
SOUTHERN BASINS PWA

ULEY WANILLA LENS

Groundwater Level and Salinity Status Report

2013



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2013 SUMMARY



The Southern Basins Prescribed Wells Area (PWA) is located at the southern most part of the Eyre Peninsula, approximately 270 km west of Adelaide. 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 Wanilla lens is located in the north of the Southern Basins PWA.

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. Areas within the Quaternary limestone aquifer defined by salinity of less than

1000 mg/L, such as the Uley Wanilla 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 southerly direction towards the coast.

Licensed groundwater extractions occur predominantly from fresh groundwater lenses within the Quaternary limestone aquifer and in 1949 the Uley Wanilla lens was the first groundwater lens developed to augment the Tod River Reservoir. Extractions from Uley Wanilla have decreased steadily since 1993 in response to falling groundwater levels. Metered extractions from the Uley Wanilla lens totalled 5.2 ML* in 2012–13, a 92% decrease from the previous water-use year (Fig. 1). This volume of extraction equates to 3% of the total allocation limit of 198 ML for the Uley Wanilla lens and is 0.1% of the total licensed extractions from the Southern Basins PWA.

The sustainability of the groundwater resources in the Southern Basins 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 that greater recharge responses have been observed when rainfall occurs in high-intensity events. The Big Swamp rainfall station (number 18017), located to the east of the Uley Wanilla lens recorded an annual rainfall of 641 mm for 2013. This is 84 mm above the long-term annual rainfall average for that station of 557 mm. In 2013, rainfall was above monthly averages for six out of 12 months with significant above-averages occurring from June through to September. However, below-average rainfall occurred for six months from January through to May and in October (Fig. 2).

The long-term observation records show a positive correlation between groundwater levels and rainfall. A trend of declining groundwater levels between 1940 and 1963 coincides with a dominant below-average trend in rainfall recorded at the Big Swamp rainfall station for that period. The rise in groundwater levels recorded in observation wells in 2009 and 2010 correlates with above-average rainfall received in those years and reduction in extraction, but levels were still well below those recorded before 1985. In 2013, there were twelve observation wells with sufficient data to allow a comparison of changes in maximum recovered water levels from the levels recorded in 2012. Six wells mostly located in the south extent of the lens, recorded a decline in the maximum recovered groundwater level of less than 0.1 m which accounts for less than 1% of the known saturated thickness of the Uley Wanilla lens. However, six wells recorded a rise of up to 0.34 m and one well recorded no change when compared to 2012 water level data (Fig. 3). The slight overall rise in levels is likely to be due to the above average rainfall and significant reduction in extraction in 2013.

* 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

Groundwater salinities of the Quaternary limestone aquifer range from 400 to 800 mg/L (Fig. 4). Observation wells show a variety of salinity trends over the historical record. Regular salinity measurements taken from town water supply wells show salinities have stabilised since 2009 and salinities measured in 2013 are similar to 2012 values.

The Uley Wanilla lens of the Southern Basins PWA has been assigned a green status for 2013:

2013 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 2013 status for the Uley Wanilla lens is supported by:

- an overall slight increase in the maximum recovered groundwater level when compared to 2012 water level data
- no significant change in salinity in 2013 when compared to 2012 salinity data.

To view the *Southern Basins PWA 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 Uley Wanilla PWA, please see the *Water Allocation Plan for the Musgrave Prescribed Wells Area* on the Eyre Peninsula Natural Resources Management [website](#).

