligible change in the maximum recovered groundwater level when compared to 2013 water level data
- most wells recorded a decrease in or stable salinity levels in 2014 when compared to 2013.

While most wells recorded stable or improving water levels, the decline in groundwater level in the areas of intensive irrigation around Lyndoch and Angaston should not be overlooked.

To view the descriptions for all status symbols, please visit the *Water Resource Assessments* page on [WaterConnect](#).

To view the *Barossa PWRA Groundwater Level and Salinity Status Report 2011*, which includes background information on hydrogeology, location of rainfall stations and relevant groundwater-dependent ecosystems, please visit the *Water Resource Assessments* page on [WaterConnect](#).

To download groundwater level and salinity data from observation wells within the Barossa PWRA, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#).

For further details about the Barossa PWRA, please see the *Water Allocation Plan for the Barossa Prescribed Water Resources Area* on the Natural Resources Adelaide and Mt Lofty Ranges [website](#).

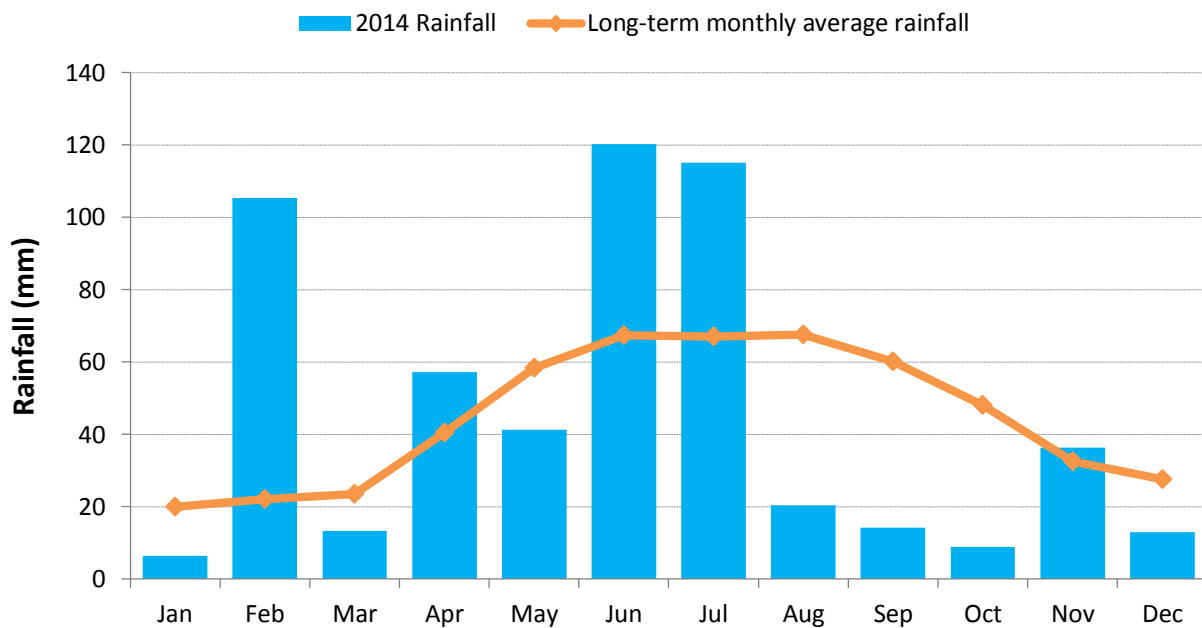


Figure 1. Monthly rainfall (mm) for 2014 and the long-term average monthly rainfall (mm) at the Angaston rainfall station² (number 23300) in the Barossa Prescribed Water Resources Area

