

# Clare Valley PWRA

## 2015 Surface water status report



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This document is available online at [www.waterconnect.sa.gov.au/Systems/GSR/Pages](http://www.waterconnect.sa.gov.au/Systems/GSR/Pages)

To view the *Clare Valley PWRA Surface water status report 2010–11*, which includes background information on rainfall, streamflow, salinity, water use and relevant water-dependent ecosystems, please visit the *Water Resource Assessments* page on [WaterConnect](#)

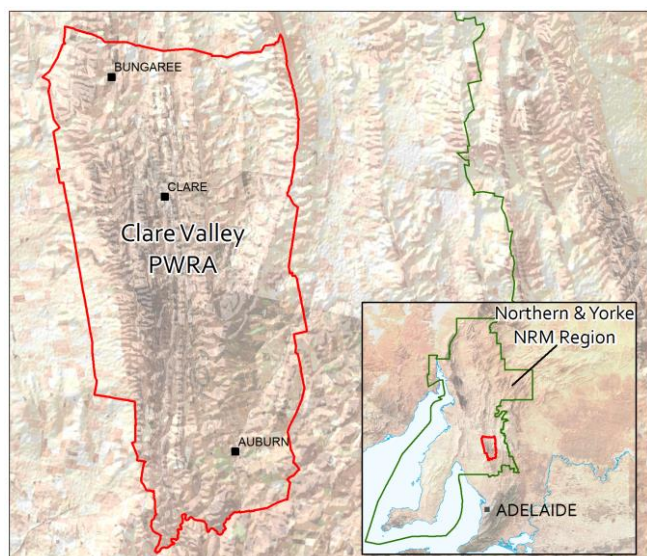
For further details about the *Clare Valley PWRA*, please see the *Water Allocation Plan* for the Clare Valley PWRA on the Natural Resources Northern and Yorke [website](#)

Gridded rainfall data was sourced from the Bureau of Meteorology (BoM). Station rainfall data was sourced from the Scientific Information for Land Owners database (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>

To view descriptions for all status symbols, please visit [WaterConnect](#)

# 2015 Summary



## Description of the Prescribed Area

The Clare Valley Prescribed Water Resources Area (PWRA) is located approximately 100 km north of Adelaide. 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) developed by the Northern and Yorke Natural Resources Management Board and adopted in 2009, seeks to provide for sustainable management of these water resources.

The topography, characterised by hills and valleys, essentially divides the area into a northern half, comprising part of the Broughton River catchment that drains to Spencer Gulf near Port Pirie and a southern half, comprising part of the Wakefield River catchment that drains to Gulf St Vincent near Port Wakefield. The main watercourses that drain to the north are the ephemeral Hill

and Hutt Rivers, while Wakefield River is the main ephemeral watercourse draining to the south. Many permanent pools, primarily sustained by groundwater, occur along these ephemeral watercourses.

Surface water resources are highly dependent on rainfall, with trends in streamflow and salinity primarily climate driven, i.e. below-average winter rainfall results in a reduction in annual streamflow volumes. Below-average summer rainfall can also result in increased irrigation extractions, and these two elements can cause salinities to increase by reducing the amount of streamflow available to dilute salts. Conversely, increased rainfall results in increased streamflow volumes, decreased irrigation extractions and salinities may stabilise or decline.

## Rainfall summary

The Clare (Calcannia) rainfall station (M021075) is located 9 km north of the township of Clare (Fig. 5), where annual rainfall totalled 437 mm during the 2014–15 water-use year, 117 mm below the long-term average (Fig. 1). Last year's rainfall was also the sixth lowest of the past 45 years of rainfall records at the Clare rainfall station (for the period 1970–2015, to align with the period of availability of streamflow data). During the 12 months to June 2015, only three months (July, January and April) had above average rainfall, with the late winter and spring months of September to November and the autumn month of March recording below average rainfall during the last three consecutive years. This trend of months with consecutive below average spring rainfall is commensurate with the Watervale rainfall station (M021054), located 14 km south of Clare. The spatial distribution of rainfall for the past five-years shows average annual rainfall above the long-term average across the central part of the Clare Valley PWRA (Fig. 5). The spatial distribution of rainfall for 2014–15 shows well below long-term average rainfall across the entire PWRA.

