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# SOUTHERN BASINS PWA

## COFFIN BAY-A LENS

Groundwater Level and Salinity Status Report

2013

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Water and Natural Resources

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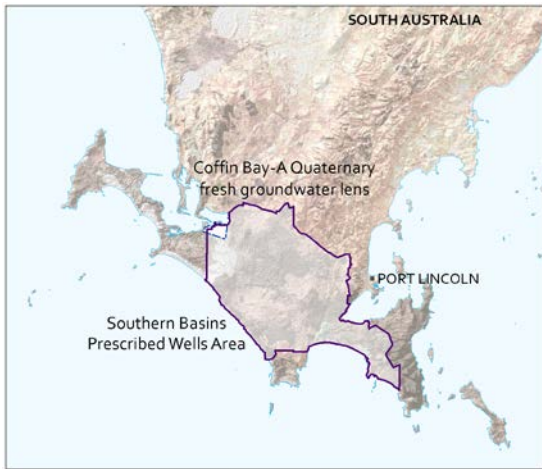
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# 2013 SUMMARY

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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 Coffin Bay-A lens is located in the north-west 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 Coffin Bay-A 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 toward the nearest coastline in the Southern Basins PWA.

Licensed groundwater extractions occur predominantly from the Quaternary limestone aquifer. Metered extractions from the Coffin Bay-A lens totalled 121 ML in 2012–13, a 23% increase from the previous water-use year (Fig. 1). This volume of extraction equates to 86% of the total allocation limit of 141 ML for the Coffin Bay-A lens and is 2% of the total licensed extractions from the Quaternary limestone aquifer in the Southern Basins PWA.

The sustainability of the groundwater resources in the Southern Basins 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 Big Swamp rainfall station (number 18017), located about 20 km to the east of the Coffin Bay-A lens, recorded 641 mm of rainfall in 2013. This is 83 mm above the long-term average annual rainfall for that station. Rainfall was significantly above average from June through to September (Fig. 2).

Long-term groundwater level trends in the Coffin Bay-A lens show a positive correlation to rainfall recorded at the Big Swamp rainfall station, with a slight drop in levels recorded over the period of below-average rainfall from 1992 to 2008. Above-average rainfall in 2009 and 2010 has resulted in a recovery of groundwater levels. In 2013, all 6 wells with monitoring data showed a notable rise in the maximum recovered water level ranging from 0.16 to 0.31 m (Fig. 3).

Within the Coffin Bay-A lens, groundwater salinity has been reasonably stable over the last 20 years at around 300 to 500 mg/L. In 2013, 6 of the 7 wells monitored recorded a salinity of less than 1000 mg/L (Fig. 4). Compared with 2012 measurements, salinity levels in 2013 have generally decreased slightly.

The large variability in salinity samples collected from the Coffin Bay-A lens were examined and are thought to be caused by the method of collection. Salinity samples are collected using two methods: bailing and pumping. Salinity results derived from groundwater samples collected by pumping, after a minimum of three well volumes have been discharged, show little variation and are considered to be representative of the aquifer's salinity. Samples collected by bailer showed large variations. Consequently, these samples are considered unreliable and have not been included in the salinity analysis.

The observation well LKW 39 recorded a salinity of nearly 1100 mg/L in 2013 and there has been a marked increase in salinity between 1985, when the well was installed, and 2008, when regular salinity sampling using pumping began. This well is located

50 m downgradient from, and at a similar depth to a production well for town water supply that was abandoned due to increases in salinity caused by upconing of deeper groundwater of higher salinity. The salinity increase caused by upconing in the production well is likely to have influenced the higher salinity recorded in LKW 39.

The Coffin Bay-A 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 Coffin Bay-A lens is supported by:

- an overall increase in the maximum recovered groundwater level in 2013 when compared to 2012 water level data
- an overall decrease in salinity in monitoring wells recorded in 2013 when compared to the 2012 salinity data.

To view the *Southern Basins PWA Coffin Bay-A Lens 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 Coffin Bay-A lens PWA, please see the *Southern Basins Prescribed Wells Area Water Allocation Plan* on the Eyre Peninsula Natural Resources Management [website](#).