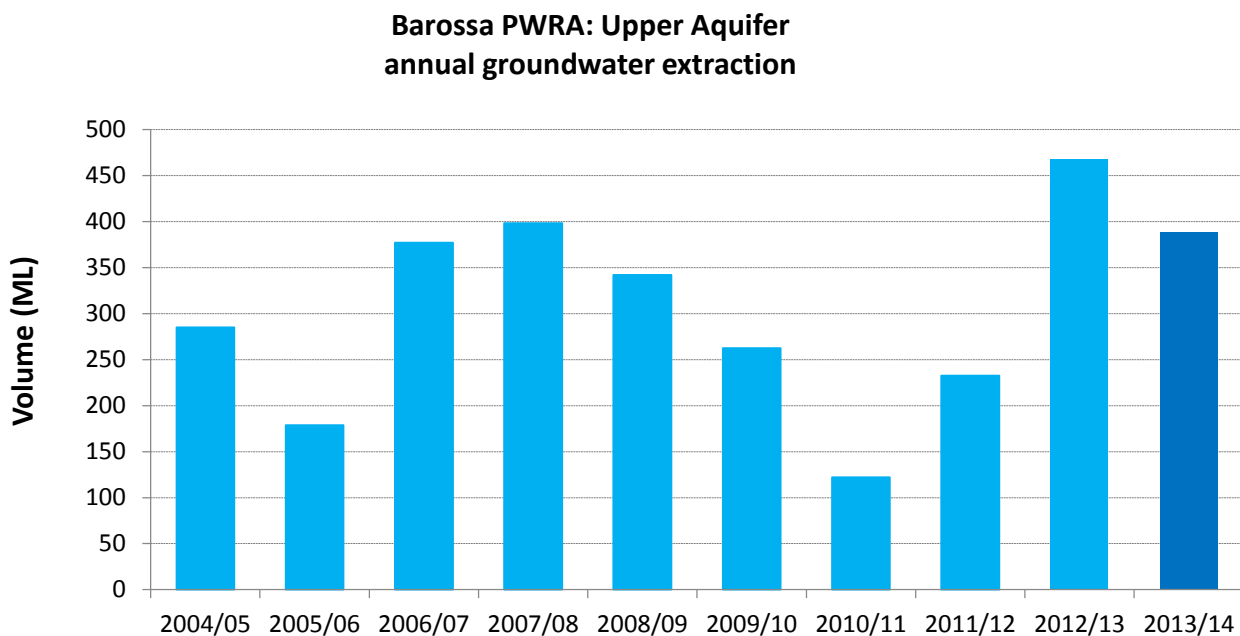


Figure 2. Historical licensed groundwater use for the Upper Aquifer of the Barossa Prescribed Water Resources Area

² 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.

