

Southern Basins PWA

Uley South lens

2015 Groundwater level and salinity status report



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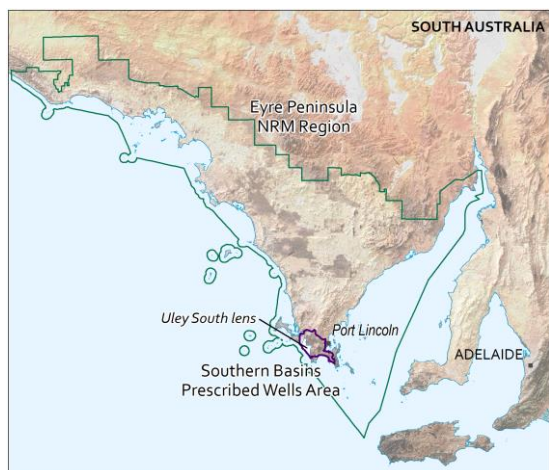
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2015 Summary



The Southern Basins Prescribed Wells Area (PWA) is located at the southernmost part of the Eyre Peninsula, between Port Lincoln and Coffin Bay, in the Eyre Peninsula NRM Region. 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 Uley South lens is located towards the south of the Southern Basins PWA and is contiguous with the Southern Ocean (Fig. 1).

Within the Southern Basins 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. These sediments are known to be over 130 m thick in parts of the Uley basin. Areas

within the Quaternary limestone aquifer delineated by groundwater salinity of less than 1000 mg/L, such as the Uley South lens, are described as fresh groundwater lenses in the current water allocation plan. The main source of recharge to the Quaternary limestone aquifer is the direct infiltration of rainfall and the direction of groundwater flow is predominantly toward the nearest coastline.

Groundwater levels and salinities in the Southern Basins PWA are highly dependent on recharge from rainfall and any trends in groundwater level or salinity are primarily climate driven: below-average rainfall results in a reduction in recharge to the aquifers. Below-average summer rainfall can also result in increased extraction, and combined may cause groundwater levels to fall and salinities to increase. Conversely, above-average rainfall may result in increased recharge, decreased extraction and groundwater levels may rise and salinities stabilise or decline. Historical rainfall data indicate that trends of above or below-average rainfall can last for up to 25 years, and that high-intensity rainfall can result in greater and more-rapid water level (i.e. recharge) response.

The Westmere rainfall station (BoM Station 18137) is located approximately 10 km east of the Uley South lens, and recorded 355 mm of rainfall in the 2014–15 water-use year, the fourth-lowest on record. This is 215 mm below the long-term average of 570 mm (1900–2015) and 195 mm below the five-year average of 550 mm (Figs. 1 and 2). Long-term seasonal rainfall patterns show generally higher rainfall during the winter months and lower rainfall over summer. Notable seasonal variations over the past five years include the unusually wet spring and summer of 2010–11, dry spring–summer of 2012–13 and wet summer of 2013–14. The 2014–15 water-use year was particularly dry, with most months receiving below their long-term average monthly rainfall and, despite high rainfall in 2013–14 (Fig. 2), a trend of declining rainfall is evident over the past five years.

In the Uley basin, licensed groundwater extractions occur predominantly from the fresh groundwater lenses within the Quaternary limestone aquifer. Metered extractions from the Uley South lens totalled 5158 ML in 2014–15, a 9% increase from the previous water-use year and 2% greater than the five-year average annual extraction (Fig. 3). This volume of extraction equates to 70% of the total allocation limit for the Uley South lens and accounts for 95% of the total licensed extractions within the Southern Basins PWA.

Groundwater levels in the Uley South lens show a positive correlation with Westmere rainfall. Since the mid-1980s, groundwater levels have shown a declining trend, coinciding with predominantly below-average rainfall. A substantial decrease in groundwater extractions from 2008 and above-average rainfall since 2009 has resulted in a recovery of groundwater levels; however, water levels are still considerably lower than those observed prior to the 1980s. In the past five years, all groundwater level monitoring wells recorded a rising trend (Fig. 4).

