South Australian Murray Region
Water Resource Plan
Provided for accreditation pursuant to section 63 of the Commonwealth’s Water Act 2007
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### Abbreviations and Acronyms

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<td>ANZECC</td>
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<td>the Minister</td>
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<td>the risk assessment report</td>
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<td>SE NRM</td>
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<td>Sustainable Diversion Limit</td>
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<td>Water Act 2007 (Cwlth)</td>
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Acknowledgements

Acknowledgement of First Nations

The First Nations of South Australia, the Aboriginal Traditional Owners, have occupied, enjoyed and managed their customary lands and waters since time immemorial and continue their deep cultural, social, environmental, spiritual and economic connection today.

The South Australian Government acknowledges and pays respect to the Traditional Owners and their Nations. The South Australian Government also acknowledges and respects the rights, interests and obligations of Traditional Owners to speak and care for their Country – lands and waters – in accordance with their laws, customs, beliefs and traditions.

In acknowledging this history and connection we also recognise the deep and irreversible damage and dislocation that Aboriginal and Torres Strait Islander people have experienced and continue to experience, through European colonisation, settlement and displacement.

Aboriginal Nations have advocated strongly for a healthier Murray-Darling Basin and just settlement of their land and water rights. This commitment led to a stronger Basin Plan for South Australians and asks us as a State Government to better recognise Traditional Owner interests in our water resource management.

The Department for Environment and Water seeks to enable partnerships with Aboriginal Nations built upon mutual respect and trust. We recognise the differences between Nations and their preferred approaches for engagement with Government and will work through these arrangements to support Traditional Owners to meet their customary rights and obligations in natural resource planning and implementation.

Acknowledgement of contributors

The development of this Water Resource Plan has been a collaborative effort across many areas within the Department for Environment and Water; the South Australian Murray-Darling Basin, South East and South Australian Arid Lands Natural Resources Management Boards; Aboriginal Nations; the Crown Solicitor’s Office; and Murray-Darling Basin Authority staff. The risk assessment component was informed by experts from a range of government agencies.

Many thanks to all who have invested significant time and energy to ensure that the South Australian Murray Region Water Resource Plan is a robust and defensible document.
1 Introduction

The Commonwealth's Water Act 2007 (Water Act) requires that for each water resource plan area a water resource plan must be developed consistent with the requirements of the Basin Plan. The development of the South Australian (SA) Murray Region Water Resource Plan (WRP) has been a staged process informed by a development program, a detailed risk assessment, a transition to Basin Plan gap analysis and through a thorough drafting and advice process.

This document, together with the associated package of instruments and texts as detailed in section 5.2.3 of this document, constitutes the SA Murray Region WRP. Figure 1 below outlines the broad concept of the SA Murray Region WRP. The SA Murray Region WRP has been developed to address the requirements of each of the sections of Chapter 10 of the Basin Plan and is submitted for accreditation against Basin Plan version F2017C00078 under section 63 of the Water Act.

Figure 1  Outline of the broad concept of a WRP in South Australia
2 Overview of the South Australian Murray Region Water Resource Plan Area

2.1 Description of the area

The SA Murray Region WRP area covers approximately 63,509 km² and incorporates all surface water and groundwater resources within this area, excluding those of the South Australian River Murray (identified as SS11 in the Basin Plan).

As shown in Figure 2, the SA Murray Region WRP area incorporates the majority of the Murray-Darling Basin in South Australia from the Victorian border in the east, to the edge of the plains of the Mount Lofty Ranges in the west and south-east to the coast. Falling outside of the SA Murray Region WRP area are the Eastern Mount Lofty Ranges and the River Murray and its floodplain to the 1956 flood level.

The area can be categorised into two different landscapes: the hills zone of the Olary Ranges and Mount Lofty Ranges (along the north, north-eastern boundary) and the plains region that characterises the remainder of the WRP area (CSIRO and SKM, 2010). The surface waters associated with the Coorong and Murray Mouth are also part of the SA Murray Region WRP area; however, the Lower Lakes (Lake Albert and Lake Alexandrina) and the River Murray fall outside of the SA Murray Region WRP area. Groundwater underlying these surface water areas is, however, part of the SA Murray Region.

The SA Murray Region WRP area incorporates all or parts of the traditional lands of the Ngaiawang, Nawait, Nganguru, Erawirung, Ngintait, Ngaralte, Ngarkat, Peramangk, Ngarrindjeri, Wilyakali, Adnyamathanha, Kaurna, Tanganekald, Meintangk and Bunganditj people. The water resources of the region are inextricably connected to the land and all living things and, as such, are integral to their collective and individual cultural identities.

The region incorporates nearly all the South Australian Murray-Darling Basin (SAMDB) Natural Resources Management (NRM) region and a portion of the South Australian Arid Lands (SAAL) and South East (SE) NRM regions (Figure 2).

The SA Murray Region WRP area is a complex area due to its diverse nature and the geographically large area it covers. The water resources are varied and include episodic semi-arid ephemeral surface water systems through to pockets of good quality water amongst brackish or highly saline groundwater systems. The water resources in the area are a mix of resources prescribed under the South Australian Natural Resources Management Act 2004 (NRM Act) and non-prescribed resources. Therefore, there is a variety of management arrangements in place to assist in the sustainable use of the resource.

Table 2 provides a summary of the Sustainable Diversion Limits (SDL) Resource units within each of the South Australian WRP areas as outlined in Schedule 2 and Schedule 4 of the Basin Plan.

---

1 See Hemming, S., Trevorrow, T. & Rigney, M. 2002 ‘Ngarrindjeri Culture’ In M. Goodwin & S. Bennett (eds) The Murray Mouth: Exploring the implications of closure or restricted flow, Department of Water, Land and Biodiversity Conservation, Adelaide, Chapter 1, 13-19. This published report featured the Ngarrindjeri perspectives of connection to Country and featured the words of Tom Trevorrow ‘the land and waters is a living body’. Ngarrindjeri Tendi, Ngarrindjeri Heritage Committee and Ngarrindjeri Native Title Management Committee on behalf of the Ngarrindjeri Nation 2006 Ngarrindjeri Nation Yarliwar-Ruwe Plan: Caring for Ngarrindjeri Sea Country and Culture, Ngarrindjeri Lands and Progress Association, Meningie.
### Table 2  Summary of SDL resource units within each of the South Australian WRP areas

<table>
<thead>
<tr>
<th>WRP area</th>
<th>Surface / Groundwater</th>
<th>SDL Resource Unit</th>
<th>Status</th>
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<tr>
<td>SA Murray Region</td>
<td>Surface water</td>
<td>SA Non-Prescribed Areas (SS10)</td>
<td>Non-prescribed</td>
</tr>
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<td></td>
<td>Groundwater</td>
<td>Mallee (Pliocene Sands) (GS3)</td>
<td>Prescribed and non-prescribed</td>
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<td></td>
<td></td>
<td>Mallee (Murray Group Limestone) (GS3)</td>
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<td>Mallee (Renmark Group) (GS3)</td>
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<td></td>
<td>Groundwater</td>
<td>Peake, Roby and Sherlock (unconfined) (GS5)</td>
<td>Prescribed</td>
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<tr>
<td></td>
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<td>Peake, Roby and Sherlock (confined) (GS5)</td>
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<tr>
<td></td>
<td>Groundwater</td>
<td>SA Murray (GS6)</td>
<td>Non-prescribed</td>
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<td></td>
<td>Groundwater</td>
<td>SA Murray Salt Interception Schemes (GS7)</td>
<td>Non-prescribed</td>
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<td>SA River Murray</td>
<td>Surface water</td>
<td>South Australian Murray (SS11)</td>
<td>Prescribed</td>
</tr>
<tr>
<td>Eastern Mount Lofty Ranges</td>
<td>Surface water</td>
<td>Eastern Mount Lofty Ranges (SS13)</td>
<td>Prescribed</td>
</tr>
<tr>
<td></td>
<td>Surface water</td>
<td>Marne-Saunders (SS12)</td>
<td>Prescribed</td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
<td>Angas Bremer (Quaternary Sediments) (GS1)</td>
<td>Prescribed</td>
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<td>Angas Bremer (Murray Group Limestone) (GS1)</td>
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<td></td>
<td>Groundwater</td>
<td>Eastern Mount Lofty Ranges (GS2)</td>
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<td>Groundwater</td>
<td>Marne Saunders (fractured rock) (GS4)</td>
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<td>Marne Saunders (Murray Group Limestone) (GS4)</td>
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<tr>
<td></td>
<td></td>
<td>Marne Saunders (Renmark Group) (GS4)</td>
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</table>

Following is a series of indicative maps as required by section 10.04(3)(b) of the Basin Plan aimed at providing context to the water resources and management areas within the SA Murray Region.
Figure 2    South Australian WRP areas with NRM region boundaries
Figure 3  South Australian Non-Prescribed Areas surface water SDL resource unit
Figure 4  South Australian groundwater SDL resource units
2.2 Surface water

The surface water of the SA Murray Region WRP area (SS10) is highly ephemeral in nature and watercourses tend to terminate as they fan out across the plains. Annual average rainfall across the region varies from approximately 470 mm at Meningie near the Coorong in the south to approximately 236 mm at Yunta in the north (Barnett, 2015). Annual average evaporation is between 3 and 10 times greater than annual rainfall. South of the River Murray, rainfall tends to be seasonal with higher rainfall through winter and spring. In the northern parts of the SA Murray Region, rainfall is generally unpredictable and, when it does rain, it can be local, very heavy and the annual rainfall can fall in a single rainfall event (SAAL Regional NRM Plan, 2010).

Surface water runoff from the Murray Mallee region is minimal due to the flat terrain, low rainfall and highly permeable soils. Inflows to the River Murray from the SA Murray Region are from groundwater drainage, which follows a general north-westerly flow path.

Burra Creek is the most significant tributary and is located in the north-west of the SA Murray Region WRP area. The central part of the Burra Creek catchment has a well-defined channel with permanent flow, primarily from groundwater baseflow. Further to the east, flow becomes discontinuous, and permanent waterholes are irregularly located before Burra Creek becomes poorly defined and becomes a floodout plain, with braided and discontinuous drainage lines (Deane, et al., 2008). Burra Creek receives flows from a catchment of approximately 934 km²; however, surface water flows are highly unreliable.

In the northern part of the SA Murray Region WRP area, there are a number of watercourses including Olary Creek, Wiawera Creek, Yunta Creek and Manunda Creek. These watercourses have irregular flow and are subject to extreme flood, drought and siltation. There are also known permanent and semi-permanent streams and waterholes in the Olary Ranges; however, these are primarily fed by groundwater (SAAL Biodiversity Plan Vol 3, 2009).

The Coorong is an elongate coastal lagoon that extends from the mouth of the River Murray, 100 kilometres south-east parallel to the coast. The waterbody is confined by the coastal dune barrier of Younghusband and Sir Richard Peninsulas. The Coorong is hydrologically connected to the Lower Lakes in the north and to the South East drains in the south. There are three distinct habitats ranging from the seasonal freshwater near the barrages, to the brackish Murray Mouth and northern lagoon area, and the hypersaline southern lagoon. It is a significant region for migratory birds, fish and unique vegetation communities. The Coorong, in conjunction with the Lower Lakes, is listed as a Wetland of International Importance in the Ramsar Convention. Increased use of the River Murray’s water resources for consumptive purposes, construction of locks and barrages, and construction of drains for agricultural purposes in the south-east, have all contributed to the significantly altered freshwater flows into the Coorong (DEWNR, 2015b).
2.3 Groundwater

The SA Murray Region has two different aquifer types: the highland fractured rock aquifers of the Northern Mount Lofty Ranges and the Olary Ranges with various lithology and of varying yields, and the sedimentary aquifers within the Murray Basin (Barnett, 2015).

The Murray Basin consists of layers of sand, clay and limestone up to 300 metres thick. These sediment layers were deposited 30 million years ago during the Tertiary Period when an ocean inundated the area during the separation of Australia and Antarctica by continental drift. Groundwater flows under low hydraulic gradients from the basin margins towards the River Murray, a focus for groundwater discharge. Natural discharge rates are low because of the low flow gradients from the distant recharge areas.

Barnett (2015) outlines the following four main regional aquifers separated by two confining layers:

**Quaternary Limestone aquifer**

This unconfined aquifer was deposited on the low-lying Coastal Plain in the south-west margin of the basin. It is hydraulically connected with the underlying Murray Group Limestone and contains groundwater of varying quality with flow toward the Coorong and Lower Lakes under low gradients.

**Pliocene Sands aquifer**

An unconfined aquifer which is saturated only in the north-east of the SA portion of the Basin. The unit comprises unconsolidated- to weakly-cemented fine to coarse sand. The groundwater flow is generally towards the River Murray under low gradients, except where watertable mounds exist beneath irrigation areas adjacent to the river. The salinity in the aquifer is generally over 20,000 mg/L.

**Bookpurnong Formation (confining layer)**

This unit occurs only to the north-east where it dips down gradually to the east and increases in thickness. It consists of plastic silts and shelly clays that confine the underlying limestone aquifer.

**Murray Group Limestone aquifer**

Comprises a consolidated, highly fossiliferous, and fine to coarse limestone. It is mostly unconfined, but the eastern part of the aquifer, where much of the irrigation extraction occurs, is confined (refer to Figure 6). The aquifer has been developed for stock, domestic, irrigation and town water supplies because it contains low salinity groundwater over large areas. Recharge occurs from high rainfall areas around the basin margins such as the Mount Lofty Ranges to the west and south-west Victoria to the south-east. Groundwater flows under low hydraulic gradients to the River Murray where it discharges and contributes to the increasing salinity of the river. Salinities increase downgradient, from below 1,000 mg/L at the recharge areas to over 20,000 mg/L adjacent to the river.

**Ettrick Formation (confining layer)**

A low permeability layer between the Murray Group Limestone and the underlying confined aquifer, consisting of a glauconitic and fossiliferous marl. Towards the west of the area, in the Coastal Plains region near Peake, the Ettrick Formation is progressively absent due to the complex erosion and deposition history.

**Renmark Group aquifer**

A confined aquifer comprising unconsolidated carbonaceous sands, silt and clay. It has been developed for stock and domestic supplies only around the basin margins where it is relatively shallow and contains groundwater that is usually fresher than that within the overlying limestone aquifer which is sometimes saline. Groundwater flow is generally from the basin margins towards the river where discharge occurs to the overlying aquifer by upward leakage. Salinities are in the range of 10,000 to 20,000 mg/L.
Figure 5 Simplified geology of the Murray Basin
Within the SA Murray Region, there are four groundwater SDL areas with seven defined groundwater SDL resource units. Below is a description of each of the groundwater SDL areas and the water resources within.

**Mallee (GS3)**

The geographic boundary of the Mallee SDL resource unit covers the Mallee Prescribed Wells Area (PWA) and the Noora Groundwater Management Area (GMA) as shown in Figure 6. The Mallee PWA is approximately 11,850 km² and covers the underground water resources in a large portion of the Murraylands area of South Australia. The Noora GMA covers an area of approximately 1,330 km², extending from the northern boundary of the Mallee PWA to the River Murray. Despite being managed as two separate areas, the underground resources are continuous across both areas. Part of the Mallee SDL resource unit is also contained within the Designated Area of the Groundwater (Border Agreement) Act 1985 (SA) as shown in Figure 7.

It should be noted that the boundary for the Mallee (GS3) SDL resource units shown in Figure 4 does not cover the entire Mallee PWA, which is shown in Figure 6. The Mallee PWA extends beyond the boundary of the Murray-Darling Basin. The Basin Plan only applies to water resources within or beneath the Murray-Darling Basin, so the parts of the Mallee PWA that fall outside the Murray-Darling Basin surface water boundary shown in Figure 3 are not part of the Mallee (GS3) SDL resources units.

As illustrated in Figure 5 above, the Murray Basin underlies the Mallee PWA and the Noora GMA. There are three main water-bearing layers which are managed by the Mallee WAP and the SAMDB NRM Plan – Volume B (Noora GMA).

The Mallee (GS3) SDL resource units are defined based on the vertical separation of the three water-bearing aquifers as follows:

1. **Mallee – Pliocene Sands**
2. **Mallee – Murray Group Limestone**
3. **Mallee – Renmark Group**

The hydrogeology of these three layers, specific to the Mallee PWA and Noora GMA, is as follows (RMCWMB 2001; SAMDB NRM Board 2012; Barnett 2015):

1. **Pliocene Sands**
   - **Mallee PWA**
     - The aquifer contains underground water only in the eastern part. In the western part the aquifer is higher than the watertable and is therefore unsaturated. Salinity ranges from 1,500 mg/L to over 20,000 mg/L, increasing to the north and east.
   - **Noora GMA**
     - The salinity ranges from 20,000 mg/L to 35,000 mg/L from south to north and has no current commercial extraction.

2. **Murray Group Limestone**
   - **Mallee PWA**
     - Aquifer averages over 100 metres in thickness, with a maximum of 140 metres in the north-west.
     - The salinity increases in a north-westerly direction from around 1,000 mg/L to 20,000 mg/L. There is a large area where the salinity is below 3,000 mg/L, which provides water supplies suitable for irrigation. This was recharged through the deep sandy soils of the Big and Little Deserts around 20,000 years ago.
     - Increased recharge that has resulted from native vegetation clearance has not yet reached the watertable of this aquifer. When it does, it is likely that the watertable will rise and salt stored in the unsaturated zone will be flushed into the aquifer. This stored salt has concentrations of up to 30,000 mg/L.
mg/L and so will likely increase the salinity of the aquifer, although the rate and magnitude will vary. This is a long-term risk to water use in this area.

- Yields vary from 0.5 L/s from stock windmills (drilled to a few metres) to over 60 L/s for irrigation supplies (drilled to 200 metres).

3. Noora GMA

- The salinity varies from around 2,000 mg/L in the south to 35,000 mg/L in the north, with a significant variation in potential yield.

Renmark Group

- In the Mallee PWA, the salinity is generally similar to the overlying Murray Group Limestone.

- In the Noora GMA, the salinity varies from around 6,000 mg/L in the south to 20,000 mg/L in the north, with highly variable yields.

Peake, Roby and Sherlock (GS5)

The geographic boundary of the Peake, Roby and Sherlock (GS5) SDL resource units coincides with the Peake, Roby and Sherlock PWA. The area is approximately 1,120 km², bordering the Tintinara Coonalpyn PWA in the south and the Mallee PWA in the east (Figure 6). The Peake, Roby and Sherlock PWA is underlain by two main water-bearing layers, namely a shallow unconfined aquifer and the underlying confined aquifer which are separated by the Ettrick Formation (SAMDB NRM Board, 2010).

The Peake, Roby and Sherlock SDL resource units are defined based on the vertical separation of the two water-bearing aquifers as follows:

1. Peake, Roby and Sherlock – Unconfined

2. Peake, Roby and Sherlock – Confined

The hydrogeology of these two layers is as follows (SAMDB NRM Board, 2010a):

1. Unconfined Aquifer

   - A limestone aquifer that is connected but can be subdivided into the Mallee Highland region in the east and the Coastal Plain region in the west.

   - Mallee Highland: Murray Group Limestone aquifer, which is the same aquifer developed in the adjacent Mallee SDL resource unit. The watertable can be as deep as 50 metres. Salinity is generally around 2,000 to 3,000 mg/L.

   - Coastal Plain: the aquifer underlying this flat, low-lying region is contained within the Coomandook and Bridgewater Formations, which is composed of younger Quaternary limestone (less than one million years old). The watertable averages 5 metres below ground level. Salinity is high and generally in excess of 15,000 mg/L.

2. Confined Aquifer

   - Contains the Buccleuch Group (bryozoal limestone) and the underlying Renmark Group (interbedded sands and clays) which are highly interconnected.

   - Main recharge source is south-western Victoria. From here it moves in an east-west direction beneath the Peake, Roby and Sherlock PWA.

   - Salinity increases from 1,500 to 3,000 mg/L in the east to over 7,000 mg/L in the west.
**SA Murray (GS6)**

The SA Murray (GS6) SDL resource unit includes all groundwater resources (except those identified below for GS7) within the Murray-Darling Basin that have not been prescribed under the NRM Act. The groundwater beneath Lakes Alexandrina and Albert are also considered part of this SDL resource unit. This area includes the fractured rock aquifers of the Northern Mount Lofty Ranges and the Olary Ranges and the sedimentary aquifers within the Murray Basin.

The groundwater has highly variable salinity levels but water is generally of a quality only suited for use by stock.

**SA Murray Salt Interception Schemes (GS7)**

The SA Murray Salt Interception Schemes (GS7) SDL resource unit incorporates the groundwater under the River Murray, the River Murray floodplain and adjacent areas, extending west from the South Australian – Victorian border to the east of Morgan. Parts of this SDL resource unit are contained within the Noora GMA and the Designated Area defined under the *Groundwater (Border Agreement) Act 1985* (SA).

The hydrogeology is as follows (CSIRO 2010):

- Beneath the floodplain lies the Monoman Formation, which consists of predominantly re-worked fine to coarse-grained, fluvial sediments of the Pliocene Sands that the river has incised over time. The Monoman Formation is hydraulically connected to the regional groundwater flow system.

- In the eastern half of the area, the regional watertable is located within the Pliocene Sands aquifer which varies from approximately 30 to 100 metres in thickness with salinities over 35,000 mg/L. It is separated from the underlying confined Murray Group Limestone aquifer by the Bookpurnong Beds.

- In the west, the watertable is mostly contained within the Murray Group Limestone where salinities are generally around 20,000 mg/L.

- Recharge occurs via infiltration of rainfall and downward percolation of irrigation water.

There are currently seven salt interception schemes within this SDL resource unit.
3 South Australian Water Management Framework

3.1 Managing Water Resources in the SA Murray Region

Water resources within South Australia are managed under the NRM Act. The NRM Act provides the statutory framework for the development of water management controls. These are:

- management of activities that can affect water, for example control of the location and construction of wells and dams or any other infrastructure that collects or diverts water;
- control of the taking and use of water through prescription of water resources and a water licensing regime; and
- authorisation or restriction of water use through a range of means available to the Minister.

The first two controls are implemented via NRM plan functions – primarily regional NRM plans and water allocation plans (WAPs). The third control lies outside the operation of regional NRM plans and includes a number of powers available to the Minister to use at his or her discretion to either allow for or restrict the use of water in certain circumstances.

In areas where there are limited risks to the water resources, high-level principles within the regional NRM plans, together with specific principles to guide approvals of water affecting activities, provide appropriate protection for the water resources and dependent ecosystems. Where there are greater risks to the water resources, prescription of the resource or resources occurs. Prescription triggers an obligation to develop a WAP which sets out the maximum consumptive take from the resource, any limitations on purposes of take, rules for trade, rules for the allocation of any ‘spare’ water available within consumptive limits, and other rules for the protection of the resource, dependent ecosystems and third parties. Prescription also triggers the establishment of a water licensing system where initial water licences are issued to existing users and these become a property right able to be traded consistent with the provisions in the WAP. More explicit water affecting activity controls can also be included within a WAP.

During the preparation of a WAP, an assessment is required as to whether the taking or use of water from the resource will have a detrimental effect on the quantity or quality of water that is available from any other water resource.

The Groundwater (Border Agreement) Act 1985 gives effect to the Border Groundwaters Agreement between South Australia and Victoria which was signed in 1985 to cooperatively and equitably manage the groundwater resources along the state border. The area, known as the Designated Area, extends 20 kilometres either side of the border, and from the south coast to the River Murray (refer Figure 7). It comprises 22 management zones, with 11 zones in each state. The Border Groundwaters Agreement is an acknowledgement that the water resources are not bound by the limits of the state border and therefore must be collaboratively managed. No such agreement exists between New South Wales and South Australia as the relatively poor groundwater quality and limited land capability results in negligible use.
Figure 6  Prescribed groundwater and groundwater management sub-area
Figure 7  Border Groundwaters Agreement boundaries
4 Index Table

Table 3 is provided as an index to the part of the SA Murray Region WRP that addresses a particular requirement within Chapter 10 of the Basin Plan. Table 3 meets the requirement of section 10.04(4)(a) and (b) of the Basin Plan.

Table 3 Index table

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<td><strong>Part 1—Preliminary</strong></td>
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<td>10.01 Simplified outline</td>
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<td><strong>Part 2—Identification of water resource plan area and other matters</strong></td>
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<tr>
<td>10.02 Identification of water resource plan area and water resources</td>
<td>Section 5.2.1 – accredited text</td>
</tr>
<tr>
<td>(1) A water resource plan must identify:</td>
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<tr>
<td>(a) the water resource plan area; and</td>
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<tr>
<td>(b) the water resources; to which it applies.</td>
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<tr>
<td>(2) The water resource plan area must be one of the water resource plan areas described in Part 2 of Chapter 3 and must be identified using the same description of that area as is set out in that Part, with any variations permitted by section 3.04.</td>
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<td>(3) The water resources must be those described in Part 2 of Chapter 3 as the water resources of the water resource plan area and must be identified using the same description of those water resources as is set out in that Part.</td>
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<tr>
<td>10.03 Identification of SDL resource units and water resources</td>
<td>Section 5.2.2 – accredited text</td>
</tr>
<tr>
<td>(1) A water resource plan must identify:</td>
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<tr>
<td>(a) each SDL resource unit in the water resource plan area; and</td>
<td></td>
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<tr>
<td>(b) the water resources within each SDL resource unit.</td>
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2 The full text of the chapter is set out in this column, including both that text which imposes a requirement (therefore fulfilling 10.04[4][a] of the Basin Plan) and, for completeness, that text which does not impose a requirement.
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<tr>
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<td><strong>10.04 Form of water resource plan</strong></td>
<td><strong>Section 5.2.3 – accredited text</strong></td>
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<tr>
<td><strong>Water resource plan constituted by 2 or more instruments</strong></td>
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</tbody>
</table>
| (1) If a water resource plan is constituted by 2 or more instruments or texts, subsections (2) and (3) apply to it.  
Note: Subsection 63(1) of the Act states that a water resource plan may be constituted by 2 or more instruments. | |
| (2) The water resource plan must identify the instruments or texts that constitute the water resource plan.  
Note: The same instrument or text may be used for more than one water resource plan. | Section 5.2.3 – accredited text – Table 6 |
| (3) If an instrument or text applies only to some of the water resources of the water resource plan area, the water resource plan must:  
(a) identify the water resources or the parts of the water resources to which the instrument or text applies; and  
(b) include an indicative map of the water resources identified in paragraph (a). Water resource plan to include list of requirements. | 3(a) Section 5.2.3 – accredited text – Table 6, Column 3  
3(b) The following indicative maps identify water resources identified in paragraph (a):  
Figure 2 – South Australian WRP areas with NRM region boundaries  
Figure 3 – South Australian Non-Prescribed Areas surface water SDL resource unit  
Figure 4 – South Australian groundwater SDL resource units  
Figure 6 – Prescribed groundwater and groundwater management sub-area  
Figure 7 – Border Groundwaters Agreement boundaries |

(4) A water resource plan must include a list that specifies:
### 10.04 Chapter 10 of the Basin Plan

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<td>Part of the SA Murray Region WRP that addresses requirement</td>
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</table>

(a) each requirement set out in this Chapter; and  
(b) the part of the plan that addresses each requirement; and  
(c) the parts of the plan that will cease to have effect or are to be reviewed, and the times at which those parts will cease to have effect or are to be reviewed.  

### 10.05 Regard to other water resources

A water resource plan must:  
(a) be prepared having regard to the management and use of any water resources which have a significant hydrological connection to the water resources of the water resource plan area; and  
(b) describe the way in which paragraph (a) was complied with.  

### 10.06 Matters relating to requirements of Chapter

(1) For each matter that this Chapter requires to be dealt with in a water resource plan, the plan must specify the person responsible for the matter.  
(2) Without limiting subsection (1), if a water resource plan requires a measure or action to be undertaken, the plan must specify the person responsible for undertaking that measure or action.  

### 10.07 Consultation to be demonstrated

(1) A water resource plan prepared by a Basin State must contain a description of the consultation in relation to the plan (including in relation to any part of the plan), if any, that was undertaken before the State gave the plan to the Authority under subsection 63(1) of the Act.
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**Note:** A water resource plan prepared by the Authority and adopted under section 69 of the Act is a legislative instrument. The [*Legislative Instruments Act 2003*](https://www.legislation.gov.au) requires that the explanatory statements for such plans describe the consultation undertaken in relation to the plans.

(2) If a water resource plan is amended in accordance with section 65 of the Act, the plan must contain a description of the consultation in relation to the amendment, if any, that was undertaken before the relevant Basin State gave the proposed amendment to the Authority under subsection 65(2) of the Act.

### Part 3—Incorporation and application of long-term annual diversion limit

#### Division 1—Water access rights

**10.08 Water access rights must be identified**

(1) A water resource plan must identify the following:

- (a) each form of take from each SDL resource unit in the water resource plan area;
- (b) any classes of water access right that apply to the forms of take identified under paragraph (a);
- (c) the characteristics of each class of right including, where appropriate, the number of rights and any conditions on the exercise of the rights.

(2) A water resource plan must require a holder of a water access right to comply with the conditions of that right.

**10.09 Identification of planned environmental water and register of held environmental water**

(1) A water resource plan must identify the planned environmental water in the water resource plan area and associated rules and arrangements relating to that water.

(2) A water resource plan must provide for the establishment and maintenance of a register, to be published on a website specified by the plan, of held environmental water for the water resource plan area which records:

- (a) the characteristics of held environmental water in the water resource plan area (for example, quantity, reliability, security class, licence type, limitations); and
- (b) who holds that water.
### Chapter 10 of the Basin Plan

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<tr>
<td>(3) Subsection (2) is satisfied if the plan identifies a register of</td>
<td>No accredited text required</td>
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<td>held environmental water which records the matters required by subsection  (3) and is published on a website.</td>
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### Division 2—Take for consumptive use

Note: This Division sets out the principal provisions for how a water resource plan incorporates and applies the SDL for each SDL resource unit. The SDLs take effect from 1 July 2019. Water resource plans may be accredited before then and ordinarily have effect for a period of 10 years: see section 64 of the Act.

### 10.10 Annual determinations of water permitted to be taken

(1) For each SDL resource unit in a water resource plan area, and for each form of take, the water resource plan must set out the method for determining the maximum quantity of water that the plan permits to be taken for consumptive use during a water accounting period.

(2) The method for subsection (1) may include modelling, and must be designed to be applied after the end of the relevant water accounting period, having regard to the water resources available during the period.

(3) The method must:

   (a) account for the matters in subsection 10.12(1); and
   
   (b) be consistent with the other provisions of the water resource plan.

(4) The plan must also set out a demonstration that the method relates to the SDL of each resource unit in such a way that, if applied over a repeat of the historical climate conditions, it would result in meeting the SDL for the resource unit, including as amended under section 23B of the Act.

Note 1: Under the Basin Plan, the SDL is the same as the long-term annual diversion limit because the temporary diversion provision for each SDL resource unit is zero. Section 6.04 and Schedules 2 and 4 set out the SDLs for each SDL resource unit.

Note 2: Amendments under section 23B of the Act are made following proposals for adjustment under Chapter 7.

(5) If, as a result of an amendment under section 23B of the Act, the SDL for a surface water SDL resource unit is expressed as a formula that changes with time, the SDL for subsection (4) is taken to be:

   (a) for a water accounting period beginning on or after 1 July 2019—the SDL as it stood on 30 June 2019; and
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(b) for a water accounting period beginning on or after 1 July 2022—the SDL as it stood on 30 June 2022; and  
(c) for a water accounting period beginning on or after 1 July 2024—the SDL as it stood on 30 June 2024.

### 10.11 Rules for take, including water allocation rules

(1) A water resource plan must set out rules (including, if applicable, rules for water allocations) that ensure, as far as practicable, that the quantity of water actually taken from each SDL resource unit for consumptive use in a water accounting period that beginning on or after 1 July 2019 does not (after making any adjustments for the disposal or acquisition of held environmental water) exceed the unit’s annual permitted take for the period.

**Note 1:** Water resource plans are not required to give effect to the long-term average sustainable diversion limits until 1 July 2019. Compliance with the long-term annual diversion limit will then be measured using the annual permitted take (see Part 4 of Chapter 6). The *annual permitted take* is defined in subsection 6.10(1).

**Note 2:** Water allocations can be made during or before a water accounting period. The annual permitted take is usually worked out after the end of a water accounting period.