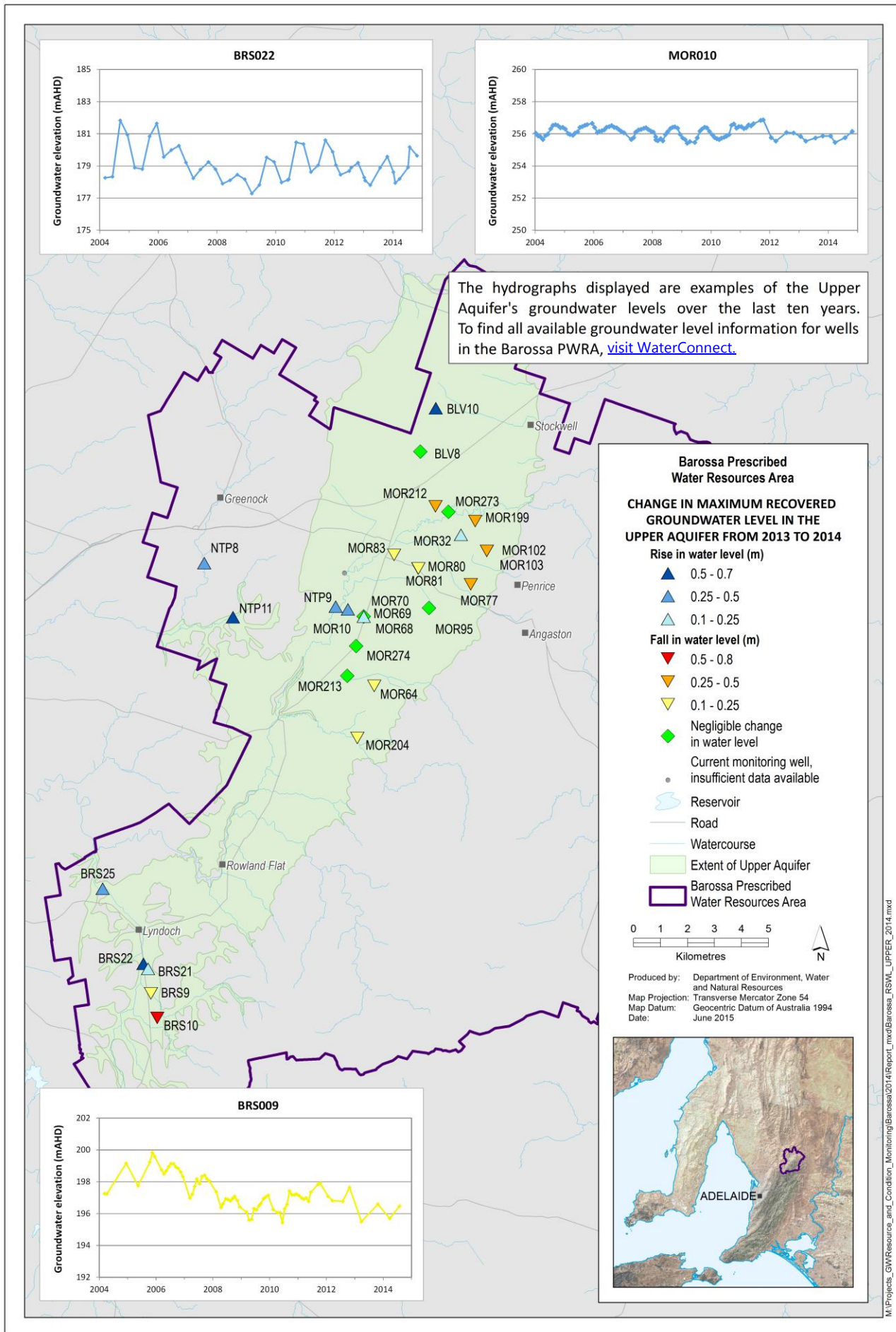


Figure 3. Overall changes in maximum groundwater levels in the Upper Aquifer of the Barossa Prescribed Water Resources Area from 2013 to 2014

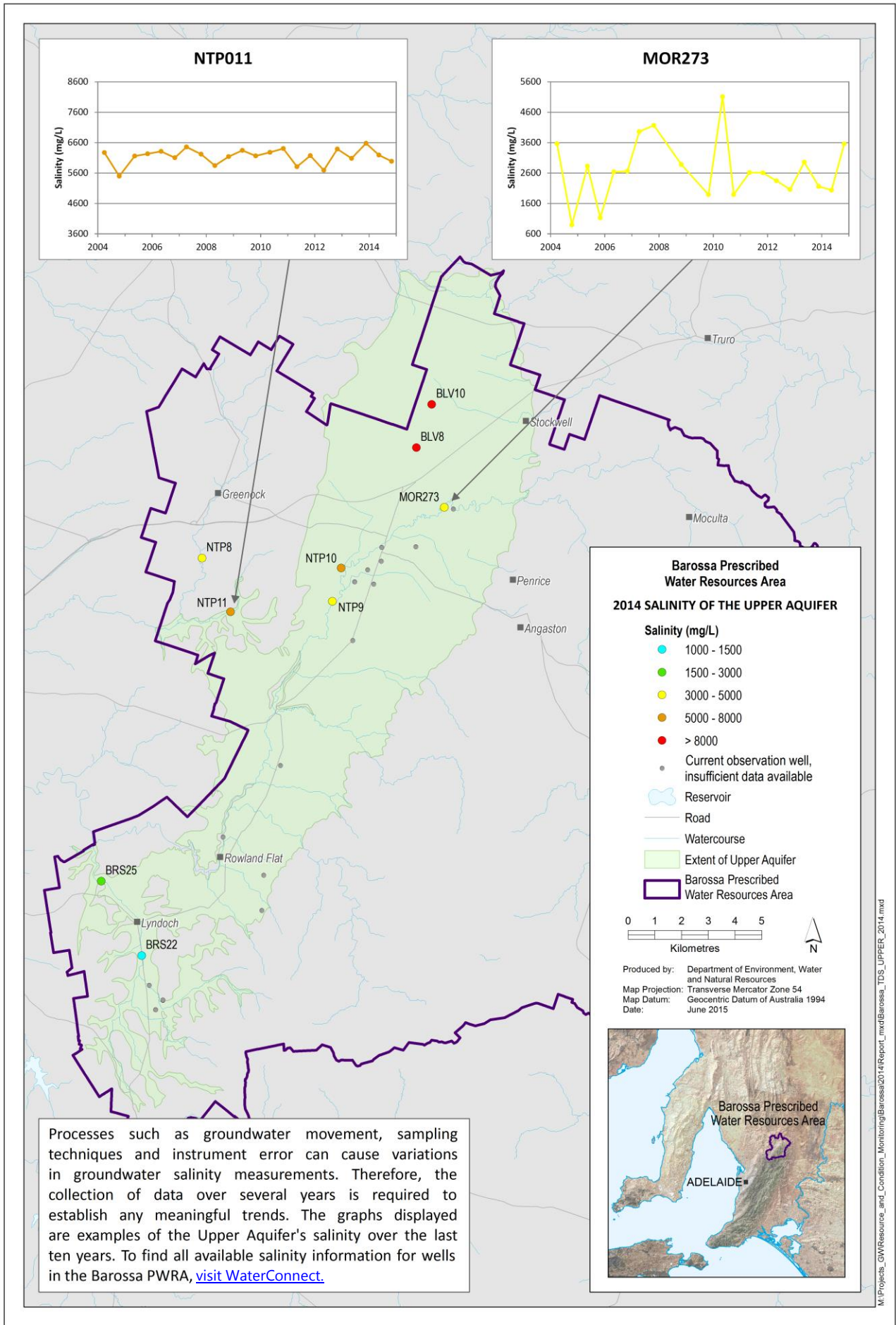


Figure 4. Groundwater salinity of the Upper Aquifer in the Barossa Prescribed Water Resources Area for 2014