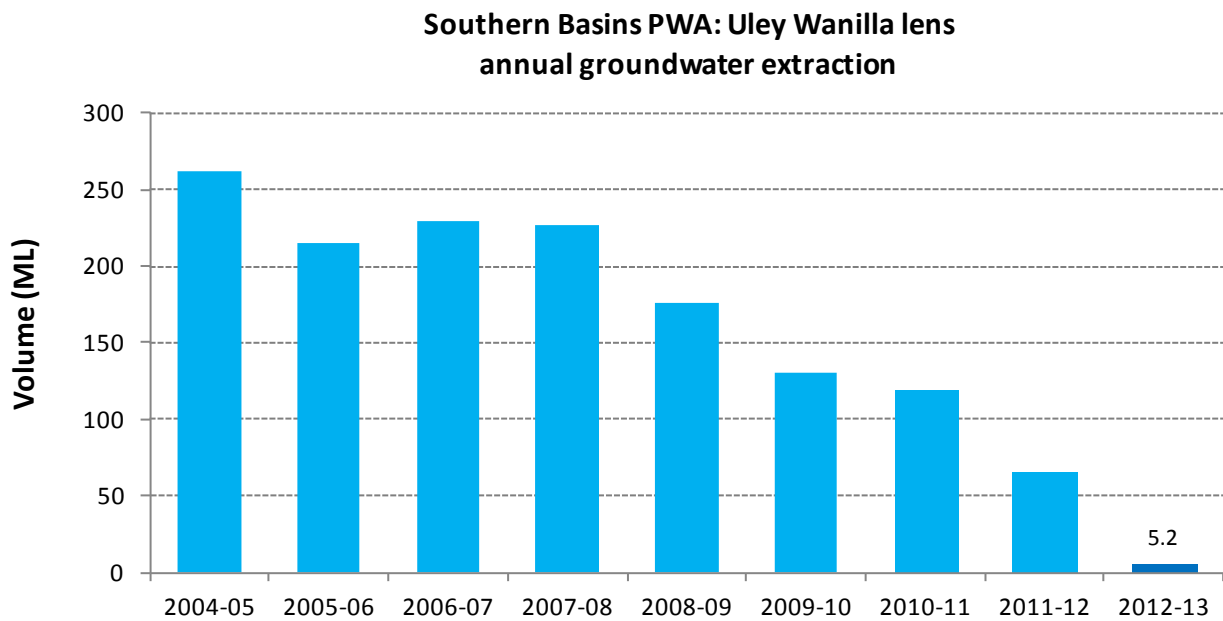


Figure 1. Historical licensed groundwater use* for the Uley Wanilla lens of the Southern Basins Prescribed Wells Area

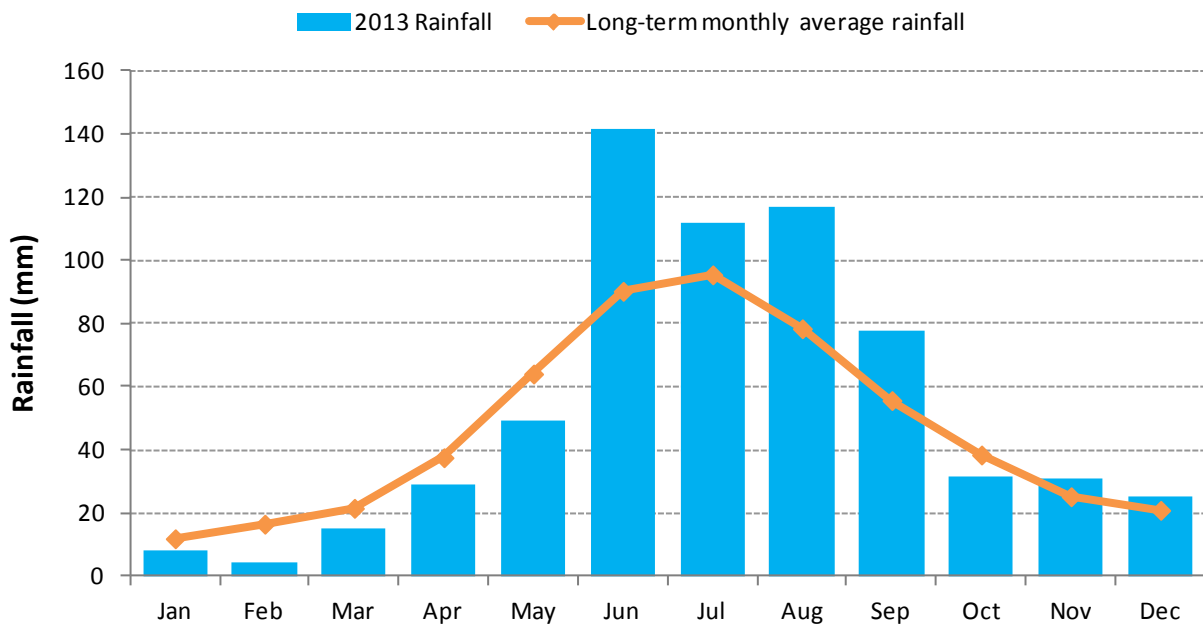


Figure 2. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Big Swamp rainfall station (number 18017) in the Southern Basins Prescribed Wells Area

* 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.