A water resource plan may provide for less water to be taken

(2) To avoid doubt, the rules may be designed to ensure that the quantity of water that is actually taken for consumptive use from an SDL resource unit in a water accounting period is less than the annual permitted take.

### 10.12 Matters relating to accounting for water

(1) For paragraph 10.10(3)(a), the following matters must be accounted for:

(a) all forms of take from the SDL resource unit and all classes of water access right;

(b) water allocations that are determined in one water accounting period and used in another, including water allocations that are carried over from one water accounting period to the next;

(c) for a surface water SDL resource unit—return flows, in a way that is consistent with arrangements under the Agreement immediately before the commencement of the Basin Plan;

(d) subject to subsection (3)—trade of water access rights;

(e) water resources which have a significant hydrological connection to the water resources of the SDL resource unit;

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Section 5.3.4 – accredited text

Section 5.3.5 – accredited text
### Column 1
**Chapter 10 of the Basin Plan**

- (f) circumstances in which there is a change in the way water is taken or held under a water access right;
- (g) changes over time in the extent to which water allocations in the unit are utilised;
  
  **Note:** Paragraph (g) includes what is commonly known as a growth-in-use strategy.
- (h) water sourced from the Great Artesian Basin and released into a Basin water resource, by excluding that water;
- (i) water resources which are used for the purpose of managed aquifer recharge.

(2) Subject to this section, the method may account for other matters.

(3) For paragraph (1)(d), the water resource plan must account for the disposal and acquisition of held environmental water separately and in a way that does not affect the method under section 10.10.

### Column 2
**Part of the SA Murray Region WRP that addresses requirement**

#### 10.13 Limits on certain forms of take

(1) Subject to this section, a water resource plan must require that the long-term annual average quantity of water that can be taken from a surface water SDL resource unit for consumptive use by:
  
  - (a) take under basic rights; or
  - (b) take by runoff dams; or
  - (c) net take by commercial plantations;

  does not exceed the level specified in column 2 of Schedule 3 for that form of take.

(2) The quantity specified in subsection (1) for a form of take may be increased above the level specified in column 2 of Schedule 3 for that form of take if:
  
  - (a) the long-term annual average quantity of water that can be taken by another form of take from the same SDL resource unit is changed at the same time so that there is no overall change in the total long-term annual average quantity of water that can be taken; and
  
  - (b) take by the forms of take affected by the changes are capable of:
    
    - (i) being accurately measured (for example, through the use of a meter); or
    
    - (ii) in the case of a form of take that is not capable of being accurately measured at the time the water resource plan is submitted for accreditation or adoption—being reasonably estimated using the best available method immediately before the water resource plan is submitted; and

- **Section 5.3.6 – accredited text**
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<td>(c) the changes are not expected to result in the take from the SDL resource unit ceasing to be an environmentally sustainable level of take.</td>
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<tr>
<td><strong>10.14 Effects, and potential effects, on water resources of the water resource plan area</strong></td>
<td>Section 5.3.7 – accredited text</td>
</tr>
<tr>
<td>(1) A water resource plan must identify the effect, or potential effect, if any, of the following on the use and management of the water resources of the water resource plan area:</td>
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<tr>
<td>(a) the taking of groundwater that is not a Basin water resource resulting in water being removed from a groundwater SDL resource unit in the water resource plan area because of a pre-existing hydrological connection or a hydrological connection created by the process of taking that groundwater;</td>
<td></td>
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<tr>
<td>(b) the taking of groundwater that is not a Basin water resource resulting in water that would otherwise flow directly or indirectly into an SDL resource unit in the water resource plan area no longer flowing into that unit.</td>
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<tr>
<td>(2) If a water resource plan identifies an effect, or potential effect, of the kind referred to in subsection (1), the water resource plan must set out:</td>
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<tr>
<td>(a) a process for monitoring that effect or potential effect; and</td>
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<tr>
<td>(b) actions that will be taken to respond to that effect or potential effect.</td>
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<tr>
<td>(3) Without limiting paragraph (2)(b), the water resource plan may require a person to hold a water access right in the water resource plan area in relation to the effect, or potential effect, identified.</td>
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<tr>
<td><strong>Division 3—Actual take</strong></td>
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<tr>
<td><strong>10.15 Determination of actual take must be specified</strong></td>
<td>Section 5.3.8 – accredited text</td>
</tr>
<tr>
<td>(1) A water resource plan must set out how the quantity of water actually taken for consumptive use by each form of take from each SDL resource unit will be determined after the end of a water accounting period using the best information available at the time.</td>
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<tr>
<td>Note: The annual actual take for the SDL resource unit is the sum of the quantity of water actually taken by each form of take for consumptive use: see subsection 6.10(2). Paragraph 71(1)(c) of the Act requires the annual actual take to be set out in a report to the Authority within 4 months after the end of the water accounting period.</td>
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<tr>
<td><strong>Chapter 10 of the Basin Plan</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td><strong>Part of the SA Murray Region WRP that addresses requirement</strong></td>
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<tr>
<td>(2) For a particular form of take, and subject to the requirement that a determination use the best information available at the time, a determination may be made by:</td>
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<td>(a) measuring the quantity of water actually taken; or</td>
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<td>(b) estimating the quantity of water actually taken; or</td>
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<tr>
<td>(c) a combination of the above.</td>
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<tr>
<td>(3) Where a determination for a form of take is made by estimating the quantity of water actually taken, the water resource plan must provide for the estimate to be done consistently with the method under subsection 10.10(1) that relates to that form of take.</td>
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<tr>
<td>(4) The quantity of water actually taken must:</td>
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<tr>
<td>(a) include water that was held environmental water which was disposed of and then used in the SDL resource unit for consumptive use; and</td>
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<tr>
<td>(b) exclude water sourced from the Great Artesian Basin and released into and taken from a Basin water resource.</td>
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**Part 4—The sustainable use and management of water resources**

**Division 1—Sustainable use and management**

**10.16 Sustainable use and management of water resources**

This Part sets out the requirements in relation to the sustainable use and management of water resources of the water resource plan area within the long-term annual diversion limit for an SDL resource unit.

**Division 2—Surface water**

**10.17 Priority environmental assets and priority ecosystem functions**

(1) A water resource plan must be prepared having regard to whether it is necessary for it to include rules which ensure that the operation of the plan does not compromise the meeting of environmental watering requirements of priority environmental assets and priority ecosystem functions.
Column 1
Chapter 10 of the Basin Plan\textsuperscript{2}

| Note: The environmental watering requirements of priority environmental assets and priority ecosystem functions will be set out in long-term watering plans and may also be set out in the Basin-wide environmental watering strategy. Long-term watering plans are required to use the methods in Part 5 of Chapter 8 to identify those requirements. |

| 2 |

| Without limiting subsection (1), regard must be had to whether it is necessary for the rules to prescribe: |
| (a) the times, places and rates at which water is permitted to be taken from a surface water SDL resource unit; and |
| (b) how water resources in the water resource plan area must be managed and used. |

| If the outcome of the requirement in subsection (1) is that such rules are necessary, the water resource plan must include those rules. |

| Division 3—Groundwater |

| 10.18 | Priority environmental assets dependent on groundwater |

| (1) A water resource plan must be prepared having regard to whether it is necessary for it to include rules which ensure that, for priority environmental assets and priority ecosystem functions that depend on groundwater, the operation of the plan does not compromise the meeting of environmental watering requirements. |

| Note: The environmental watering requirements of priority environmental assets and priority ecosystem functions will be set out in long-term watering plans and may also be set out in the Basin-wide environmental watering strategy. Long-term watering plans are required to use the methods in Part 5 of Chapter 8 to identify those requirements. |

| (2) Without limiting subsection (1), regard must be had to whether it is necessary for the water resource plan to include rules that specify: |
| (a) the times, places and rates at which water is permitted to be taken from a groundwater SDL resource unit; and |
| (b) resource condition limits, being limits beyond which the taking of groundwater will, for a priority environmental asset that depends on groundwater, compromise an environmental watering requirement; and |
| (c) restrictions on the water permitted to be taken (including the times, places and rates at which water may be taken) in order to prevent a resource condition limit from being exceeded. |

| If the outcome of the requirement in subsection (1) is that such rules are necessary, the water resource plan must include those rules. |

| 3 |

<p>| Section 5.4.3 – accredited text |</p>
<table>
<thead>
<tr>
<th>Column 1</th>
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<tbody>
<tr>
<td><strong>Chapter 10 of the Basin Plan</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td><strong>Part of the SA Murray Region WRP that addresses requirement</strong></td>
</tr>
<tr>
<td><strong>10.19 Groundwater and surface water connections</strong>&lt;br&gt;(1) A water resource plan must be prepared having regard to whether it is necessary for it to include rules which ensure that, for groundwater that has a significant hydrological connection to surface water, the operation of the plan does not compromise the meeting of environmental watering requirements (for example, base flows).&lt;br&gt;(2) Without limiting subsection (1), regard must be had to whether it is necessary for the water resource plan to include rules that specify:&lt;br&gt;  (a) the times, places and rates at which water is permitted to be taken from a groundwater SDL resource unit; and&lt;br&gt;  (b) resource condition limits, being limits beyond which the taking of groundwater will compromise the discharge of water into any surface water resource; and&lt;br&gt;  (c) restrictions on the water permitted to be taken (including the times, places and rates at which water may be taken) in order to prevent a resource condition limit from being exceeded.&lt;br&gt;(3) If the outcome of the requirement in subsection (1) is that such rules are necessary, the water resource plan must include those rules.</td>
<td>Section 5.4.4 – accredited text</td>
</tr>
<tr>
<td><strong>10.20 Productive base of groundwater</strong>&lt;br&gt;(1) A water resource plan must be prepared having regard to whether it is necessary for it to include rules which ensure that:&lt;br&gt;  (a) there is no structural damage to an aquifer (whether within or outside the water resource plan area) arising from take within the long-term annual diversion limit for an SDL resource unit; and&lt;br&gt;  (b) hydraulic relationships and properties between groundwater and surface water systems, between groundwater systems, and within groundwater systems are maintained.&lt;br&gt;(2) Without limiting subsection (1), regard must be had to whether it is necessary for the water resource plan to include rules that specify:&lt;br&gt;  (a) the times, places and rates at which water is permitted to be taken from a groundwater SDL resource unit; and&lt;br&gt;  (b) any zones in the water resource plan area where continued groundwater extraction will result in a long-term decline in groundwater levels; and&lt;br&gt;  (c) measures to prevent any long-term decline in groundwater levels in that zone, except where the groundwater is a non-renewable groundwater resource; and</td>
<td>Section 5.4.5 – accredited text</td>
</tr>
</tbody>
</table>
### Environmental outcomes relating to groundwater

1. **A water resource plan must be prepared having regard to whether it is necessary for it to include rules to prevent elevated levels of salinity and other types of water quality degradation within a groundwater SDL resource unit.**

2. **Without limiting subsection (1), regard must be had to whether it is necessary for the water resource plan to include rules that specify:**
   - the times, places and rates at which water is permitted to be taken from a groundwater SDL resource unit; and
   - resource condition limits, being limits beyond which the taking of groundwater from the groundwater SDL resource unit will result in an elevated level of salinity or another type of water quality degradation; and
   - restrictions on the water permitted to be taken (including the times, places and rates at which water may be taken) in order to prevent a resource condition limit from being exceeded; and
   - a requirement to establish and maintain a register which identifies the sites of bores used to monitor salinity or other water quality characteristics in the groundwater SDL resource unit.

3. **If the outcome of the requirement in subsection (1) is that such rules are necessary, the water resource plan must include those rules.**

### Description of how requirements have been met

1. **A water resource plan must:**
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<thead>
<tr>
<th>Column 1</th>
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<tbody>
<tr>
<td>Chapter 10 of the Basin Plan</td>
<td>Part of the SA Murray Region WRP that addresses requirement</td>
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<tr>
<td>(a) describe what was done to comply with the requirements in this Part; and</td>
<td></td>
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<tr>
<td>(b) if a risk of a kind referred to in subsection 10.41(1) has been identified in relation to the water resources of the water resource plan area—explain why rules addressing the risk have or have not been included in the plan.</td>
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<tr>
<td><strong>Part 5—Interception activities</strong></td>
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</tr>
<tr>
<td><strong>10.23 Listing types of interception activity</strong></td>
<td>Section 5.5.1 – accredited text</td>
</tr>
<tr>
<td>(1) A water resource plan must, having regard to the risk identification and assessment conducted for section 10.41, specify whether there are any types of interception activity in the water resource plan area which have the potential to have a significant impact on:</td>
<td></td>
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<tr>
<td>(a) the water resources of the water resource plan area; or</td>
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<tr>
<td>(b) water resources which are hydrologically connected to the water resources of the water resource plan area; whether on an activity-by-activity basis, or cumulatively.</td>
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<tr>
<td>(2) If there are any such types of interception activity, the water resource plan must list those types.</td>
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<tr>
<td>(3) For the purpose of determining whether a type of interception activity is of the kind referred to in subsection (1), regard must be had to the following factors:</td>
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<tr>
<td>(a) the location of particular activities of that type in the water resource plan area;</td>
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<tr>
<td>(b) the impact of the type of activity on the availability of:</td>
<td></td>
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<tr>
<td>(i) the water resources of the water resource plan area; and</td>
<td></td>
</tr>
<tr>
<td>(ii) any water resources which are hydrologically connected to the water resources of the water resource plan area;</td>
<td></td>
</tr>
<tr>
<td>(c) the projected growth of the type of activity over the period for which the water resource plan will have effect.</td>
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</tr>
<tr>
<td>Note: The following are types of interception activity which may have the potential to have a significant impact on the water resources of a water resource plan area:</td>
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<tr>
<td>(a) interception by runoff dams;</td>
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<tr>
<td>(b) interception by commercial plantations;</td>
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<tr>
<td>(c) interception by mining activities, including coal seam gas mining;</td>
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<tr>
<td>Column 1</td>
<td>Column 2</td>
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</tbody>
</table>
| **Chapter 10 of the Basin Plan**<sup>2</sup>
(d) interception by floodplain harvesting. | **Part of the SA Murray Region WRP that addresses requirement** |

### 10.24 Monitoring impact of interception activities

If a water resource plan includes a list of the kind referred to in subsection 10.23(2), the plan must set out, in respect of each type of interception activity listed, a process for monitoring the impact of that type of activity on:

(a) the water resources of the water resource plan area; and

(b) water resources which are hydrologically connected to the water resources of the water resource plan area.

### 10.25 Actions to be taken

(1) A water resource plan must identify actions that will be taken in the event that monitoring under section 10.24 shows that:

(a) an impact of a type of interception activity compromises the meeting of an environmental watering requirement; or

(b) an impact of several types of activity together compromises the meeting of an environmental watering requirement; or

(c) there is an increase in the quantity of water being intercepted by a type of activity; after the commencement of the water resource plan.

(2) Subsection (1) does not apply if the relevant outcome in paragraph (1)(a), (b) or (c) is accounted for by the method under subsection 10.10(1).

**Note 1:** This section provides a mechanism to address unanticipated effects of, or changes in, interception activity.

**Note 2:** Section 10.13 sets out the circumstances in which a water resource plan may allow for an increase in anticipated take by an interception activity.

### Part 6—Planning for environmental watering

#### 10.26 Planning for environmental watering

(1) A water resource plan must provide for environmental watering to occur in a way that:

(a) is consistent with:

(i) the environmental watering plan; and

(ii) the Basin-wide environmental watering strategy; and
### Chapter 10 of the Basin Plan

<table>
<thead>
<tr>
<th>Column 1</th>
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</thead>
<tbody>
<tr>
<td>(b) contributes to the achievement of the objectives in Part 2 of Chapter 8.</td>
<td>Part of the SA Murray Region WRP that addresses requirement</td>
</tr>
<tr>
<td>(2) For the purposes of subsection (1), the water resource plan must be prepared having regard to:</td>
<td></td>
</tr>
<tr>
<td>(a) the most recent version of the long-term watering plan prepared in accordance with the requirements of Division 3 of Part 4 of Chapter 8; and</td>
<td></td>
</tr>
<tr>
<td>(b) the views of local communities, including bodies established by a Basin State that express community views in relation to environmental watering.</td>
<td></td>
</tr>
</tbody>
</table>

#### 10.27 Enabling environmental watering between connected water resources

1. This section applies if:
   - (a) there are 2 water resource plan areas that contain surface water; and
   - (b) there is a surface water connection between the 2 areas.
2. The water resource plan for each of the areas must provide for the co-ordination of environmental watering between the 2 areas.

#### 10.28 No net reduction in the protection of planned environmental water

A water resource plan must ensure that there is no net reduction in the protection of planned environmental water from the protection provided for under State water management law immediately before the commencement of the Basin Plan.

### Part 7—Water quality objectives

Note: Section 1.07 defines water quality to include water salinity.

#### 10.29 Water resource plan to include WQM Plan

A water resource plan must include a water quality management plan (WQM Plan). The WQM Plan must be made in accordance with this Part.

#### 10.30 WQM Plan to identify key causes of water quality degradation

The WQM Plan must identify the causes, or likely causes, of water quality degradation in the water resource plan area having regard to the key causes of water quality degradation identified in Part 2 of Chapter 9 and set out in Schedule 10.
<table>
<thead>
<tr>
<th>Column 1</th>
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<tbody>
<tr>
<td><strong>Chapter 10 of the Basin Plan</strong></td>
<td><strong>Part of the SA Murray Region WRP that addresses requirement</strong></td>
</tr>
<tr>
<td><strong>10.31 Measures addressing risks arising from water quality degradation</strong></td>
<td>Section 5.7.3 – accredited text</td>
</tr>
<tr>
<td>If a risk of a kind mentioned in paragraph 10.41(2)(d) has been identified in relation to the water resources of the water resource plan area, the WQM Plan must explain why measures addressing the risk have or have not been included in the water resource plan.</td>
<td>10.32 (1) and (2) Section 5.7.4 – accredited text</td>
</tr>
<tr>
<td><strong>10.32 WQM Plan to identify water quality target values</strong></td>
<td>10.32 (3) Section 5.7.5 – accredited text</td>
</tr>
<tr>
<td>(1) The WQM Plan must identify the water quality target values for the water resource plan area.</td>
<td>10.32 (4) Section 5.7.6 – accredited text</td>
</tr>
<tr>
<td>(2) The water quality target values are the following:</td>
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<tr>
<td>(a) for freshwater-dependent ecosystems—the applicable target values referred to in section 9.16;</td>
<td></td>
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<tr>
<td>(b) for irrigation water—the target values for water quality characteristics set out in section 9.17;</td>
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<tr>
<td>(c) for water used for recreational purposes—the values set out in section 9.18.</td>
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<tr>
<td>Note: The ADWG sets out standards for the quality of raw water for treatment for human consumption.</td>
<td></td>
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<tr>
<td>(3) However, if the objectively determined actual value of a water quality characteristic at a site is better than the target value identified in subsection (2), then the target value is that better value.</td>
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<tr>
<td>Note: See the objective in section 9.08.</td>
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<tr>
<td>(4) The WQM Plan may specify an alternative water quality target value if:</td>
<td></td>
</tr>
<tr>
<td>(a) it is consistent with the water quality objectives in Part 3 of Chapter 9; and</td>
<td></td>
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<tr>
<td>(b) it is determined in accordance with the procedures set out in the ANZECC Guidelines; and</td>
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<tr>
<td>(c) either:</td>
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<tr>
<td>(i) the alternative target value provides a better level of protection than the value that would apply under subsection (2) or (3), as applicable; or</td>
<td></td>
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<tr>
<td>(ii) the WQM Plan sets out reasons why the alternative target value will be as effective in achieving the objectives in Part 3 of Chapter 9; or</td>
<td></td>
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<tr>
<td>(iii) the WQM Plan sets out reasons why the target value in subsection (2) or (3), as applicable, is inappropriate for the water resource plan area; and</td>
<td></td>
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</tbody>
</table>
### 10.33 WQM Plan to identify measures

1. The WQM Plan must specify measures to be undertaken in or in relation to the water resources of the water resource plan area that contribute to the achievement of the objectives set out in:
   - (a) section 9.04 (Objectives of water-dependent ecosystems); and
   - (b) section 9.05 (Objectives for raw water for treatment for human consumption); and
   - (c) section 9.06 (Objective for irrigation water); and
   - (d) section 9.07 (Objective for recreational water quality); and
   - (e) section 9.08 (Objective to maintain good levels of water quality);
   unless there are no such measures that can be undertaken cost-effectively.

2. The measures must be prepared having regard to:
   - (a) the causes, or likely causes, of water quality degradation identified in accordance with section 10.30; and
   - (b) target values identified in accordance with section 10.32; and
   - (c) the targets in Division 4 of Part 4 of Chapter 9.

3. The measures may include land management measures.

**Note 1:** Chapter 9 contains both water quality objectives and water quality targets. A WQM Plan must specify measures that contribute to the achievement of the objectives. The targets are relevant only to the extent that subsection (2) requires that the measures be prepared having regard to the targets. This section does not require a WQM Plan to set out measures designed to achieve the targets.

**Note 2:** See also subsections 22(9) to (12) of the Act.

### 10.34 WQM Plan to identify locations of targets for irrigation water

The WQM Plan must identify the sites in the water resource plan area at which the target values for irrigation water apply.

### 10.35 Impact of WQM Plan on another Basin State

The measures specified in the WQM Plan must be developed having regard to:
<table>
<thead>
<tr>
<th>Column 1</th>
<th>Chapter 10 of the Basin Plan²</th>
<th>Column 2</th>
<th>Part of the SA Murray Region WRP that addresses requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>the impact those measures (including the absence of adequate measures) may have on the ability of another Basin State to meet water quality targets; and</td>
<td></td>
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<tr>
<td>(b)</td>
<td>any adverse impacts those measures may have on Basin water resources in the other Basin State.</td>
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<td></td>
<td>Note: See also the consultation requirement in subsection 63(2) of the Act.</td>
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</tbody>
</table>

**Part 8—Trade of water access rights**

**10.36 Application of Part**

This Part does not apply to water access rights of a kind that are not able to be traded under State water management law.

**10.37 Circumstances in which conditions in section 12.24 are met**

(1) A water resource plan must set out the circumstances in which trade between 2 locations within a groundwater SDL resource unit is permitted. In setting out the circumstances, a water resource plan must ensure that each condition set out in section 12.24 will be met in relation to the proposed trade.

(2) If the water resource plan applies a conversion rate to meet the condition in paragraph 12.24(d), the water resource plan must either:

- (a) specify the conversion rate; or
- (b) set out the way in which the conversion rate will be determined from time to time and made generally available.

**10.38 Circumstances in which conditions in section 12.25 are met**

(1) A water resource plan must set out the circumstances in which trade between 2 groundwater SDL resource units is permitted. In setting out the circumstances, a water resource plan must ensure that each condition set out in section 12.25 will be met in relation to proposed trade.

(2) If the water resource plan applies a conversion rate to meet the condition in paragraph 12.25(e), the water resource plan must either:

- (a) specify the conversion rate; or
- (b) set out the way in which the conversion rate will be determined from time to time and made generally available.
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<tbody>
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<td><strong>Chapter 10 of the Basin Plan</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td><strong>Part of the SA Murray Region WRP that addresses requirement</strong></td>
</tr>
<tr>
<td><strong>10.39  Circumstances in which conditions in section 12.26 are met</strong></td>
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</tr>
<tr>
<td>(1) A water resource plan must set out the circumstances in which trade between a groundwater SDL resource unit and a surface water SDL resource unit is permitted. In setting out the circumstances, a water resource plan must ensure that each condition set out in section 12.26 will be met in relation to proposed trade.</td>
<td></td>
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<tr>
<td>(2) If the water resource plan applies a conversion rate to meet the condition in paragraph 12.26(e), the water resource plan must either:</td>
<td></td>
</tr>
<tr>
<td>(a) specify the conversion rate; or</td>
<td></td>
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<tr>
<td>(b) set out the way in which the conversion rate will be determined from time to time and made generally available.</td>
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</tr>
<tr>
<td><strong>Part 9—Approaches to addressing risks to water resources</strong></td>
<td></td>
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<tr>
<td><strong>10.40  Definitions</strong></td>
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<tr>
<td>In this Part:</td>
<td></td>
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<tr>
<td><em>risk</em> means a risk listed in a water resource plan in accordance with subsection 10.41(4).</td>
<td></td>
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<tr>
<td><em>level of risk</em> has the meaning given in AS/NZS ISO 31000:2009 <em>Risk Management—Principles and Guidelines</em>.</td>
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</tr>
<tr>
<td><strong>10.41  Risk identification and assessment methodology</strong></td>
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</tr>
<tr>
<td>(1) A water resource plan must be prepared having regard to current and future risks to the condition and continued availability of the water resources of the water resource plan area.</td>
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<tr>
<td>(2) Without limiting subsection (1), the risks include (where applicable):</td>
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<tr>
<td>(a) risks to the capacity to meet environmental watering requirements; and</td>
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<tr>
<td>(b) risks arising from the matters referred to in subsection 10.20(1); and</td>
<td></td>
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<tr>
<td>(c) risks arising from potential interception activities; and</td>
<td></td>
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<tr>
<td>(d) risks arising from elevated levels of salinity or other types of water quality degradation.</td>
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<tr>
<td>(3) In identifying risks for the purposes of subsection (1), regard must be had to:</td>
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Section 5.8.4 – accredited text

Section 5.9.1 – accredited text

10.41(1) Section 5.9.2 – accredited text
10.41(2) Section 5.9.3 – accredited text
10.41(3) Section 5.9.4 – accredited text
10.41(4) Section 5.9.5 – accredited text
10.41(5) Section 5.9.6 – accredited text
10.41(6) Section 5.9.7 – accredited text
10.41(7) Section 5.9.8 – accredited text
10.41(8) Section 5.9.9 – accredited text
<table>
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<td><strong>Part of the SA Murray Region WRP that addresses requirement</strong></td>
</tr>
</tbody>
</table>
| (a) risks identified in section 4.02; and  
(b) any guidelines published by the Authority in relation to risk identification and risk assessment. | |
| (4) The water resource plan must list the risks identified for the purposes of subsection (1). | |
| (5) The water resource plan must assess each risk. | |
| (6) The water resource plan must define the level of risk of each risk, using the following categories:  
(a) low;  
(b) medium;  
(c) high;  
(d) if it is considered appropriate, any additional category. | |
| (7) The water resource plan must describe the data and methods used to identify and assess the risks. | |
| (8) The water resource plan must describe any quantified uncertainties in the level of risk attributed to each risk, including the results of any sensitivity analysis. | |
| **10.42 Description of risks**<br>A water resource plan must describe:  
(a) each risk which is defined in accordance with subsection 10.41(6) as having a medium or higher level of risk; and  
(b) factors that contribute to those risks. | **Section 5.9.10 – accredited text** |
| **10.43 Strategies for addressing risks**<br>(1) If a water resource plan defines a risk in accordance with subsection 10.41(6) as having a medium or higher level of risk, the water resource plan must either:  
(a) describe a strategy for the management of the water resources of the water resource plan area to address the risk in a manner commensurate with the level of risk; or  
(b) explain why the risk cannot be addressed by the water resource plan in a manner commensurate with the level of risk. | **10.43(1) Section 5.9.11 – accredited text**  
**10.43(2) Section 5.9.12 – accredited text**  
**10.43(3) Section 5.9.13 – accredited text** |
| (2) If the water resource plan identifies a risk which relates to a matter dealt with by a requirement in another Part of this Chapter, the strategy must take account of that requirement. | |
A water resource plan must be prepared having regard to:

(a) the strategies listed in subsection 4.03(3); and
(b) any guidelines published by the Authority in accordance with section 4.04.

Note: The Authority may publish guidelines in accordance with section 4.04 in relation to the implementation of strategies to manage or address risks identified in section 4.02.

### Part 10—Measuring and monitoring

#### 10.44 Information relating to measuring take—water access entitlements

A water resource plan must include the following information in relation to each class of water access right relating to the water resources of the water resource plan area:

(a) the best estimate of the total long-term annual average quantity of water taken that is measured;
(b) the best estimate of the total long-term annual average quantity of water taken that is not measured;
(c) how the quantities under paragraphs (a) and (b) were calculated;
(d) the proportion of the quantity referred to in paragraph (a) that is measured in accordance with standards for measuring agreed by the Basin States and the Commonwealth.

#### 10.45 Supporting measuring

(1) A water resource plan must specify measures for maintaining and, if practicable, improving:

(a) the proportion of take that is measured in the water resource plan area; and
(b) the standard to which take is measured.

(2) The water resource plan must specify the timeframe for implementing the measures.

#### 10.46 Monitoring water resources

(1) A water resource plan must specify the monitoring of the water resources of the water resource plan area that will be done to enable the Basin State to fulfil its reporting obligations under section 13.14.

(2) Nothing in this section limits the capacity of the Basin State to conduct other monitoring of the water resources of a water resource plan area.
## Part 11—Reviews of water resource plans

**10.47  Review of water resource plans**  
A water resource plan must require that if a review of the plan (or a part of the plan) is undertaken, the report of the review must be given to the Authority within 30 days after the report is completed.

Section 5.11.1 – accredited text

**10.48  Amendment of water resource plan**  
A water resource plan must require a Basin State that proposes an amendment to the plan arising from a review to give the reasons for the amendment to the Authority.  
Note: See also section 65 of the Act.

Section 5.11.2 – accredited text

## Part 12—Information used to prepare water resource plan

**10.49  Best available information**  
(1) A water resource plan must be based on the best available information.  
(2) The water resource plan must identify and describe the significant sources of information on which the water resource plan is based.

Section 5.12.1 – accredited text

**10.50  Methods used to develop water resource plan**  
A water resource plan must identify any significant method, model or tool that has been used to develop the water resource plan.

Section 5.12.2 – accredited text

## Part 13—Extreme events

**10.51  Measures in response to extreme events**  
(1) A water resource plan must describe how the water resources of the water resource plan area will be managed during the following types of events:  
   (a) an extreme dry period;  
   (b) a water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values;

Section 5.13.1 – accredited text
### Part 14—Indigenous values and uses

**Note:** If a water resource plan is prepared by a Basin State, it is expected that the Authority will consult with relevant Indigenous organisations in relation to whether the requirements of this Part have been met, for the purposes of paragraph 63(3)(b) of the Act.

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chapter 10 of the Basin Plan</strong></td>
<td><strong>Part of the SA Murray Region WRP that addresses requirement</strong></td>
</tr>
<tr>
<td>(c) any type of event that has resulted in the suspension of a statutory regional water plan in the past 50 years (including a transitional water resource plan or interim water resource plan).</td>
<td></td>
</tr>
<tr>
<td>(2) If an event of a type listed in subsection (1) would compromise a Basin State’s ability to meet critical human water needs in the water resource plan area, the water resource plan must set out measures to meet critical human water needs during such an event.</td>
<td></td>
</tr>
<tr>
<td>(3) The water resource plan must provide that, if new scientific information suggests a change in the likelihood of an event of a type listed in subsection (1) occurring (for example, due to climate change), consideration must be given to whether, as a result of this new information, the water resources should be managed differently.</td>
<td></td>
</tr>
</tbody>
</table>

### 10.52 Objectives and outcomes based on Indigenous values and uses

(1) A water resource plan must identify:

(a) the objectives of Indigenous people in relation to managing the water resources of the water resource plan area; and

(b) the outcomes for the management of the water resources of the water resource plan area that are desired by Indigenous people.