Most salinity monitoring wells in the Uley South lens are aligned forming a north-west – south-east strip at the centre of the lens and show stable salinities over the past ten years. In 2015, salinities ranged between 370 and 630 mg/L (Fig. 5). In the past five years, all salinity monitoring wells show stable salinities (Fig. 6).

To determine the status of the Uley South lens for 2015, the trends in groundwater level and salinity over the past five years (2011 to 2015, inclusive) were analysed. This is a new approach, in contrast to the year-to-year assessments that have been used in past *Groundwater level and salinity status reports*. Please visit the [Frequently Asked Questions](#) on the *Water Resource Assessments* page on WaterConnect for a detailed explanation of the new method of status assessment.

The Uley South lens of the Southern Basins PWA has been assigned a green status for 2015:

2015 Status



Positive trends have been observed over the past five years

The 2015 status of the Uley South lens is based on:

- all monitoring wells showing a five-year trend of rising groundwater level
- all monitoring wells showing a five-year trend of stable salinity.

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

To view the *Southern Basins Prescribed Wells Area 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 view or download groundwater level and salinity data from monitoring wells within the Southern Basins PWA, please visit [Groundwater Data](#) on WaterConnect.

For further details about the Southern Basins PWA, please see the *Water Allocation Plan for the Southern Basins and Musgrave Prescribed Wells Areas* on the Natural Resources Eyre Peninsula [website](#).