## Streamflow summary

Streamflow gauging stations of the Hill and Hutt Rivers are located outside the Clare Valley PWRA, meaning flow data recorded at these locations includes contributions from areas outside the PWRA boundary (Fig. 6). The Wakefield River gauging station also has a large catchment area outside of the PWRA that contributes to the flow record of the station. The Hill River gauging station recorded a total streamflow of 4226 ML during the 2014–15 water-use year, which is higher than the long-term average water year streamflow of 3989 ML (Fig. 2). However, only one month (3322 ML in July 2014) had above average streamflow, with the late winter and spring months and the autumn month of March recording below average streamflow for the past four consecutive years at Hill, Hutt and Wakefield River gauging stations. Streamflow recorded at the Hutt River and Wakefield River gauging stations in 2014–15 totalled 5475 ML and 5880 ML respectively. Annual streamflow from the three gauging stations were combined each year for the period 1970–71 to 2014–15 and then ranked. The total 2014–15 streamflow of 15 580 ML (4226 + 5475 + 5880) from the three streamflow gauges is the 68<sup>th</sup> percentile (%ile) and ranks in the 50–75<sup>th</sup> percentile range of streamflow over the period of record. The percentile range of each streamflow gauging station is included later in the report (Fig. 6).

## Water use summary

Surface water use in the Clare Valley PWRA includes licensed extractions from dams and watercourses that are metered, estimated demand from non-licensed farm dams (generally stock and domestic) and the Clare Valley Water Supply Scheme. The latter brings treated water from the River Murray by SA Water for the purpose of municipal water supply and for irrigation of high value crops, including wine grapes. During 2014-15 this volume totalled 724 ML (997 ML in 2013-14). Water use from licensed surface water sources totalled 1666 ML in 2014-15 (1901 ML in 2013-14). Existing stock and domestic dams are not managed through the Clare Valley 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. Estimated non-licensed water demand is 675 ML and this volume equates to approximately 30% of the existing stock and domestic dam capacity. Recorded streamflow for the Clare Valley PWRA in 2014-15 was around 11 950 ML (scaled to the PWRA), with approximately 2341 ML (sum of licensed and non-licensed extraction) recorded or estimated as being extracted. As such, of the 14 291 ML (11 950 plus 2341 ML) total estimated resource capacity for 2014-15 (not including evaporation from farm dams), it is estimated that 16% was extracted for use (18% in 2013-14). The 5-year moving average for the percentage of resource capacity extracted for use indicates a short-term declining trend (Fig. 3).

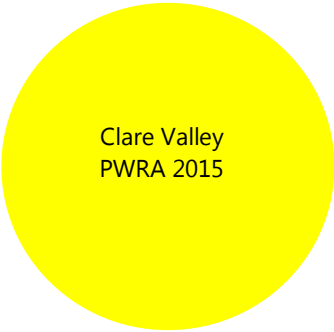
## Salinity summary

Despite some data gaps with no recorded information, the Skillogalee Creek and Wakefield River gauging stations provide a good indication of salinity (measured as Total Dissolved Solids) from July 2005 (Fig. 4). A clear pattern of increasing salinity in the spring and summer months and decreasing salinity in the autumn and winter months is shown in Figure 4, highlighting the climatic influence. In Skillogalee Creek, 84% of salinity data is less than 2500 mg/L, while 71% is between 2500-4000 mg/L in the Wakefield River. Salinities peaked in the Wakefield River during the millennium drought in early 2008, the result of many years of below average streamflow. The 5-year moving averages show an overall steady trend in salinity at Skillogalee Creek and Wakefield River (Fig. 4).