(2) In identifying the matters set out in subsection (1), regard must be had to:

(a) the social, spiritual and cultural values of Indigenous people that relate to the water resources of the water resource plan area *(Indigenous values)*; and

(b) the social, spiritual and cultural uses of the water resources of the water resource plan area by Indigenous people *(Indigenous uses)*;

as determined through consultation with relevant Indigenous organisations, including (where appropriate) the Murray Lower Darling Rivers Indigenous Nations and the Northern Murray-Darling Basin Aboriginal Nations.
<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chapter 10 of the Basin Plan²</strong></td>
<td><strong>Part of the SA Murray Region WRP that addresses requirement</strong></td>
</tr>
<tr>
<td>(3) A person or body preparing a water resource plan may identify</td>
<td></td>
</tr>
<tr>
<td>opportunities to strengthen the protection of Indigenous values and</td>
<td></td>
</tr>
<tr>
<td>Indigenous uses in accordance with the objectives and outcomes identified</td>
<td></td>
</tr>
<tr>
<td>under subsection (1), in which case the opportunities must be specified</td>
<td></td>
</tr>
<tr>
<td>in the water resource plan.</td>
<td></td>
</tr>
</tbody>
</table>

### 10.53 Consultation and preparation of water resource plan

(1) A water resource plan must be prepared having regard to the views of relevant Indigenous organisations with respect to the matters identified under section 10.52 and the following matters:

(a) native title rights, native title claims and Indigenous Land Use Agreements provided for by the Native Title Act 1993 in relation to the water resources of the water resource plan area;

(b) registered Aboriginal heritage relating to the water resources of the water resource plan area;

(c) inclusion of Indigenous representation in the preparation and implementation of the plan;

(d) Indigenous social, cultural, spiritual and customary objectives, and strategies for achieving these objectives;

(e) encouragement of active and informed participation of Indigenous people;

(f) risks to Indigenous values and Indigenous uses arising from the use and management of the water resources of the water resource plan area.

Note: For examples of the principles that may be applied in relation to the participation of Indigenous people, see the document titled ‘MLDRIN and NBAN Principles of Indigenous Engagement in the Murray-Darling Basin’.

(2) In this section, registered Aboriginal heritage means Aboriginal heritage registered or listed under a law of a Basin State or the Commonwealth that deals with the registration or listing of Aboriginal heritage (regardless of whether the law deals with the listing of other heritage).

### 10.54 Cultural flows

A water resource plan must be prepared having regard to the views of Indigenous people with respect to cultural flows.

### 10.55 Retention of current protection

A water resource plan must provide at least the same level of protection of Indigenous values and Indigenous uses as provided in:

(a) a transitional water resource plan for the water resource plan area; or

(b) an interim water resource plan for the water resource plan area.
5 Addressing Chapter 10 Requirements

5.1 Part 1 – Preliminary

10.01 Simplified outline

5.1.1 Accredited Text
Not Applicable – no response required for this section

5.2 Part 2 – Identification of water resource plan area and other matters

10.02 Identification of water resource plan area and water resources

5.2.1 Accredited Text
The SA Murray Region WRP area is the area as identified in section 3.07(e) of the Basin Plan as the SA Murray Region.

For the purpose of section 10.02(1)(b) of the Basin Plan, the SA Murray Region WRP area, as described in section 3.07(e) of the Basin Plan, applies to:

- all surface water resources in the area, excluding those in the SA River Murray (Basin Plan section 3.05(l)); and
- all groundwater resources beneath the area.

No variations of the kind that are permitted by section 3.04 of the Basin Plan are proposed.

10.03 Identification of SDL resource units and water resources

5.2.2 Accredited Text
The SDL resource units and water resources within each SDL resource unit for the SA Murray Region WRP are as follows:

Table 4 Surface water SDL resource units in SA Murray Region as identified in column 1 of the table in Schedule 2 of the Basin Plan (pursuant to section 6.02 of the Basin Plan)

<table>
<thead>
<tr>
<th>Surface water SDL resource unit (code)</th>
<th>Surface water covered by surface water SDL resource unit (as identified in section 6.02 of the Basin Plan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Australian Non-Prescribed Areas (SS10)</td>
<td>surface water resources within the area</td>
</tr>
</tbody>
</table>
Table 5  Groundwater SDL resource units in SA Murray Region as identified in Schedule 4 of the Basin Plan (pursuant to section 6.03 of the Basin Plan)

<table>
<thead>
<tr>
<th>Groundwater SDL resource unit (code)</th>
<th>Groundwater covered by groundwater SDL resource unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mallee (Pliocene Sands) (GS3)</td>
<td>groundwater in the Pliocene sands</td>
</tr>
<tr>
<td>Mallee (Murray Group Limestone) (GS3)</td>
<td>groundwater in the Murray Group Limestone</td>
</tr>
<tr>
<td>Mallee (Renmark Group) (GS3)</td>
<td>groundwater in the Renmark Group, and all other groundwater, excluding groundwater in the Pliocene sands and Murray Group Limestone aquifers</td>
</tr>
<tr>
<td>Peake–Roby–Sherlock (unconfined) (GS5)</td>
<td>groundwater in:</td>
</tr>
<tr>
<td></td>
<td>(a) the unconfined Murray Group Limestone comprising the Coomandook and Bridgewater Formations; and</td>
</tr>
<tr>
<td></td>
<td>(b) the unconfined Quaternary limestone</td>
</tr>
<tr>
<td>Peake–Roby–Sherlock (confined) (GS5)</td>
<td>groundwater in:</td>
</tr>
<tr>
<td></td>
<td>(a) the confined Renmark Group; and</td>
</tr>
<tr>
<td></td>
<td>(b) the confined Buccleuch Group; and</td>
</tr>
<tr>
<td></td>
<td>all other groundwater, excluding groundwater in unconfined aquifer</td>
</tr>
<tr>
<td>SA Murray (GS6)</td>
<td>all groundwater</td>
</tr>
<tr>
<td>SA Murray Salt  Interception Schemes (GS7)</td>
<td>all groundwater</td>
</tr>
</tbody>
</table>

10.04  Form of water resource plan

5.2.3  Accredited Text

The SA Murray Region WRP is constituted by 2 or more instruments or texts; therefore, sections (2) and (3) of the Basin Plan apply. The SA Murray Region WRP is constituted by the instruments or texts (or parts thereof) identified in Table 6 of this document.

Table 6 also outlines the water resources to which the instruments or texts apply (10.04(3)(a) and (b) of the Basin Plan), and when the instrument or text either ceases to operate or is required to be reviewed (10.04(4)(c) of the Basin Plan).

It should be noted, as per section 1.09 of the Basin Plan, that the water resource plan (as part of the Basin Plan) cannot impose an obligation on the State that would contravene the Constitution of Australia, even if the wording of the instruments or texts that constitute the WRP implies that it does. Where an obligation in a law of the State of South Australia is incorporated by reference into this WRP, that obligation should be interpreted in the same way as it would be interpreted in the State legislative framework within which that obligation sits.

The Index Table (Table 3) in section 4 of this document sets out the requirements in chapter 10 of the Basin Plan and the parts of the SA Murray Region WRP that address each requirement. Where the information in Table 3 refers to a section of the WRP that includes other instruments or texts, and those instruments and texts are also included in Table 6 below, those instruments or texts also form part of the WRP for the purpose of addressing that requirement even if they have not been specifically identified in Table 3. This meets the requirement of section 10.04(4)(a) and (b) of the Basin Plan.

This SA Murray Region WRP is subject to the water trading rules in chapter 12 of the Basin Plan.
<table>
<thead>
<tr>
<th>Row</th>
<th>Legislation</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Natural Resources Management Act 2004 Version: 4.7.2016</strong></td>
<td>Instruments or texts that constitute the South Australian Murray Region Water Resource Plan (10.04(2) of the Basin Plan)</td>
<td>Material that is not part of the WRP (10.04(5) of the Basin Plan)</td>
<td>Water resources to which the instrument or text applies (if not all those of the WRP area) (10.04(3)(a)(b) of the Basin Plan)</td>
<td>The parts of the plan that will cease to have effect or are to be reviewed (10.04(4)(c) of the Basin Plan)</td>
</tr>
<tr>
<td>1</td>
<td><strong>Environment Protection Act 1993 Version: 22.6.2017</strong></td>
<td>All parts except for:</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>- Chapter 1, section 3, definitions of domestic purposes and intensive farming</td>
<td></td>
<td></td>
<td>Ongoing</td>
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<td></td>
<td></td>
<td>- Chapter 2, part 2, sections 9(1) and (2)</td>
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<td></td>
<td>- Chapter 7, part 1, section 124</td>
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<td></td>
<td></td>
<td>- Chapter 7, part 2, sections 127(1), 127(2), 127(3), 127(5) and 127(6), 128, 132(1), 135(4)</td>
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<td></td>
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<td>- Chapter 7, part 3 sections 146, 147(3)(a)(i), 148, 149, 150, 152, 153, 154(1)(a)(i), 156, 157, 164N</td>
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<td>- Chapter 7, part 5, sections 169(1)-7</td>
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<tr>
<td>2</td>
<td><strong>Groundwater (Border Agreement) Act 1985 Version: 31.10.2006</strong></td>
<td>All parts except for:</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Part 4, sections 25(1), 25(2)(a) and (c)</td>
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<tr>
<td></td>
<td></td>
<td>- Part 8, division 1, sections 64(1), 64(1a)(b), 64(6) and (7)</td>
<td></td>
<td>Coorong only</td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td>All parts except for:</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Schedule 2, clauses 26(b), 31</td>
<td></td>
<td>That part of the SA Murray Region WRP area that is within the Border Groundwaters Agreement area of GS3 and GS7 (Figure 7)</td>
<td></td>
</tr>
<tr>
<td>Row</td>
<td>Column 1</td>
<td>Column 2</td>
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<tr>
<td></td>
<td><strong>Instruments or texts that constitute the South Australian Murray Region Water Resource Plan (10.04(2) of the Basin Plan)</strong></td>
<td><strong>Material that is not part of the WRP (10.04(5) of the Basin Plan)</strong></td>
<td><strong>Water resources to which the instrument or text applies (if not all those of the WRP area) (10.04(3)(a)(b) of the Basin Plan)</strong></td>
<td><strong>The parts of the plan that will cease to have effect or are to be reviewed (10.04(4)(c) of the Basin Plan)</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><em>Development Act 1993</em> &lt;br&gt;Version: 18.9.2014</td>
<td>All parts except for: &lt;br&gt;• Part 1, section 4 (definition of ‘development’) &lt;br&gt;• Part 4, sections 32, 33(1), 33(4), 37</td>
<td>SS10</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Regulations / Subordinate Legislation</strong></td>
<td></td>
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<tr>
<td>5</td>
<td><em>Environment Protection (Water Quality) Policy 2015</em> &lt;br&gt;(Subordinate legislation to the Environment Protection Act) &lt;br&gt;Version: 1.1.2016</td>
<td>All parts except for: &lt;br&gt;• Part 1, sections 5, 6, 7(a) &lt;br&gt;• Part 2, Division 1, sections 9(b)-(d) &lt;br&gt;• Part 2, Division 2, section 10(1)</td>
<td>Entire SA Murray Region WRP area</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><em>Natural Resources Management (General) Regulations 2005</em> &lt;br&gt;Version: 1.7.2018</td>
<td>All regulations except for: &lt;br&gt;• Regulations 12, 47</td>
<td>Entire SA Murray Region WRP area</td>
<td>Current regulations will cease to have effect on 1 August 2019.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><em>Natural Resources Management (Financial Provisions) Regulations 2005. Version: 1.7.2018</em></td>
<td>All regulations except for: &lt;br&gt;• Regulations 11(1)(b), 13–16</td>
<td>Mallee (GS3) – Murray Group Limestone and Renmark Group Peake, Roby and Sherlock (GS5) – confined and unconfined</td>
<td>Current regulations will cease to have effect on 1 August 2019.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td><em>Development Regulations 2008</em> &lt;br&gt;Version: 1.07.2018</td>
<td>All regulations except for: &lt;br&gt;• Schedule 3, clause 10 ‘dams’ &lt;br&gt;• Schedule 8 – item 12(1)</td>
<td>SS10</td>
<td>Current regulations will cease to have effect, 1 August 2019.</td>
<td></td>
</tr>
<tr>
<td>Row</td>
<td>Column 1</td>
<td>Column 2</td>
<td>Column 3</td>
<td>Column 4</td>
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<tr>
<td></td>
<td>Addressing Chapter 10 Requirements</td>
<td>s10.04 Form of water resource plan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.04</td>
<td>In Instruments or texts that constitute the South Australian Murray Region Water Resource Plan (10.04(2) of the Basin Plan)</td>
<td>Material that is not part of the WRP (10.04(5) of the Basin Plan)</td>
<td>Water resources to which the instrument or text applies (if not all those of the WRP area) (10.04(3)(a)(b) of the Basin Plan)</td>
<td>The parts of the plan that will cease to have effect or are to be reviewed (10.04(4)(c) of the Basin Plan)</td>
<td></td>
</tr>
<tr>
<td>Statutory Plans</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
| 9 | South Australian Arid Lands Natural Resources Management Board, Regional Natural Resources Management Plan for the SA Arid Lands Natural Resources Management Region, Volume 2, Business and Operational Plan 2017/18 – 2019/20, Appendix 1: Water affecting activities policy | All parts except for:  
• Section 2.3  
• Section 3.2, principles (a), (c), (d) and (j)  
• Section 4.1, principles 1-4, 8  
• Section 4.2, principle 15, 17, 19-21  
• Section 4.3, principles 23, 34, 35  
• Section 4.4, principles 49, 50  
• Section 4.6, principles 71, 72  
• Section 4.7, principles 86, 87 | That part of the SA Murray Region WRP area that falls within the South Australian Arid Lands NRM Region (Figure 2)  
Note: Surface water provisions only apply to SS10, and well and aquifer provisions GS6 | Review due by 2020, but will continue to have legal effect after that date. |
| 10 | South Australian Murray-Darling Basin Regional Natural Resources Management Plan, Volume B, Board Business and Operational Plan 2016/17 – 2018/19, version 4.0 | All parts except for:  
• Section 5.2.2, principles 1(d), 1(e), 2(a)-(f) and 2(i)  
• Section 5.3.1, principles 3-6  
• Section 5.3.2, principle 8, 9, 10, 11, 13-16  
• Section 5.3.3, principles 19(a) and (b)  
• Section 5.3.4, principles 28(c), 29, 31-34 and 41-46, and figure 5.3 | That part of the SA Murray Region WRP area that falls within the South Australian Murray-Darling Basin NRM Region (Figure 2)  
Note: Surface water provisions only apply to SS10, and well and aquifer provisions only apply to the groundwater SDL resource units | Review due by 6 April 2019, but will continue to have legal effect after that date. |
<table>
<thead>
<tr>
<th>Row</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instruments or texts that constitute the South Australian Murray Region Water Resource Plan (10.04(2) of the Basin Plan)</td>
<td>Material that is not part of the WRP (10.04(5) of the Basin Plan)</td>
<td>Water resources to which the instrument or text applies (if not all those of the WRP area) (10.04(3)(a)(b) of the Basin Plan)</td>
<td>The parts of the plan that will cease to have effect or are to be reviewed (10.04(4)(c) of the Basin Plan)</td>
</tr>
</tbody>
</table>
| 11  | Amended South East Natural Resources Management Plan, Part 4: NRM Policy, February 2010 as revised 2017 | All parts except for:  
• Section 4.3.1, principles 1-5, 7 and 8  
• Section 4.4.4  
• Section 4.4.4.2, principles 6 and 7 and Table 4 | That part of the SA Murray Region WRP area that falls within the South East NRM Region (Figure 2)  
Note: Surface water provisions only apply to SS10, and well and aquifer provisions GS6 | Review due by 31 May 2020, but will continue to have legal effect after that date. |
| 12  | The Water Allocation Plan for the Mallee Prescribed Wells Area (2017) | All parts except for:  
• Section 4.2.1  
• Section 5.1, principles 1-5, 7 and table 5  
• Section 6.1, principles 38-43 and table 6,  
• Section 6.1.1, principle 45  
• Section 7.1, principles 48, 49, 51  
• Section 7.1.4, principle 52  
• Section 8.3, principle 59 | All groundwater SDL resource units that fall within GS3 (Figure 4) | Review due by 2 May 2022, but will continue to have legal effect after that date. |
| 13  | Water Allocation Plan for the Peake, Roby and Sherlock Prescribed Wells Area (2017) | All parts except for:  
• Section 4.2  
• Section 5.3.1, principles 1-3 and Figure 6  
• Section 5.3.2, principles 4-5 and table 2  
• Section 5.3.4, principles 8(i)- (iii) and 9  
• Section 6.2, principles 14-18 and table 5  
• Section 6.2.1, principles 19 and 20  
• Section 6.2.2, principle 21  
• Section 6.2.3, principle 22  
• Section 8.2.1, principle 30 | All groundwater SDL resource units that fall within GSS (Figure 4) | Review due by 2 March 2021, but will continue to have legal effect after that date. |
### Addressing Chapter 10 Requirements

#### s10.04 Form of water resource plan

<table>
<thead>
<tr>
<th>Row</th>
<th>Column 1</th>
<th>Column 2</th>
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<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instruments or texts that constitute the South Australian Murray Region Water Resource Plan (10.04(2) of the Basin Plan)</td>
<td>Material that is not part of the WRP (10.04(5) of the Basin Plan)</td>
<td>Water resources to which the instrument or text applies (if not all those of the WRP area) (10.04(3)(a)(b) of the Basin Plan)</td>
<td>The parts of the plan that will cease to have effect or are to be reviewed (10.04(4)(c) of the Basin Plan)</td>
</tr>
</tbody>
</table>
| 14  | Water Allocation Plan for the River Murray Prescribed Watercourse (2017) | All parts except for:  
  - Section 6.3.1, principles 70 and 71 | GS6 and GS7 | Review due by 2027, but will continue to have legal effect after that date. |
| 15  | South Australian Murray Region Water Resource Plan (this document) (2018) | All parts except for:  
  - Figures 2,3,4,6,7  
  - Section 4  
  - Section 5 – accredited text (including only those referenced texts or instruments that are also listed in table 6)  
  - Attachment 2 | All water resources in the SA Murray Region WRP area | As per the duration of accreditation under section 64 of the Water Act |
| 16  | South Australian Murray Region Water Resource Plan Risk Assessment (2017) | All parts except for:  
  - Chapter 2  
  - Chapter 4  
  - Appendices B-K | All water resources in the SA Murray Region WRP area | Ongoing |

**Policies, Guidelines and Other Documents**

- **Note:** For clarification, with the exception of regulations, statutory instruments under the Natural Resources Management Act 2004 do not cease to have effect; they have a statutory review requirement, but this review may result in no changes to the instrument. An instrument stays in force until a new instrument is adopted by the Minister.

Figures 2, 3, 4, 6 and 7 are indicative maps of the water resources (or parts thereof) identified in section 10.04(3)(a) of the Basin Plan. These address the requirements of 10.04(3)(b) of the Basin Plan.
10.05 Regard to other water resources

5.2.4 Accredited Text

The SA Murray Region WRP was developed having regard to the management and use of any water resources which have a significant hydrological connection to the water resources of the WRP area.

The SA Murray Region Water Resource Plan Area Risk Assessment (the risk assessment report) includes the risks associated with the management of connected resources and the consequences to the resources (both within and outside the SA Murray Region). One high risk (r844) was identified that directly related to connected water resources, and one medium risk (r700) was identified which did not have the risk source as the connected water resources but the management of the risk is directly related to the management of the connected resources.

Section 76(4)(a)(ii) of the NRM Act requires an assessment as to whether the taking or use of water from the resource will have a detrimental effect on the quantity or quality of water that is available from any other water resource as part of the development of a WAP. Principles in the WAP reflect the required management to protect the connections. These are indicated in section 5.3.4 through limiting take from each aquifer, and sections 5.8.2 and 5.8.3 to manage potential impacts from trade of water access rights.

Sections 5.3.3, 5.3.7, 5.4.2, 5.4.4, 5.4.5, 5.4.6, 5.5.1, 5.6.2, 5.7.3, 5.7.7, 5.7.9, 5.9.2, 5.9.11, 5.13.1, and 5.14.2 of this WRP also consider the management of connected resources.

The following outlines the various hydrological connections applicable to the SA Murray Region WRP area. It considers current management arrangements; risks to connected resources; and the significance of connections (whether there are likely to be material impacts). The text in supporting information provides the relevant context and the tables below summarise the connections, their significance and management. For the purpose of considering connections, the following categories were assigned:

Insignificant
There is limited to no connection between resources, or activities in one resource are unlikely to have a material impact on the other and therefore there are no specific management strategies. General duty of care provisions in the NRM Act and high-level principles in regional NRM Plans provide adequate management.

Medium
Connections between resources exist to varying degrees but the current management arrangements are fit-for-purpose and appropriate to manage the potential for any material impact.

Significant
There are clear connections between different resources and a high likelihood of impacts from the use of one resource on the other. Management arrangements tend to be cross-jurisdictional such as Basin Plan, Border Groundwaters Agreement or Schedule B of Schedule 1 of the Water Act 2007 (Basin Salinity Management).

Local Significance
A connection is significant but only to a small local area and there are no broad implications for the resource as a whole. Existing management arrangements such as regional NRM Plan principles are deemed fit-for-purpose.
Table 7  Connectivity of the South Australian Non-Prescribed Areas (SS10) SDL resource unit with other resources

<table>
<thead>
<tr>
<th>Part of SS10</th>
<th>Connection</th>
<th>Nature of connection</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coorong</strong></td>
<td>SA Murray (SS11) SDL resource unit (River Murray)</td>
<td>Significant</td>
<td>Through Basin Plan implementation and River Murray WAP</td>
</tr>
<tr>
<td></td>
<td>Eastern Mount Lofty Ranges (SS13) and Marne-Saunders (SS12)</td>
<td>Local</td>
<td>Through the Eastern Mount Lofty Ranges WAP, Marne Saunders WAP and River Murray WAP</td>
</tr>
<tr>
<td></td>
<td>NSW Murray (SS14) SDL resource unit</td>
<td>Significant</td>
<td>Through Basin Plan implementation</td>
</tr>
<tr>
<td></td>
<td>Victorian Murray (SS2) SDL resource unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Murrumbidgee (SS15) SDL resource unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goulburn (SS6) SDL resource unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA Murray (GS6) groundwater SDL</td>
<td>Medium</td>
<td>Through Basin Plan implementation (maintaining levels and flows)</td>
</tr>
<tr>
<td></td>
<td>South East surface water and groundwater (non-basin water resource)</td>
<td>Medium / Local impacts (positive) on water quality</td>
<td>SE Flows Restoration Project</td>
</tr>
<tr>
<td><strong>Northern Mount Lofty Ranges and Olary Ranges</strong></td>
<td>SA River Murray (SS11)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fractured rock (GS6)</td>
<td>Local significance; Surface water contributes to permanent pools providing scouring and freshening</td>
<td>Farm dam policies</td>
</tr>
<tr>
<td><strong>Surface water on plains</strong></td>
<td>SA Murray groundwater (GS6)</td>
<td>Insignificant</td>
<td></td>
</tr>
</tbody>
</table>

s10.05 Regard to other water resources
### Addressing Chapter 10 Requirements

#### s10.05 Regard to other water resources

<table>
<thead>
<tr>
<th>Aquifer</th>
<th>Connection to:</th>
<th>Nature of connection</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pliocene Sands</strong></td>
<td>SA Murray Salt Interception Schemes (GS7) and SA Murray (GS6)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA Non-Prescribed Area (surface water) (SS10)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wimmera-Mallee: Sedimentary Plain (GS9)</td>
<td>Medium</td>
<td>Border Groundwaters Agreement</td>
</tr>
<tr>
<td><strong>Murray Group Limestone</strong></td>
<td>SA Murray Salt Interception Schemes (GS7)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peake, Roby and Sherlock (unconfined) (GS5)</td>
<td>Medium</td>
<td>Through WAP policies</td>
</tr>
<tr>
<td></td>
<td>Mallee (Pliocene Sands) (GS3)</td>
<td>Medium</td>
<td>Through WAP policies</td>
</tr>
<tr>
<td></td>
<td>Wimmera-Mallee: Sedimentary Plain (GS9)</td>
<td>Significant</td>
<td>Through Border Groundwaters Agreement and implemented through the Mallee WAP and SAMDB NRM Plan – Vol B</td>
</tr>
<tr>
<td></td>
<td>South East groundwater (Tintinara-Coonalpyn and Tatiara PWAs)</td>
<td>Medium</td>
<td>Through WAP policies</td>
</tr>
<tr>
<td></td>
<td>SA Non-Prescribed Areas (surface water) (SS10) and SA Murray Salt Interception Schemes (GS6)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td><strong>Renmark Group</strong></td>
<td>Mallee (Murray Group Limestone) (GS3)</td>
<td>Medium</td>
<td>Through WAP policies</td>
</tr>
<tr>
<td></td>
<td>SA Murray Salt Interception Schemes (GS7)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peake, Roby and Sherlock (Confined) (GS5)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South East (Tintinara-Coonalpyn and Tatiara PWAs)</td>
<td>Insignificant</td>
<td></td>
</tr>
</tbody>
</table>

---

**Table 8  Connectivity of the Mallee (GS3) SDL resource unit with other resources**
Table 9  Connectivity of the Peake, Roby and Sherlock (GS5) SDL resource unit with other resources

<table>
<thead>
<tr>
<th>Aquifer</th>
<th>Connection to:</th>
<th>Nature of connection</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unconfined</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peake, Roby and Sherlock (Confined) (GS5)</td>
<td>Medium</td>
<td>Managed through WAP policies</td>
</tr>
<tr>
<td></td>
<td>Mallee (Murray Group Limestone) (GS3)</td>
<td>Medium</td>
<td>Managed through WAP policies</td>
</tr>
<tr>
<td></td>
<td>South East (Tintinara-Coonalpyn and Tatiara PWAs)</td>
<td>Medium</td>
<td>Managed through WAP policies</td>
</tr>
<tr>
<td></td>
<td>SA Non-Prescribed Area (surface water) (SS10)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA Murray (GS6)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td><strong>Confined</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak, Roby and Sherlock (Unconfined) (GS5)</td>
<td>Medium</td>
<td>Managed through WAP policies</td>
</tr>
<tr>
<td></td>
<td>Mallee (Renmark Group) (GS3)</td>
<td>Medium</td>
<td>Managed through WAP policies</td>
</tr>
<tr>
<td></td>
<td>South East (Tintinara-Coonalpyn and Tatiara PWAs)</td>
<td>Medium</td>
<td>Managed through WAP policies</td>
</tr>
<tr>
<td></td>
<td>SA Murray (GS6)</td>
<td>Insignificant</td>
<td></td>
</tr>
</tbody>
</table>
Table 10 Connectivity of the SA Murray (GS6) SDL resource unit with other resources

<table>
<thead>
<tr>
<th>Aquifer</th>
<th>Connection to:</th>
<th>Nature of connection</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All sedimentary aquifers</strong></td>
<td>Mallee (Pliocene Sands) (GS3)</td>
<td>Insignificant for most connections or Medium where there is higher irrigation take</td>
<td>Not actively managed where connections are insignificant due to low level of development and poor quality of water – general management principles in regional NRM Plans</td>
</tr>
<tr>
<td></td>
<td>Mallee (Murray Group Limestone) (GS3)</td>
<td></td>
<td>Medium managed through WAP policies</td>
</tr>
<tr>
<td></td>
<td>Mallee (Renmark Group) (GS3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peake, Roby and Sherlock (unconfined) (GS5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peake, Roby and Sherlock (confined) (GS5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA Murray Salt Interception Schemes (GS7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Angas Bremer (Quaternary Sediments) (GS1)</td>
<td>Insignificant</td>
<td>Managed through the Eastern Mount Lofty Ranges WAP and the Marne Saunders WAP</td>
</tr>
<tr>
<td></td>
<td>Angas Bremer (Murray Group Limestone) (GS1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eastern Mount Lofty Ranges (GS2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marne Saunders (Fractured Rock) (GS4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marne Saunders (Murray Group Limestone) (GS4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marne Saunders (Renmark Group) (GS4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW Western Porous Rock (GS50)</td>
<td>Insignificant</td>
<td>No active joint management as saline and low take</td>
</tr>
<tr>
<td></td>
<td>Adelaide Fold Belt (GS10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA Non-Prescribed Area (surface water) (SS10)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA River Murray (SS11)</td>
<td>Medium</td>
<td>Managed through WAP policies</td>
</tr>
<tr>
<td></td>
<td>Non-basin resources from Upper South East</td>
<td>Local significance</td>
<td>Managed through operations plan</td>
</tr>
<tr>
<td><strong>Fractured rock</strong></td>
<td>SA Non-Prescribed Areas (surface water) (SS10)</td>
<td>Local significance</td>
<td>Not actively managed due to low level of development – general management principles in regional NRM Plans</td>
</tr>
</tbody>
</table>
Table 11  Connectivity of the SA Murray Salt Interception Schemes (GS7)

<table>
<thead>
<tr>
<th>Aquifer</th>
<th>Connection to:</th>
<th>Nature of connection</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>All groundwater</td>
<td>Mallee (GS3) (Pliocene Sands; Murray Group Limestone; and Renmark Group)</td>
<td>Medium (although lateral flow is from GS3 and GS6 to GS7)</td>
<td>Through WAP policies or not required due to poor quality and low level of development</td>
</tr>
<tr>
<td></td>
<td>SA Murray (GS6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NSW Western Porous Rock (GS50)</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wimmera-Mallee Highlands (GS9)</td>
<td>Medium</td>
<td>Border Groundwaters Agreement</td>
</tr>
<tr>
<td></td>
<td>SA River Murray (SS11)</td>
<td>Significant</td>
<td>Salt interception schemes – Basin Salinity Management Plan 2030 and the Water Act, Schedule 1 Murray-Darling Agreement</td>
</tr>
</tbody>
</table>

5.2.4.1  Supporting Information

The Basin Plan requires a WRP to have regard to the management and use of any water resources that have a significant hydrological connection. Position statement 2B (MDBA, 2016) considers a significant connection to be where the water of one resource is physically able to move to the other resource and activities in one resource may have a material impact on the state or condition of the other.

The following supporting information provides further detail on the connections to each of the SDL resource units:

South Australian Non-Prescribed Areas (SS10)

The Coorong and Murray Mouth are hydrologically connected to the Lower Lakes and River Murray. Flows from the River Murray Prescribed Watercourse at the northern end of the Coorong are integral to maintaining the ecological character of the area. The flow from the River Murray, in turn, is highly dependent on the management of water resources in the NSW Murray (SS14) and Victorian Murray (SS2) as well as Murrumbidgee (SS15) and Goulburn (SS6) SDL resource units, among others. The South Lagoon of the Coorong has been historically impacted by the redirection of water (both floodwater and saline groundwater) into the South East drainage system and out to sea rather than into the Coorong. A project to restore flows to the Coorong South Lagoon is in development and will provide freshwater flows into the Coorong to assist in maintaining salinity levels in the South Lagoon within the target range of 60,000 mg/L to 100,000 mg/L (93,600 – 156,000 EC).

Surface water flows from ephemeral creeks are limited, and flows out of the highland areas of the Northern Mount Lofty Ranges and the Olary Ranges usually only occur in very wet years. Discharge out onto the plains occurs for short distances before dissipating by evaporation or infiltration into permeable sediments, where they exist. The largest tributary to the River Murray (within the SA Murray Region) is Burra Creek. This creek has not flowed into the River Murray in over 70 years, with the last known record of water reaching the river being in 1941. Surface water runoff from the watercourses originating on the Olary Ranges only reaches the River Murray through limited groundwater drainage after a significant period of time.

In the highland areas of the Northern Mount Lofty Ranges and the Olary Ranges, the connections between the non-prescribed surface water and fractured rock groundwater aquifers are likely to be limited. Although there is virtually no groundwater monitoring due to negligible extraction in the Burra area, monitoring suggests low
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s10.05 Regard to other water resources

recharge with a noticeable watertable response only occurring in very wet years (Barnett, 2015). There are known permanent and semi-permanent pools through parts of the highland areas which are surface expressions of the groundwater. Freshwater flows from the catchment are likely to play a significant role in freshening these areas for the local water-dependent ecosystems.

There is no surface water that flows from within the SA Murray Region to areas outside of the Basin.

**Mallee (GS3)**

*Mallee (Pliocene Sands)*
The Pliocene Sands (also referred to in SA as Parilla Sands) aquifer (including both the Mallee and part of Noora GMA) extends westwards to the River Murray and eastwards into Victoria. Only the eastern part of the Mallee SDL resource unit contains groundwater in this aquifer. In the western part, it is higher than the watertable and therefore unsaturated (SAMDB NRM Board, 2012).

There are no surface water resources as a result of the sandy soils, very low rainfall and high evapotranspiration throughout the region. The only significant connectivity occurs where saline groundwater discharges to the River Murray and the floodplain with adverse impacts.

There is a connection with the Murray Group Limestone aquifer through downward leakage which numerical groundwater flow modelling has indicated would be increased by extraction (Barnett and Osei-Bonsu, 2006).