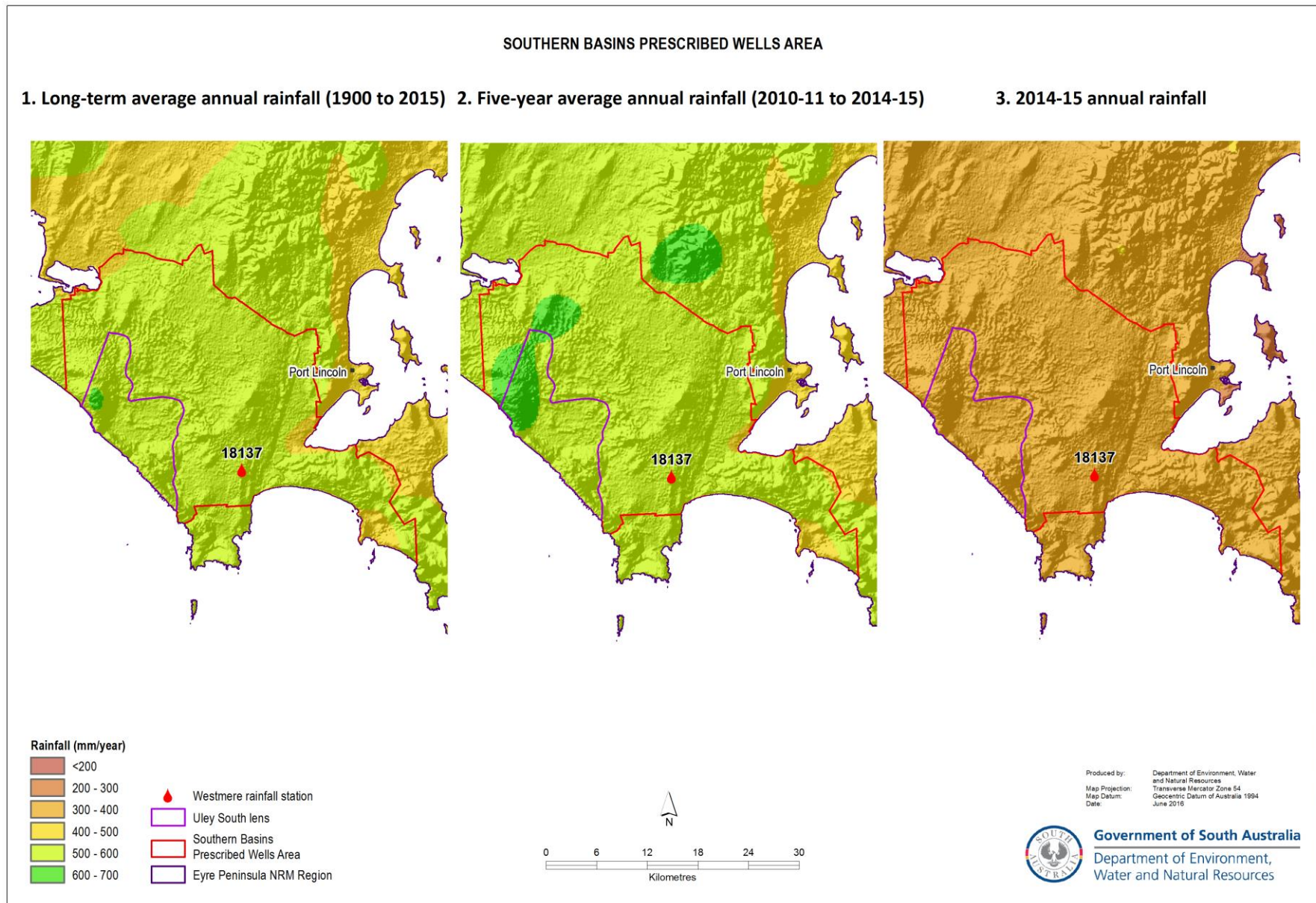


Figure 3. (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall for the 2014–15 water-use year in the Southern Basins Prescribed Wells Area¹

¹ 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.