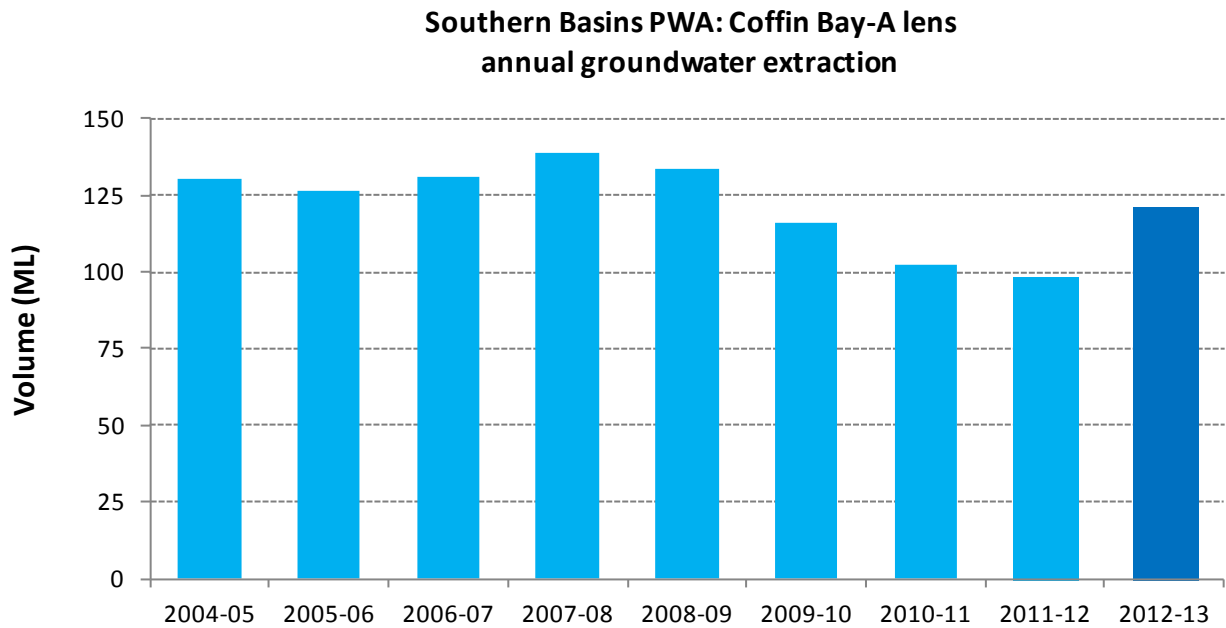


Figure 1. Historical licensed groundwater use for the Coffin Bay-A lens of the Southern Basins Prescribed Wells Area

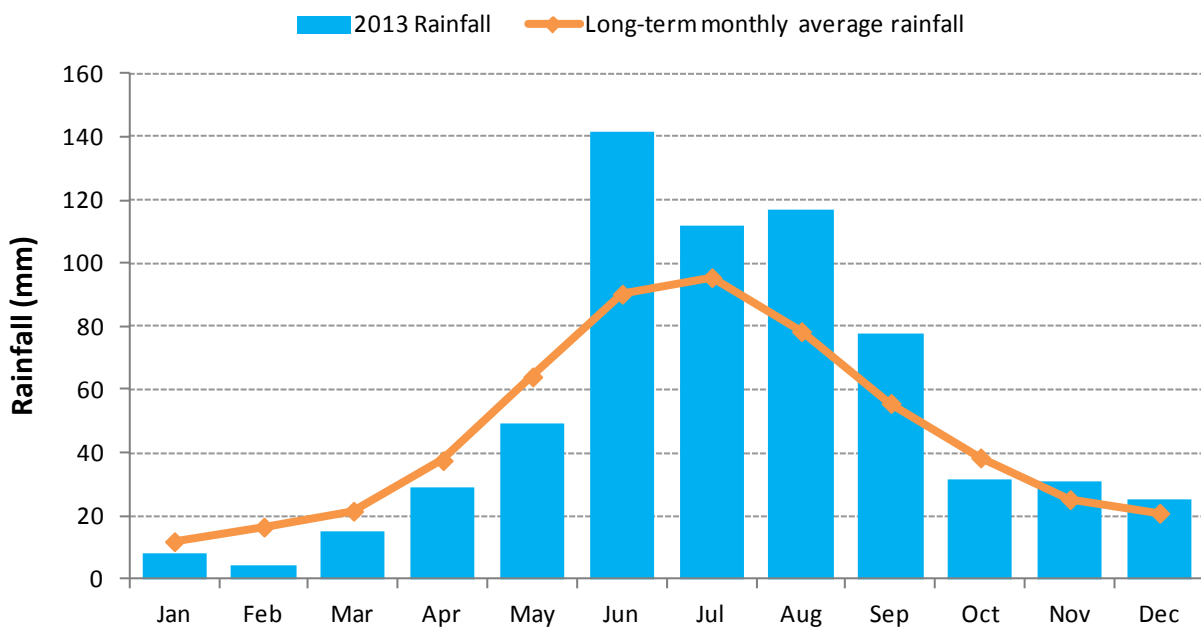


Figure 2. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Big Swamp rainfall station (number 18017) in the Southern Basins Prescribed Wells Area

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](http://www.longpaddock.qld.gov.au/silo).