## Status summary

To determine the surface water status of the Clare Valley PWRA for 2015, the total streamflow from the Hill, Hutt and Wakefield River gauging stations for the water use period July 2014 - June 2015 (2014-15) is expressed as a percentile by comparing it to the annual streamflow data measured over the entire period of record (1970-71 to 2014-15). The percentile value indicates the percentage of records in the dataset that are equal to or below that streamflow. For example, if the 90<sup>th</sup> percentile annual streamflow is 100 ML, this indicates that 90 percent of the annual streamflow values over the entire period of record were equal to or lower than 100 ML/y. The total 2014-15 annual streamflow is the 68<sup>th</sup> percentile, which means 68% of the annual streamflow values during the period 1970-71 to 2014-15 were equal to or below the 2014-15 total annual streamflow. Status is defined based on which percentile grouping the current year's streamflow percentile value occurs within (shown in the image below). This is a new approach, compared to assessments used in past *Surface water status reports*. Please visit the [Frequently Asked Questions](#) on the *Water Resource Assessments* page on WaterConnect for more detail on the current method of evaluating the status of surface water resources.

# 2015 Status



Clare Valley  
PWRA 2015

The Clare Valley at a whole PWRA scale is assigned a yellow surface water status for 2015 based on the status of total streamflow recorded at the Hill, Hutt and Wakefield River gauging stations:

'Annual streamflow was between the 50<sup>th</sup>-75<sup>th</sup> percentile of the period of record'

The percentile range of all three streamflow gauging stations used in analysis can be seen in Figure 6.

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 such as prescription and water allocation planning.

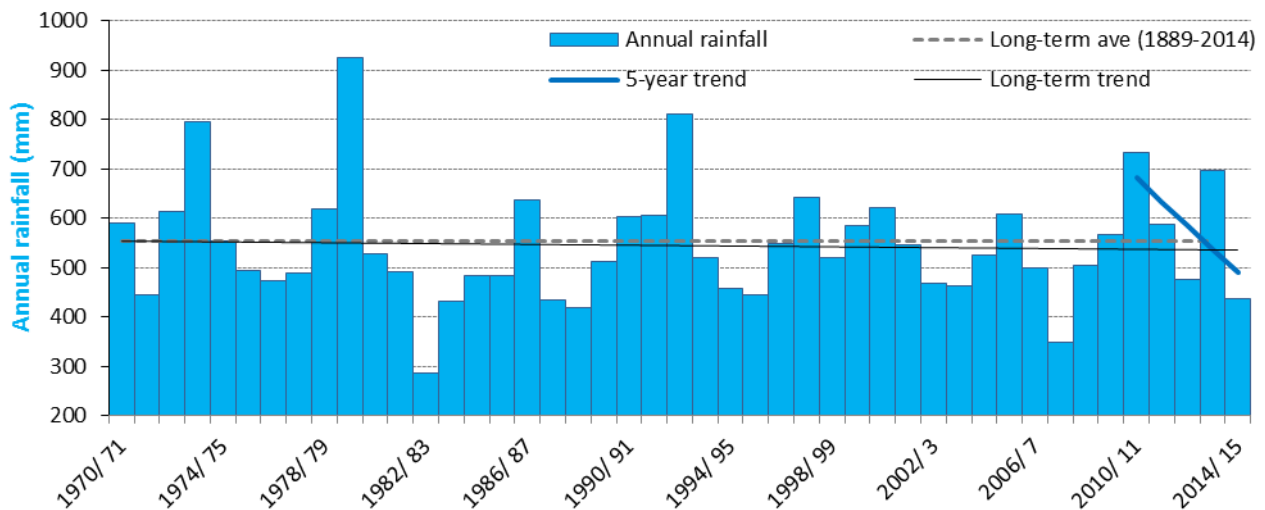


Figure 1. Annual rainfall (mm) for the 1970–71 to 2014–15 water-use years (July–June), the long-term trend and long-term average annual rainfall, and the short-term trend for the past five-years recorded at Clare (Calcannia) rainfall station (M021075)