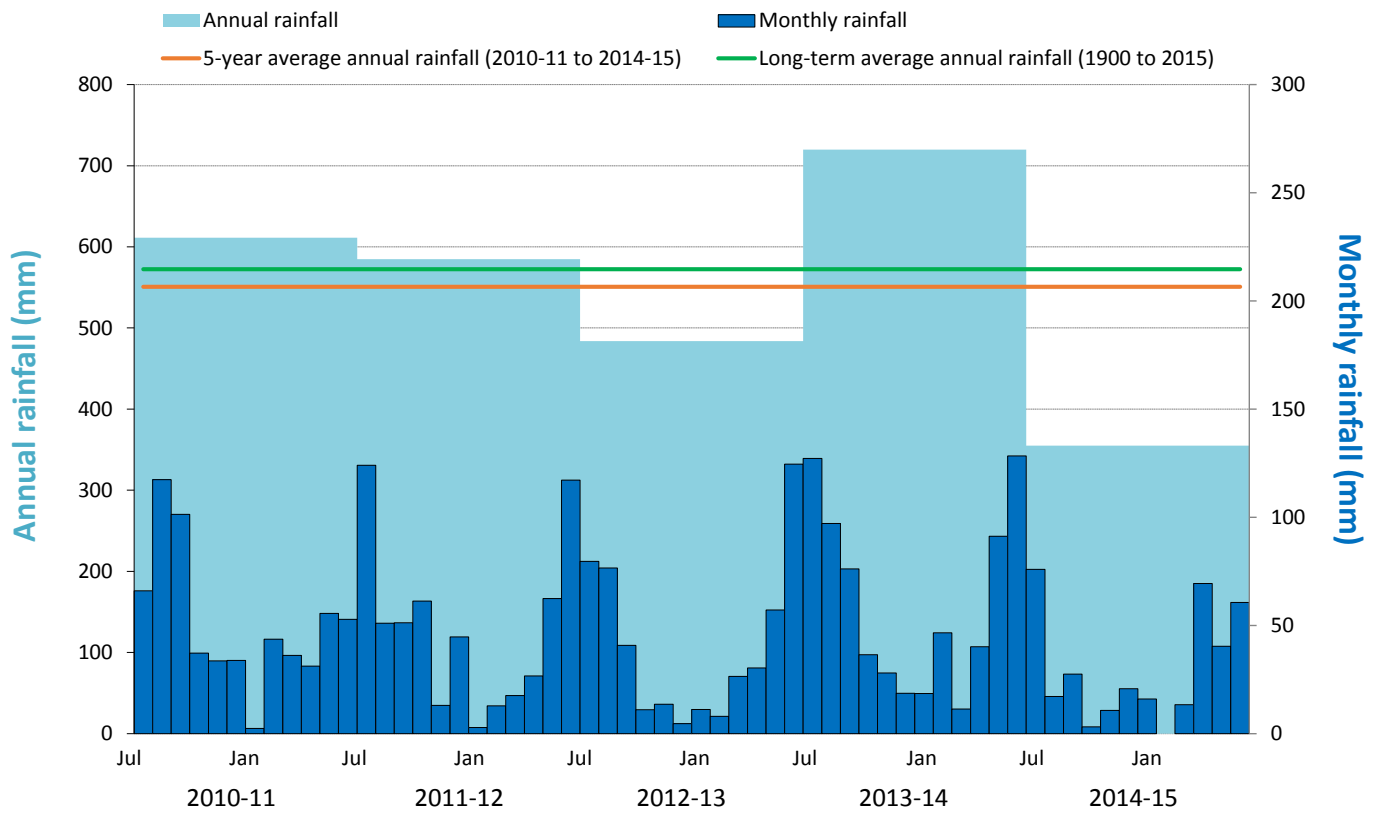


Figure 2. Annual (July–June) and monthly rainfall for the past five water-use years, and the five-year and long-term average annual rainfall recorded at the Westmere rainfall station (BoM Station 18137)²

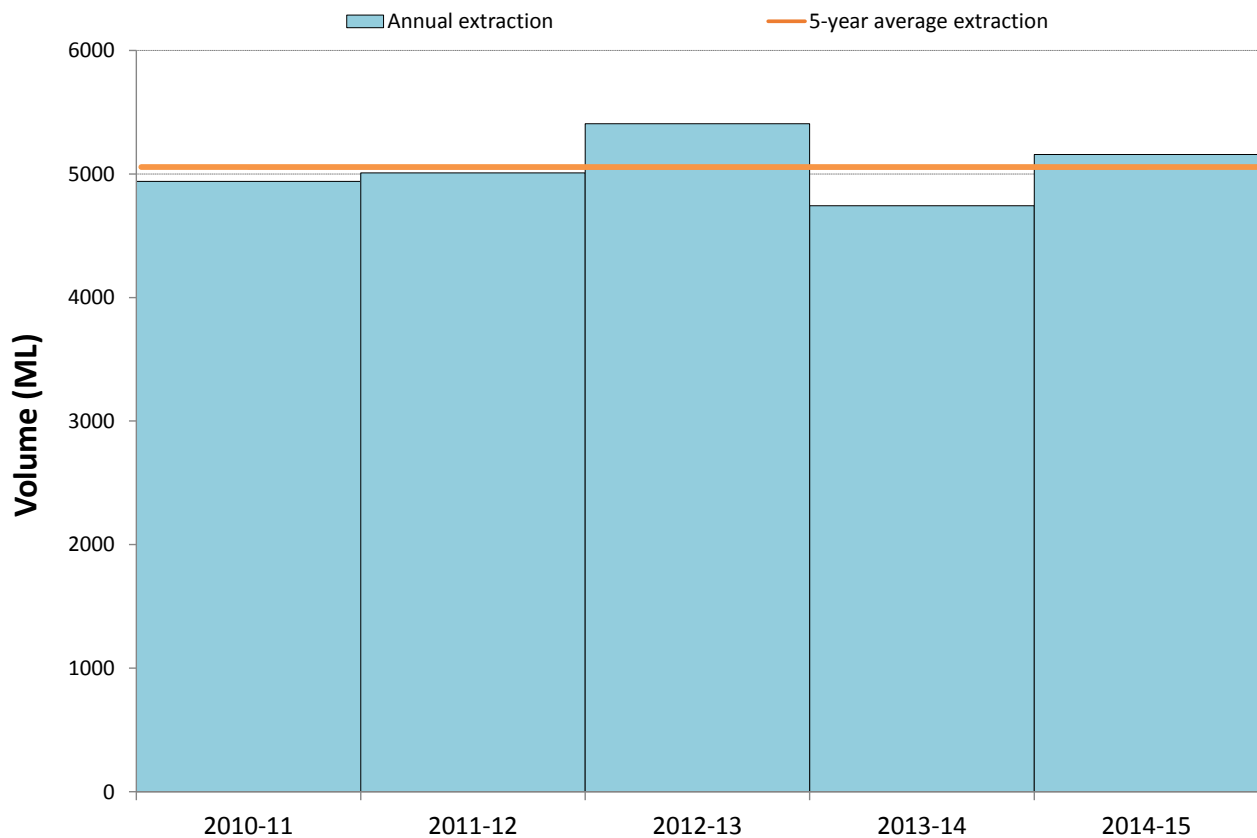


Figure 3. Licensed groundwater extraction volumes for the past five water-use years, for the Uley South lens in the Southern Basins Prescribed Wells Area

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.

