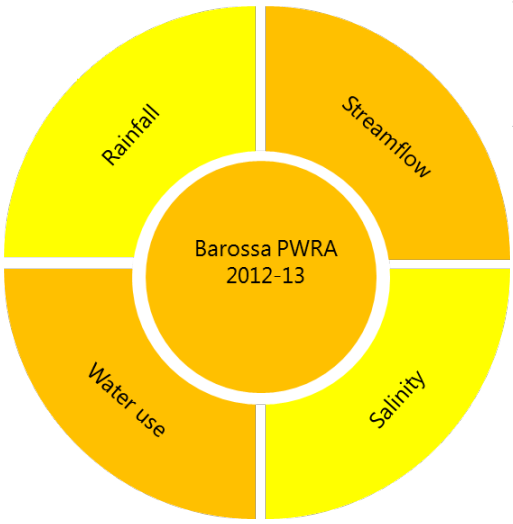
Barossa PWRA

Surface water status report

2012–13

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

2012–13 Summary



The Barossa Prescribed Water Resources Area (PWRA) has been assigned an amber status for 2012–13:

Adverse trends indicating medium risk to the resource eventuating in the short-term

This hydrological status for 2012–13 is supported by:

- Below average rainfall at 3 of 3 rainfall analysis sites
- below average streamflow at 4 of 4 streamflow analysis sites
- variable salinity at 3 salinity analysis sites
- extremely high water use compared to annual streamflow.

This status report provides a snapshot of the surface water resources in the Barossa PWRA for the financial year 2012–13. Surface water status reports are limited to reporting on the hydrological status of the PWRA. Available data on climate, streamflow, salinity and water use is summarised and compared with recent and long-term data to provide an indication of the hydrological status of its water resources. Each element is discussed with reference to recent or more long-term trends where, if at all, they are present in the data. These status reports seek to support informed policy-development and management decisions by resource managers and those responsible for, or reliant on, the water resources. Status of the prescribed resource for the previous years is shown below.

2010-11 Status (green)	2011-12 Status (yellow)	2012-13 Status (amber)

This status report does not seek to evaluate the sustainable limits of the resource, nor does it make any recommendations on management or monitoring of the resource. These actions are important, but occur through separate processes.

The Barossa PWRA is located approximately 60 km north-east of Adelaide (Figure 1). Surface water (including within watercourses) and groundwater resources in the PWRA have been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan (WAP) was developed by the Adelaide and Mount Lofty Ranges Natural Resources Management Board in 2009, which seeks to provide for sustainable management of water resources.

Status symbols

No adverse trends, indicating a stable or improving situation (green)

Trends are either stable (no significant change), or have improved over the reporting period, indicating that there is insignificant risk of impact to the beneficial use of the resource.

Adverse trends, indicating low risk to the resource in the short-term (1 to 3 years) (yellow)

Observed adverse trends are gradual and if continued, are unlikely to lead to a change in the current beneficial uses of the surface water resource in the short-term.

Adverse trends, indicating medium risk to the resource eventuating in the short-term (amber)

Observed adverse trends are significant and if continued, moderately likely to lead to a change in the current beneficial uses of the surface water resource in the short-term.

Adverse trends, indicating high risk to the resource within the short-term (red)

Trends indicate degradation of the resource is occurring. Degradation will very likely result in a change in the beneficial use (e.g. reduced ability to access surface water entitlements and/or decline in the condition of environmental assets).

Unclear (grey)

Trends are unable to be determined due to a lack of adequate information on which to base a sound judgement of status.

Data from the same stations summarised in previous reports are used in analysis, for comparison of annual trends. Three long-term meteorological stations were selected for analysis of rainfall trends; Angaston (M023300), Tanunda (M023318) and Williamstown (M023752) (Figure 1). Rainfall was below average at all analysis sites in 2012–13.

Four long-term gauging stations were selected for analysis of streamflow trends; North Para River at Yaldara (A5050502), North Para River at Penrice (A5070517), North Para River at Mt McKenzie (A5050533) and Tanunda Creek (A5050535) (Figure 1). Streamflow was well below average at all analysis sites in 2012–13.