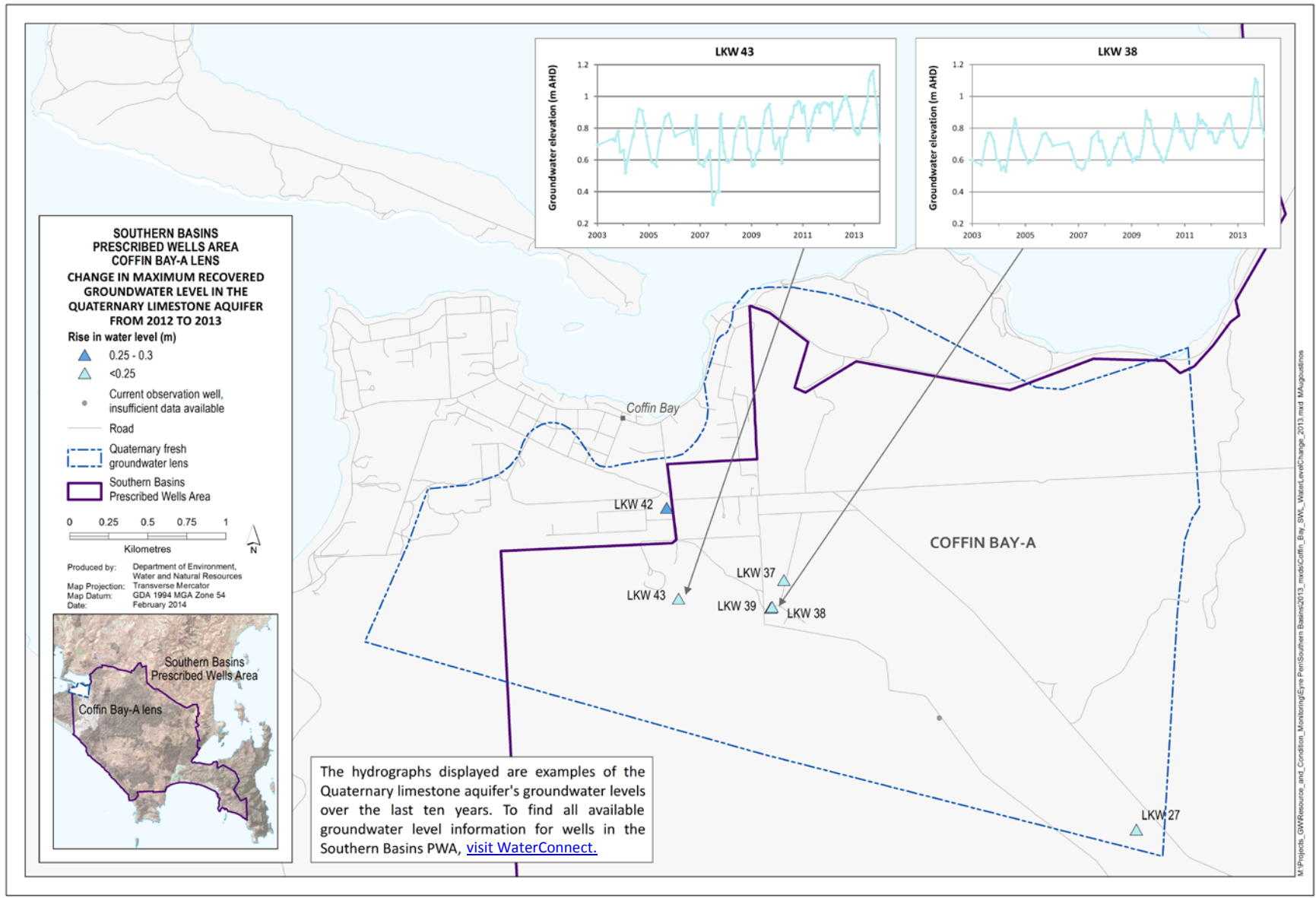


Figure 3. Overall changes in maximum recovered groundwater levels in the Coffin Bay-A lens of the Southern Basins Prescribed Wells Area from 2012 to 2013