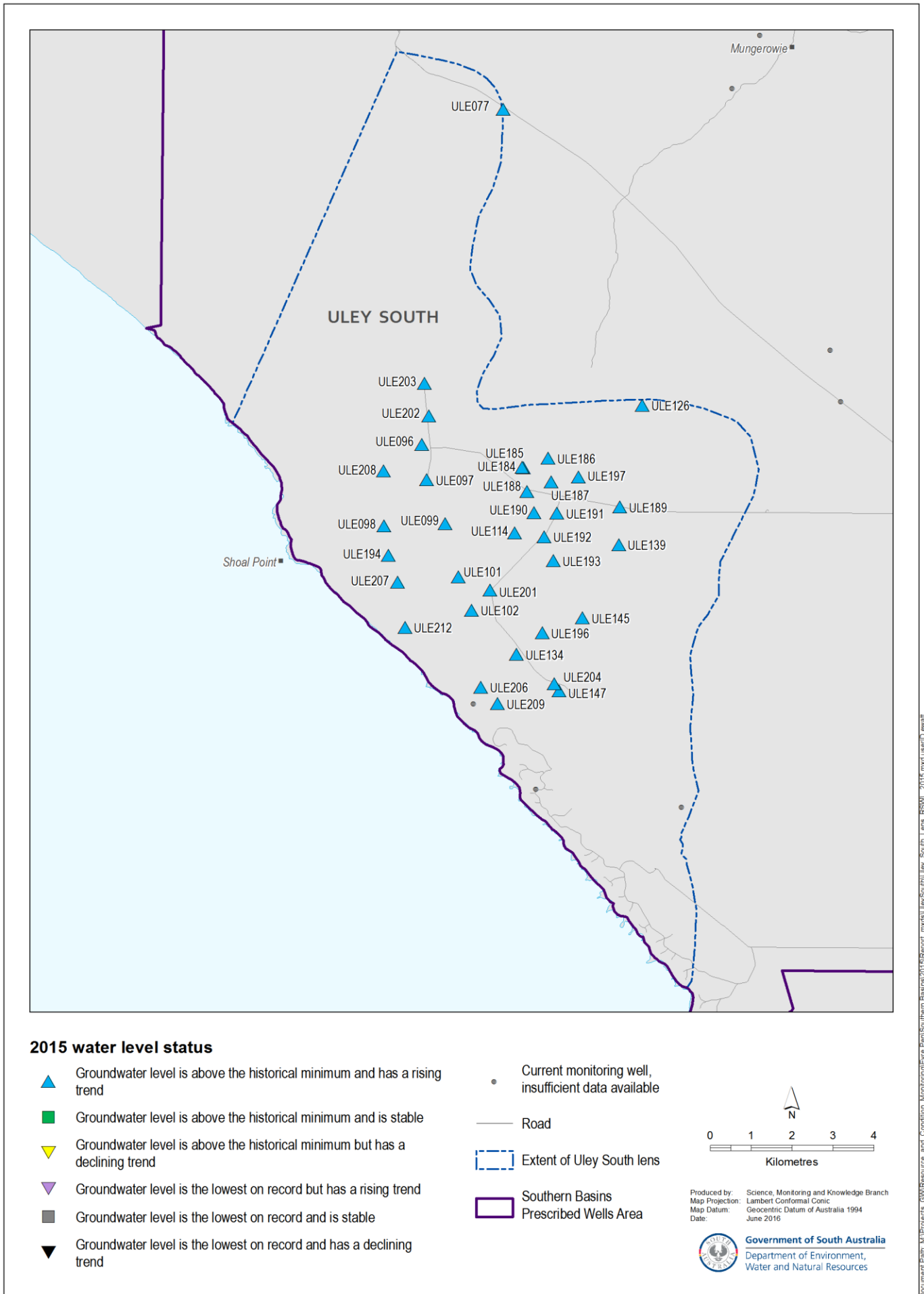


Figure 4. 2015 status of groundwater levels in the Uley South lens (Southern Basins Prescribed Wells Area) based on the five-year trend from 2011 to 2015