*Mallee (Murray Group Limestone)*
The Murray Group Limestone aquifer extends from the Mount Lofty Ranges in the west to Swan Hill, Victoria, in the east (SAMDB NRM Board, 2012). Very little, if any, rainfall recharges this aquifer within the Mallee (GS3) SDL resource unit. The main recharge source is rainfall in south-western Victoria. From there, it moves slowly through the Mallee and drains into the River Murray. The rate of movement of the underground water is slow due to the flat terrain and large distances resulting in low watertable gradients. As the Murray Group Limestone is one large connected basin, it is considered appropriate to allow trade across the basin within defined limits and consistent with management arrangements detailed in the relevant WAPs.

In the eastern area of the Mallee (GS3) SDL resource unit (Figure 6), the aquifer is confined. Although confined by a clay layer in this area, drawdown due to irrigation would result in downward leakage of more saline underground water from the Pliocene Sands aquifer above the clay layer. Modelling suggests that this is a potential long-term risk over the next 100 to 150 years.

The Mallee (GS3) SDL resource unit (Murray Group Limestone) is directly connected (same aquifer) to the Mallee Highland part of the Peake, Roby and Sherlock SDL resource unit (unconfined). For the Murray Group Limestone unconfined aquifer (in the western area of the Mallee PWA), there may be small drawdown impacts on the unconfined aquifer in the Peake, Roby and Sherlock PWA if extractions were to concentrate close to the common boundary. Transfer principle 41 in section 6.1 of the Mallee WAP is intended to prevent a concentration of extraction points.

The Mallee (GS3) SDL resource unit is also connected to the Murray Group limestone aquifer of the Murrayville Water Supply Protection Area in Victoria. The taking of water from the Murray Group Limestone aquifer in the Mallee PWA may have contributed to drawdown of underground water levels in the Murrayville Water Supply Protection Area in addition to that caused by local extractions. The extraction limits in the WAP, the State groundwater monitoring program, and the rules in the Border Groundwaters Agreement aim to manage this impact.

The Murray Group Limestone aquifer extends southward to the Tatiara PWA and Tintinara Coonalpyn PWA to the south. Underground water moves to the west on a completely different flowpath to that beneath the Mallee PWA and the vast majority of users will not be affected by the taking of underground water in the Mallee PWA. There may, however, be small, localised drawdown impacts on the Tintinara Coonalpyn PWA if extractions in the Mallee PWA or Peake, Roby and Sherlock are concentrated close to the common boundary, but these are unlikely to be significant. Buffer zone rules associated with trade principles in the WAPs aim to minimise the potential for impacts from concentrated extraction.
The Murray Group Limestone aquifer extends southwards into the Tatiara PWA (Figure 6) in Border Sub-Zone 9A South within the Border Designated Area (Figure 7). The area within three kilometres of the common boundary is a National Park with no licensed extractions, and therefore there will be negligible impacts on the Tatiara PWA from any extractions within the Mallee PWA.

**Mallee (Renmark Group)**

The movement of groundwater in the Renmark Group aquifer is from the high rainfall recharge area of the Dundas Plateau in south-west Victoria, in a westerly to north-westerly direction towards the River Murray. The Renmark Group and the Murray Group Limestone aquifers are hydraulically separated by the Ettrick Formation until the River Murray where the Renmark Group discharges by upward leakage into the Mallee SDL resource unit unconfined Murray Group Limestone aquifer (Barnett, 2015).

The potentiometric surface of the Renmark Group aquifer is naturally higher than that in the Murray Group Limestone aquifer and this head difference creates a potential for minor upward leakage. Extractions from the Murray Group Limestone aquifer have increased the head difference, and modelling has shown increased upward leakage occurring as a result (Barnett and Osei-Bonsu, 2006). However, this is not considered to be significant as extraction limits from the Murray Group Limestone aquifer are modest and observation wells completed in the Renmark Group aquifer show little or no response to extractions from the Murray Group Limestone. There are currently no users extracting water from the Renmark Group aquifer and rules in the Mallee WAP limit extractions from this aquifer to public water supply.

The Mallee (GS3) SDL resource unit (Renmark Group) is directly connected to the Peake, Roby and Sherlock SDL resource unit (confined) as it is the same aquifer. As there are no extractions in the Mallee PWA from the Renmark Group confined aquifer, there will be no impacts on users from this aquifer in the Peake, Roby and Sherlock PWA.

The Renmark Group aquifer also extends to the Tintinara Coonalpyn PWA and Tatiara PWA to the south.

**Peake, Roby and Sherlock (GS5)**

As outlined above, the Peake, Roby and Sherlock (unconfined) SDL resource unit and the Peake, Roby and Sherlock (confined) (GS5) SDL resource unit are directly connected to the Mallee (GS3) SDL resource unit (Murray Group Limestone) and Mallee (GS3) SDL resource unit (Renmark Group) respectively. Within the Peake, Roby and Sherlock PWA, groundwater flow modelling (Barnett and Yan, 2008) has indicated that there are small volumes of inter-aquifer leakage between the aquifers even though the model assumes a consistent confining layer across the area. Improved understanding of the area outlined in the Barnett (2015) identifies that the unconfined and confined aquifers are separated by the Ettrick Formation in the east of the area but are progressively absent towards the west due to the complex erosion and depositional history. Both aquifers extend into the Tintinara Coonalpyn PWA to the south.

The unconfined aquifer is recharged by both local rainfall which infiltrates directly into the aquifer through the soil profile and from lateral groundwater flow through the aquifer system from the Mallee Highland (SAMDB NRM Board, 2011). Recharge can occur relatively quickly beneath the Coastal Plain, where the watertable averages 5 metres below ground level. However, beneath the Mallee Highland areas, where the watertable can be as deep as 50 metres, rainfall recharge could take several decades to reach the watertable.

**SA Murray (GS6)**

The SA Murray (GS6) SDL resource unit includes all groundwater resources within the Murray-Darling Basin that have not been prescribed under the NRM Act. Prescribed groundwater resources that are covered by WAPs are covered by separate SDL resource units. The groundwater beneath Lakes Alexandrina and Albert are also considered part of the SA Murray (GS6) groundwater SDL resource unit.

The Pliocene Sands (top aquifer) are extensive and blanket most of the region (Barnett, 2015). The watertable lies within the Pliocene Sands over most of the region except where the sands are elevated above the zone of saturation towards the north and west. Local rainfall may at times percolate to the watertable but this is likely only in exceptionally wet years.

Although all aquifers north of the River Murray extend laterally into New South Wales, there is virtually no current use in either state because of the poor water quality and limited land capability. There is therefore no active...
management. Future extractions for mining would only impact interstate resources if they occurred within several kilometres of the border and, even then, the consequences would be negligible due to the low level of take.

As mentioned previously, there is a locally significant connection between the non-prescribed surface water and fractured rock aquifers in the Northern Mount Lofty Ranges and Olary Ranges which contribute to the maintenance of dependent ecosystems. The groundwater provides for permanent pools and the surface water assists in freshening and scouring to maintain pool depths.

The groundwater aquifers in the SA Murray (GS6) SDL resource unit are a mix of confined and unconfined with confining layers preventing significant connection between aquifers. The SA Murray (GS6) SDL resource unit is directly connected to the Mallee (Pliocene Sands) (GS3), Mallee (Murray Group Limestone) (GS3), Mallee (Renmark Group) (GS3), Peake, Roby and Sherlock (unconfined) (GS5), Peake, Roby and Sherlock (confined) (GS5) and the SA Murray Salt Interception Schemes (GS7) SDL resource units. However, due to the quality of the water and the limited take in GS6, there is no active management of this connection.

**SA Murray Salt Interception Schemes (GS7)**

The unconfined groundwater of this SDL resource unit is hydrologically connected to the SA River Murray (SS11) SDL resource unit, the Wimmera Mallee Highlands (GS9) SDL resource unit and the Western Porous Rock (GS50) SDL resource units (Barnett, 2015). Connections within the SA Murray Region include the Mallee (Pliocene Sands) (GS3), Mallee (Murray Group Limestone) (GS3), Mallee (Renmark Group) (GS3), and SA Murray (GS6) SDL resource units. The extensive development of salt interception schemes along the River Murray has significantly reduced salt loads to the River Murray caused by the discharge of saline groundwater. Extraction of approximately 10,000 ML/yr has prevented about 500 tonnes/day of salt from entering the river. While there is a small reduction in baseflows to the River Murray, there are significant improvements in water quality.

**Risk to Connected Resources**

The risk assessment undertaken for the SA Murray Region considered connected water resources as a source of risk and also considered the consequences to connected water resources arising from a risk in terms of water quality and water quantity. From this assessment, two risks were identified as having a medium or high level of risk. The high risk pertains to the Coorong surface water and the management of connected water resources causing potential changes to water inflows. The Coorong is highly reliant on flows from the River Murray to maintain its ecological character. Large scale development of water resources upstream impacts both water levels and water quality in the Coorong. Excessively high salinity and/or inappropriate water levels impact key ecological processes in the Coorong (e.g. growth of *Ruppia tuberosa*) which are important for the Coorong’s ecological character. This risk is of relevance at the state and national scale because the Coorong (as part of the Lower Lakes, Coorong and Murray Mouth Icon Site) is listed as a wetland of international significance under the Ramsar Convention.

The medium risk relates to the unconfined groundwater aquifers near the Coorong, Lower Lakes and River Murray and the potential for climate extremes to cause either an increase in evaporative discharge or a reduction in recharge. The unconfined aquifers of this sub-area are shallow and partially reliant on recent rainfall. If groundwater levels alter as a result of climate change, there is a risk that the springs and soaks on the Younghusband Peninsula that are fed by groundwater recharged via rainfall onto the dunes may be adversely impacted. More importantly, climate extremes can result in altered surface water levels below Lock 1 (Blanchetown) and can therefore trigger increased discharge from the unconfined aquifers resulting in GDEs being affected.

Both of these risks require controls outside the SA Murray Region WRP area as they are dependent on water levels in the River Murray, the Lower Lakes, and flow over the barrages into the Coorong. Management strategies to address these risks must therefore be managed by upstream connected water resources.
Addressing Chapter 10 Requirements
s10.06 Matters relating to requirements of Chapter 6.3

10.06  **Matters relating to requirements of Chapter**

5.2.5  **Accredited Text**

Table 12 lists each section of Chapter 10 that requires one or more matters to be dealt with in the WRP. The responsible person identified for each section is responsible for each matter required to be dealt with in the WRP. The person identified in this table is only responsible for a matter (including a measure or action) to the extent that another provision of the WRP does not expressly identify a person responsible for that matter (including a measure or action).

**Table 12  Responsible person for each matter that Chapter 10 requires to be dealt with in a WRP (10.06)**

<table>
<thead>
<tr>
<th>Basin Plan Requirement (section)</th>
<th>Responsible ‘person’ (10.06)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.01 Simplified outline</td>
<td>n/a</td>
</tr>
<tr>
<td>10.02 Identification of water resource plan area and water resources</td>
<td>CE(^1) DEW</td>
</tr>
<tr>
<td>10.03 Identification of SDL resource units and water resources</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.04 Form of water resource plan</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.05 Regard to other water resources</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.06 Matters relating to requirements of Chapter</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.07 Consultation to be demonstrated(^4)</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.08 Water access rights must be identified</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.09 Identification of planned environmental water and register of held environmental water</td>
<td>Minister(^5)</td>
</tr>
<tr>
<td>10.10 Annual determinations of water permitted to be taken</td>
<td>Minister</td>
</tr>
<tr>
<td>10.11 Rules for take, including water allocation rules</td>
<td>Minister</td>
</tr>
<tr>
<td>10.12 Matters relating to accounting for water</td>
<td>Minister</td>
</tr>
<tr>
<td>10.13 Limits on certain forms of take</td>
<td>Minister</td>
</tr>
<tr>
<td>10.14 Effects, and potential effects, on water resources of the water resource plan area</td>
<td>Minister (Prescribed water); CE DEW (Non-prescribed water)</td>
</tr>
<tr>
<td>10.15 Determination of actual take must be specified</td>
<td>CE DEW</td>
</tr>
</tbody>
</table>

\(^1\) CE – Chief Executive

\(^4\) Where consultation from a statutory instrument that forms part of the SA Murray Region WRP has been used to demonstrate consultation, the Presiding Member of the relevant NRM Board is the responsible person.

\(^5\) Minister responsible for the *Natural Resources Management Act 2004* – at the time of adoption, this is the Minister for Environment and Water.
<table>
<thead>
<tr>
<th>Basin Plan Requirement (section)</th>
<th>Responsible 'person' (10.06)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.16 Sustainable use and management of water resources</td>
<td>CE DEW</td>
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<td>10.17 Priority environmental assets and priority ecosystem functions</td>
<td>CE DEW</td>
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<td>10.18 Priority environmental assets dependent on groundwater</td>
<td>CE DEW</td>
</tr>
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<td>10.19 Groundwater and surface water connections</td>
<td>CE DEW</td>
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<td>10.20 Productive base of groundwater</td>
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<td>10.21 Environmental outcomes relating to groundwater</td>
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<td>10.22 Description of how requirements have been met</td>
<td>CE DEW</td>
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<tr>
<td>10.23 Listing types of interception activity</td>
<td>Minister</td>
</tr>
<tr>
<td>10.24 Monitoring impact of interception activities</td>
<td>n/a</td>
</tr>
<tr>
<td>10.25 Actions to be taken</td>
<td>n/a</td>
</tr>
<tr>
<td>10.26 Planning for environmental watering</td>
<td>CE DEW</td>
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<tr>
<td>10.27 Enabling environmental watering between connected water resources</td>
<td>CE DEW</td>
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<tr>
<td>10.28 No net reduction in the protection of planned environmental water</td>
<td>Minister</td>
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<tr>
<td>10.29 Water resource plan to include WQM Plan</td>
<td>CE DEW</td>
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<tr>
<td>10.30 WQM Plan to identify key causes of water quality degradation</td>
<td>CE DEW</td>
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<tr>
<td>10.31 Measures addressing risks arising from water quality degradation</td>
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<td>10.32 WQM Plan to identify water quality target values</td>
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<td>10.33 WQM Plan to identify measures</td>
<td>CE DEW</td>
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<td>10.34 WQM Plan to identify locations of targets for irrigation water</td>
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<tr>
<td>10.35 Impact of WQM Plan on another Basin State</td>
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<td>10.36 Application of part</td>
<td>CE DEW</td>
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<td>10.37 Circumstances in which conditions in section 12.24 are met</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.38 Circumstances in which conditions in section 12.25 are met</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.39 Circumstances in which conditions in section 12.26 are met</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.40 Definitions</td>
<td>CE DEW</td>
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<tr>
<td>10.41 Risk identification and assessment methodology</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.42 Description of risks</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.43 Strategies for addressing risks</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.44 Information relating to measuring take—water access entitlements</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.45 Supporting measuring</td>
<td>CE DEW</td>
</tr>
</tbody>
</table>
### Addressing Chapter 10 Requirements

#### s10.07 Consultation to be demonstrated

<table>
<thead>
<tr>
<th>Basin Plan Requirement (section)</th>
<th>Responsible ‘person’ (10.06)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.46 Monitoring water resources</td>
<td>CE DEW</td>
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<tr>
<td>10.47 Review of water resource plans</td>
<td>CE DEW</td>
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<td>10.48 Amendment of water resource plan</td>
<td>CE DEW</td>
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<td>10.49 Best available information</td>
<td>CE DEW</td>
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<tr>
<td>10.50 Methods used to develop water resource plan</td>
<td>CE DEW</td>
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<td>10.51 Measures in response to extreme events</td>
<td>CE DEW</td>
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<tr>
<td>10.52 Objectives and outcomes based on Indigenous values and uses</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.53 Consultation and preparation of water resources</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.54 Cultural flows</td>
<td>CE DEW</td>
</tr>
<tr>
<td>10.55 Retention of current protections</td>
<td>Minister</td>
</tr>
</tbody>
</table>

### 5.2.6 Accredited Text

The SA Murray Region WRP consists of a number of documents, policies, legislation, plans and reports. Each of these documents has been through some form of internal or external consultation process.

#### Instruments of State Law

The regional NRM Plans and WAPs included within this WRP have a statutory requirement for consultation under section 79 of the NRM Act. This section of the NRM Act imposes minimum consultation requirements when developing regional NRM plans and WAPs and includes requirements for holding public meetings, minimum two-month public consultation periods and drafting consultation reports.

Amendments made to the regional NRM Plans and WAPs to provide greater consistency with the Basin Plan have undergone a non-statutory consultation phase. This consultation is outlined in Attachment 1.

#### Consultation on WRP elements

Consultation on elements of the SA Murray Region WRP such as the risk assessment, methodologies and connected resources has involved cross-agency input, consultation with relevant NRM Boards, and various agencies such as SA Water, Environment Protection Authority, Primary Industries and Regions SA, Department of Health, and the South Eastern Water Conservation and Drainage Board.

#### Community input into environmental priorities and values

Community consultation with the South Australian scientific community, Aboriginal representative bodies (Ngarrindjeri Regional Authority and First Peoples of the River Murray and Mallee Region) and regional environmental water practitioners was undertaken during preparation of the River Murray Long-Term Watering Plan (LTWP), which includes the area of the Coorong. Although the LTWP is not part of the accredited SA Murray Region WRP, the WRP must have regard to the LTWP, including priority environmental assets and priority ecosystem functions identified within the LTWP. A consultation report for the River Murray LTWP was developed.

The SA Murray Region LTWP was peer reviewed by environmental water practitioners and ecologists within the Department for Environment and Water.
Indigenous values and uses

Section 5.14.2 outlines the consultation and engagement activities undertaken with Aboriginal Nations.

Consultation with other jurisdictions and MDBA

Section 63(2) of the Water Act states that if the WRP is adjacent to a WRP area located in another state, the proposed WRP must be prepared in consultation with that other Basin State.

There is an ongoing dialogue between South Australia and Victoria on the shared groundwater resource through the Border Groundwaters Agreement. There is virtually no current use of the groundwater resources between South Australia and New South Wales because of the poor quality and limited land capability. Therefore it was not considered necessary to consult with New South Wales in relation to these groundwater resources.

Outside of the River Murray, the movement of surface water between Victoria and South Australia is insignificant. The Coorong forms part of the Lower Lakes, Coorong and Murray Mouth Living Murray Icon Site and the Coorong, Lakes Alexandrina and Albert Ramsar Wetland of International Importance. The Coorong is intrinsically connected to the River Murray and Lower Lakes, and as such, significant consultation occurs through the ongoing management of this area, particularly in relation to the negotiations through mechanisms such as the Southern Connected Basin Environmental Watering Committee for the delivery of environmental water.

Engagement opportunities with other Basin States have occurred through various cross-jurisdictional workshops and meetings. South Australia has discussed the process and outcomes of the South Australian Murray Region risk assessment with staff from Victoria, NSW and Queensland. A copy of the risk assessment report was also provided to Victoria and NSW for information.
5.3 Part 3 – Incorporation and application of long-term annual diversion limit

Division 1—Water access rights

10.08 Water access rights must be identified

5.3.1 Accredited Text

Table 13 and the text below sets out, for each SDL resource unit in the SA Murray WRP area:

- each form of take relevant to the SDL resource unit;
- any classes of water access right that apply to those forms of take; and
- the characteristics of each class of right, including the number of rights and any conditions on the exercise of those rights.

The following applies to the SDL resource units in the SA Murray Region WRP area:

- There are no regulated rivers in the South Australian Murray Region WRP area, so take from regulated rivers as a form of take is not applicable to any of the SDL resource units.
- The practice of floodplain harvesting does not occur in any SDL resource units in the SA Murray Region WRP area, so take by floodplain harvesting as a form of take is not applicable.
- Take from groundwater is a form of take that is not applicable to the surface water SDL resource units.
- Take from a watercourse and take by runoff dams are forms of take that are not applicable to the groundwater SDL resource units.
- Take under basic rights is incorporated into take from groundwater and take by runoff dams as a class of water right, as set out below and in Table 13.
- Take by commercial plantations is negligible\(^6\) in the SA Murray Region WRP area and this form of take is not included in the baseline diversion limit (BDL) for the SA Non-Prescribed Areas surface water SDL resource unit (SS10). Hence, net take by commercial plantations is unlikely to have a significant interception impact for the purpose of part 5 of chapter 10 of the SA Murray Region WRP area.

The following classes of water rights apply (and their associated characteristics) in the SA Murray Region WRP:

- ‘Licence’ – refers to a water licence issued under chapter 7, part 3, section 146 or 164N of the NRM Act, and the associated water allocation that may be obtained on account of the quantity of water endorsed on the licence in accordance with the Natural Resources Management (General) Regulations 2005, regulation 47(1)(c).
  
  The characteristics of this right are those provided for under chapter 7, part 3, sections 146, 148, 152 and 153 of the NRM Act and regulation 47 of the Natural Resources Management (General) Regulations 2005.

  A person must comply with the conditions of this right as required under chapter 7, part 2, sections 127(1)(a)(i)(B) and 127(6) of the NRM Act. Licence conditions in the SA Murray Region include that the allocation must only be used on land parcels on licence, allocation must only be taken from sources on licence and must not exceed volume specified per source (if any), allocation must only be used for specified purpose, water must be applied using water efficient technologies and techniques, take must be metered, notification requirement for change of details, and provision of annual water use report and water sample.

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\(^6\) Dryland forestry coverage across the SDL resource unit area is approximately 0.0005%. The spatial information on land use coverage does not indicate if the forestry is commercial or not; however, due to the low rainfall and sporadic nature of the rainfall, and distance from any major centres, most is unlikely to be commercial.
Licences only apply to the groundwater in the Mallee Prescribed Wells Area which forms part of the Mallee (GS3)(Murray Group Limestone) SDL resource unit and Mallee (GS3)(Renmark Group) SDL resource unit; and groundwater in the Peake, Roby and Sherlock Prescribed Wells Area which aligns with the Peake, Roby and Sherlock (GS5)(unconfined) SDL resource unit and Peake, Roby and Sherlock (GS5)(confined) SDL resource unit.

- ‘General rights’ – refers to take allowed under chapter 7, part 1, sections 124(1) and 124(2) of the NRM Act and applies to both groundwater and surface water that is not prescribed. General rights also apply to dams greater than 5 megalitres in volume or with a wall height greater than 3 meters that are approved under sections 32, 33(1) and 33(4) of the Development Act 1993.

  The characteristics of this right are those provided for under sections 124 and 127(2) of the NRM Act. This includes that where a water resource is not prescribed under the NRM Act, a person who has lawful access to a watercourse, lake or well may take water from the watercourse, lake or well for any purpose; or the occupier of land is entitled to take surface water from the land for any purpose. However, a person must not take water from non-prescribed water resources in contravention of a regional NRM Plan [127(2)].

  A person must comply with the conditions of this right as required under sections 124(1), 127(2), 127(3), 127(5) and 127(6) of the NRM Act.

  General rights apply to the SA Non-Prescribed surface water SDL resource unit (SS10), the SA Murray groundwater SDL resource unit (GS6), and the SA Murray Salt Interception Schemes SDL groundwater unit (GS7).

  General rights apply to all purposes and therefore incorporate basic rights as defined in the Basin Plan for the non-prescribed water resources.

- ‘Basic right’ – as defined by the Basin Plan, refers in the SA Murray Region, to take allowed under sections 124(4) or 124(6) of the NRM Act.

  The characteristics of this right are those provided for under section 124 of the NRM Act. This includes the condition of this right that the take must relate to the taking of water for domestic purposes, for watering stock (other than stock subject to intensive farming), or for the purposes of drinking and cooking up to the rates prescribed by the regulations, as per sections 124(4) and 124(6) of the NRM Act. Domestic purposes and intensive farming are defined in section 3 of the NRM Act. The rate for drinking and cooking within the ambit of section 124(6) are set out in regulation 12 of the Natural Resources Management (General) Regulations 2005.

  A person must comply with the conditions of this right as required under sections 124, 127(1)(a)(ii) and 127(6) of the NRM Act.

- ‘Authorisation’ – refers to take authorised under section 128 of the NRM Act. The characteristics of this right are those provided for under section 128 of the NRM Act. A person must comply with the conditions of this right as required under sections 124, 127(1)(a)(ii) and 127(6) of the NRM Act.
Table 13  Water access rights for each form of take

<table>
<thead>
<tr>
<th>Form of take</th>
<th>Class of water access right</th>
<th>Number of rights</th>
<th>Current Volume (GL/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Non-Prescribed Areas (SS10)</td>
<td>General right</td>
<td>7920</td>
<td>21.18</td>
</tr>
<tr>
<td>Take by runoff dams</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take from Watercourses</td>
<td>General right</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mallee (Pliocene Sands) (GS3)</td>
<td>General right</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Basic right</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>General right</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mallee (Murray Group Limestone) (GS3)</td>
<td>Licence</td>
<td>193</td>
<td>60.35</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Basic right</td>
<td>778</td>
<td>2.25</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Authorisation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>General right</td>
<td>14</td>
<td>0.028</td>
</tr>
<tr>
<td>Mallee (Renmark Group) (GS3)</td>
<td>Licence</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Basic right</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Authorisation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>General right</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Peake, Roby and Sherlock (unconfined) (GS5)</td>
<td>Licence</td>
<td>1</td>
<td>0.29</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Basic right</td>
<td>95</td>
<td>0.19</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Authorisation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Peak-Roby-Sherlock (confined) (GS5)</td>
<td>Licence</td>
<td>8</td>
<td>1.92</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Basic right</td>
<td>205</td>
<td>0.41</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>Authorisation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SA Murray Region (GS6)</td>
<td>General right</td>
<td>957</td>
<td>1.8</td>
</tr>
<tr>
<td>Take from Groundwater</td>
<td>General right</td>
<td>7 schemes</td>
<td>Up to 28.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>192 production wells*</td>
<td></td>
</tr>
</tbody>
</table>

Notes: There are no other classes of water access rights as defined by the Water Act for the groundwater or surface water resources in the SA Murray Region.
Number of rights are based on current data and are subject to change.
* Production well numbers may change with scheme operation

5.3.1.1  Supporting Information

As outlined in the accredited text, the water resources of the Mallee groundwater SDL resource units (GS3) and the Peake, Roby and Sherlock groundwater SDL resource units (GS5) are prescribed water resources under the NRM Act. According to section 124(3)(a) of the NRM Act, a water allocation or authorisation under section 128 of the NRM Act is generally required to take water from a prescribed water resource. ‘Authorisation’ as a class of water access right has been included for each of the SDL resource units where the resource is prescribed. Section 128 of the NRM Act allows the Minister to authorise the taking of water from a prescribed water resource for a special purpose. There are currently no authorisations in place in the SA Murray Region other than statewide section 128 authorisations which are for purposes of use where the volume involved is negligible and/or unpredictable, and/or the impact on water resources and dependent users is expected to be negligible. The statewide authorisations cover activities such as firefighting, road making, Aboriginal social, cultural or spiritual purposes, and applying chemicals to non-irrigated crops or to control pests.
The volume of water assigned against basic rights has been taken from the relevant WAP. The volume of water assigned against general rights has been estimated for both the SA Non-Prescribed Areas surface water SDL resource unit (SS10) and the non-prescribed groundwater (GS6 and part of GS7). Estimated take by the non-prescribed surface water was determined using a revised estimate of farm dams outlined in the GIS analysis report (Herpich, 2016). The methods used to establish the estimated volume of general right take in SA Murray groundwater SDL resource unit (GS6) is provided as Attachment 2. Take in the non-prescribed part of SA Murray (GS6) was determined using the estimated volume of 2 ML/active well. Take from the SA Murray Salt Interception Schemes, while a general right, is metered to assist in management of the schemes and therefore does not need to be estimated.

Water licences are ‘bundled’ in both the Mallee and the Peake, Roby and Sherlock Prescribed Wells areas, as provided for under regulation 47 of the Natural Resources Management (General) Regulations 2005. Under these provisions:

- a water licence in a bundled prescribed area need not make express provisions for a water access entitlement as contemplated by the NRM Act (regulation 47 (1)(a));
- a water licence may include a quantity of water determined under the relevant WAP or existing user allocation process that may be taken to be a water access entitlement (regulation 47 (1)(b)); and
- the holder of a licence is entitled to obtain a water allocation equivalent to the amount provided on the licence (regulation 47 (1)(c)).

Table 13 refers to the ‘licence’ as the class of water access right in the SA Murray Region WRP area for some of the SDL resource units. Allocation and water access entitlement can be considered to be the same and are all part of the bundled licence.

The quantity of water provided for on a licence in the SA Murray Region WRP area is a fixed maximum volume that may be taken in a water-use year. Allocation volumes are not varied from year to year. The permissible annual volume is a maximum sustainable limit of extraction each year based on modelled scenarios of recharge. For the Murray Group Limestone aquifer, the permissible annual volume is an agreed volume that will deplete the aquifer at a rate of no more than 5cm/yr or 15% after 300 years.

**General licence and allocation characteristics**

A water licence is issued under section 146 or 164N of the NRM Act. Under section 152 of the NRM Act, a water allocation is obtained on account of a water access entitlement under a water licence. However, as noted above for bundled licences such as occur in parts of the SA Murray Region WRP area, the allocation is obtained based on the quantity of water included on the licence (which may be taken to be a water access entitlement).

The overarching characteristics of a licence and allocation are set out in sections 146, 148, 152 and 153 of the NRM Act. Key points:

- A water licence provides an entitlement for the holder to gain access to a share of water available in consumptive pools (or to a quantity of water for bundled licences), as specified on the licence and after taking into consideration any factors specified by the relevant WAP or regulations (‘water access entitlement’) (NRM Act section 146(2) and Natural Resources Management (General) Regulations 2005 regulation 47).
- Allocation is the volume issued for up to 12 months, obtained on account of entitlement (152(1)).
- A water access entitlement, and allocation, must relate to a specific water resource (surface water, watercourse, underground) (146(1), 148(a) and 152(4)).

**Noora Groundwater Management Area**

Take in the Noora Groundwater Management Area is a general right but as per section 127(2) of the NRM Act, there are specific principles within the SA MDB NRM Plan: Volume B – part 5, sections 5.2 and 5.3.1 which apply to the management of the area.
10.09 Identification of planned environmental water and register of held environmental water

5.3.2 Accredited Text

Section 6 of the Water Act defines planned environmental water (PEW). Consistent with the definition in the Water Act, an assessment was undertaken as part of the development of the SA Murray Region LTWP and considering the River Murray LTWP. The assessment identified that within the SA Murray Region, PEW occurred in only 3 areas.

Planned environmental water has been identified in the Northern Mount Lofty Ranges (surface water), Coorong (surface water), and the Peake, Roby and Sherlock prescribed wells area (groundwater) through the following policies within instruments under State law:

1. Sub-catchment dam development limits in the Northern Mount Lofty Ranges defined in the SAMDB NRM plan – Volume B – principles 31 and 32;
2. Water-affecting activity permits not being issued in ecologically sensitive areas in the SAMDB NRM plan – Volume B – section 5.2.2 principles 2(b), 2(c), 2(d) and 2(f) and the SE NRM Plan – Part 4 – section 4.3.1 principles 1-5; and
3. Buffer zones around saline wetlands in the Peake, Roby and Sherlock WAP (section 5.3.1, principle 3 and Figure 6).

Held environmental water from the SA River Murray WRP area agreed for delivery to the Coorong will be accounted as HEW over the barrages, but for the purposes of the non-prescribed SA Murray Region WRP area, will be considered to be PEW and protected as such once in the lagoons of the Coorong.

The NRM Act requires that the regional NRM Plan is developed consistent with the object of the River Murray Act 2003 (River Murray Act) and, therefore, must ensure that the regional NRM Plan enhances, protects and restores the River Murray environment.

As outlined in Table 2 of the SA Murray Region LTWP, the dam capacity limits in the NRM Plans that have been included for the purpose of demonstrating compliance with the non-prescribed surface water SDL resource unit are not considered to be PEW rules. The SA Murray Region is unique when compared to other areas in the Basin, and the ecosystems that are in the region will not change or improve as a result of these dam capacity limit rules.

Sections 127(2), 127(3) and 127(5) of the NRM Act operate to provide a legislative obligation which assist in protecting PEW.

South Australia does not consider it necessary to include further rules in the SA Murray Region WRP to commit or preserve water for the purposes of achieving environmental outcomes.