Southern Basins PWA

Coffin Bay-A Lens Groundwater Status Report 2013

Department of Environment, Water and Natural Resources

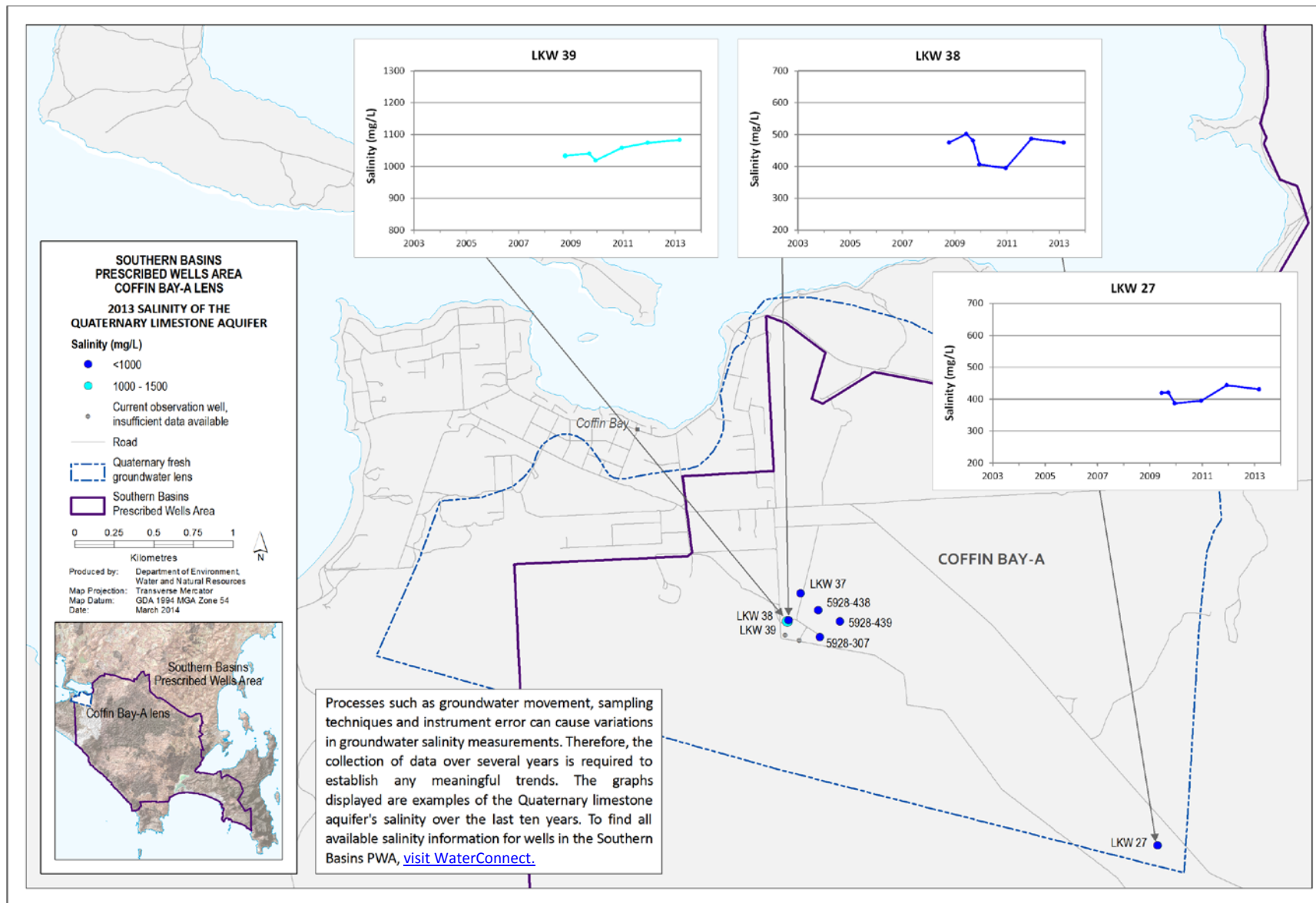


Figure 4. Groundwater salinity of the Coffin Bay-A lens in the Southern Basins Prescribed Wells Area for 2013

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