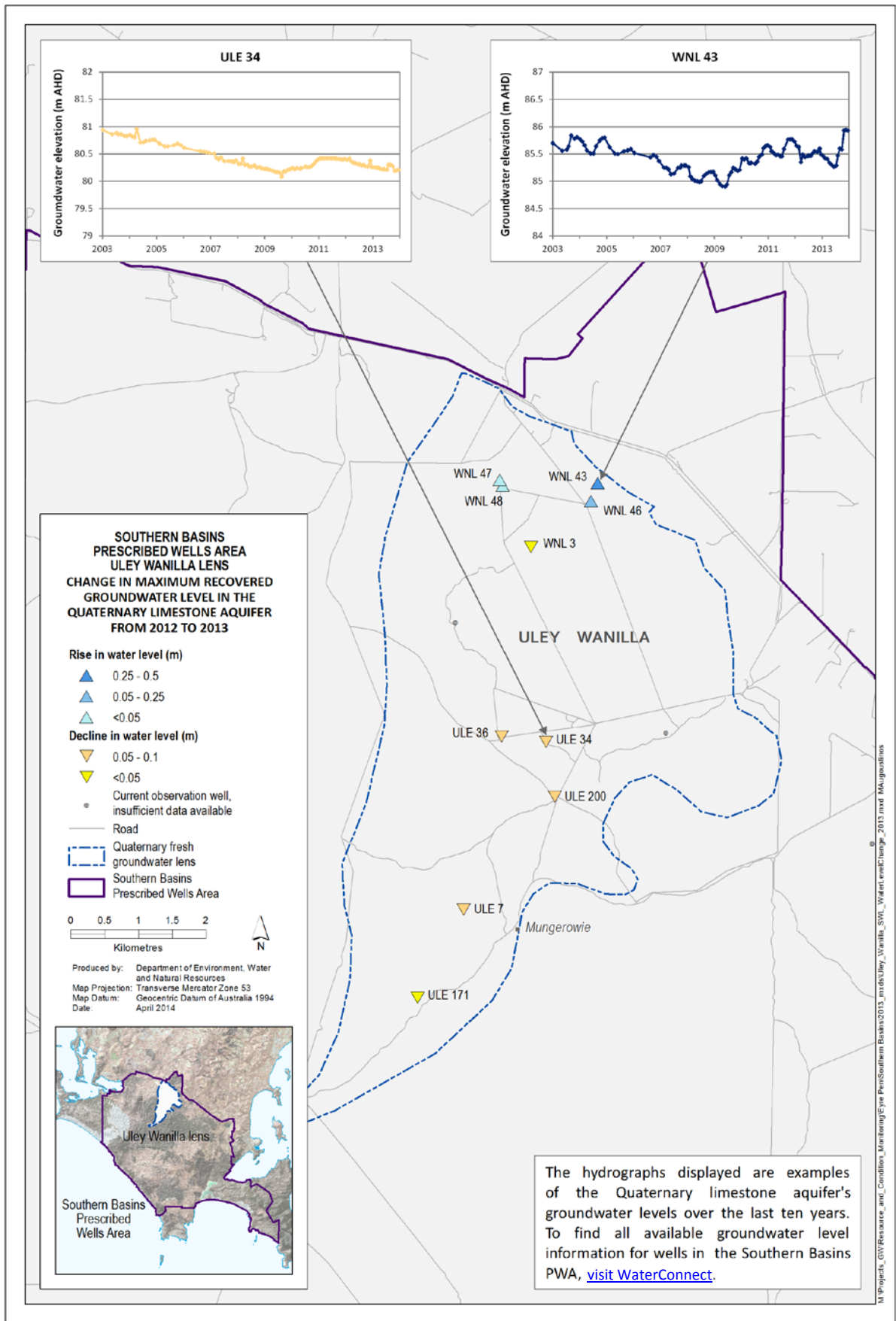


Figure 3. Overall changes in maximum recovered groundwater levels in the Uley Wanilla lens of the Southern Basins Prescribed Wells Area from 2012 to 2013