There is no held environmental water in the SA Murray Region and therefore the register required by section 10.09(2) of the Basin Plan has not been developed. In the unlikely event that water is held for the environment, the Chief Executive of DEW will be responsible for the establishment and maintenance of a register outlining the characteristics of the held environmental water, consistent with the requirements of section 10.09(2) of the Basin Plan, and making it publicly available on DEW’s website.

5.3.2.1 Supporting Information

1) The Water Act identifies “planned environmental water” as water that:
   a) is committed by:
      i. the Basin Plan or a water resource plan for a water resource plan area; or
      ii. a plan made under a State water management law; or
      iii. any other instrument made under a law of a State;
   to either or both of the following purposes:
      i. achieving environmental outcomes; and/or
ii. other environmental purposes that are specified in the plan or the instrument; and

b) cannot, to the extent to which it is committed by that instrument to that purpose or those purposes, be taken or used for any other purpose.

2) For the purposes of the Water Act, planned environmental water is water that:

a) is preserved, by a law of a State or an instrument made under a law of a State, for the purposes of achieving environmental outcomes by any other means (for example, by means of the setting of water flow or pressure targets or establishment zones within which water may not be taken from a water resource); and

b) cannot, to the extent to which it is preserved by that instrument for that purpose or those purposes, be taken or used for any other purpose.

3) The water may be committed to, or preserved, for the purpose or purposes referred to in paragraph 1(a) or 2(a) either generally or only at specified times or in specified circumstances.

Based on the above definition, an assessment process was undertaken for the SA Murray Region LTWP and River Murray LTWP to determine policies and instruments that operate to protect planned environmental water within the SA Murray Region. The assessment identified that within the SA Murray Region, planned environmental water (PEW) occurred in only 3 areas. This was largely due to the highly variable nature of the surface water resources, the depth and salinity of the groundwater, and the climatic conditions which meant that intensive consumptive take from the resources does not occur. Table 2 in the SA Murray Region LTWP details the assessment undertaken to consider PEW. In Table 5 of the same document, the discussion recommends retaining the existing dam capacity rules, well drilling principles and buffer zone requirements but does not propose that additional protections be included through the SA Murray Region WRP.

PEW has been identified in the Northern Mount Lofty Ranges (Burra / Rangelands) and the Peake, Roby and Sherlock PWA through policies within instruments under State law as outlined above. While groundwater also contributes to the Northern Mount Lofty Ranges ecosystems, the groundwater is not considered PEW through rules in State instruments and the SA Murray Region LTWP does not deem it necessary to include rules to make the groundwater PEW. This is primarily due to the salinity of the water, the unpredictability of the yield and the very low likelihood of development of the resource.

Water, once in the Coorong, is considered to be PEW as a result of the rules in the regional NRM Plan outlined in section 5.3.2 which protect ecologically sensitive areas. These protections ensure that a permit for a water-affecting activity, such as a structure or pump, will not be issued and therefore take for consumptive use is prevented. For the purpose of the SA Murray Region WRP, the Coorong and Murray Mouth are considered an ecologically sensitive area as part of a Wetland of International Importance under the Ramsar Convention.

It should be noted that the ecological character of the Coorong is reliant on the freshwater and seawater components that mix to make an estuarine environment. As such, the water in the Coorong has many sources including flow over the barrages, flow from the ocean and flow from the South East drains.

The water from the South East drains that flows into the South Lagoon of the Coorong is only considered PEW once it is in the Coorong as it originates from outside of the Murray-Darling Basin.

Broad protections for the environment also exist within a number of instruments but these protections do not specifically preserve the water for achieving environmental outcomes and as such are not deemed to be PEW for the purposes of the Water Act.
Division 2—Take for consumptive use

10.10 Annual determinations of water permitted to be taken

5.3.3 Accredited Text
This section addresses the Basin Plan requirements of sections:
• 10.10 – Annual determination of water permitted to be taken; and
• 10.12 – Matters relating to accounting for water.

For each SDL resource unit in the SA Murray Region WRP area, Table 14 sets out the method for determining the maximum quantity of water permitted to be taken for consumptive use during a water accounting period, fulfilling the Basin Plan requirements under sections 10.10(1) and 10.10(2), as well as the section 10.12 requirements referred to under section 10.10(3)(a). These methods will be applied after the end of the relevant water accounting period (1 July – 30 June).

Take under statewide authorisations (using section 128 of the NRM Act) for the purposes of firefighting, road making, Aboriginal social, cultural or spiritual purposes, and applying chemicals to non-irrigated crops or to control pests are not included in the annual determinations of permitted take due to the limited volume taken and the highly variable nature of the take, of the take not being for consumptive use.

Accounting for the disposal and acquisition of HEW as per section 10.12(3) of the Basin Plan does not apply to any of the SDL resource units (surface water and groundwater) due to the following reasons:

• There is no requirement in the Basin Plan to reduce consumptive take (i.e. recover any held environmental water) in the SA Murray Region WRP area to achieve compliance with SDLs.
• The method to determine annual permitted take is a fixed value for all SDL resource units in the SA Murray Region WRP area, as provided under 10.10 of the Basin Plan. It is for consumptive take only.
• There is no prospect of water access rights being used for held environmental water (HEW) purposes in the SA Murray Region WRP area given the nature of the water access rights and the type of water resources in the WRP area.

Therefore, as there is no prospect of HEW being acquired in the SA Murray Region WRP area, in either surface or groundwater, and the annual permitted take is a fixed number which is equal to the SDL and is consumptive water take only, there is no need to provide a method to account for the acquisition and disposal of HEW in any of the SDL resource units in the SA Murray Region WRP area.

For the purposes of section 10.10(3) of the Basin Plan, the methods put forward to demonstrate permitted take in 10.10 are consistent with other provisions in the SA Murray Region WRP.

The annual permitted take for each SDL resource unit is a fixed annual limit equal to the relevant SDL. Applying this limit to each year of the historical climate sequence ensures that the SDL will be met for each resource unit. This fulfils the Basin Plan requirements of section 10.10(4) for the SA Murray Region WRP.

There have been no amendments under section 23B of the Water Act and therefore section 10.10(5) of the Basin Plan does not apply to the SA Murray Region WRP.
# Addressing Chapter 10 Requirements

## s10.10 Annual determinations of water permitted to be taken

### Table 14  Annual permitted take and matters relating to accounting of water

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Chapter 10 Requirement</th>
<th>Description</th>
<th>Approach to Requirement</th>
<th>Information Supporting Approach</th>
</tr>
</thead>
</table>
| **SA Non-Prescribed Surface Water (SS10)** | 10.10 (1) | Method for annual permitted take:  
*Take by runoff dams*  
*Take from a watercourse* | Annual permitted take = 55.2 GL  
55.2 GL minus annual permitted take from a watercourse  
annual permitted take = sum of volumes on water affecting activity permit approval for watercourse diversions | The resources of this SDL resource unit are not prescribed and all take is permitted under General Rights (NRM Act). Take is managed by dam capacity limits and water affecting activity approvals which is the appropriate level of management for this low risk area. The method for determining the revised BDL was provided to the MDBA in a letter to the MDBA dated 9 June 2016, reference DENWRD – 00006862 together with the document “South Australian Non-Prescribed Surface Water (SDL resource unit SS10) in the Murray Region Water Resource plan area – a comparative analysis of GIS datasets to support BDL renegotiations report – June 2016”. These are provided as supporting information. The method in the report is an agreed approach, which will continue to be used to determine the annual permitted take until an agreed, better approach is determined. |
| | 10.10 (2) | Regard to water resources available | Regard to water resources available has been demonstrated through the application of dam development limits included in statutory documents. |
| | 10.12 (1)(a) | Forms of take  
*Take by runoff dams*  
*Take from a watercourse* | As described in accredited text to address 10.08. |
| | 10.12 (1)(b) | Carryover allocations | Not applicable for either form of take  
Not licensed – no carryover; no held environmental water. |
| | 10.12 (1)(c) | Return flows | Not applicable for either form of take  
Not licensed – no return flows. |
| | 10.12 (1)(d) | Trade | Not applicable for either form of take  
Not licensed, therefore there is no trade and there cannot be held environmental water. There is no intention to prescribe the surface water of this SDL resource unit and create a licensed system. |
| | 10.12 (1)(e) | Hydrological connection | No significant connection that is relevant to determining annual permitted take for the SA Murray Region WRP area  
Refer to section 5.2.4.1 |
| | 10.12 (1)(f) | Change in way water held or taken | Not applicable for either form of take  
The SDL resource unit is non-prescribed and water is taken under a General Right. Any change to conditions would not change the permitted take. |
| | 10.12 (1)(g) | Change in utilisation | Not applicable for either form of take  
Permitted take method already assumes full utilisation. Dam capacity limit is fixed. Any increase in the current dam capacity up to the limit will not affect |
<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Chapter 10 Requirement</th>
<th>Description</th>
<th>Approach to Requirement</th>
<th>Information Supporting Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10.10 (1)(h)</td>
<td>Great Artesian Basin (GAB)</td>
<td>Not applicable as this is a surface water SDL resource unit</td>
<td>No water sourced from GAB.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(i)</td>
<td>Aquifer recharge</td>
<td>Not applicable for either form of take</td>
<td>No managed aquifer recharge.</td>
</tr>
<tr>
<td><strong>Mallee (Pliocene Sands) (GS3)</strong></td>
<td>10.10 (1)</td>
<td>Method for permitted take</td>
<td>Annual permitted take = 41.4 GL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.10 (2)</td>
<td>Regard to water resources available</td>
<td></td>
<td>Regard has been had to the water resources available as the permitted take is a fixed number equal to the SDL and, in setting the SDL in the Basin Plan, the MDBA considered the long-term availability of the water. The storage component of the groundwater resource means that there is little change in water availability from year to year</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(a)</td>
<td>Forms of take</td>
<td>Take from groundwater</td>
<td>Take for Basic Rights permitted only. No licensed take. No other forms of take.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(b)</td>
<td>Carryover allocations</td>
<td>Not applicable</td>
<td>Not licensed – no carryover.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(c)</td>
<td>Return flows</td>
<td>Not applicable</td>
<td>Groundwater SDL resource unit.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(d)</td>
<td>Trade</td>
<td>Not applicable</td>
<td>There are no licences permitted for this SDL resource unit and therefore there cannot be trade or water held for the environment.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(e)</td>
<td>Hydrological connection</td>
<td>No significant connection</td>
<td>Refer to 5.2.4.1</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(f)</td>
<td>Change in way water held or taken</td>
<td>Not applicable</td>
<td>Currently no take from this aquifer. No licensed take permitted from aquifer. Future take unlikely due to either being unsaturated or saline. Any change will not alter the permitted take.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(g)</td>
<td>Change in utilisation</td>
<td>Not applicable</td>
<td>Currently no take from this aquifer.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(h)</td>
<td>Great Artesian Basin</td>
<td>Not applicable</td>
<td>No water sourced from GAB.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(i)</td>
<td>Aquifer recharge</td>
<td>Not applicable</td>
<td>No managed aquifer recharge.</td>
</tr>
<tr>
<td>SDL Resource Unit</td>
<td>Chapter 10 Requirement</td>
<td>Description</td>
<td>Approach to Requirement</td>
<td>Information Supporting Approach</td>
</tr>
<tr>
<td>-------------------</td>
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<td>---------------------------------</td>
</tr>
</tbody>
</table>
| Mallee (Murray Group Limestone) (GS3) | 10.10 (1) | Method for permitted take  
*Take from groundwater* | Annual permitted take = 63.6 GL |  |
| 10.10 (2) | Regard to water resources available |  | Regard has been had to the water resources available as the annual permitted take is a fixed number equal to the SDL and, in setting the SDL in the Basin Plan, the MDBA considered the long-term availability of the water. The storage component of the groundwater resource means that there is little change in water availability from year to year based on the agreed depletion of the aquifer at a rate of no more than 5cm/yr or 15% after 300 years. |  |
| 10.12 (1)(a) | Forms of take | *Take from groundwater* | Take from groundwater, including for Basic Rights. |  |
| 10.12 (1)(b) | Carryover allocations | Not applicable | No provisions for carryover within resource unit. |  |
| 10.12 (1)(c) | Return flows | Not applicable | Groundwater SDL resource unit. |  |
| 10.12 (1)(d) | Trade | Trade within SDL resource unit only | Trade occurs within the Mallee PWA only and taking limits do not change as a result of trade. There is no held environmental water and the nature of the resource, in particular the depth and salinity in some locations, means that it is highly unlikely that there will be any HEW in the future. |  |
| 10.12 (1)(e) | Hydrological connection | Connections already accounted for in determination of the limits on take under the Mallee WAP, the basis of the SDL | Refer to section 5.2.4.1 |  |
| 10.12 (1)(f) | Change in way water held or taken | Not applicable | Take occurs under the rules in the Mallee WAP and the NRM Act (for Basic Rights). Any changes will not alter the permitted take. |  |
| 10.12 (1)(g) | Change in utilisation | Not applicable | Fixed annual limit assumes full utilisation of licensed and non-licensed take. Any increase from current level of utilisation will not alter the permitted take. |  |
| 10.12 (1)(h) | Great Artesian Basin | Not applicable | No water sourced from GAB. |  |
| 10.12 (1)(i) | Aquifer recharge | Not applicable | No managed aquifer recharge. |  |
### Addressing Chapter 10 Requirements

**s10.10 Annual determinations of water permitted to be taken**

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Chapter 10 Requirement</th>
<th>Description</th>
<th>Approach to Requirement</th>
<th>Information Supporting Approach</th>
</tr>
</thead>
</table>
| Mallee (Renmark Group) (GS3) | 10.10 (1) | Method for permitted take  
*Take from groundwater* | Annual permitted take = 2 GL |  
Regard has been had to the water resources available as the permitted take is a fixed number equal to the SDL and, in setting the SDL in the Basin Plan, the MDBA considered the long-term availability of the water. The storage component of the groundwater resource means that there is little change in water availability from year to year. |
| | 10.10 (2) | Regard to water resources available |  |  |
| | 10.12 (1)(a) | Forms of take  
*Take from groundwater* |  
Take from groundwater, including for Basic Rights. |  |
| | 10.12 (1)(b) | Carryover allocations | Not applicable | No provisions for carryover within resource unit. |
| | 10.12 (1)(c) | Return flows | Not applicable | Groundwater SDL resource unit |
| | 10.12 (1)(d) | Trade | Not applicable | Water access rights from this aquifer can only be issued to SA Water for public water supply purposes. No trade is permitted under State water management law. |
| | 10.12 (1)(e) | Hydrological connection | No significant connection | Refer to section 5.2.4.1 |
| | 10.12 (1)(f) | Change in way water held or taken | Not applicable | Take occurs under the rules in the Mallee WAP and the NRM Act (for Basic Rights). Any changes will not alter the permitted take. |
| | 10.12 (1)(g) | Change in utilisation | Not applicable | No water access rights have been issued and there is no take from the aquifer. Should water access rights be issued in the future, licensed take is only permitted from the aquifer for water supply up to 402 ML (significantly lower than SDL) when the equal reduction is made to the public water supply licence held for the Murray Group Limestone aquifer. Take from the Renmark Group aquifer is unlikely due to the depth of the aquifer and the highly variable yields. Changes in take will not alter the permitted take. |
| | 10.12 (1)(h) | Great Artesian Basin | Not applicable | No water sourced from GAB. |
| | 10.12 (1)(i) | Aquifer recharge | Not applicable | No managed aquifer recharge. |
### Peake, Roby and Sherlock (GS5) Confined Aquifer

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Chapter 10 Requirement</th>
<th>Description</th>
<th>Approach to Requirement</th>
<th>Information Supporting Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.10 (1)</td>
<td>Method for permitted take</td>
<td>Annual permitted take = 2.58 GL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.10 (2)</td>
<td>Regard to water resources available</td>
<td>Regard has been had to the water resources available as the permitted take is a fixed number equal to the SDL and, in setting the SDL in the Basin Plan, the MDBA considered the long-term availability of the water. The storage component of the groundwater resource means that there is little change in water availability from year to year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(a)</td>
<td>Forms of take</td>
<td>Take from groundwater, including for Basic Rights.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(b)</td>
<td>Carryover allocations</td>
<td>No provisions for carryover within resource unit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(c)</td>
<td>Return flows</td>
<td>Groundwater SDL resource unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(d)</td>
<td>Trade</td>
<td>Trade occurs within the Peake, Roby and Sherlock WPA which includes both the confined and the unconfined SDL units and annual permitted take does not change as a result of trade. There is no held environmental water and the nature of the resource, in particular the depth and salinity in some locations, means that it is highly unlikely that there will be any HEW in the future.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(e)</td>
<td>Hydrological connection</td>
<td>Refer to section 5.2.4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(f)</td>
<td>Change in way water held or taken</td>
<td>Not applicable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(g)</td>
<td>Change in utilisation</td>
<td>Fixed annual limit assumes full utilisation of licensed and non-licensed take. Any increase from current level of utilisation will not alter the permitted take.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(h)</td>
<td>Great Artesian Basin</td>
<td>Not applicable – No water sourced from GAB.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 (1)(i)</td>
<td>Aquifer recharge</td>
<td>No managed aquifer recharge.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SDL Resource Unit</td>
<td>Chapter 10 Requirement</td>
<td>Description</td>
<td>Approach to Requirement</td>
<td>Information Supporting Approach</td>
</tr>
<tr>
<td>-------------------</td>
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<td>---------------------------------</td>
</tr>
<tr>
<td>Peake, Roby and Sherlock (GS5) Unconfined Aquifer</td>
<td>10.10 (1)</td>
<td>Method for permitted take Take from groundwater</td>
<td>Annual permitted take = 3.41 GL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.10 (2)</td>
<td>Regard to water resources available</td>
<td></td>
<td>Regard has been had to the water resources available as the permitted take is a fixed number equal to the SDL and, in setting the SDL in the Basin Plan, the MDBA considered the long term availability of the water. The storage component of the groundwater resource means that there is little change in water availability from year to year.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(a)</td>
<td>Forms of take</td>
<td>Take from groundwater</td>
<td>Take from groundwater, including for Basic Rights.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(b)</td>
<td>Carryover allocations</td>
<td>Not applicable</td>
<td>No provisions for carryover within resource unit.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(c)</td>
<td>Return flows</td>
<td>Not applicable</td>
<td>Groundwater SDL resource unit</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(d)</td>
<td>Trade</td>
<td>Trade within SDL resource unit and between the confined aquifer and unconfined aquifer</td>
<td>Trade occurs within the Peake, Roby and Sherlock WAP which includes both the confined and the unconfined SDL units and annual permitted take does not change as a result of trade. There is no held environmental water and the nature of the resource, in particular the depth and salinity in some locations, means that it is highly unlikely that there will be any HEW in the future.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(e)</td>
<td>Hydrological connection</td>
<td>Connection already accounted for in determination of the limits on take under the Peake, Roby and Sherlock WAP, the basis of the SDL</td>
<td>Refer to section 5.2.4.1</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(f)</td>
<td>Change in way water held or taken</td>
<td>Not applicable</td>
<td>Take occurs under the rules in the Peake, Roby and Sherlock WAP and the NRM Act (for Basic Rights). Any changes will not alter the permitted take.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(g)</td>
<td>Change in utilisation</td>
<td>Not applicable</td>
<td>Fixed annual limit assumes full utilisation of licensed and non-licensed take. Any increase from current level of utilisation will not alter the permitted take.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(h)</td>
<td>Great Artesian Basin</td>
<td>Not applicable</td>
<td>No water sourced from GAB.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(i)</td>
<td>Aquifer recharge</td>
<td>Not applicable</td>
<td>No managed aquifer recharge.</td>
</tr>
</tbody>
</table>
### Addressing Chapter 10 Requirements

#### s10.10 Annual determinations of water permitted to be taken

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Chapter 10 Requirement</th>
<th>Description</th>
<th>Approach to Requirement</th>
<th>Information Supporting Approach</th>
</tr>
</thead>
</table>
| SA Murray (GS6)   | 10.10 (1)               | Method for annual permitted take  
                   | Take from groundwater         | Annual permitted take = 64.8 GL |
|                   | 10.10 (2)               | Regard to water resources available |                             | Regard has been had to the water resources available as the permitted take is a fixed number equal to the SDL and, in setting the SDL in the Basin Plan, the MDBA considered the long-term availability of the water. The storage component of the groundwater resource means that there is little change in water availability from year to year. |
|                   | 10.12 (1)(a)            | Forms of take         | Take from groundwater     | Take from groundwater, including for Basic Rights. |
|                   | 10.12 (1)(b)            | Carryover allocations | Not applicable            | Not licensed – no carryover. |
|                   | 10.12 (1)(c)            | Return flows          | Not applicable            | Groundwater SDL resource unit |
|                   | 10.12 (1)(d)            | Trade                | Not applicable            | Not licensed – no trade; no held environmental water. |
|                   | 10.12 (1)(e)            | Hydrological connection | No significant connection | Refer to section 5.2.4.1 |
|                   | 10.12 (1)(f)            | Change in way water held or taken | Not applicable | Water is taken under a General Right. Any change to conditions would not change the permitted take. |
|                   | 10.12 (1)(g)            | Change in utilisation | Not applicable            | Any increase from current level of utilisation will not affect the permitted take as full utilisation is assumed in the method for permitted take. |
|                   | 10.12 (1)(h)            | Great Artesian Basin  | Not applicable            | No water sourced from GAB. |
|                   | 10.12 (1)(i)            | Aquifer recharge      | Not applicable            | No managed aquifer recharge. |
### Addressing Chapter 10 Requirements

**s10.10 Annual determinations of water permitted to be taken**

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Chapter 10 Requirement</th>
<th>Description</th>
<th>Approach to Requirement</th>
<th>Information Supporting Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Murray Salt Interception Schemes (GS7)</td>
<td>10.10 (1)</td>
<td>Method for permitted take</td>
<td>Annual permitted take = 28.6 GL</td>
<td>Take from this SDL resource unit is based on the pumping required to achieve a target groundwater level to reduce saline inflows to the connected South Australian Murray (SS11) surface water SDL resource unit.</td>
</tr>
<tr>
<td></td>
<td>10.10 (2)</td>
<td>Regard to water resources available</td>
<td></td>
<td>The annual permitted take in this SDL resource unit is based on the requirements to meet saline water interception targets.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(a)</td>
<td>Forms of take</td>
<td>Take from groundwater</td>
<td>Take from groundwater through salt interception schemes only.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(b)</td>
<td>Carryover allocations</td>
<td>Not applicable</td>
<td>Not licensed – no carryover.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(c)</td>
<td>Return flows</td>
<td>Not applicable</td>
<td>Groundwater SDL resource unit</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(d)</td>
<td>Trade</td>
<td>Not applicable</td>
<td>Not licensed – no trade; no held environmental water.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(e)</td>
<td>Hydrological connection</td>
<td>Significant connection to the SA Murray (SS11) SDL resource unit. But as purpose of take is to intercept saline groundwater from entering the River Murray, no adjustment to permitted take is needed. No other significant connections.</td>
<td>Refer to section 5.2.4.1</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(f)</td>
<td>Change in way water held or taken</td>
<td>Not applicable</td>
<td>Water is taken under a General Right and only for salt interception purposes. Any change to conditions would not change the permitted take.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(g)</td>
<td>Change in utilisation</td>
<td>Not applicable</td>
<td>Fixed annual limit. Any increase from current level of take will not alter the permitted take.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(h)</td>
<td>Great Artesian Basin</td>
<td>Not applicable</td>
<td>No water sourced from GAB.</td>
</tr>
<tr>
<td></td>
<td>10.12 (1)(i)</td>
<td>Aquifer recharge</td>
<td>Not applicable</td>
<td>No managed aquifer recharge.</td>
</tr>
</tbody>
</table>
10.11 Rules for take, including water allocation rules

5.3.4 Accredited Text

Table 15 sets out the rules for each SDL resource unit in the SA Murray Region WRP area that ensure, as far as practicable, that the quantity of water taken from the SDL resource unit for consumptive use in a water accounting period does not exceed the unit’s annual permitted take. In addition, the obligations placed on a water access right holder to comply with the conditions of a right, as outlined in section 5.3.1, also act to ensure permitted take does not exceed actual take.

Table 15 Rules for take of water by SDL resource unit

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Form of Take</th>
<th>Instrument and relevant provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Non-Prescribed Surface Water (SS10)</td>
<td>Take by runoff dam and take from a watercourse</td>
<td>NRM Act 2004 Chapter 1, section 3, definitions of domestic purposes and intensive farming 124(3), 124(4), 127(2), 127(3), 127(5), 135(4) Development Act 1993 Sections 4 (definition of ‘development’), 32, 33(1) and (4), 37 Development Regulations 2008: schedule 3, clause 10 ‘dams’; schedule 8 – item 12(1) SA Murray-Darling Basin Regional NRM Plan Volume B - Section 5, principles 31 and 32, figure 5.3 South East NRM Plan, Part Four: NRM Policy Section 4.4.4, section 4.4.4.2 – principles 6 and 7 and Table 4 SA Arid Lands Regional NRM Plan (Volume 2) Business and Operational Plan 2017/18-2019/2020; Appendix 1: Water Affecting Activities Policy Section 2.3 and principles 23, 34, 35, 49, 50, 71, 72, 86, 87</td>
</tr>
<tr>
<td>Mallee (GS3) Pliocene Sands</td>
<td>Take from groundwater</td>
<td>NRM Act 2004 Chapter 1, section 3, definitions of domestic purposes and intensive farming Chapter 7, sections 124(3), 124(4), 127(1) 127(2) and 135(4) Mallee WAP – section 5.1, principle 5 SA MDB NRM Plan: Volume B - part 5.3.1, principles 3-6</td>
</tr>
<tr>
<td>Mallee (GS3) Murray Group Limestone</td>
<td>Take from groundwater</td>
<td>NRM Act 2004 Chapter 1, section 3, definitions of domestic purposes and intensive farming Chapter 7, sections 124(3), 124(4), 127(1) and 127(2) Relating to licences and allocations: 147(3)(a)(i), 154(1)(a)(i), 149(3)(a)(i), 156(3)(a)(i), 150(8)(a) and 157(5)(a) Natural Resources Management (General) Regulations 2005, regulation 47(1)(b) Mallee WAP – sections 5.1, principles 1, 2, 7 SA MDB NRM Plan: Volume B - part 5.3.1, principles 3-6 and 15</td>
</tr>
<tr>
<td>Mallee (GS3) Murray Group Limestone</td>
<td>Take from groundwater</td>
<td>NRM Act 2004 Chapter 1, section 3, definitions of domestic purposes and intensive farming</td>
</tr>
</tbody>
</table>

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### Addressing Chapter 10 Requirements
*s10.11 Rules for take, including water allocation rules*

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Form of Take</th>
<th>Instrument and relevant provision</th>
</tr>
</thead>
</table>
| Renmark Group     |              | Chapter 7, sections 124(3), 124(4), 127(1) 127(2) and 135(4)  
Relating to licenses and allocations:  
147(3)(a)(i), 154(1)(a)(i), 149(3)(a)(i), 156(3)(a)(i), 150(8)(a) and 157(5)(a)  
Natural Resources Management (General) Regulations 2005, regulation 47(1)(b)  
Mallee WAP – section 5, principles 3 and 4  
SA MDB NRM Plan: Volume B - part 5.3.1, principles 3-6 and 15 |
| Peake, Roby and Sherlock (GS5) Confined Aquifer | Take from groundwater | NRM Act 2004  
Chapter 1, section 3, definitions of domestic purposes and intensive farming  
Chapter 7, sections 124(3), 124(4) and 127(1)  
Relating to licences and allocations:  
147(3)(a)(i), 154(1)(a)(i), 149(3)(a)(i), 156(3)(a)(i), 150(8)(a) and 157(5)(a)  
Natural Resources Management (General) Regulations 2005, regulation 47(1)(b)  
Peake, Roby and Sherlock WAP – section 5.3.1, principles 1 and 2, section 5.3.2, principles 4 and section 6.2 principles 15 and 16 |
| Peake, Roby and Sherlock (GS5) Unconfined Aquifer | Take from groundwater | NRM Act 2004  
Chapter 1, section 3, definitions of domestic purposes and intensive farming  
Chapter 7, sections 124(3), 124(4) and 127(1)  
Relating to licences and allocations:  
147(3)(a)(i), 154(1)(a)(i), 149(3)(a)(i), 156(3)(a)(i), 150(8)(a) and 157(5)(a)  
Natural Resources Management (General) Regulations 2005, regulation 47(1)(b)  
Peake, Roby and Sherlock WAP – section 5.3.1, principles 1 and 2, section 5.3.2, principles 4 and section 6.2 principles 15 and 16 |
| SA Murray (GS6) | Take from groundwater | NRM Act 2004  
Chapter 1, section 3, definitions of domestic purposes and intensive farming  
124(3), 124(4), 127(2), 127(3), 127(5) and 135(4)  
SA Murray-Darling Basin Regional NRM Plan Volume B - section 5.3.1, principles 3-6, and section 5.3.2 principle 15.  
Groundwater (Border Agreement) Act 1985 – Schedule 2, clauses 26(b), 31 and Schedule 3, clause 18 |
| SA Murray Salt Interception Schemes (GS7) | Take from groundwater | NRM Act 2004  
Chapter 1, section 3, definitions of domestic purposes and intensive farming  
124(3), 124(4), 127(2), 127(3), 127(5) and 135(4)  
SA Murray-Darling Basin Regional NRM Plan Volume B - section 5.3.1, principles 3-6, and section 5.3.2 principle 15.  
Groundwater (Border Agreement) Act 1985 – Schedule 2, clauses 26(b), 31 and Schedule 3, clause 18 |

There are no limits in State law on total take for the two non-prescribed groundwater SDL resource units:
Addressing Chapter 10 Requirements
s10.11 Rules for take, including water allocation rules

- SA Murray (GS6); and
- SA Murray Salt Interception Schemes (GS7) (excluding the part that is within the Noora Groundwater Management Area).

To ensure that South Australia does not exceed permitted groundwater take, the following process will be applied by the CE DEWNR at the end of each water year:

1. Annual actual take from wells across the SA Murray (GS6) SDL resource unit and the SA Murray Salt Interception Scheme SDL (GS7) will be calculated as per the applicable method set out in Table 16 and Attachment 2.
2. For each of the SDL resource units, the annual actual take recorded will be compared to the annual permitted take for that unit (as per column 4 of Schedule 4 of the Basin Plan).
3. For each of the SDL resource units, if annual actual take is greater than or equal to the annual permitted take for that SDL resource unit, the delegate must not approve an application for a well construction permit for new take in that unit.

5.3.4.1 Supporting Information

Table 15 above identifies the instruments and the relevant parts or provisions within those instruments that will ensure that actual take does not exceed permitted take in the SA Murray Region. The descriptions below are intended to assist in providing clarity as to how the parts or provisions operate.

NRM Act

Sections 124(3) and (4) of the NRM Act operate to require take from a prescribed water resource to be authorised under section 128 or require a water allocation that relates to the resource. It provides an exemption for the take of water for domestic purposes or for watering stock other than stock subject to intensive farming in prescribed areas. Section 3 of the NRM Act provides a definition of ‘domestic purposes’ and ‘intensive farming’.

Section 127(1) of the NRM Act identifies that a person must not take water from a prescribed resource unless:

- authorised to do so under section 128; or
- taking the water as part of an allocation that relates to the relevant water resource; or
- entitled to take water for domestic or stock purposes under chapter 7, part 1 of the NRM Act; and
- if the taking consists of the erection, construction or enlargement of a dam, wall or other structure that collects or diverts water flowing in a watercourse or over land – unless the person is authorised to erect, construct or enlarge the dam by a water management authorisation or a water affecting activity permit.

Section 127(2) requires that take in a non-prescribed area is consistent with the regional NRM Plan that operates in the area.

Section 127(3) requires the issuing of a permit for particular activities and 127(5) requires that a person cannot undertake the activities contrary to the regional NRM plan applying in the area. These are referred to as water affecting activity permits and each of the regional NRM plans has sections addressing the issuing of these permits. The permit application process provides information such as purpose of take and estimated volume which is recorded to ensure that take does not exceed the SDL in the non-prescribed resources.