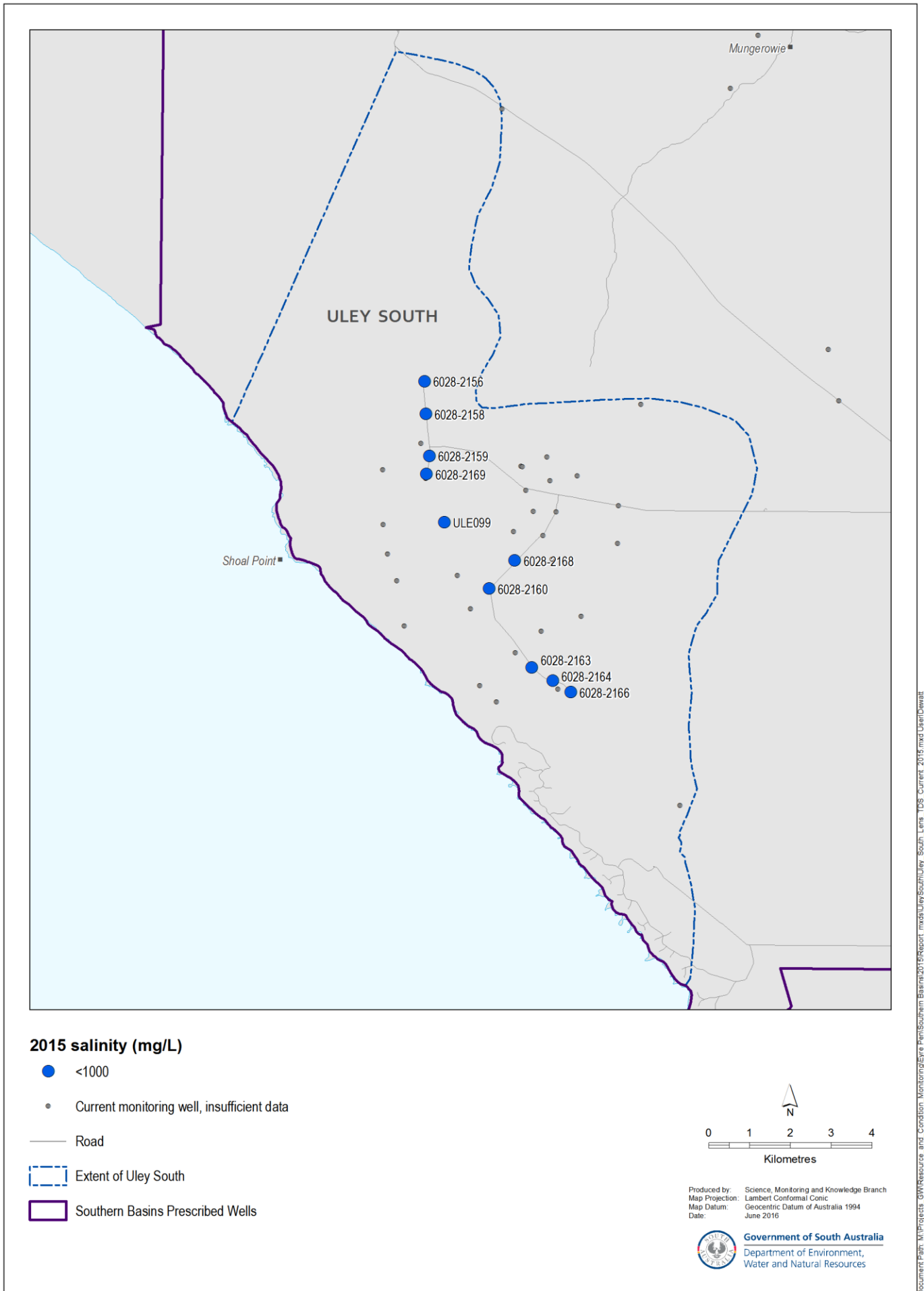


Figure 5. 2015 groundwater salinity of the Uley South lens (Southern Basins Prescribed Wells Area)