Three long-term gauging stations were selected for analysis of salinity trends; North Para River at Yaldara (A5050502), North Para River at Penrice (A5070517) and Tanunda Creek (A5050535) (Figure 1). Salinity was variable in 2012–13 when compared to the range of salinity for the previous year.

Water use was extremely high in 2012–13 when expressed as a percentage of the total available streamflow in 2012–13.

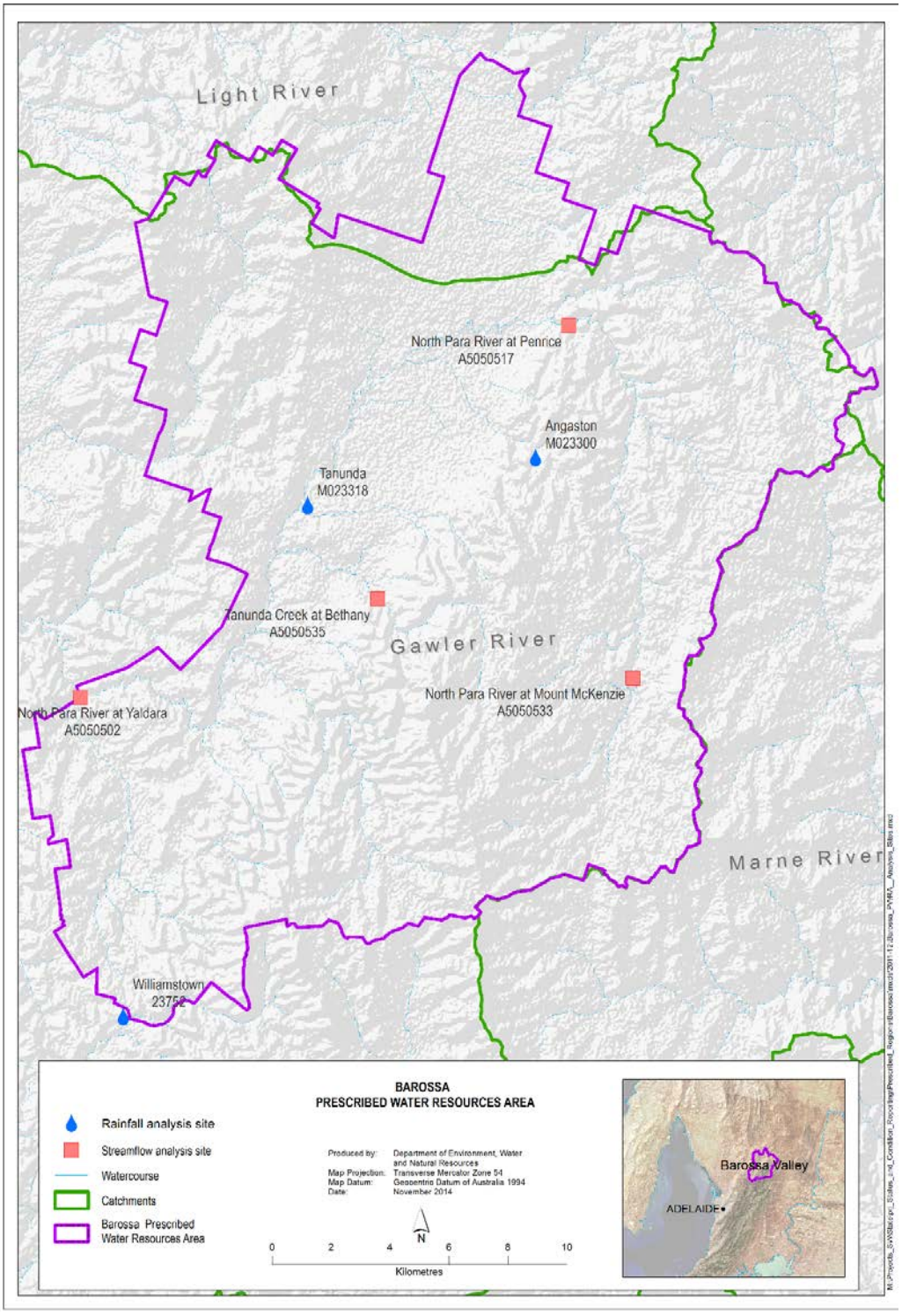


Figure 1. Monitoring analysis sites as used in the Barossa PWRA Surface water status report