Section 135(4) of the NRM Act requires that the relevant authority for granting water affecting activity permits must take into account the provisions of the relevant regional NRM plan when considering an application for a permit, and must ensure that the permit, if granted, and any conditions of the permit, are not inconsistent with the provisions of the relevant regional NRM plan.

A water affecting activity permit is generally not required to undertake an activity that is development for the purposes of the South Australian Development Act 1993 (Development Act) and that is authorised by a development authorisation under that Act (NRM Act, section 129(1)(e)). The Development Act deals with the construction of dams with a total capacity over 5 ML or a wall height greater than 3 metres. However, application for development of a dam must be referred to the relevant authority for assessment against the regional NRM Plan and the response is for direction. This means that if the proposed development is likely to cause the total
dam capacity to exceed the limit in the regional NRM Plan, the relevant authority would direct the rejection of the application. Section 37 of the Development Act requires that if a direction for refusal is made or that conditions have been placed on the approval, the relevant authority must notify the applicant of the refusal or conditions of development.

Licences and allocations
The Minister may refuse to grant an application for a licence if it would be contrary to the provisions of the relevant WAP to grant a water access entitlement under the terms being sought (NRM Act section 147 (3)(a)(i)), and may determine not to grant or issue a water allocation if it would be contrary to the provisions of the relevant WAP (NRM Act, section 154(1)(a)(i)). A water allocation granted or issued by the Minister must be consistent with the provisions of the relevant WAP (NRM Act, section 153(1)(b)). A bundled licence may include a quantity of water determined under the provisions of the relevant WAP or section 164N of the NRM Act (Natural Resources Management (General) Regulations 2005, regulation 47(1)(b)). The Minister’s decision on varying the water access entitlement on a water licence, varying a water allocation, transferring a water licence or transferring a water allocation must be consistent with the relevant WAP, as per NRM Act sections 149(3)(a)(i), 156(3)(a)(i), 150(8)(a) and 157(5)(a) respectively.

Water Allocation Plans (WAPs)
The WAPs contain principles (rules) which manage the allocation and transfer of water access entitlements and the associated water allocation in prescribed water resource areas. The principles identified for each of the WAPs are associated with the allowable annual allocation limits on take from the water resources identified in the relevant principles (section 5.1 in the Mallee WAP and section 5.3.2 in the Peake, Roby and Sherlock WAP). Where a limit has been reached, no further allocations can be issued. The annual allowable allocation volume in each of the WAPs is consistent with the SDL for the relevant unit.

Principles relating to transfers in part 6 of the Peake, Roby and Sherlock WAP are also considered relevant controls as trade can occur between the confined and unconfined SDL resource units (refer section 5.8.3). The principles ensure that trade is within allowable limits and that accounting occurs for temporary trade in both aquifers to ensure that, when the allocation reverts to the original source aquifer, it does not create an over-allocation. Trade in the Mallee SDL resource unit is only allowed within the Mallee (Murray Group Limestone) SDL resource unit and therefore transactions cannot affect the limits set for the aquifer.

Regional NRM Plans
As stated above, section 127(2) of the NRM Act requires that take in a non-prescribed area is consistent with the regional NRM Plan that operates in the area. Specific rules (outlined in Table 15) have been included in the three relevant regional NRM plans that apply in the SA Murray Region WRP area to ensure the actual take of surface water is within permitted take. This has been done by apportioning the dam development capacity (SDL divided by 1.1 – see section 5.3.3) across the three regions so that the sum of the dam development limits in each of the plans is within the SDL.

The SAMDB NRM plan – Volume B also has specific rules to manage the take of groundwater in the Noora Groundwater Management Area consistent with the limits (permissible annual volume for consumptive take) set out in Schedule 3 of the Groundwater (Border Agreement) Act 1985 or a subsequent gazette notice (clause 31 of the Agreement).

Non-prescribed groundwater areas
As identified in the accredited text, there are no total limits on take for the non-prescribed groundwater resources SA Murray (GS6) and SA Murray Salt Interception Schemes (GS7) (excluding the part that is within the Noora Groundwater Management Area). Limits have not been imposed in the regional NRM Plans due to the nature of the region and the resource, i.e. depth, yield and salinity. Current estimated take in the SA Murray (GS6) is 1.8 GL with a SDL of 64.8 GL. It is unlikely that permitted take will ever reach the SDL.

The SDL for the SA Murray Salt Interception Schemes (GS7) was established based on the estimated maximum pumping of all proposed salt interception schemes. There is now a limited area where further salt interception schemes can be constructed and there is still significant development capacity within the SDL.
To ensure that South Australia does not exceed permitted groundwater take, the accredited text above now imposes a direct obligation on the delegate who issues well permits. The delegate now must not approve an application for a well construction permit for new take in either the SA Murray (GS6) SDL resource unit or the SA Murray Salt Interception Scheme SDL (GS7) if the SDL limit in the SDL resource unit has been reached.

### 10.12 Matters relating to accounting for water

#### 5.3.5 Accredited Text

The requirements for 10.12 of the Basin Plan are addressed in Table 14, section 5.3.3.

### 10.13 Limits on certain forms of take

#### 5.3.6 Accredited Text

Take by runoff dams in the SA Non-Prescribed surface water SDL resource unit (SS10) is the only form of take applicable under this clause. Take from runoff dams under a basic right is accounted for as take by runoff dams in this SDL resource unit.

The long-term average quantity of water that can be taken by runoff dams is limited to the level specified in column 2 of Schedule 3 of the Basin Plan, i.e. the limit is the BDL\(^7\), as per the method below:

1. Take by runoff dams is limited to 55.2 GL minus the annual actual take from a watercourse (determined via the method provided under 5.3.8).
2. This limit is imposed by:
   a. Sections 127(2) and 127(3) of the NRM Act which ensures that water is not taken in contravention of a regional NRM plan that applies in relation to that water; and
   b. The regional NRM plans provide that the Basin Plan related management zone dam capacity limits must not exceed the limits listed in each of the regional NRM plans, which, when multiplied by the interception factor of 1.1, is equal to 55.2 GL. These provisions are listed:
      - South East NRM Plan, Part Four: NRM Policy – section 4.4.4.2, principle 6
   c. Sections 32, 33(1), 33(4) and 37 of the Development Act which ensure that dams which constitute a development, as defined by schedule 3, clause 10 of the Development Regulations, have development approvals and consent from the relevant authority.

Section 10.13(2) of the Basin Plan is not required to be used to increase the long-term annual average take of water by runoff dams. Any growth in take by runoff dams will be managed within the total surface water limit of 55.2 GL. As such, section 10.13(2) of the Basin Plan is not applicable to the SA Murray Region WRP.

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\(^7\) This is the revised BDL of 55.2 GL as agreed in August 2016 rather than the BDL estimate of 3.5 GL provided as a note in the Basin Plan.
5.3.6.1 Supporting Information

The Basin Plan requires that the long-term annual average quantity of water that can be taken from a surface water SDL resource unit for consumptive use by:

a) basic rights; or  
b) runoff dams; or  
c) commercial plantations

does not exceed the level specified in the Basin Plan in column 2 of Schedule 3 for that form of take.

Within the SA Murray Region WRP area, there is only one surface water SDL resource unit: SA Non-Prescribed surface water (SS10). For this SDL resource unit, column 2 of Schedule 3 of the Basin Plan identifies that the BDL is the long-term annual average limit on the quantity of water that can be taken by runoff dams and from watercourses. Take under basic rights is incorporated into take by runoff dams in the SA Murray region WRP as outlined in section 5.3.1. Plantation forestry is negligible (refer to footnote 5) in the area, unlikely to increase due to the sporadic rainfall and low viability, and not included in the BDL description. Therefore, only take from runoff dams is applicable to this section.

The quantity of water that can be taken by runoff dams is managed as a fixed annual limit on take, which has been apportioned across three NRM regions. Each of the NRM regions has agreed to a dam capacity limit for their "part" of the SA Murray Region. Water affecting activity policies within the regional NRM Plan, which are instruments under State law, limit the amount (volume) of dam development, as discussed in section 5.3.4. This ensures that the single limit across the SA Murray Region will not be exceeded.

10.14 Effects, and potential effects, on water resources of the water resource plan area

5.3.7 Accredited Text

South Australia has identified there are no effects, or potential effects, of the issues identified in Basin Plan section 10.14(1)(a) and (b) on the use and management of the water resources of the SA Murray Region WRP area. This has been determined through the risk assessment process (see risk assessment report, section 4.1.3) and consideration of each of the water resource connections, their significance and management as provided under section 5.2.4.

The connections to non-Basin water resources for groundwater in the SA Murray Region WRP area have been listed as medium and insignificant connections.

Insignificant connections identify that there are limited to no connections between resources. Medium connections identify that there are connections that exist to varying degrees; however, management arrangements are considered fit for purpose and are appropriate to manage the potential for any material impact.

Therefore, based on the above assessment, SA does not consider there to be any effect, or potential effect, on the water resources of the SA Murray Region WRP area from these connections.

5.3.7.1 Supporting Information

Further information is provided under sections 5.2.4 and 5.2.4.1, sub-heading 'risks to connected resources'.

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Division 3—Actual take

10.15 Determination of actual take must be specified

5.3.8 Accredited Text

Table 16 outlines the method for determining the actual annual take for each SDL resource unit in the SA Murray Region WRP area, fulfilling the requirements under sections 10.15(1) and 10.15(2) of the Basin Plan.

Where take is estimated, information is provided in the calculation column in Table 16 below. Where the take is measured, it is done so through a flow measuring device. Part 3, sections 11(1)(b) and 13 – 16 (entire sections) of the Natural Resources Management (Financial Provisions) Regulations 2005 apply to measured take.

Consistent with section 10.10 of the Basin Plan, take under statewide authorisations (using section 128 of the NRM Act) for the purposes of firefighting, road making, Aboriginal social, cultural or spiritual purposes, and applying chemicals to non-irrigated crops or to control pests are not included in the estimated annual actual take due to the limited volume taken and the highly variable nature of the take, or not being take for consumptive use.

To assist in ensuring that the actual take for each of the non-prescribed water resources is not breached, an assessment trigger has been established. When the estimated take from the water resources reaches 90 percent of the SDL, an assessment process will be triggered to further clarify actual levels of take from the resource.

The methods outlined in Table 16 below are based on the best information available at the time that annual actual take is determined, as they account for take at the end of the water year using either meter reads or the agreed existing take plus additional volumes on any new water affecting activity permits.

Where Table 16 includes a method for estimating the quantity of water actually taken, then this estimate is done consistently with the method (for that form of take) outlined in section 5.3.3 for 10.10(1) of the Basin Plan. This fulfils the Basin Plan requirements of section 10.15(3) for the SA Murray Region.

There is no held environmental water within the SA Murray Region WRP area and no water is sourced from the Great Artesian Basin, therefore section 10.15(4) of the Basin Plan does not apply.
Table 16  Determination of annual actual take of water by SDL resource unit

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Method</th>
<th>Form of Take</th>
<th>Measured(^8)/ Estimate</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Non-Prescribed Surface Water Areas (SS10)</td>
<td>Annual actual take by runoff dams is the current dam capacity (determined by the SA Non-Prescribed Areas surface water (SDL resource unit SS10) in the Murray Region Water Resource plan area – a comparative analysis of GIS datasets report and Topography Water Bodies dataset Number 902 archived by the Department for Environment, Water and Natural Resources for the purposes of Basin Plan compliance) plus the sum of the volumes listed on any new water affecting permits or development approvals for runoff dams granted since 30 June 2009</td>
<td>Take by runoff dams</td>
<td>Estimate</td>
<td>Annual actual take based on dam volume x 1.1 The dam capacity of existing dams is fixed based on method described. The dam capacity of new dams is based on the volume applied for and approved on the water affecting permit or development approval Take from a watercourse is estimated based on infrastructure capabilities and landowner requirements as identified in a water affecting activity permit for the pumping infrastructure</td>
</tr>
<tr>
<td></td>
<td>Annual actual take from a watercourse is the sum of the volumes listed in the water affecting activity permits for watercourse diversion</td>
<td>Take from a watercourse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mallee (GS3) Pliocene Sands</td>
<td>Annual actual take (=) Long-term estimate of take from groundwater under Basic Rights</td>
<td>Take from groundwater</td>
<td>Estimate</td>
<td>Long-term take (=) Number of bores (*) 0.002 GL(^9)</td>
</tr>
</tbody>
</table>

\(^8\) All consumptive take in the Mallee and Peake, Roby and Sherlock SDL units is required to be metered; however, in the event that a meter is inoperable for all or part of a year, a method for determining take is gazetted each year in accordance with section 106 of the NRM Act. The method is based on FAO crop factors and this is considered the best available estimate.

\(^9\) There is unlikely to be any take from this aquifer as in some areas this aquifer is unsaturated and, where there is water, it is highly saline. If there is any new well development, the stock and domestic take will be estimated at 2 ML or (0.002 GL) / well consistent with Peake, Roby and Sherlock WAP, Noora GMA and the non-prescribed groundwater.
### Addressing Chapter 10 Requirements

**s10.15 Determination of actual take must be specified**

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Method</th>
<th>Form of Take</th>
<th>Measured / Estimate</th>
<th>Calculation</th>
</tr>
</thead>
</table>
| **Mallee (GS3)** | Annual actual take = Total licensed take + authorised take + stock and domestic take | Take from groundwater | Measured | Total of all meter readings (including any calculated take based on gazetted method used if a meter is inoperable for all or part of the year)  
Meter readings apply to licensed take and specific purpose authorised take (under section 128 of the NRM Act) |
| **Murray Group Limestone** | | | | |
| **Renmark Group** | Annual actual take = Total licensed take + authorised take + stock and domestic take | Take from groundwater | Estimate | S&D estimate = 2.278 GL  
(2.25 GL Mallee PWA + 0.028 Noora GMA)  
The estimate of take is based on section 4.2.1 of the Mallee WAP using the upper limit, and the number of active wells in the Noora GMA with an estimated take of 0.002 GL per active well per year |
| **Peake, Roby and Sherlock (GS5)** | Annual actual take = Total licensed take + authorised take + stock and domestic take | Take from groundwater | Measured | Total of all meter readings  
Meter readings apply to licensed take and specific purpose authorised take (under section 128 of the NRM Act) |
| **Confined Aquifer** | | | | |
| | | | | |

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**S&D estimate = 0.41 GL**  
The estimate of take is based on 0.002 ML per active well annually as outlined in section 4.2 of the Peake, Roby and Sherlock WAP
### Addressing Chapter 10 Requirements

**s10.15 Determination of actual take must be specified**

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Method</th>
<th>Form of Take</th>
<th>Measured/Estimate</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peake, Roby and Sherlock (GS5)</strong> Unconfined Aquifer</td>
<td><strong>Annual actual Take = Total licensed take + authorised take + stock and domestic take</strong></td>
<td>Take from groundwater</td>
<td>Measured</td>
<td>Total of all meter readings (including any calculated take based on gazetted method used if a meter is inoperable for all or part of the year) &lt;br&gt; Meter readings apply to licensed take and specific purpose authorised take (under section 128 of the NRM Act)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>S&amp;D estimate = 0.19 GL</strong> &lt;br&gt; The estimate of take is based on 0.002 ML per active well annually as outlined in section 4.2 of the Peake, Roby and Sherlock WAP</td>
</tr>
<tr>
<td><strong>SA Murray (GS6)</strong></td>
<td><strong>Annual actual take = BDL estimate + the sum of estimated volumes of take from new water affecting activity well construction permits</strong></td>
<td>Take from groundwater</td>
<td>Estimate</td>
<td>Estimated take = 1.8 GL &lt;br&gt; Refer Attachment 2 – which is the method used to calculate BDL. Take from new wells will be estimated by purpose using method outlined in Attachment 2 or as advised by the applicant based on purpose of use and pumping infrastructure capacity</td>
</tr>
<tr>
<td><strong>SA Murray Salt Interception Schemes (GS7)</strong></td>
<td><strong>Annual actual take = Total take via Salt Interception Schemes</strong></td>
<td>Take from groundwater</td>
<td>Measured</td>
<td>Total of all meter readings</td>
</tr>
</tbody>
</table>
5.3.8.1 Supporting Information

The method gazetted each year in accordance with section 106 of the NRM Act to estimate take when a meter breaks down for all or part of the year, to date has been the method developed by Doorenbos and Pruitt (1977), and refined by Allen et al, (1998) and is set out in the Primary Industries and Regions SA Technical Report No. 263, second edition. The method is as follows:

_Crop factors will be calculated from $K_c$ (crop coefficient) values from Food and Agriculture Organisation of the United Nations, Rome Irrigation and Drainage Paper 56 (Allen, Pereira et al, 1998) (FAO 56) and using site specific monthly $K_p$ (pan coefficient) values and average monthly $K_g$ values (bird guard coefficient) set out in the Report._

This method is published at the start of each water year in the South Australian Government Gazette to ensure that a standardised and transparent method is applied by DEW assessment and compliance staff for the period a meter is inoperable.

The estimates used for stock and domestic use are based on a review of stocking rates and domestic usage during the development of the relevant WAPs. Significant increases are unlikely (refer to the Mallee WAP section 4.3.1 and Peake, Roby and Sherlock WAP section 4.2). Stock and domestic use is also unlikely to vary significantly between years, so inter-annual variation of actual annual take is not considered necessary.

A comparative analysis of GIS dams data in the SDL resource unit SS10 was undertaken to underpin the revision of the BDL estimate in 2016. This process established an improved farm dam dataset using a combination of the Geoscience Australia dataset, which was considered the better dataset for the SA Arid Lands area, and the State held topographic water bodies dataset (topo water bodies) which was considered more accurate for the remainder of the area. This revised dataset is now the baseline for existing dams (DEWNR Topo Water Bodies dataset number 902 archived by the Department of Environment, Water and Natural Resources for the purposes of Basin Plan compliance). The volume from any new dams approved through either a development application or a water affecting activity permit after 30 June 2009 will be added to the existing dam volume.

An internal DEW procedure has been developed to assist in ensuring that the development of any spare surface water and groundwater development capacity is appropriately documented for accounting and reporting purposes. The procedure also sets out a trigger for an assessment process should take from the non-prescribed resource reach 90 percent of the SDL. The process may include but not be limited to:

**Groundwater**

1. Clarification from landholders to determine whether any new wells have resulted in new take or if they contribute to existing level of take as a result of replacing an old well or simply providing a new watering point.
2. Seek updated information regarding stocking rates, dwellings, hours pumped and pump capacity to assist in refining stock and domestic take estimates.
3. Clarify estimated actual take versus previously estimated take based on pumping rates, pumping hours, and crop or industry type.

**Surface water**

4. Review of farm dams including re-digitising from aerial imagery to improve size estimates and interception potential
5. Review of method for determining surface to area volume calculation
6. Review of any pumps or other methods of take
5.4  **Part 4 – The sustainable use and management of water resources**

**Division 1—Sustainable use and management**

**10.16  Sustainable use and management of water resources**

5.4.1  **Accredited Text**

Not applicable. No accredited text required for 10.16 of the Basin Plan

**Division 2—Surface water**

**10.17  Priority environmental assets and priority ecosystem functions**

5.4.2  **Accredited Text**

The surface water priority environmental assets (PEAs) and priority ecosystem functions (PEFs) for the SA Murray Region are limited to the Coorong and Murray Mouth; and the Northern Mount Lofty Ranges watercourses. These two assets were determined through the development of the River Murray LTWP which included the Coorong and Murray Mouth area; and the SA Murray Region LTWP. These plans were developed consistent with the requirements of Chapter 8 of the Basin Plan.

Through the development of the LTWPs, and the risk assessment process for the SA Murray Region, consideration was given to the existing rules within statutory instruments. The risk assessment process considered the risks to water-dependent ecosystems and, with the exception of the two risks identified as medium or high, risks were considered low. In the Northern Mount Lofty Ranges, risks were low due to the existing management controls, whereas throughout the rest of the non-prescribed surface water area the risks were inherently low due to the nature of the resource (see section 5.9.5). The management of the high and medium risks was identified as completely reliant on controls in the WRPs of water resources connected to the SA Murray Region water resources rather than controls within the SA Murray Region WRP (refer section 5.9.11).

Existing controls within the SA Murray Region which assist in providing protection to identified surface water PEAs and PEFs and their environmental watering requirements (EWRs) include:

- SAMDB NRM Plan – Volume B – principles 1(d), 1(e), 2(a)-f), 28(c), 29, 33, 34, 41-46.
- Sections of the NRM Act as outlined in 5.3.1

In addition to the above principles, the SAMDB NRM Plan – Volume B also provides protection to ensure that water in the Coorong, which is considered to be PEW, is not taken under a general right for a consumptive purpose. The NRM Act requires that the regional NRM Plan is developed consistent with the object of the *River Murray Act 2003* (River Murray Act) and, as such, must ensure that the regional NRM Plan enhances, protects and restores the River Murray environment. The following principles prevent water affecting activity permits being issued for the Coorong:

- SAMDB NRM Plan – Volume B – section 5.2.2 principles 2(b), 2(c), 2(d) and 2(f); and
- SE NRM Plan – Part 4 – section 4.3.1 principles 1-5.

These protections act to “preserve” the water in the Coorong from being taken for consumptive purposes.

The rules from statutory instruments included above provide protections for the meeting of EWRs for PEAs and PEFs and, as such, it is not considered necessary to include additional rules within the SA Murray Region WRP to:

- manage timing, places and rates at which water is permitted to be taken from the surface water in this area;
- set out how the water resources in the SA Murray Region WRP area must be managed and used; or
- ensure that the operation of the plan does not compromise the meeting of EWRs for PEAs and PEFs.
5.4.2.1 Supporting Information

The LTWP identifies the EWRs that will achieve the targets and objectives for the PEAs and PEFs.

Coorong and Murray Mouth

Environmental watering requirements are primarily based on water levels, timing, intervals, duration, and flow volumes as outlined in section 3.5.4 of the River Murray LTWP. The EWRs are not met from the water resources within the SA Murray Region WRP area. Once water is in the Coorong it is considered PEW and therefore contributes to the EWRs. The Coorong and Murray Mouth EWRs are reliant on connected water resources, including the South Australian Murray (SS11) and water resources in other jurisdictions including NSW Murray (SS14), Victorian Murray (SS2), Murrumbidgee (SS15) and Goulburn (SS6) SDL resource units.

The controls outlined in section 5.4.2 to protect PEAs and PEFs and their EWRs are further supported by the following sections of the NRM Act:

- Section 8 requires regard to the objects of the Act when exercising power, function or duty under the Act
- Section 9 requires a person to act reasonably in relation to the management of natural resources within the State
- Section 75(1) which requires plans to be developed consistently with the objects of the Act
- Section 130(1)(b) details powers to require the rectification of unauthorised activity

Section 75(3)(c)(ii) of the NRM Act requires that the regional NRM Plan is developed consistent with the object of the River Murray Act. The SAMDB NRM Plan – Volume B includes principles to ensure that water affecting activity permits from ecologically sensitive areas are not issued.

In the unlikely event that it is deemed necessary to further manage the risk of take from the Coorong, a permit that relates to the River Murray Protected Area (of which the Coorong is part) may be prescribed by regulation. This would require the relevant authority to refer the permit to the Minister responsible for administering the River Murray Act for direction. In accordance with section 22(4)(a)(i) of the River Murray Act, the Minister must take into consideration and seek to further the objects of the River Murray Act. The following objects are of specific relevance:

- River Murray Act – sections 6(1)(c) and (f)

In addition to these State-based controls, section 16 of the Commonwealth’s Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) requires that a person must not take an action that has or will have a significant impact on the ecological character of a declared Ramsar wetland, or is likely to have a significant impact on the ecological character of a declared Ramsar wetland. The taking of PEW water designed to support the Coorong ecosystems would also be prevented under the Commonwealth’s EPBC Act.

The South East Flows Restoration Project has been established to improve outcomes for South East wetlands and increase flows to the Coorong when required for salinity management. The South East drains contribute water resources from outside of the Murray-Darling Basin into the Coorong and are therefore not considered PEW until it is within the lagoon of the Coorong.

As outlined in section 5.9.11, two risks (1 medium, 1 high) have been identified with consequences where the water-dependent ecosystems of the Coorong are impacted. The management of both of these risks relate to the management strategies in relevant WRPs managing the water resources connected to the water resources of the SA Murray Region. As there is almost no contribution to the EWRs of the Coorong from the water resources within the SA Murray Region WRP, there are no relevant controls that can be applied to the SA Murray Region that will manage the risk. Section 5.6.2 outlines the coordination of environmental watering between the two surface water resources.

Northern Mount Lofty Ranges watercourses

The Northern Mount Lofty Ranges watercourses are primarily considered a surface water priority environmental asset, although aquatic habitats in the deeper waterholes are also maintained by baseflows from groundwater, which are generally saline (see section 5.4.4.1).
The surface water provides freshening and biota breeding triggers. The higher surface water flow events also ensure that the depths of the pools are maintained by scouring out sediments which maintains habitats. Sub-catchment dam development limits have been in place in the Northern Mount Lofty Ranges since 2009, prior to the commencement of the Basin Plan (principle 33-34 of the SAMDB NRM plan – Volume B). These limits were set as a maximum dam development of 30% of average runoff across the sub-catchment area during the period May – November. It is considered that dam development beyond these limits would have an unacceptable risk to the environment (SKM, 2004).

Principle 29 of the SAMDB NRM plan – Volume B, requires that the construction or enlargement of dams does not occur across watercourses with a stream order of three or higher, except in exceptional circumstances where there is no reasonably practical alternative approach on the property to collect or access sufficient water to meet the reasonable requirements of the proponent. The plan also contains a range of broader protections that minimise the impact of future water affecting activities on water-dependent ecosystems and their EWRs (principles 1(d), 1(e), 2(a)-(f), 28(c)), as well as a requirement for low flows to be bypassed or returned around new dams and diversions (principle 41-46). These rules, together with the dam development limits, protect the water-dependent ecosystems and their environmental watering requirements in the Northern Mount Lofty Ranges.

It is not considered necessary to include additional rules to manage timing, places and rates at which water is permitted to be taken in this area due to the existing management approach, i.e. the maximum dam development which is based on avoiding unacceptable risk to the environment.

**Banrock Station Ramsar site**

The Banrock Station Ramsar site includes part of the highland within the SA Murray Region WRP area. While this area meets the criteria in schedule 8 of the Basin Plan to be considered an environmental asset, the part in the SA Murray Region is 40-50 metres above the floodplain of the River Murray and the vegetation is fully reliant on rainfall and is not able to be managed with environmental water. Therefore, it does not meet the definition of a PEA under the Basin Plan.

No further priority environmental assets or priority ecosystem functions, as defined by sections 8.49 and 8.50 of the Basin Plan, have been identified that depend on the surface waters of the SA Murray Region WRP area.

**Division 3—Groundwater**

### 10.18 Priority environmental assets dependent on groundwater

#### 5.4.3 Accredited Text

Through the development of the SA Murray Region LTWP and the SA River Murray LTWP, no solely groundwater-dependent priority environmental assets or ecosystem functions were identified; however, the Northern Mount Lofty Ranges watercourses have some dependence on groundwater through baseflow maintaining semi-permanent waterholes. This groundwater contribution to environmental watering requirements is considered in section 5.4.4.

As no groundwater-dependent priority environmental assets or ecosystem functions were identified, section 5.4.3 is not applicable and no rules are necessary to ensure that the operation of the SA Murray Region WRP does not compromise the environmental watering requirements of PEAs and PEFs that depend on groundwater, in addition to those rules set out in section 5.4.4.

#### 5.4.3.1 Supporting Information

**Coorong**

The SA River Murray LTWP (section 2.1) identifies that ecological outcomes in the Coorong are driven by surface water inputs from the River Murray via the Lower Lakes, while the volume of surface water arriving in the Coorong from the SA Murray Region WRP area is small and the groundwater inputs are not well quantified. Section 3.2.1 of the SA Murray Region LTWP states that during the development of the SA Murray Region LTWP consideration was given to groundwater during the development of the EWRs, but no groundwater metrics are expressed in the
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EWRs either because it is not considered a significant ecological driver (relative to surface water) or because there is insufficient data.

**Northern Mount Lofty Ranges watercourses**
The SA Murray Region LTWP identifies that there are few groundwater-dependent ecosystems (GDEs) in the area, and only the Northern Mount Lofty Ranges meet the definition of a priority environmental asset. However, the asset only meets the definition of a priority environmental asset because there is surface water PEW.

The Northern Mount Lofty Ranges watercourses are primarily considered a surface water priority environmental asset (see section 5.4.2); however, the deeper waterholes within the watercourses are also reliant on baseflows from groundwater. Section 5.4.4 sets out rules to ensure the operation of the SA Murray Region WRP does not compromise the meeting of environmental watering requirements relating to significant hydrological connection between surface water and groundwater.

**Groundwater-dependent ecosystems across the plains in the SA Murray region**
The SA Murray Region LTWP identifies that the existence of GDEs is largely determined by two factors: the depth to the groundwater below the ground surface and the salinity of the groundwater. As the depth to groundwater increases, the reliance on groundwater by vegetation decreases and alternative sources of water are required. The depth to the groundwater throughout the vast majority of the SA Murray Region WRP area is greater than 30 metres. It can therefore be reasonably assumed that there are no GDEs through most of the area based on depth.

Where the groundwater is shallow enough to be used by vegetation, the groundwater salinities throughout much of the area are greater than 7,000 mg/L and therefore it is considered unlikely to support GDEs.

The likelihood of future development of the mostly saline groundwater within the SA Murray Region WRP area is quite low, but if it did occur in the sedimentary aquifers, it is likely to have a beneficial effect on the environment (Barnett, 2015) as less saline water will reach the River Murray.

Surveys throughout the Mallee WAP have not identified the presence of Stygofauna (Mallee WAP, section 2) and therefore specific rules have not been included in the statutory planning instruments.

As identified in Table 5 and Table 6 of the SA Murray Region LTWP, other than the Northern Mount Lofty Ranges, there are no other groundwater-dependent environmental assets that are considered PEAs or PEFs.

**Saline Wetlands in Peake, Roby and Sherlock PWA**
The Peake, Roby and Sherlock WAP includes groundwater buffer zones around saline wetlands created by surface expression of groundwater in the area, and these rules have been determined to be PEW. However, through the development of the SA Murray Region LTWP, the saline wetlands in the Peake, Roby and Sherlock WPA were assessed and not considered to meet the criteria of an environmental asset in schedule 8 or ecosystem function in schedule 9 of the Basin Plan. These wetlands therefore do not meet the criteria of PEAs or PEFs as defined by the Basin Plan.

**Noora Evaporation Basin**
The Noora Evaporation Basin has been identified in the Basin-wide Environmental Watering Strategy (MDBA, 2014) as an environmental asset for the purpose of abundance and diversity of waterbirds. While the basin does provide habitat, it is an artificially wet area created as a result of the disposal of highly saline water through salt interception schemes. The pumping of water for salt interception is take from groundwater and not environmental water (position statement 6D) and, as such, the Noora Evaporation Basin is not considered a priority environmental asset in South Australia as it is not able to be managed with environmental water from the water resources of the SA Murray Region.
10.19 **Groundwater and surface water connections**

5.4.4 Accredited Text

A review of information relating to the connected resources (refer sections 5.2.4 and 5.2.4.1) identified that there is a significant connection between the SA Murray Salt Interception Schemes (GS7) groundwater SDL resource unit and the surface water of the connected SA River Murray (SS11); a locally significant connection between the fractured rock highland aquifers that form part of the SA Murray groundwater SDL resource unit (GS6) and the SA Non-Prescribed Areas surface water SDL resource unit (SS10) in the Northern Mount Lofty Ranges and the Olary Ranges; a medium connection between the Coorong as part of the SA Non-prescribed Areas surface water SDL resource unit (SS10) and the SA Murray groundwater SDL resource unit (GS6); and a medium connection between the SA River Murray SDL resource unit (SS11) (which includes the Lower Lakes as part of the CLLMM PEA) and the SA Murray groundwater SDL resource unit (GS6).

While there is considered to be a significant connection between the SA Murray Salt Interception Schemes (GS7) groundwater SDL resource unit and the surface water of the connected SA River Murray (SS11), the River Murray LTWP notes that groundwater-derived flows do not contribute to meeting the EWRs of the Channel and Floodplain assets. Therefore, it is not necessary for this plan to include rules which ensure that the operation of the plan does not compromise the meeting of environmental watering requirements related to this particular significant hydrological connection between groundwater and surface water.