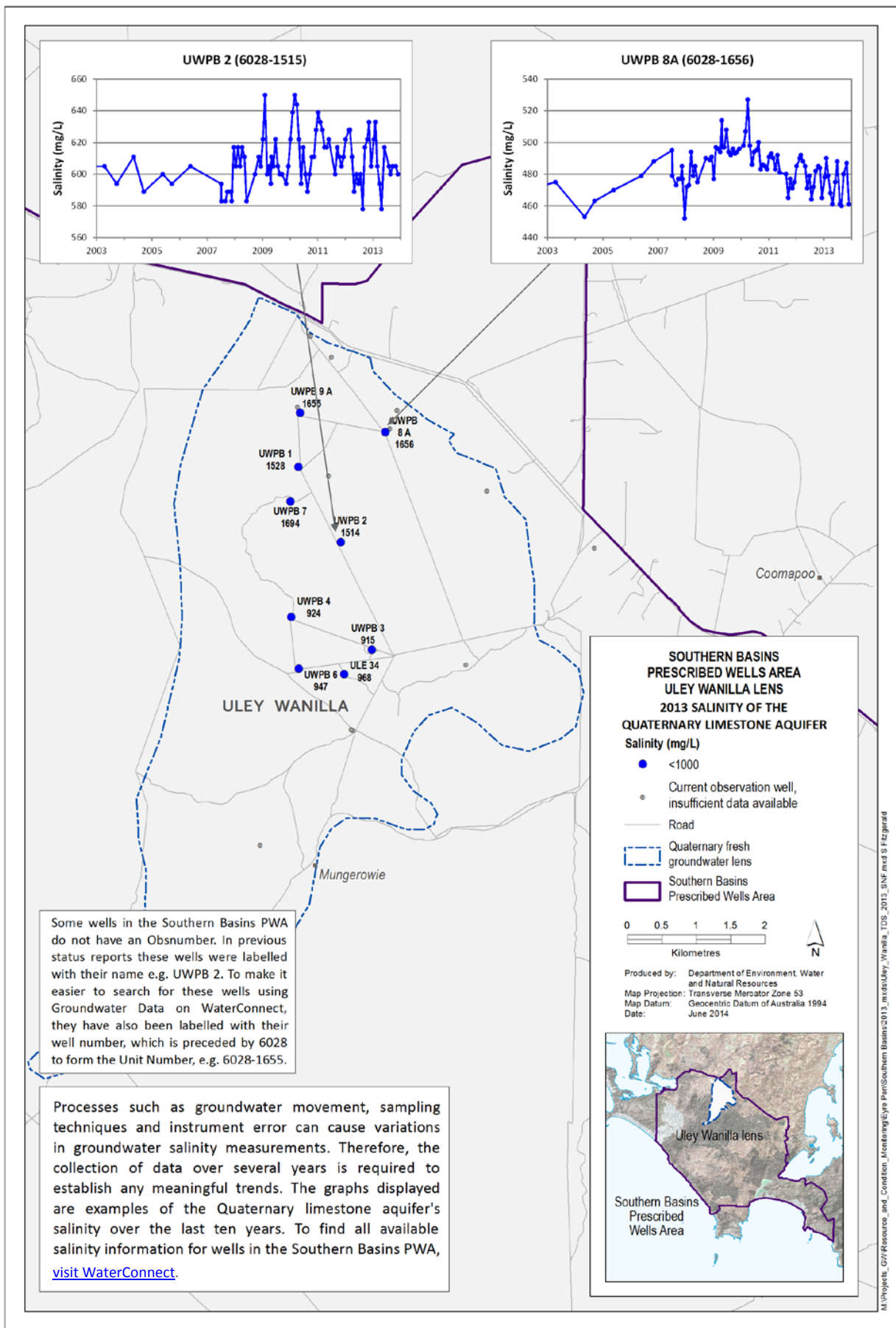


Figure 4. Groundwater salinity of the Uley Wanilla lens in the Southern Basins Prescribed Wells Area for 2013

Southern Basins PWA

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