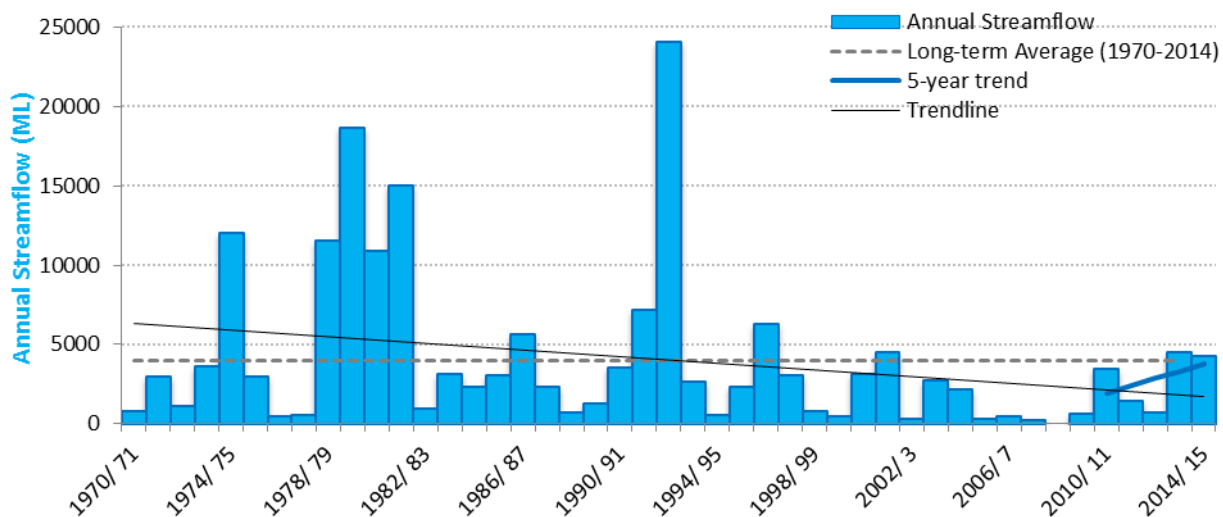


Figure 2. Annual streamflow (ML) for the 1970–71 to 2014–15 water-use years (July–June), the long-term trend and long-term average annual streamflow, and the short-term trend for the past five-years recorded at Hill River gauging station (A5070500)