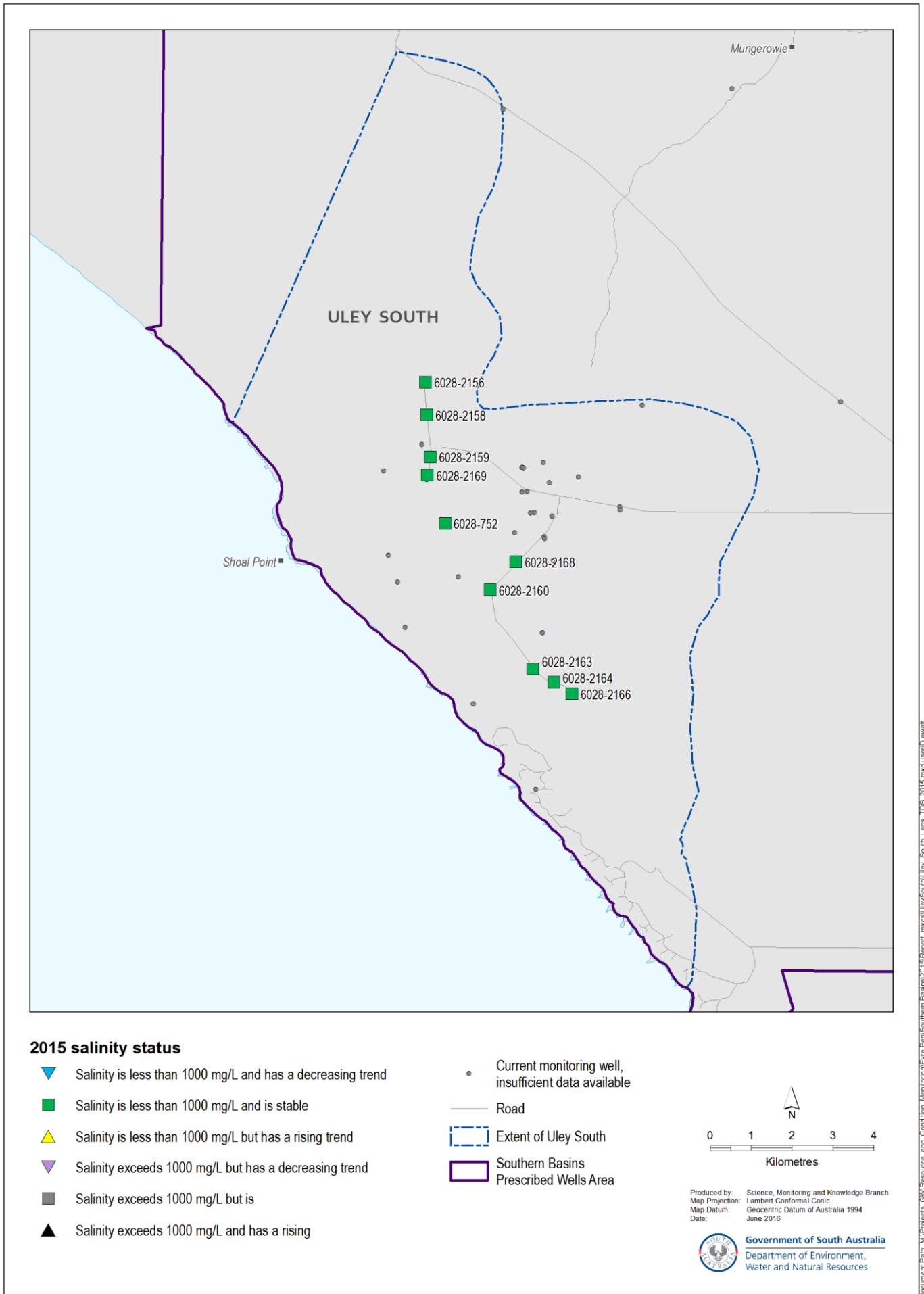


Figure 6. 2015 status of groundwater salinity in the Uley South lens (Southern Basins Prescribed Wells Area) based on the five-year trend from 2011 to 2015