The SA Murray Region Risk Assessment identified that the risks to water-dependent ecosystems in the Northern Mount Lofty Ranges and the Olary Ranges watercourses were low. In the Northern Mount Lofty Ranges, risks were low due to the existing management controls, whereas in the Olary Ranges the risks were inherently low due to the nature of the resource. The locally significant groundwater connections, which provide baseflow to support EWRs within the deep waterholes within watercourses in the Northern Mount Lofty Ranges and the Olary Ranges watercourses, are protected through the following rules:

- SAMDB NRM Plan – Volume B – principles 1(d), 1(e), 2(b)-(d), 2(f), 2(i), 8, 9, 13, 14
- SAAL NRM Plan (Volume 2) – Appendix 1 – section 3.2 principles (a), (c) and (d); principles 1-4, 19-21.
- Sections of the NRM Act as outlined in 5.3.1

Section 5.4.2 outlines the rules that assist to provide protections for the EWRs of the Coorong. These controls would also act to provide appropriate protections for the EWRs that may be dependent on the connection between the Coorong as part of the SA Non-prescribed Areas surface water SDL resource unit (SS10) and the SA Murray groundwater SDL resource unit (GS6).

The rules from statutory instruments included above (including those identified for the Coorong in section 5.4.2) provide sufficient protections for the meeting of EWRs and, as such, it is not considered necessary to include additional rules within the SA Murray Region WRP to:

- manage timing, places and rates at which water is permitted to be taken from the groundwater in this area;
- place resource condition limits relating to discharge of groundwater into surface water;
- place restrictions on the water permitted to be taken; or
- otherwise ensure that the operation of the plan does not compromise the meeting of EWRs related to groundwater that has a significant hydrological connection to surface water.

5.4.4.1 Supporting Information

The permanent and semi-permanent pools in the Northern Mount Lofty Ranges and Olary Ranges are considered reliant on both groundwater and surface water to support dependent ecosystems (Table 5 – SA Murray Region LTWP). While the baseflows are generally saline and are unlikely to maintain the existing ecology for extended periods without surface water flows, they provide important refugia during dry periods. As identified in the SA Murray Region Risk Assessment report, the low level of demand for the groundwater due to rugged terrain and
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s10.20 Productive base of groundwater

poor groundwater quality (Barnett, 2015) means that the broad protections in the regional NRM Plans are sufficient to maintain groundwater derived EWRs at an acceptable level of risk.

While there is limited data regarding the groundwater inputs into the Coorong, controls identified provide adequate precautionary protections for the connection between groundwater and surface water. As outlined in section 5.4.2.1, EWRs for the Coorong are not met by either the surface water resources or groundwater resources of the SA Murray Region WRP area. Additional supporting protections for the Coorong EWRs are also outlined in section 5.4.2.1.

10.20 Productive base of groundwater

5.4.5 Accredited Text

Areas of good quality groundwater where concentrated extractions are currently occurring within the SA Murray Region are covered by the Mallee WAP, and the Peake, Roby and Sherlock WAP. Determination of the sustainable limits for extraction in these plans has used groundwater modelling to take into account considerations such as structural integrity and the potential for, and the consequences of, inter-aquifer leakage. Management zones and buffer zone rules within the WAPs are designed to minimise intensive extraction from areas to ensure that potential impacts to third parties or to the aquifers from leakage are managed.

The risk assessment process conducted for the SA Murray Region found that there were no significant (medium or higher) risks to groundwater resources. This is primarily due to the inherent nature of the groundwater system (aquifer depth, thickness and salinity) or because the risks are adequately managed through current arrangements.

Rules in the SA Murray Region WRP which assist in providing protections to the aquifers or the hydraulic relationships include:

- Sections of the NRM Act as outlined in 5.3.1

Mallee WAP

- Mallee (Pliocene Sands) – principle 5
- Mallee (Murray Group Limestone) – principles 1, 2, 7, 38-43, 48, 49, 51.
  
  Note: The rules for this aquifer are based on a cross-border agreed maximum rate of depletion of the aquifer each year and a total maximum estimated reduction over a 300 year period.
- Mallee (Renmark Group) – principles 1, 3, 4, 7, 52

Peake, Roby and Sherlock WAP

- Peake, Roby and Sherlock (unconfined) – principles 1, 2, 4, 5, 8(i) and (ii), 9, 15, 16
- Peake, Roby and Sherlock (confined) – principles 1, 2, 4, 5, 8(i) and (ii), 9, 15, 16, 19

SAMDB NRM Plan – Volume B

The following rules apply to all groundwater SDL resource units or parts of units that fall within the SAMDB NRM region as identified by Figure 4:

- Section 5.2.2, principles 1(d), 2(c) and (i)
- Section 5.3.1, principle 3
- Section 5.3.2, principles 9, 10, 11, 14, 16
- Section 5.3.3, principles 19(a) and (b)
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**SAAL NRM Plan (Volume 2) – Appendix 1**

The following rules apply to the part of the SA Murray groundwater SDL resource unit (GS6) that falls within the SA Arid Lands NRM region as identified by Figure 4:

- Sections 3.2(d) and (j)
- Principles 2, 4, 8, 15, 17, 20 and 21

**SE NRM Plan – Part Four**

The following rules apply to the part of the SA Murray groundwater SDL resource unit (GS6) that falls within the SE NRM region as identified by Figure 4:

- Section 4.3.1, principles 7 and 8

The rules from statutory instruments included above provide protections to maintain the structural integrity of the aquifers and the hydraulic relationships within and outside of the SA Murray Region WRP area. These rules are considered fit-for-purpose and sufficient to maintain a low risk of impacts to groundwater (including structural damage to an aquifer and hydraulic relationships between systems) and, as such, it is not considered necessary to include additional rules within the SA Murray Region WRP that specify:

- The times, places and rates at which water is permitted to be taken from the groundwater SDL resource units in this area; or
- Any additional zones where continued extraction will result in a long-term decline in groundwater levels or measures to prevent long-term decline; or
- A planned rate of decline in groundwater levels for non-renewable groundwater resources; or
- Resource condition limits or restrictions on the water permitted to be taken to prevent the resource condition limit from being exceeded.

**5.4.5.1 Supporting Information**

**Mallee PWA**

At the State level, the Border Groundwaters Agreement Review Committee is a Victorian/South Australian Committee that sets the management arrangements for groundwater resources 20 km either side of the SA-Victoria State border. Among other duties, this committee establishes the Permissible Annual Volume (PAV) for the various management zones along the border, which is the upper limit for groundwater extractions. A management decision was made by this Committee to allow controlled depletion of the Murray Group Limestone aquifer. This decision was based on the robust nature of the aquifer and the large amount of storage within the aquifer. The controlled depletion of volumes equivalent to a drawdown averaged over the whole region of no more than 5 cm/yr would lead to a depletion of only 15% over 300 years. This takes into account the derived inflows, outflows and inter-aquifer leakage volumes and assumes the maximum PAV is pumped each year.

In the Mallee PWA, the methodology used in the Border Zones to determine PAVs was extrapolated to set extraction limits under the WAP (section 5). The impacts of extraction up to these limits were modelled to determine drawdowns and salinity risks from inter-aquifer leakage and lateral flow within the limestone aquifer (Barnett and Osei-Bonsu, 2006).

The SDLs established under the Basin Plan for the Mallee groundwater resource are the extraction limits (including estimated stock and domestic take) established in the Mallee WAP.

**Peake, Roby and Sherlock PWA (GS5)**

Extractions from the confined aquifer were modelled (Barnett and Yan, 2008) to determine risks from structural integrity (by ensuring pressure levels of confined aquifers do not fall below the confining layer) and lateral flows of saline groundwater within the confined aquifer.

The limits identified in both the Mallee WAP and Peake, Roby and Sherlock WAP are considered adequate to ensure the productive base of groundwater is maintained. The risks to the structural integrity of aquifers or aquitards in both PWAs are low because of the presence of consolidated Tertiary limestones and the absence of...
large thicknesses of unconsolidated silts and clays that typically contribute to subsidence and other structural issues (Barnett, 2015).

The SDLs established under the Basin Plan for the Peake, Roby and Sherlock groundwater resource are the extraction limits (including estimated stock and domestic take) established in the Peake, Roby and Sherlock WAP.

SA Murray (GS6) – non-prescribed

Rules in the regional NRM Plans provide broad protections to the non-prescribed groundwater resources to ensure that there is no structural damage to the aquifers from well construction and use, and that the hydraulic relationships are maintained. The risk assessment report identified that these rules are considered sufficient to maintain a low level of risk to the groundwater resources.

No further rules are deemed necessary in the SA Murray Region WRP as the high salinities in all aquifers outside the prescribed areas mean that the most likely demand for these resources is for mining development, particularly heavy mineral sands. Such developments require a program for environment protection and rehabilitation (PEPR) under the Mining Act 1971 (Barnett, 2015) which would include conditions on extractions including monitoring and metering of the resource even if the resource is not prescribed.

10.21 Environmental outcomes relating to groundwater

5.4.6 Accredited Text

The risk assessment process for the SA Murray Region considered the potential for water quality degradation and increases in groundwater salinity. No risks were identified as either medium or high as either the risks were inherently low or, with the existing management controls in place (outlined below), were considered low. As the developed aquifers are mostly confined and not subject to managed aquifer recharge (see section 5.3.3), water quality degradation issues, other than salinity, are not considered relevant and therefore no rules have been included for this purpose.

The potential for increases in groundwater salinity in the higher usage areas with good quality water is managed through extraction limits, management zones, well buffers and construction rules, and trade rules within the Mallee WAP and the Peake, Roby and Sherlock WAP. These rules are:

- Sections of the NRM Act as outlined in 5.3.1

Mallee WAP

- Mallee (Murray Group Limestone) – principles 1, 2, 7, 38-43, 48, 49, 51, 59
- Mallee (Renmark Group) – principles 1, 4, 7, 52, 59

Peake, Roby and Sherlock WAP

- Peake, Roby and Sherlock (unconfined) – principles 1, 2, 4, 5, 8(iii) 15, 16, 30
- Peake, Roby and Sherlock (confined) – principles 1, 2, 4, 5, 8(iii), 15, 16, 19, 30

It is not considered necessary to include rules for the non-prescribed groundwater of the SA Murray (GS6) or SA Murray Salt Interception Scheme (GS7) to prevent elevated levels of salinity as the groundwater already has naturally high salinity levels. The likelihood of future development is limited, and the consequences of any resultant changes in salinity would be minimal and highly unlikely to lead to a change in the beneficial use of the resource or ecosystems if present.

The rules from statutory instruments included above provide sufficient protections to prevent elevated levels of salinity within the groundwater resources and therefore it is not considered necessary to include additional rules that specify:

- the times, places and rates at which water is permitted to be taken from the groundwater SDL resource units in this area; or
- resource condition limits or restrictions on the water permitted to be taken to prevent the resource condition limit from being exceeded; or
• a requirement to establish and maintain a register of bore sites to monitor salinity or other water quality characteristics.

5.4.6.1 Supporting Information

Regular salinity monitoring is carried out and resource condition limits for both water levels and salinity have been established. Monitoring data is available online (www.waterconnect.sa.gov.au) that shows locations of monitoring bores in the prescribed wells areas. Data can be filtered to show historic and current water quality characteristics, including salinity.

A specific salinity risk assessment has been carried out for the Murray Group Limestone aquifer in the Mallee PWA (Barnett, 2007) which found that all salinity risks (due to inter-aquifer leakage and lateral inflows) were long-term (over timeframes of decades to hundreds of years). Groundwater modelling (Barnett and Osei-bonsu, 2006) found that, in the area of maximum drawdown (and greatest potential for downward leakage), a small increase of 40 mg/L (4% of the current salinity levels) was predicted after 25 years. The Mallee Renmark Group aquifer is not used (and has limited capacity for use under the current rules in the Mallee WAP) in the Mallee PWA due to its depth and unreliable yield.

In the Peake, Roby and Sherlock PWA, the salinity impacts from extractions from the confined aquifer were determined by groundwater modelling (Barnett and Yan, 2008). The predicted drawdown due to extractions over 5,000 ML/yr were found to cause inflows of saline groundwater from the west, resulting in the stock salinity limit being exceeded within 200 years, as well as creating a high risk of collapse of the confining layer and depressurisation of the confined aquifer. However, the limit for stock water quality would not be exceeded within 200 years if extractions from the confined aquifer remain below 1800 ML/yr in the low salinity zone. The Peake, Roby and Sherlock WAP has limited extractions to 1718 ML/yr in this zone; however, the current extractions for the confined aquifer have significantly declined over recent years to approximately 50 ML/year.

The rules in the Mallee WAP and the Peake, Roby and Sherlock WAP act to manage the resource in multiple ways including to manage the integrity of the aquifers, impacts to third parties and the environment, and salinity inflows. Each of the WAPs includes rules for the monitoring of salinities within the WAP boundaries.

Outside the prescribed wells areas, the high groundwater salinities result in a low likelihood of future development and, even if development was to occur, the consequences of any resultant changes in salinity would be minimal and highly unlikely to lead to a change in the beneficial use of the resource.

Other water quality issues are not considered a risk in the SA Murray Region as the highly utilised water is mostly confined and water degradation is unlikely. As discussed in 5.4.5.1, the most likely demand for the groundwater resources outside of the prescribed wells areas is for mining development which is strictly controlled under the Mining Act 1971 and therefore the likelihood of degradation from other types of water quality issues is low.

In the unlikely event that it was necessary to manage the risk to the non-prescribed groundwater resources of GS6 and GS7, section 5.2.2, principle 2(f) of the SAMDB NRM Plan – Volume B and section 4.3.1, principle 7 of the SE NRM Plan – Part 4 could be used to prevent the issuing of water affecting permits.
Division 4 – How requirements have been met

10.22 **Description of how requirements have been met**

5.4.7 **Accredited Text**

The descriptions of what was done to comply with the requirements of this Part are contained within section 5.4.2 accredited text; 5.4.3 accredited text; 5.4.4 accredited text; 5.4.5 accredited text; and 5.5.6 accredited text. These sections also consider the risk assessment process as required by Part 9 of Chapter 10 of the Basin Plan. An explanation of why rules addressing the high and medium risks identified through the risk assessment have not been included in the SA Murray Region WRP is discussed in sections 5.4.2 and 5.4.2.1. It was not considered necessary to include additional rules within the SA Murray Region WRP where risks were identified as low due to either the inherent nature of the risk or the management controls that are already in place.
5.5 Part 5 – Interception activities

10.23 Listing types of interception activity

5.5.1 Accredited Text

The SA Murray Region WRP has been developed having regard to the risk identification and assessment conducted for section 10.41 of the Basin Plan, to specify whether there are any types of interception activity in the WRP area which have the potential to have a significant impact on the water resources or hydrologically connected water resources (whether on an activity-by-activity basis or cumulatively) through the risk assessment report.

The SA Murray Region Risk Assessment Report has identified the following interception activities occurring with the SDL resource unit: runoff dams, commercial plantations and mining. Each of these activities has been assessed in the risk assessment process, having regard to the factors outlined in section 10.41(3) of the Basin Plan. Through the risk assessment process consideration has been given to the current controls in place to manage these risks, and SA has considered those current controls to be sufficient. As a result, the risk from each of the above listed interception activities has been identified as being low. Appendix B of the risk assessment report sets out the risk source, consequence and the 352 provisional risk statements generated through the risk assessment process. The final 43 risks assessed in phase 2 of the risk assessment process and the risk levels for each are outlined in Appendix K of the risk assessment report. Appendices C to J of the risk assessment report outline the factors and controls considered for the assessment for each of the final (phase 2) risks.

Therefore, in reference to the requirements of sections 10.23(1) and (2) of the Basin Plan, no types of interception activity in the SA Murray Region WRP area were found to have the potential to have a significant impact on water resources or hydrologically connected water resources, whether on an activity-by-activity basis or cumulatively.

5.5.1.1 Supporting Information

Consideration was given to interception activities and the potential for significant impact as part of the risk assessment process. Sections 1.1.1 to 1.1.8 of Appendix A in the risk assessment report outlines the evidence used in considering the likelihood of significant impact. The Mindarie mine discussed in section 1.1.4 ceased operation in 2015 and the section 128 authorisation for water expired on 30 June 2017.

It should be noted that there is a spare interception capacity by runoff dams (or watercourse take that is accounted against the runoff dam limit) of approximately 29 GL for the SA Non-Prescribed Areas surface water (SS10) as a result of a renegotiation of the BDL. Consideration was given to whether the increased BDL, and consequently SDL, would alter the risks as first assessed. Section 4.3 of the risk assessment report describes the additional analysis undertaken and concludes that there is no change to the risks or risk rating because the original risk assessment process did not consider a limit on projected growth of surface water development in the SA Murray Region outside the Northern Mount Lofty Ranges but the inherent demand and capacity for runoff dams.

No risks as a result of commercial plantations were identified. Dryland forestry coverage across the SDL resource unit area is approximately 0.0005%. The spatial information on land use coverage does not indicate if the forestry is commercial or not; however, due to the low rainfall and sporadic nature of the rainfall, and distance from any major centres, it is unlikely to be commercial.

There is potential for mining expansion in the SA Murray Region with a number of mining tenements; however, the location of deposits and the prices of commodities influences whether mining activities will occur. Within the prescribed water resources, which are close to sustainable limits, the rules in the WAPs prevent further take beyond the annual allowable limits. In the non-prescribed areas, much of the water is too saline for commercial irrigation and the resource has significant development capacity. The Mining Act 1971, Part 10A, Programs for environment protection and rehabilitation, requires that a mining company identify and manage any potential impacts. This includes a requirement to meter water take.
Demand for additional runoff dams has been very low in recent years and this is unlikely to change significantly. Stocking rates and species stocked in the pastoral lands in the north of the SA Murray Region are controlled through conditions on pastoral leases under the *Pastoral Land Management and Conservation Act 1989*, sections 22(b)(i) and (ii). Controls in the SAMDB NRM plan – volume B, principle 33 and 34 prevent development above sustainable ecological limits in specified sub-catchments in the Northern Mount Lofty Ranges. In other areas, the nature of the resources and historical development has meant that interception from runoff dams is not considered likely to pose a significant impact.

In determining whether any of the interception activities were likely to have an impact on the availability of water in the water resource area or water resources which are hydrologically connected to the water resources of the SA Murray Region WRP area, consideration was given through both the risk assessment process and the assessment of connected water resources as outlined in section 5.2.4.1. Because of the nature of the resources and the limited hydrological connectivity to other resources, interception activities were considered unlikely to pose potential risks to either the water resources in the WRP area or those hydrologically connected.

**10.24 Monitoring impact of interception activities**

**5.5.2 Accredited Text**

No types of interception activity in the SA Murray Region WRP area were found to have the potential to have a significant impact on the water resources such that they would need to be listed in accordance with section 10.23 of the Basin Plan. Section 10.24 of the Basin Plan is therefore not applicable to the SA Murray Region WRP.

**10.25 Actions to be taken**

**5.5.3 Accredited Text**

No types of interception activity in the SA Murray Region WRP area were found to have the potential to have a significant impact on the water resources in the plan area or on hydrologically connected water resources. Section 10.25 of the Basin Plan is therefore not applicable to the SA Murray Region WRP.
5.6 Part 6 – Planning for environmental watering

10.26 Planning for environmental watering

5.6.1 Accredited Text

The SA Murray Region WRP provides for environmental watering to occur in a way that is consistent with the environmental watering plan (chapter 8 of the Basin Plan) and the Basin-wide environmental watering strategy, and contributes to the achievement of the objectives of part 2 of chapter 8 of the Basin Plan, as set out in sections 5.4.2, 5.4.4 and 5.6.2.

The opportunities for environmental watering are limited in the SA Murray Region, given the limited water-dependent PEAs and PEFs in the SA Murray Region, the low level of water resource development in most areas, and inability to actively manage environmental watering given the unregulated nature of the system.

As identified in section 5.3.2 of this plan, and in the SA Murray Region LTWP, there is no held environmental water in the SA Murray Region and planned environmental water is limited to the Northern Mount Lofty Ranges (surface water), the Coorong (surface water), and the Peake, Roby and Sherlock prescribed wells area (groundwater).

PEW is not actively managed in the Northern Mount Lofty Ranges or the Coorong; rather, the controls outlined in section 5.3.2 result in PEW being provided. PEAs and PEFs in the Northern Mount Lofty Ranges and Coorong are protected through the controls identified in sections 5.4.2 and 5.4.4.

In the Peake, Roby and Sherlock PWA, groundwater is considered PEW (as outlined in section 5.3.2) and provides for environmental watering consistent with 10.26(1)(a)(i) of the Basin Plan. The SA Murray Region LTWP indicates that the saline wetlands in the Peake, Roby and Sherlock PWA are significantly degraded and do not meet the criteria of a PEA or PEF.

The Coorong and Murray Mouth are reliant on environmental water from outside of the SA Murray Region, i.e. through the connected resources of the SA River Murray (SS11) and, as such, are reliant on the River Murray WRP and other connected WRPs providing for environmental watering consistent with the River Murray LTWP and as outlined in 5.6.2. The South East Flows Restoration Project will provide water, from water resources outside the Murray-Darling Basin, to the Coorong, to assist in the management of salinity in the South Lagoon.

While the Noora Evaporation Basin has been identified as an environmental asset through the Basin-Wide Environmental Watering Strategy due to the abundance and diversity of waterbirds, the site is not watered with either PEW or HEW (as per section 5.4.3.1) and, therefore, this section does not apply.

For the purpose of 10.26(2) of the Basin Plan, the views of the community are included during the development of the statutory instruments as outlined in section 5.2.6, and were included as part of the development of the River Murray LTWP. Due to the limited opportunities for active management of environmental water in the SA Murray Region outside of the Coorong and Murray Mouth, the existing consultation on the statutory instruments, together with the Aboriginal engagement on objectives and outcomes undertaken for Part 14 of Chapter 10 of the Basin Plan, was considered fit-for-purpose for the SA Murray Region LTWP.

5.6.1.1 Supporting Information

The Coorong and Murray Mouth are included within the River Murray LTWP due to the clear hydrological connectivity with the River Murray and Lower Lakes. As the EWRs of the Coorong and Murray Mouth are reliant on environmental water from outside the SA Murray Region area, it is essential that coordination of appropriate decision making with upstream states; the connected SA River Murray WRP area and the Commonwealth Environmental Water Holder is undertaken. The implementation of effective monitoring and evaluation strategies are in place to provide for the ecological values of the Coorong and Murray Mouth (refer section 5.10.3).

In developing the River Murray LTWP, the views of the community were considered (section 2.3.1 of the River Murray LTWP) including extensive input from the Indigenous Nations – the Ngarrindjeri, and the First Peoples of the Murray and Mallee (First Peoples); the River Murray Advisory Committee, the Scientific Advisory Group for the Coorong, Lower Lakes and Murray Mouth (CLLMM) and the Community Advisory Panel for the CLLMM.
As outlined in section 2.4.1 of the SA Murray Region LTWP, consultation on the statutory water planning instruments, together with the ongoing conversations with Aboriginal Nations, was considered appropriate to guide the development of the SA Murray Region LTWP.

**10.27 Enabling environmental watering between connected water resources**

**5.6.2 Accredited Text**

Section 10.27 of the Basin Plan applies to the SA Murray Region WRP area as connections have been identified between the surface waters of the SA Non-prescribed Areas SDL resource unit (SS10) within the SA Murray Region WRP area, and the surface water of the SA Murray (SS11) SDL resource unit within the River Murray WRP area.

The connection occurs in two locations:

- The connection between the Coorong and Murray Mouth (SS10), and the Lower Lakes (SS11); and
- The connection between the Burra Creek (SS10) and the main River Murray channel (SS11).

Connections have also been identified between the SA Non-prescribed Areas SDL resource unit (SS10) within the SA Murray Region WRP area, and the interstate surface water SDL units connected to SA Murray SS11 (refer sections 5.2.4 and 5.2.4.1), however, the coordination of environmental water between SA River Murray (SS10) and the connected interstate surface water SDL units identified in 5.2.4 will be managed through the SA River Murray WRP.

The River Murray LTWP includes the Coorong and Murray Mouth as part of the Coorong, Lower Lakes and Murray Mouth (CLLMM) PEA. The LTWP describes the environmental water requirements and the ecological objectives and targets for the CLLMM PEA as a whole. The environmental water requirements for the Coorong and Murray Mouth are considered on an annual basis through the development of annual environmental watering priorities as part of the coordinated process for decision making for the use of available environmental water for the Southern Connected Basin. This process is consistent with Division 4 of Chapter 8 of the Basin Plan. Specific outcomes are sought for the Coorong and Murray Mouth and these are discussed in detail with the relevant community groups. The River Murray annual watering plan (inclusive of the Coorong and Murray Mouth) underpins South Australia’s negotiations for access to available environmental water each year.

As the Coorong and Murray Mouth rely on environmental water from the broader connected river system of the Southern Connected Basin, the environmental water planning, coordination and delivery is negotiated through the Southern Connected Basin Environmental Watering Committee. This committee has representatives from individual states in the Southern Connected Basin, the MDBA and the Commonwealth Environmental Water Office. Each year, the Committee considers the available water and the annual priorities put forward by each of the states (consistent with the relevant LTWPs) and agrees on environmental outcomes and delivery. More detailed negotiations specific to the Coorong and Murray Mouth occur through local committees in conjunction with the State Government and the Commonwealth Environmental Water Office consistent with local operating strategies and policies such as the Barrage Operating Strategy and the Variable Lakes policy.

Flows into the Coorong South Lagoon through the South East Drainage Network (once complete) will be coordinated and adjusted annually subject to the requirements of the Coorong and the wetlands en route to the Coorong.

It is not considered necessary to plan for the coordination of environmental watering between Burra Creek and the main River Murray channel due to the exceptionally rare nature of the connection.

**5.6.2.1 Supporting Information**

The largest tributary to the River Murray (within the SA Murray Region) is Burra Creek. This creek has not flowed into the River Murray since 1941 when between 110 mm and 150 mm fell over two days around the Burra district. Burra Creek is thought to have only flowed to the River Murray a small number of times since European settlement (Deane et. al, 2008).
The River Murray LTWP outlines the significance of the connection between the Coorong and Murray Mouth and the Lower Lakes. The Coorong, Lower Lakes and Murray Mouth are together considered to be a priority environmental asset and is similar in area to both the Living Murray (TLM) Lower Lakes, Coorong and Murray Mouth Icon Site and the Coorong, Lakes Alexandrina and Albert Ramsar Wetland of International Importance. Environmental water requirements that have been developed for this site are for the whole area.

While the Coorong and Murray Mouth have been included within the SA Murray Region WRP area, they are managed through the environmental water planning processes in place for the connected River Murray in South Australia and the broader Southern Connected Basin. The River Murray LTWP outlines the EWRs for the Coorong, Lower Lakes and Murray Mouth together with those for the River Channel PEA and the Floodplain PEA.

10.28 No net reduction in the protection of planned environmental water

5.6.3 Accredited Text

Section 5.3.2 outlines the rules within the existing State statutory plans that are considered to provide for planned environmental water. These rules, as specified in section 5.3.2, are the sub-catchment dam development limits in the Northern Mount Lofty Ranges sub-catchments; water affecting activity permits not being issued for ecologically sensitive areas (Coorong); and the buffer zones around the saline wetlands in the Peake, Roby and Sherlock area.

The rules in the Peake, Roby and Sherlock WAP have not changed since adoption in 2011. The SA Murray-Darling Basin Regional NRM plan has been amended; however, the principles relating to dam capacity limits and water affecting activity permits not being issued for ecologically sensitive areas are essentially unchanged since 2009.

No other rules existed at the time to protect planned environmental water and as such there has been no net reduction in the protection of planned environmental water under State water management law immediately before the commencement of the Basin Plan.

5.6.3.1 Supporting Information

The PEW rules in place just prior to the commencement of the Basin Plan were:

- Water affecting activity permits not being issued in ecologically sensitive areas in the SA Murray-Darling Basin Regional NRM Plan – Volume 3: Regulatory and Policy Framework (2009) – section 2.2.2 principles (2)(b), (2)(c), (2)(d) and (2)(f); and SE NRM Plan – Part 4 – section 4.3.1 principles 1-5.
- Buffer zones around saline wetlands in the WAP for the Peake, Roby and Sherlock Prescribed Wells Area Peake, Roby and Sherlock WAP (2011) – section 5.3.1, principle 3.

Water affecting activity policies previously in the SA Murray-Darling Basin Regional NRM Plan – Volume 3: Regulatory and Policy Framework were moved to the SA Murray-Darling Basin NRM Plan – Volume B: Board Business and Operational Plan when the documents were revised in 2013. The principles associated with dam capacity limits were slightly amended to provide further clarity to the application of the principle and to update table numbers. However, the dam capacity limit per sub-catchment and the sub-catchment boundaries have not changed since 2009, other than rounding the dam capacity limit per sub-catchment to the nearest ML as part of the changes from 2009 to 2013. This rounding has taken the total dam capacity limit in the Northern Mount Lofty Ranges within the SA Murray Region from 32,275.69 ML (in 2009) down to 32,274 ML (in 2013).
5.7  Part 7 – Water quality objectives

10.29  Water resource plan to include WQM Plan

5.7.1  Accredited Text
Section 5.7 of the SA Murray Region WRP constitutes the Water Quality Management Plan (WQM Plan) that must be included in the WRP. The WQM Plan has been developed in accordance with Part 7, sections 10.29 to 10.35 of the Basin Plan and is constituted by two or more instruments or texts (Basin Plan section 10.04(2)). The WQM Plan deals with all surface water and groundwater resources within the SA Murray Region WRP area.

10.30  WQM Plan to identify key causes of water quality degradation

5.7.2  Accredited Text
The causes (or likely causes) of water quality degradation that apply to the groundwater and surface water resources of the SA Murray Region WRP area are the key causes documented in Schedule 10 of the Basin Plan except for the following:

- Surface water SDL resource unit SS10 – Items 5(1), 5(2)(a) and 7(c); and
- Groundwater SDL resource units – GS3, GS5, GS6 and GS7 – Items 1(1)(a)(vi); 2, 4, 5, 6, 7(b), 7(d) and 8(3).

Regard has been had to all causes or likely causes outlined in Schedule 10 and the above exclusions have been made for the following reasons:

- Surface water-specific causes do not apply to groundwater SDL resource units;
- Groundwater-specific causes do not apply to surface water SDL resource units; and
- The very limited extent of, and inability to control, factors such as:
  - suspended matter from wave wash;
  - some factors which may contribute towards elevated levels of cyanobacteria;
  - causes of reduced levels of dissolved oxygen; and
  - pH outside natural ranges.

5.7.2.1  Supporting Information
Causes of major threats to water quality in the SA Murray Region WRP area are summarised in the following regional NRM Plans:

- South Australian Murray-Darling Basin Natural Resources Management Board Regional NRM Plan – Volume A, section 3.4.1 (SS10, GS3, GS5, GS6 and GS7); and
- South East Natural Resources Management Board Regional NRM Plan – Part 1, sections 6.3.1 and 6.3.5 (part SE NRM region that covers SS10 and GS6).

The above plans identify a number of major threats to water resources; the following threats may be relevant to the water resources in the SA Murray Region:

- the taking and use of water resources;
- poor land management practices including infestations of pest plants and animals;
- discharges from industry;
- stormwater and wastewater discharges;
- changes of land use and development pressures; and
- saline discharges from local and regional groundwater.
10.31 Measures addressing risks arising from water quality degradation

5.7.3 Accredited Text

A risk assessment for the SA Murray Region has identified risks arising from water quality degradation, as well as a number of current measures/strategies (refer to section 5.7.7) that are in place to mitigate or address the risks.

The risk assessment conducted in accordance with Basin Plan section 10.41 (refer to section 5.9.2) has identified the following medium or high risks arising from elevated levels of salinity or other types of water quality degradation:

Risk 844 – There is the potential for management of connected water resources to cause changes to inflows of water in turn leading to water quality changes impacting water-dependent ecosystems in the Coorong Surface Water risk assessment sub-region.

Risk 700 – There is a potential for climate extremes to cause increased evaporative discharge (and or reduced recharge) leading to an impact on groundwater level such that GDEs are impacted in the Coorong, River Murray and Lower Lakes risk assessment sub-region.