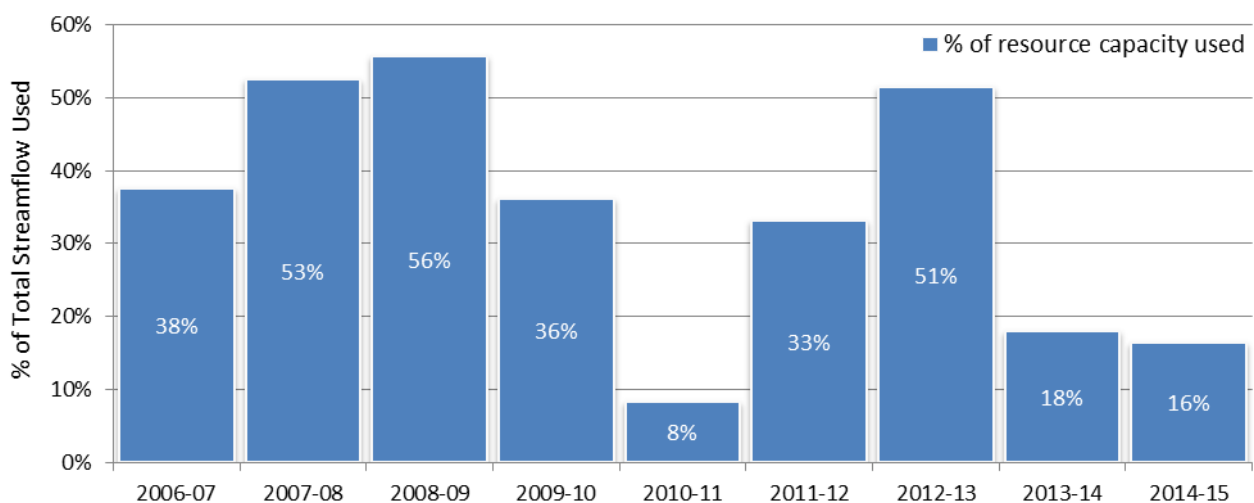


Figure 3. Surface water use as a percentage of total resource capacity available for the 2006–07 to 2014–15 water-use years for the Clare Valley PWRA

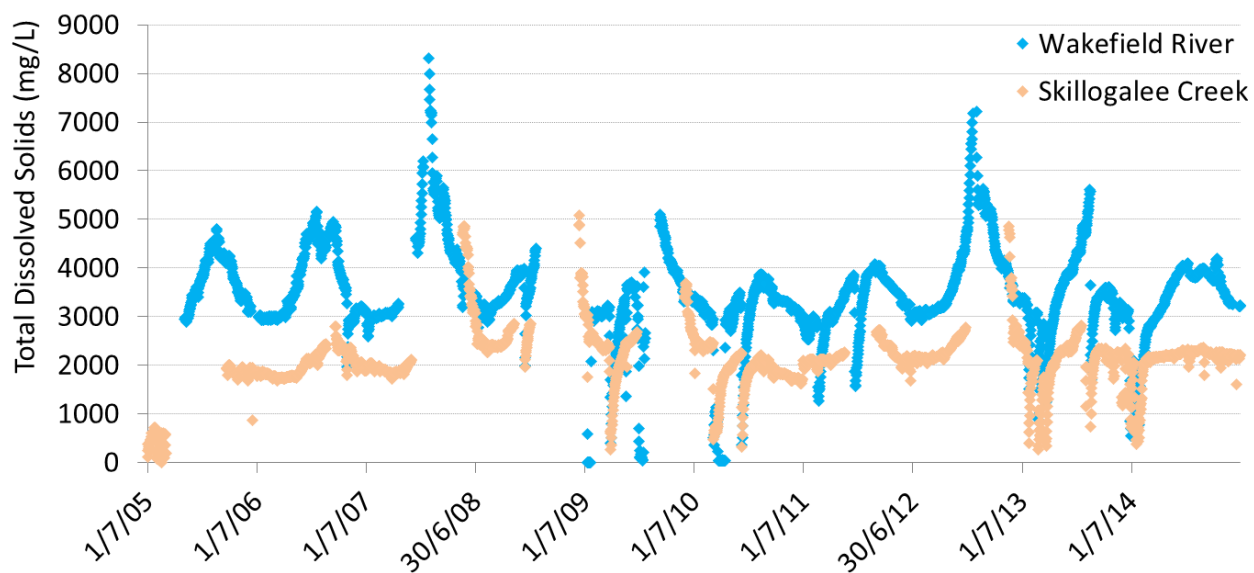


Figure 4. Salinity data (TDS mg/L) for the 2005–06 to 2014–15 water use years at Wakefield River (A5060500) and Skillogalee Creek (A5061008) gauging stations