Rainfall

Status	Degree of confidence	Comments on recent historical context
Below average rainfall at all rainfall analysis sites	High: good coverage of rainfall stations representing rainfall variation across the region	Below average rainfall at all stations after average or above rainfall the previous year

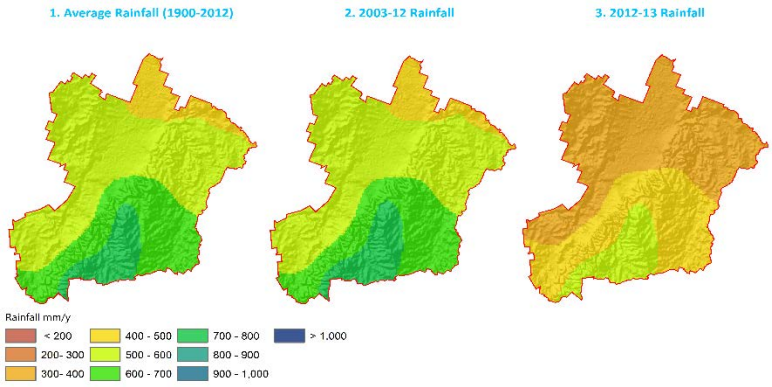


Figure 2. Annual rainfall distributions for the Barossa PWRA

Rainfall in the Barossa PWRA typically varies from 300 millimetres (mm) in the north to over 750 mm in the south (Figure 2). The three panels of Figure 2 indicate that rainfall was lower across the entire PWRA for the year 2012–13 (panel 3) in comparison to the long–term and short-term averages (panels 1 and 2).

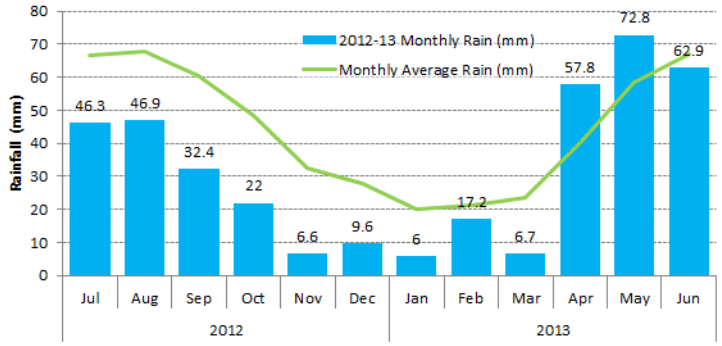


Figure 3. Monthly rainfalls at Angaston (M023300)

Angaston Bureau of Meteorology (BoM) rainfall station received a below average rainfall of 387 mm in 2012–13 in comparison to its long-term average of 535 mm (Figure 3). Above average rainfall was experienced predominantly in the late autumn months across 2012–13 at all stations. The months of October to January and also March received less than half the monthly average rainfall at Angaston.

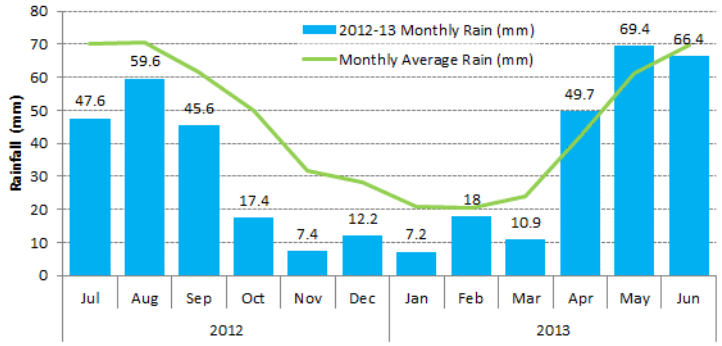


Figure 4. Monthly rainfalls at Tanunda (M023318)

Tanunda BoM rainfall station received a below average rainfall of 411 mm in 2012–13 in comparison to its long-term average of 552 mm (Figure 4). Above average rainfall was experienced in 2 months across 2012–13. As was recorded at Angaston BoM rainfall station, October to January and also March received less than half the monthly average rainfall.

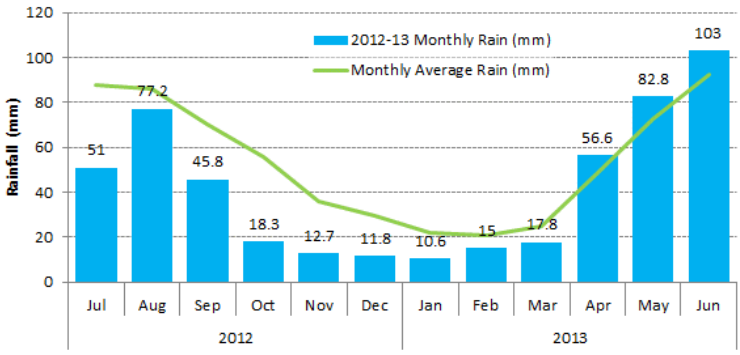


Figure 5. Monthly rainfalls at Williamstown (M023752)

Williamstown BoM rainfall station received a below average rainfall of 503 mm in 2012–13 in comparison to its long-term average of 647 mm (Figure 5). Above average rainfall was experienced in 3 months across 2012–13. The months of July to March were consistently below average across all rainfall stations summarised.

Streamflow

Status	Degree of confidence	Comments on recent historical context
Well below average streamflow at all streamflow analysis sites	High: data derived from long-term gauging stations	Consecutive years of below average streamflow at all streamflow analysis sites after above average streamflow in 2010–11

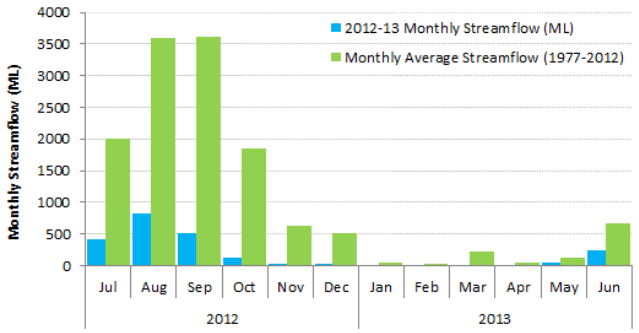


Figure 6. Monthly streamflow at Yaldara (A5050502)

North Para River at Yaldara gauging station (A5050502) experienced a below average annual streamflow of 2186 megalitres (ML) for 2012–13 (84% lower than the 13327 ML long-term average). The monthly breakdown of streamflow for 2012–13 (Figure 6) highlights that all months received well below average streamflow. Streamflow reductions ranged from 59% during May to 100% during the months of January to April where no streamflow was recorded.

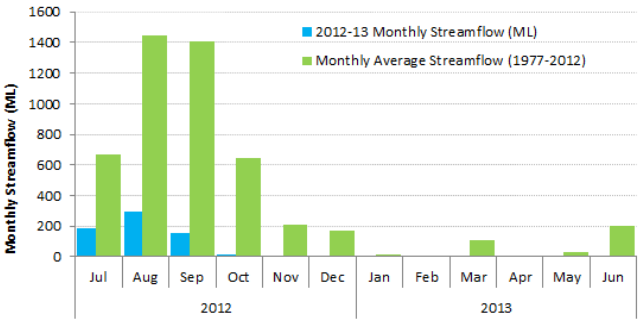


Figure 7. Monthly streamflow at Penrice (A5050517)

North Para River at Penrice gauging station (A5050517) experienced a below average annual streamflow of 654 ML for 2012–13 (87% lower than the 4920 ML long-term average). The monthly breakdown of streamflow for 2012-13 (Figure 7), highlights that all months received below average streamflow. 100% of the total streamflow was received during July to October with no streamflow recorded from November to June.