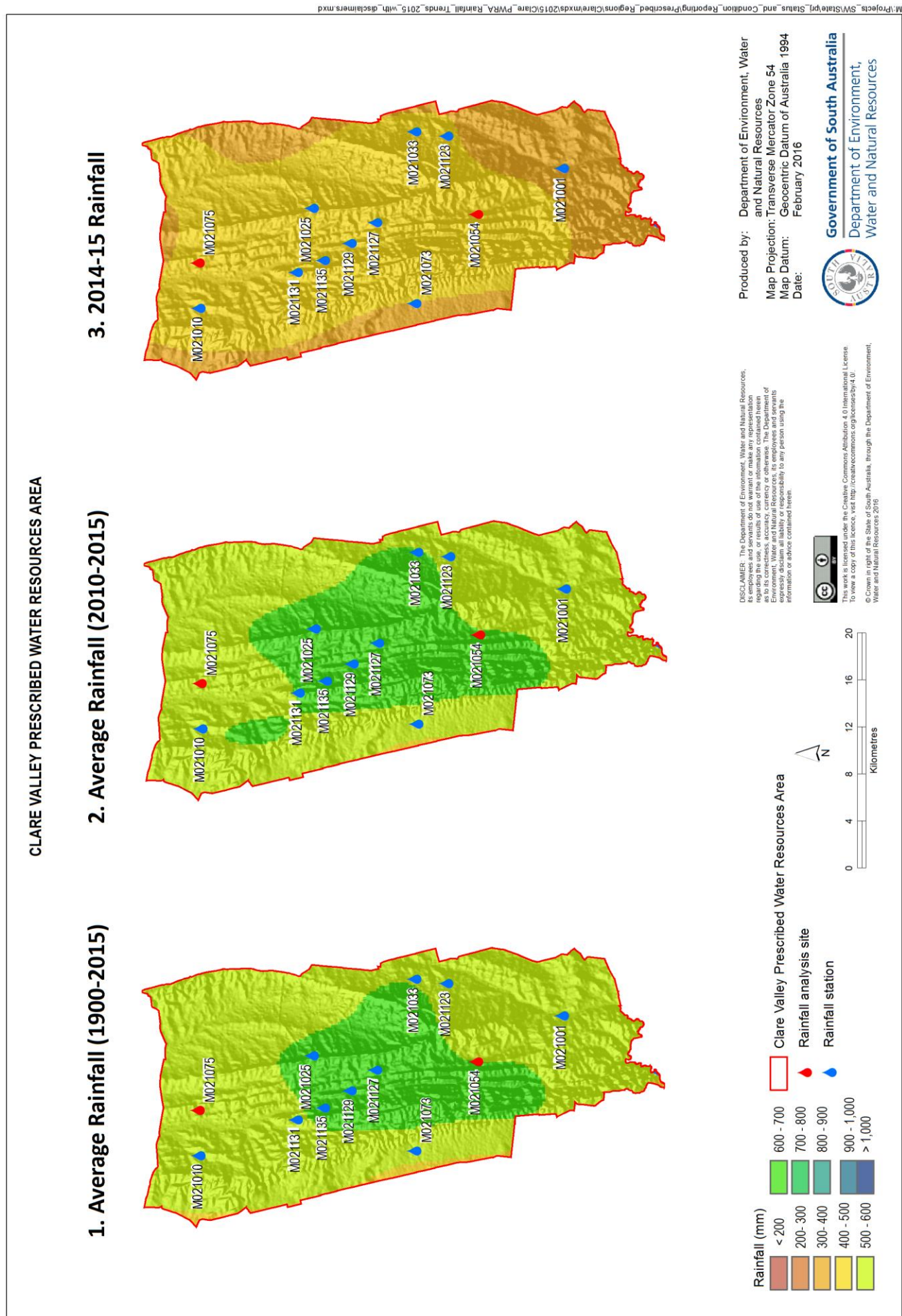


Figure 5. (1) Long-term and (2) five-year average annual rainfall and (3) annual rainfall for the 2014–15 water-use year in the Clare Valley PWRA