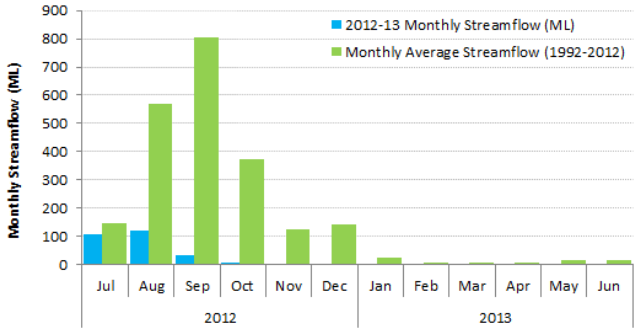


Figure 8. Monthly streamflow at Mt McKenzie (A5050533)

North Para River at Mt McKenzie gauging station (A5050533) experienced a below average annual streamflow of 257 ML for 2012–13 (88% lower than the 2222 ML long-term average). The monthly breakdown of streamflow for 2012-13 (Figure 8) highlights that all months received well below average streamflows. July and August alone received 87% of the annual total while no streamflow was recorded from November to June.

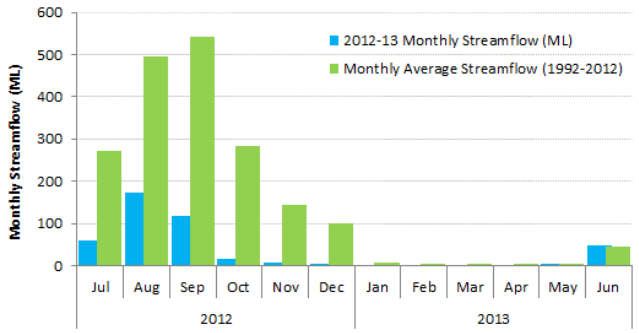


Figure 9. Monthly streamflow at Bethany (A5050535)

Tanunda Creek at Bethany gauging station (A5050535) experienced a below average annual streamflow of 424 ML for 2012–13 (78% lower than the 1898 ML long-term average). The monthly breakdown of streamflow for 2012-13 (Figure 9) highlights that June was the only month to receive above average streamflow. No streamflow was recorded from January to April.

Salinity

Status	Degree of confidence	Comments on recent historical context
Variable	High: data derived from long-term salinity monitoring	Salinity trends show the high range of salinity in 2012–13 being less than 2011–12 at the Penrice and Bethany stations. The salinity trend at the Yaldara station is higher compared to the previous year.

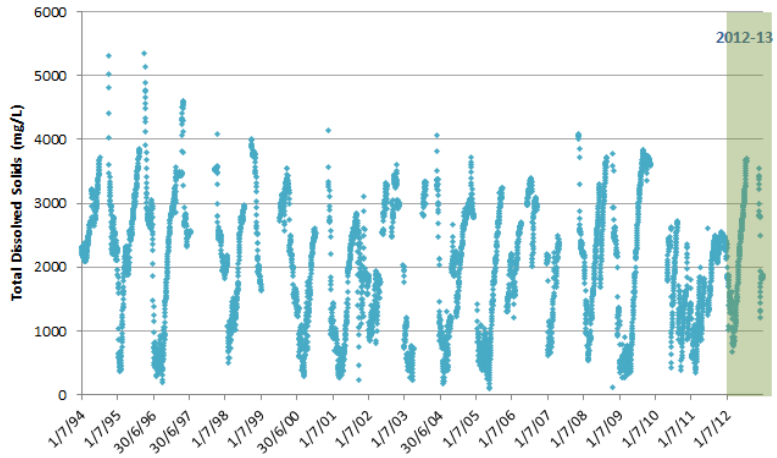


Figure 10. Salinity data at North Para River at Yaldara from 1994–2013

Of the total record for North Para River at Yaldara, 20% was recorded as <1000 mg/L, 46% of the record was between 1000–2500 mg/L, 33% between 2500–4000 mg/L and 1% was >4000 mg/L. The salinity range in 2012–13 is higher compared to the previous year but less than the high salinity levels recorded around 1995–96.

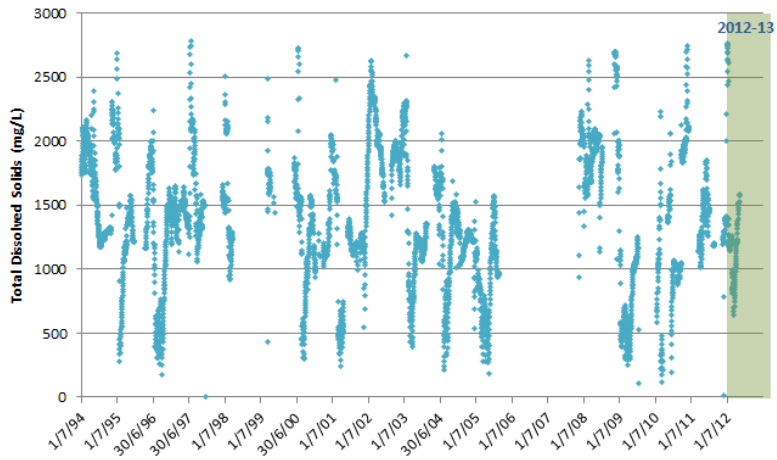


Figure 11. Salinity data at North Para River at Penrice from 1994–2013

For North Para River at Penrice, 20% was recorded as <1000 mg/L, 78% was between 1000-2500 mg/L and 2% of the record was >2500 mg/L. The salinity range in 2012–13 is lower compared to the previous year. Salinity data was not recorded from November to June as no streamflow was recorded during this period.

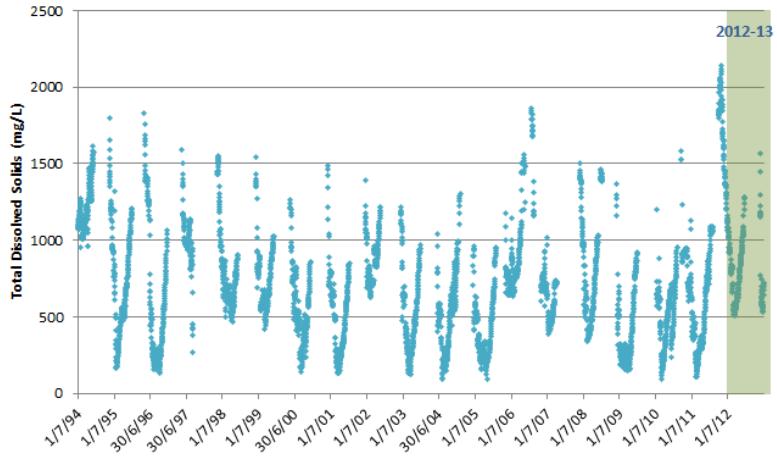


Figure 12. Salinity data at Tanunda Creek at Bethany from 1994–2013

For Tanunda Creek at Bethany, 82% of the total record was recorded as <1000 mg/L and 18% was between 1000–2500 mg/L. The salinity range in 2012–13 is lower compared to the previous year.

Surface water use

Status	Degree of confidence	Comments on recent historical context
Extremely high use compared to annual streamflow	High to medium: high confidence in metered data, medium confidence in estimated data	Water use from licensed surface water resources decreased while imported water use rose during 2012–13

Surface water use is summarised by licensed extractions and estimated non-licensed demand, together with supply from outside of the PWRA (Table 1). Imported water brings water from the River Murray for the purpose of municipal water supply and irrigation of high value crops, including wine grapes.

Table 1. Summary of surface water use in the Barossa PWRA

Barossa PWRA surface water use (ML)		Licensed surface water extractions (dams)	586
		Licensed watercourse extractions	888
		Estimated non-licensed water demand	1100
Imported Water (ML)		Barossa Infrastructure Ltd	7717
		SA Water mains (off-peak supply only)	1236
Total water extractions (ML)			**11527**

Water usage from licensed surface water sources in 2012–13 totalled approximately 1474 ML (586 + 888), which is down from the previous year's total of 1516 ML. Imported water use is up to 8953 ML (7717 + 1236) from the previous year's total of 4653 ML.

Existing stock and domestic dams are not managed through the Barossa WAP (i.e. the volume taken from them is not limited to an allocated volume and they are not metered) therefore an estimate is used to report on non-licensed water demand. The estimated non-licensed water demand is 1100 ML and this volume equates to approximately 30% of the existing stock and domestic dam capacity. As long as the estimated non-licensed dam capacity remains unchanged from one year to the next, so too will the estimated non-licensed surface water demand, irrespective of variations in annual rainfall and streamflow. As such, the limitations of this estimation method should be kept in mind when considering estimated non-licensed surface water demand.