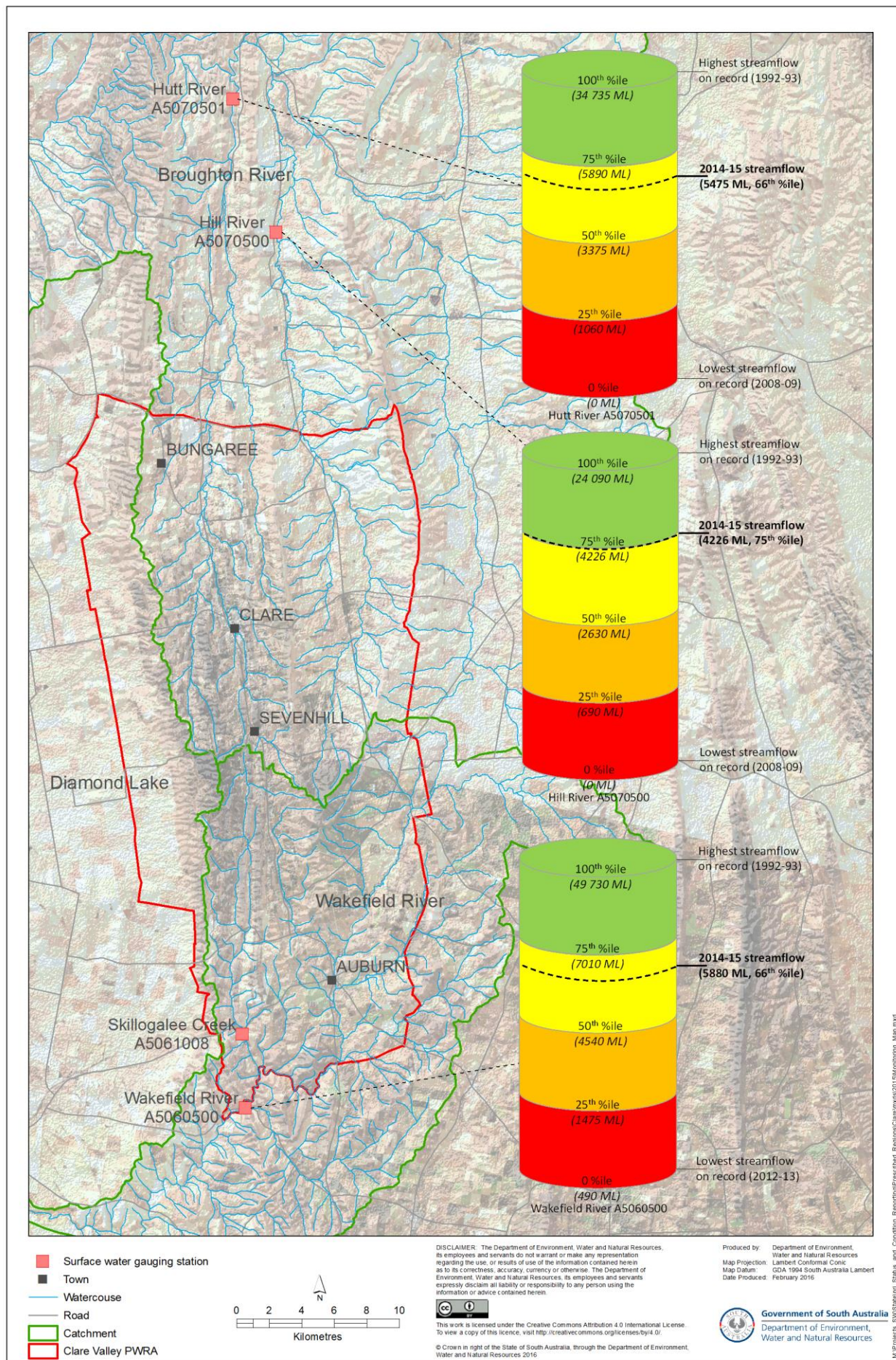


Figure 6. Surface water gauging stations and streamflow percentiles in the Clare Valley PWRA



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