The distribution of water use across the PWRA from 2008-13 is shown in Figure 13.

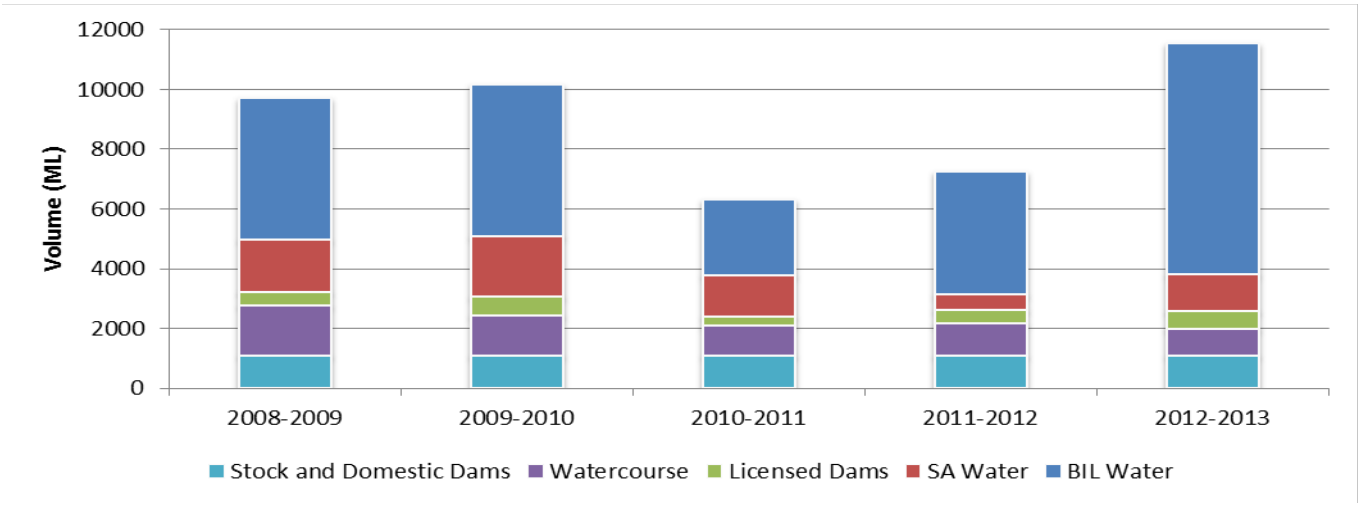


Figure 13. Surface water use in the Barossa PWRA from 2008–13

Recorded streamflow for the PWRA in 2012–13 was approximately 2186 ML (at Yaldara), with approximately 2574 ML (sum of licensed and non-licensed extraction) recorded or estimated as being extracted. As such, of the 4760 ML (2186 plus 2574 ML) total estimated PWRA streamflow volume for 2012–13 (not including evaporation from farm dams), it is estimated that 54% was extracted for use (24% in 2011–12).

The PWRA has been assigned a use rating of 6 (Extremely high use) for 2012–13.

Table 2. Use rating system

Rating	% of resource capacity used in current year	Description
1	0 – 10 %	Negligible use
2	11 – 20 %	Low use
3	21 – 30 %	Moderate use
4	31 – 40 %	High use
5	41 – 50 %	Very high use
6	Greater than 50 %	Extremely high use

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This Surface water status report is available online at http://www.waterconnect.sa.gov.au

To view the *Barossa PWRA Surface water status report 2010–11*, which includes background information on location, rainfall, streamflow, salinity, water use and relevant water dependent ecosystems, please visit the Water Resource Assessments page on WaterConnect.

For further details about the Barossa PWRA please see the *Water Allocation Plan for the Barossa PWRA* on the Natural Resources Adelaide and Mount Lofty Ranges website.

Gridded rainfall data was sourced from the Bureau of Meteorology (BoM). Station rainfall data was sourced from SILO and is Patched Point Data. Further information on SILO climate data is available at: http://www.longpaddock.qld.gov.au/silo/index.html.

Streamflow and salinity data are available via WaterConnect: http://www.waterconnect.sa.gov.au.

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