As outlined in section 5.9.11, the SA Murray Region WRP does not include measures to address risk r844 as the SA Murray Region WRP area does not contain any significant surface or groundwater systems that are connected to the Coorong and, consequently, there are no opportunities to mitigate or manage the risk through the SA Murray Region WRP. The risk assessment found that the high risk to the water-dependent ecosystems of the Coorong is being caused by the management of connected water resources, which include the entire southern connected Murray-Darling Basin. Consequently, treatment relies on full and timely delivery of the measures of the Basin Plan to deliver sufficient environmental water to reduce the risk to this Basin environmental asset.

Risk r700 is also not addressed through the SA Murray Region WRP as there are no cost-effective strategies that can be put in place to manage or mitigate the impact of climate extremes on the unconfined groundwater in the Coorong, River Murray and Lower Lakes risk assessment sub-region. The location of the ecosystem (between the ocean and inland water bodies), and the fact the unconfined groundwater is recharged by local rainfall onto the dunes limits mitigation. Some mitigation of the risk is linked to the ability to maintain water levels in the River Murray and Lower Lakes to reduce impacts on the unconfined groundwater. This is a matter for the SA River Murray WRP and WRPs in the southern connected Murray-Darling Basin upstream of South Australia.

10.32 WQM Plan to identify water quality target values

5.7.4 Accredited Text – 10.32(1) and (2)

The water quality target values that apply to the South Australian Non-Prescribed Areas (SS10) surface water SDL resource unit in the SA Murray Region WRP area consistent with sections 9.16 and 9.18 of the Basin Plan are as follows:

- Water quality targets for freshwater-dependent ecosystems – Schedule 11, Target Application Zone – LM (Lower Murray)
- Water quality targets for recreation water – as described in section 9.18 of the Basin Plan.

The targets for irrigation water are the target values for water quality characteristics set out in section 9.17 of the Basin Plan. The target values do not apply in the SA Murray Region as there are no sites where water is extracted by and irrigation infrastructure operator for the purpose of irrigation.

The water quality target values that apply to the Peake, Roby and Sherlock (unconfined) (GS5); SA Murray (GS6); and SA Murray Salt Interception Schemes (GS7) groundwater SDL resource units in the SA Murray Region WRP area, consistent with section 9.16 of the Basin Plan, are as follows:

- Water quality targets for freshwater-dependent ecosystems – Schedule 11, Target Application Zone – LM (Lower Murray)
Water quality targets do not apply to the groundwater resources of the Mallee (Pliocene Sands) (GS3), Mallee (Murray Group Limestone) (GS3), and Mallee (Renmark Group) (GS3); Peake, Roby and Sherlock (confined) (GS5), as there are no identified water dependent ecosystems that are reliant on groundwater (refer to 5.4.3 and 5.4.3.1). The targets for irrigation water are the target values for water quality characteristics set out in 9.17 of the Basin Plan. The target values do not apply in the SA Murray Region as there are no sites where water is extracted by an irrigation infrastructure operator for the purpose of irrigation.

5.7.4.1 Supporting Information
The target values outlined in Schedule 11, Target Application Zone – LM (Lower Murray) of the Basin Plan apply to groundwater connected to freshwater ecosystems including the Northern Mount Lofty Ranges and Olary Ranges watercourses; saline wetlands in the Peake, Roby and Sherlock PWA; the Coorong and Lower Lakes; and the River Murray Floodplains, wetlands and channel. No ecosystem has been identified as solely dependent on the groundwater to support freshwater dependent ecosystems. As outlined in section 5.4.4, the River Murray LTWP notes that groundwater derived flows do not contribute to meeting the EWRs of the River Murray floodplain or channel, and groundwater inputs are not well quantified for the Lower Lakes or Coorong.

Many of the parameters outlined in Schedule 11 of the Basin Plan, such as turbidity and dissolved oxygen, are not applicable to groundwater. Measures identified in section 5.7.7 provide adequate management controls for maintaining the quality of the native groundwater and subsequent protections for the dependent ecosystems.

5.7.5 Accredited Text – 10.32(3)
South Australia has not identified any sites where an objectively determined actual value of a water quality characteristic at a site is better than the target value for the SA Murray Region WRP area. Accordingly, it is not proposed to include any objectively determined actual values of water quality in the WQM Plan for the SA Murray Region WRP.

5.7.6 Accredited Text – 10.32(4)
No alternate water quality target values have been proposed for the SA Murray Region WRP.

If there is an amendment to the Basin Plan to include improved water quality target values, South Australia will review the appropriateness of the new target values for the SA Murray Region WRP area.

5.7.6.1 Supporting Information
The default targets for the Coorong have been demonstrated as inappropriate based on analysis detailed in a CSIRO study, “Utilizing the Coorong, Lower Lakes and Murray Mouth Water Quality and Microalgae monitoring data to evaluate indicators for the Ecological Character Description”. The updated Ecological Character Description for 2015, which is nearing finalisation, outlines the critical components, processes and services (CPS) for the site and provides Limits of Acceptable Change that act as baselines for these. By identifying the sites critical CPS, linking these to the management triggers, resource condition targets and monitoring programs through a Ramsar site management plan, management actions including environmental water delivery can be focused on these, instead of focusing on the non-critical aspects of the site. Until these updated management triggers have been described, the current default Basin Plan targets will remain in place.

Although salinity targets have not been defined, Higham (2012) details that salinity in the South Lagoon needs to be maintained at an average daily salinity of less than 100 g/L to support ecosystems. Further information is provided in section 5.10.3.1.
10.33 WQM Plan to identify measures

5.7.7 Accredited Text

The measures identified in this section contribute towards the achievement of objectives specified in chapter 9 of the Basin Plan and address key causes of water quality degradation identified under section 5.7.2 of this WQM Plan. The measures have been identified having regard to the causes or likely causes of water quality degradation identified in accordance with the Basin Plan section 10.30, target values identified in accordance with the Basin Plan section 10.32 and the targets in the Basin Plan Division 4 of Part 4 of Chapter 9.

The risk assessment for the SA Murray Region, as outlined in 5.9.2.1, considered a two-part risk event, one part of which was water quality. In doing so, the risk assessment was undertaken having regard to the causes or likely causes of water quality degradation considered relevant to the SA Murray Region WRP area (refer to Appendix A of the risk assessment report). The risk assessment considered the risk based on the measures or management practices in place to manage the level of risk. As outlined in section 5.7.3, the risk assessment process identified one medium and one high risk arising from elevated levels of salinity or other types of water quality degradation.

The following measures are considered the key management controls for the SA Murray Region WRP area that contribute to the objectives outlined in Part 3 of Chapter 9 of the Basin Plan:

- All sections and documents as identified for managing take in Table 15, section 5.3.4 of this document;
  In addition to the specific information below for each instrument, the management of water affecting activities through the regional NRM Plans will address many of the likely causes of water quality degradation in the region and contribute to the achievement of all of the objectives identified in section 5.7.2.
- WAP provisions identified in 5.4.6
  The Mallee and Peake, Roby and Sherlock WAP policies contribute to the management of water quality by limiting the volume of water that can be extracted from aquifers and specifying a minimum distance for the construction of new wells from existing wells. The plans will contribute to the management of elevated salinity levels and the achievement of objectives 9.04, 9.05, 9.06 and 9.08.
- NRM Act – sections 9(1) and (2);
  Section 9 and listed sections of the Act identified in Table 15 contribute to the objectives set out in sections 9.04, 9.05, 9.06 and 9.08 of the Basin Plan by requiring persons to have a duty of care towards the management of natural resources, controlling activities affecting water, regulating the capture, extraction and use of water and requiring owners of land to take reasonable measures to prevent damage to watercourses, lakes and reliant ecosystems.
- Environment Protection Act 1993 (EP Act) – sections 25(1), 25(2)(a) and (c), and in relation to the Murray Mouth and Coorong – sections 64(1), 64(1a)(b), 64(6) and 64(7);
  The Act contributes to the achievement of objectives 9.04, 9.05, 9.07 and 9.08 through regulating activities which have the potential to cause environmental harm and cause water quality degradation. The Act does not contribute to the achievement of objective 9.06 for irrigation water within the SA Murray Region WRP area as it does not directly address the causes of elevated levels of salinity.
- Environment Protection (Water Quality) Policy 2015 – sections 5, 6, 7(a), 9(b)-(d) and 10(1);
  The policy is the primary instrument that regulates the discharge of waste and pollutants into water in South Australia and contributes towards the achievement of all of the objectives identified in section 5.7.2.

Note: For the purpose of both the EP Act and the Environment Protection (Water Quality) Policy 2015, the Chief Executive EPA is the responsible person.
• WAP for the River Murray Prescribed Watercourse 2017 – principles 70 and 71 (GS6 and GS7 only).

Principles 70 and 71 of the River Murray WAP regulates the use of water for irrigation in particular salinity management zones to assist in limiting the impact to the River Murray and associated floodplains from the saline regional groundwater (GS7 and GS6). Through implementation of these provisions, the River Murray WAP will contribute towards the achievement of objectives 9.04, 9.05, 9.06 and 9.08.

Due to the very limited extent and the inability to control the factors such as:

• suspended matter from wave wash;
• some factors which may contribute towards elevated levels of cyanobacteria;
• causes of reduced levels of dissolved oxygen; and
• pH outside natural ranges;

specific measures that address these factors have not been included in the WQM Plan.

5.7.7.1 Supporting Information

The instruments listed above (5.7.7 accredited text), which include the instruments that manage take in Table 15, are the primary instruments that provide for the management of water quality in the SA Murray Region WRP area. In addition to these instruments, South Australia has a number of other plans, policies and statutory instruments that also contribute to water quality objectives. Those listed in section 5.7.7 accredited text are considered appropriate protections to put forward for accreditation. The additional controls listed in supporting information are included to demonstrate that in the SA Murray Region there are layers of controls beyond those put forward for accreditation.

The following information provides additional context for how the instruments listed in 5.7.7 apply:

NRM Act

The NRM Act promotes sustainable and integrated management of the State’s natural resources and makes provisions for the protection of the State’s natural resources. The WQM Plan draws on Section 9 of the Act which requires persons to act reasonably in relation to the management of natural resources within the State, and the parts of Chapter 7 which provide for the management of take from the water resources which is a key component to managing water quality.

Environment Protection Act 1993

The Environment Protection Act 1993 provides for the protection of the environment and defines the functions and powers of the Environment Protection Authority. The Act includes a general environmental duty to not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm, provides for the establishment of water protection areas and defines general offences and enforcement provisions.

Environment Protection (Water Quality) Policy 2015

The Environment Protection (Water Quality) Policy 2015 includes specific and general obligations to avoid discharge of waste into waters and to not cause certain environmental harm.

Water Affecting Activity section of regional NRM Plans

The regional NRM Plans (SAMDB NRM Plan – Volume B, SAAL NRM Plan (Volume 2) – Appendix 1, SE NRM Plan – Part 4) include a section on water affecting activities. The water affecting activities section regulates activities in a watercourse or floodplain that may have adverse impacts on the health and condition of water resources, the ecosystems that depend on them, and other water users.

Water affecting activities managed under the regional NRM Plan include: construction or enlargement of dams or structures; building of structures; obstructing or depositing solid materials in a watercourse, lake or floodplain; excavating material from a watercourse, lake or floodplain; destroying vegetation in a watercourse, lake or floodplain; draining or discharging water or brine into a watercourse or lake; drilling, deepening and back filling.
wells, bores and groundwater access trenches; and the use of effluent or water imported to an area for commercial activities.

**Water Allocation Plan for the River Murray Prescribed Watercourse**

The WAP for the River Murray Prescribed Watercourse (River Murray WAP) is relevant to the SA Murray Region as most of the land that is irrigated from water from the SA Murray (SS11) falls within the SA Murray Region WRP area. The principles in the River Murray WAP assist in limiting the impact of the saline regional groundwater (GS6 and GS7).

**Mallee WAP and Peake, Roby and Sherlock WAP**

The Mallee and Peake, Roby and Sherlock WAPs set out the rules for managing the take and use of prescribed water resources to ensure resource sustainability. The plans provide for the equitable sharing of the water resource and protection against third party impacts (including on the environment), and ensure that the integrity and hydraulic connectivity of the aquifers are protected. The plans also provide for the allocation and transfer of water.

In addition to the instruments listed in 5.7.7 accredited text and discussed above, the instruments or documents listed below contribute to the management of water quality objectives and support those instruments put forward for accreditation but are not the primary control.

**South Australian Public Health (Wastewater) Regulations 2013**

The South Australian Public Health (Wastewater) Regulations 2013 provides the framework for the design, manufacture, construction and operation of wastewater treatment facilities. The regulations contribute to the achievement of objectives 9.04, 9.05, 9.07 and 9.08 by reducing the likelihood of increased nutrients and pathogens in surface water and groundwater.

**Groundwater (Border Agreement) Act 1985**

The Groundwater (Border Agreement) Act 1985 provides the legislative basis to approve and provide for the carrying out of an Agreement for the management of groundwater within the designated area (20 km) adjacent to the border of South Australia and Victoria. The Agreement sets out the annual volume of groundwater extraction, the minimum distance to the border for new wells without referral, and the permissible rate of groundwater lowering and salinity increases. These limits are then managed through a combination of the implementation of the Mallee WAP and the SAMDB NRM Plan, Volume B principles together with water licensing and water affecting activity permit arrangements in the NRM Act. The Act contributes to the achievement of objectives 9.04, 9.05 and 9.08 by managing the rate of drawdown and salinity increases.

**Securing the Future – A Long-Term Plan for the Coorong, Lower Lakes and Murray Mouth**

The plan provides a clear direction for the future management of the Coorong, Lower Lakes and Murray Mouth region as a healthy, productive and resilient Wetland of International Importance. The plan addresses the risks arising from low lake levels and exposure of acid sulfate soils and will contribute towards the achievement of objectives 9.04 and 9.08.

**Basin Salinity Management 2030**

The Basin Salinity Management 2030 strategy provides the foundation for Basin salinity management. The strategy defines the key priorities and actions to manage the causes and impacts of salinity in the Murray-Darling Basin until 2030. The strategy will assist in reducing and mitigating the likely causes of elevated salinity and contribute towards the achievement of objectives 9.04, 9.05, 9.06 and 9.08.

**Schedule B of the Murray-Darling Basin Agreement**

Schedule B of the Murray-Darling Basin Agreement (Schedule 1 of the Water Act 2007 (Cwlth)) promotes joint works, measures and other action to reduce or limit the rate at which salinity increases within the Murray-Darling Basin, provides for the adoption of salinity targets, establishes registers to record salinity impacts, and provides for monitoring, assessment, auditing and reporting on salinity management. The continued implementation of
Addressing Chapter 10 Requirements

s10.34 WQM Plan to identify locations of targets for irrigation water

schedule B will contribute to management of the likely causes of elevated salinity levels in the River Murray and the achievement of objectives 9.04, 9.05, 9.06 and 9.08.

Development Plans

Development Plans are produced for each of the local council areas under the Development Act 1993. These plans are the key on-the-ground development assessment documents in South Australia. They contain the rules that set out what can be done on any piece of land across the state, and the detailed criteria against which development applications will be assessed.

Development plans assist in reducing the likelihood of water quality issues from development and contributes to objectives 9.04, 9.05, 9.07 and 9.08.

10.34 WQM Plan to identify locations of targets for irrigation water

5.7.8 Accredited Text

South Australia has determined that there are no sites where the target value for irrigation apply within the SA Murray Region WRP area. Irrigation infrastructure operators within the SA Murray Region only use water sourced from the SA River Murray WRP area (SS11).

10.35 Impact of WQM Plan on another Basin State

5.7.9 Accredited Text

The groundwater resources of the Mallee (GS3) are part of the Murray Basin and are shared with Victoria. The measures outlined in section 5.7.7 are agreed measures with Victoria aimed at managing the resource sustainably and to prevent unacceptable impacts to the resource or third parties. It is therefore not considered likely that the measures would have an impact on another Basin State.

As outlined in sections 5.2.4, 5.2.4.1 and 5.7.3, the Coorong and Murray Mouth have a significant hydrological connection to the Lower Lakes and River Murray. No alternate targets have been proposed for the Coorong in the SA Murray Region WRP and therefore there should be no adverse impacts on Basin water resources in other Basin States. Timing, duration and volume of freshwater flows from the connected resources are considered more critical to the health of the Coorong and Murray Mouth than the water quality targets in the WQM Plan.

5.7.9.1 Supporting Information

The groundwater resources extending 20 kilometres either side of the border, from the south coast to the River Murray, are managed under the Border Groundwaters Agreement between South Australia and Victoria. The Agreement provides for the equitable sharing and management of the groundwater resource between South Australia and Victoria. The Agreement, together with State-based statutory instruments such as the Mallee WAP, are considered adequate safeguards to ensure that the inclusion of measures in the SA Murray Region WQM Plan will not pose any risk to the ability of Victoria to meet Basin Plan water quality targets or have any adverse impacts on water resources in that state.

The Coorong and Murray Mouth are hydrologically connected to the Lower Lakes and River Murray. Flows from the River Murray (SS11) at the northern end of the Coorong are integral to maintaining the ecological character of the area. The flow from the River Murray, in turn, is highly dependent on the management of water resources in the NSW Murray (SS14) and Victorian Murray (SS2) as well as the Murrumbidgee (SS15) and the Goulburn (SS6) SDL resource units. Many of the targets are similar along the river channel from the Central Murray to the Lower Murray with some slight variations in values towards the lower end (Lower Murray – Declared Ramsar wetlands, Lakes and wetlands).
5.8 Part 8 – Trade of water access rights

10.36 Application of Part

5.8.1 Accredited Text

The following types of water access rights relating to water resources in the SA Murray Region WRP area are not tradeable water rights under State water management law:

- Unlicensed rights (basic rights) to take water for stock and domestic purposes in a prescribed area;
- General right to take water for all purposes in a non-prescribed area; and
- Water authorised under section 128 of the NRM Act.

Within the Mallee (GS3) and Peake, Roby and Sherlock (GS5) groundwater SDL resource units, the following tradability applies:

Mallee (GS3)

1. Mallee (Pliocene Sands): No water access rights (licences) are permitted to be issued within this unit and, as such, no trade is permitted under State water management law.

2. Mallee (Murray Group Limestone): Water licence rights for consumptive use are issued from this unit. Permanent and temporary trade of water licences and water allocations is permitted for ownership and location changes within the unit. All licensed water rights are tradeable.

3. Mallee (Renmark Group): Water access rights can only be issued to SA Water for public water supply purposes. No trade is permitted under State water management law.

Peake, Roby and Sherlock (GS5)

1. Peake, Roby and Sherlock (unconfined): Water licences for consumptive use are issued from this unit. Permanent and temporary trade of water licences and water allocations is permitted for ownership and location changes. All licensed water rights are tradeable.

2. Peake, Roby and Sherlock (confined): Water licences for consumptive use are issued from this unit. Permanent and temporary trade of water licences and water allocations is permitted for ownership and location changes. All licensed water rights are tradeable.

The only circumstance in State water management law in the SA Murray Region WRP area where trade is permitted between SDL units is between Peake, Roby and Sherlock (confined)(GS5) and Peake, Roby and Sherlock (unconfined)(GS5).

10.37 Circumstances in which conditions in section 12.24 are met

5.8.2 Accredited Text

A trade may only be permitted between two locations within certain groundwater SDL resource units identified in section 5.8.1 in the SA Murray Region WRP area if:

- the application is assessed to meet the requirements of the relevant section(s) of the NRM Act – section 149 (licence variation), section 150 (licence transfer), section 156 (allocation variation) and/or section 157 (allocation transfer); and
- the application is assessed to meet the requirements of the relevant WAP principles as follows:
  - a trade between two locations within the Mallee (Murray Group Limestone) (GS3) is permitted if all of the following principles in the Mallee WAP are met: 38-45 (including tables 5 and 6); and
Addressing Chapter 10 Requirements
s10.37 Circumstances in which conditions in section 12.24 are met

- a trade between two locations within the Peake, Roby and Sherlock (confined) (GS5) or the Peake, Roby and Sherlock (unconfined) (GS5) is permitted if all of the following principles in the Peake, Roby and Sherlock WAP are met: 14-22 (including tables 2 and 5).

Among other things, these principles ensure that each relevant condition set out in the Basin Plan section 12.24 will be met for a trade that is approved.

5.8.2.1 Supporting Information

Licences in the SA Murray Region WRP area are bundled. The provisions of the NRM Act are based on unbundled licences, but allowance for bundled licences to continue is set out in the transitional provisions of the NRM Act regulations (regulation 47 of the Natural Resources Management (General) Regulations 2005). Section 157(5)(a) of the NRM Act requires that a decision of the Minister to grant or refuse approval for transfer of a water allocation must be consistent with the relevant WAP.

Under the NRM Act, a transfer is a change in ownership of a licence (including its water access entitlement) or allocation. Changes to other characteristics, such as the source/location that the allocation is taken from, is achieved through varying the licence or allocation. This means that under the NRM Act, a change in ownership trade occurs via a transfer, and a concurrent change in ownership and location trade occurs via transfer-variation.

The NRM Act sections and WAP principles referenced in section 5.8.2 set out the circumstances that need to be met for a groundwater trade to be permitted in the SA Murray Region WRP area within the same SDL resource unit. Not all of these sections and principles relate to the conditions set out in the Basin Plan section 12.24. Table 17 (Mallee) and Table 18 (Peake, Roby and Sherlock) outline how each condition set out in section 12.24 of the Basin Plan will be met for a trade to be permitted.

Mallee (GS3)

The Mallee WAP outlines the circumstances which must be met for a trade between two locations within a groundwater SDL resource unit to be permitted. Section 6.1 of the Mallee WAP outlines the principles for transfer including a permanent or temporary change in location trade (principle 39). The transfer of a water allocation is subject to principles 8-37 relating to allocations and the effects of water use, and must not result in the allowable annual volume (AAV) of any management area set out in Table 5 of the Mallee WAP being exceeded (Mallee WAP – principles 38 and 40). The allocation rules aim to minimise the impact of taking water at a new location on other users, the environment and the water resource and ensure that best practice standards are met.

The Permissible Annual Volume is the sum of the AAV for each management area. The SDL volume of 65.7 GL includes the PAV (61.3 GL) plus additional unlicensed volumes for stock or domestic purposes.

Water allocation transfer will only be permitted within and outside the Designated Area subject to principles 41 and 42, and subject to exceptions set out in principles 44 and 45. These principles are intended to manage the potential for the transfer of water to interfere with the quality and quantity of water supply from wells endorsed as a source on a licence or to significantly increase local drawdown (buffer zones). These principles are consistent with the Groundwater (Border Agreement) Act 1985.

Peake, Roby and Sherlock (GS5)

The Peake, Roby and Sherlock WAP outlines the circumstances which must be met for a trade between two locations within a groundwater SDL resource unit to be permitted. Section 6.2 of the Peake, Roby and Sherlock WAP outlines the principles for transfer. Permanent and temporary trade of water allocation is permitted between two locations within and between management zones, consistent with Table 5 of the Peake, Roby and Sherlock WAP (principle 14).

Transfer of water allocation is only permitted subject to allocation principles in section 5 of the Plan and principles 15-21. An exception applies under principle 22 where it can be demonstrated that the trade will not result in negative impacts on other users, the environment and the water resource.

The allocation principles and principles 17, 18, 19 aim to minimise the impact of taking water at a new location on other users, the environment and the water resource. Principle 15 requires that an allocation trade must not result
in the annual allocated volume (AAV) of any management area set out in Table 2 of the Peake, Roby and Sherlock WAP being exceeded.

The SDL volumes of 3.41 GL (unconfined) and 2.58 GL (confined) (5.99 GL in total) include the sum of the AAV for each management area (5.38 GL) plus additional unlicensed volumes for stock or domestic purposes.

As outlined in section 2 of this document, the unconfined aquifer is connected but can be subdivided into the Mallee Highland in the east and the Coastal Plain region in the west. The confined aquifer consists of both the Buccleuch Group and the underlying Renmark Group which are highly interconnected.

<table>
<thead>
<tr>
<th>Basin Plan requirement to be met</th>
<th>How requirement is met</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12.24(a): Sufficient hydraulic connectivity between two locations</strong></td>
<td>• The Murray Group Limestone aquifer is one continuous basin and is considered to be sufficiently connected (represented by the water budget within the Mallee Groundwater model, Barnett and Osei-bonsu (2006)) to allow for trade throughout the Mallee PWA. Groundwater management zone limits and rules have been put in place to protect intensive irrigation areas from excessive drawdowns and associated impacts to third parties and the aquifer.</td>
</tr>
</tbody>
</table>
| **12.24(b): Any resource condition limits in the SDL resource unit specified in a water resource plan will not be exceeded as a result of the trade** | • Annual Allowable Volumes (AAV) for management areas keep total water use in a management zone within sustainable limits, ensure that acceptable water levels are maintained and unacceptable impacts on underground water resources are prevented.  
• A trade will not be permitted if there is not a sufficient volume of water available within the AAV in the new location, i.e. an application may be refused in accordance with section 157(5)(a) of the NRM Act which provides that a decision of the Minister to grant or refuse approval for transfer of a water allocation must be consistent with the relevant WAP. This also covers matters outlined in section 5.4.5 and 5.4.6. |
| **12.24(c): Either:** | • Underground water allocations and licences in the Mallee (Murray Group Limestone) SDL resource unit (GS3) do not have timing characteristics, so the requirement to maintain such characteristics is not applicable. There are no provisions in the Mallee WAP that relate to timing of taking groundwater allocations. The Minister’s decision on the variation of the conditions of a water licence or allocation must not be seriously at variance with the relevant WAP (NRM Act section 149 (3)(a)(ii) and 156 (3)(a)(ii)), so a trade would not result in new conditions being placed relating to timing.  
• As water rights are bundled, the volume of water allocations is not subject to allocation announcements and the holder of a water licence is entitled to a water allocation equal to the relevant amount provided on the licence (Regulation 47(1)(c) of the Natural Resources Management (General) Regulations 2005).  
• Underground water allocations in the Mallee PWA have substantially similar characteristics of volume throughout the area. The allocation volume does not change as a result of trade (ie volume is always traded 1:1 with no conversion rates). If the proposed trade volume is higher than what would be approved under the WAP principles, the application would be refused. An amended trade application for a |
### Addressing Chapter 10 Requirements

**s10.37 Circumstances in which conditions in section 12.24 are met**

<table>
<thead>
<tr>
<th>Basin Plan requirement to be met</th>
<th>How requirement is met</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>smaller volume that meets the WAP principles may be considered instead.</td>
</tr>
</tbody>
</table>

**12.24(d): Measures are in place to address the impact, as a result of trade, on water availability in relation to a water access right held by a third party**

- The following principles of the Mallee WAP provide measures to address the impact on water availability in relation to a water access right held by a third party:
  1. Water allocation objectives and AAV limits set for management areas (Part 5 of WAP);
  2. Transfer objectives (Part 6 of WAP), i.e. to maintain an acceptable water level within the aquifer that enables reasonable access to water for all water users;
  3. Principles 40 and 41: These principles are intended to manage the potential for the transfer of water to interfere with the quality and quantity of water supply from wells endorsed as a source on a licence or to significantly increase local drawdown (buffer zones). These principles are consistent with the *Groundwater (Border Agreement) Act* 1985; and
  4. Principle 43: Accounting provisions aim to prevent the potential for water to be over-allocated from an originating management area during the term of a temporary transfer.

<table>
<thead>
<tr>
<th>Basin Plan requirement to be met</th>
<th>How requirement is met</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12.24(a): Sufficient hydraulic connectivity between two locations</strong></td>
<td>Both the unconfined aquifer and the confined aquifer are considered to be sufficiently connected to allow for trade to occur within each of the aquifers (Barnett, 2015). The Assessment of the Groundwater Resource Capacity of the Peake, Roby and Sherlock PWA (Barnett and Yan, 2008) outlines the modelling work which considered various extraction scenarios from wells in each of the aquifers. Groundwater management zone limits and rules have been put in place to protect aquifers from salinity impacts, excessive drawdowns and associated impacts to third parties and the aquifer.</td>
</tr>
<tr>
<td><strong>12.24(b): Any resource condition limits in the SDL resource unit specified in a water resource plan will not be exceeded as a result of the trade</strong></td>
<td>AAV for management areas keep total water use in a management zone within sustainable limits, ensure that acceptable water levels are maintained and unacceptable impacts on underground water resources are prevented. A trade will not be permitted if there is not a sufficient volume of water available within the AAV in the new location, i.e. an application may be refused in accordance with section 157(5)(a) of the NRM Act which provides that a decision of the Minister to grant or refuse approval for transfer of a water allocation must be consistent with the relevant WAP. This also covers matters outlined in section 5.4.5 and 5.4.6.</td>
</tr>
</tbody>
</table>

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### Table 18 Explanation of how requirements of section 12.24 of the Basin Plan are met for the Peake, Roby and Sherlock SDL resource unit (GS5) – confined and unconfined aquifer

<table>
<thead>
<tr>
<th>Basin Plan requirement to be met</th>
<th>How requirement is met</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12.24(a): Sufficient hydraulic connectivity between two locations</strong></td>
<td>Both the unconfined aquifer and the confined aquifer are considered to be sufficiently connected to allow for trade to occur within each of the aquifers (Barnett, 2015). The Assessment of the Groundwater Resource Capacity of the Peake, Roby and Sherlock PWA (Barnett and Yan, 2008) outlines the modelling work which considered various extraction scenarios from wells in each of the aquifers. Groundwater management zone limits and rules have been put in place to protect aquifers from salinity impacts, excessive drawdowns and associated impacts to third parties and the aquifer.</td>
</tr>
<tr>
<td><strong>12.24(b): Any resource condition limits in the SDL resource unit specified in a water resource plan will not be exceeded as a result of the trade</strong></td>
<td>AAV for management areas keep total water use in a management zone within sustainable limits, ensure that acceptable water levels are maintained and unacceptable impacts on underground water resources are prevented. A trade will not be permitted if there is not a sufficient volume of water available within the AAV in the new location, i.e. an application may be refused in accordance with section 157(5)(a) of the NRM Act which provides that a decision of the Minister to grant or refuse approval for transfer of a water allocation must be consistent with the relevant WAP. This also covers matters outlined in section 5.4.5 and 5.4.6.</td>
</tr>
</tbody>
</table>
10.38 **Circumstances in which conditions in section 12.25 are met**

### 5.8.3 Accredited Text

Trade is permitted between two groundwater SDL resource units in the Peake, Roby and Sherlock PWA. A trade may only be permitted between the Peake, Roby and Sherlock SDL resource unit (GSS) (confined) and Peake, Roby and Sherlock SDL resource unit (GSS) (unconfined) in the SA Murray Region WRP area if:

- the application is assessed to meet the requirements of the relevant section(s) of the NRM Act – section 149 (licence variation), section 150 (licence transfer), section 156 (allocation variation) and/or section 157 (allocation transfer); and
- the application is assessed to meet the requirements of the relevant WAP principles as follows:
  - a trade between two locations within the Peake, Roby and Sherlock (confined) (GSS) and the Peake, Roby and Sherlock (unconfined) (GSS) is permitted if all of the following principles in the Peake, Roby and Sherlock WAP are met: 14-22 (including table 5).
Among other things, these principles ensure that each relevant condition set out in Basin Plan section 12.25 will be met for a trade that is approved.

There is no trade allowed between groundwater SDL resource units in the Mallee (GS3).

### 5.8.3.1 Supporting Information

As discussed in section 5.8.2.1, licences in the SA Murray Region WRP area are bundled and their operation and the manner in which transfers are administered are outlined in that section.

The NRM Act sections and WAP principles referenced in section 5.8.3 set out the circumstances that need to be met for a groundwater trade to be permitted in both the confined and unconfined Peake, Roby and Sherlock SDL resource units. Not all of these sections and principles relate to the conditions set out in the Basin Plan section 12.25. Table 19 below outlines how each condition set out in section 12.25 of the Basin Plan will be met for a trade to be permitted.

Section 6.2 of the Peake, Roby and Sherlock WAP outlines the principles for transfer. Permanent and temporary trade of water allocation is permitted between two locations within and between management zones, consistent with Table 5 of the Peake, Roby and Sherlock WAP (principle 14). This includes between SDL resource units in some management zones. Management zone rules, current demand for irrigation water, and aquifer salinities make the likelihood of trade very low. To date, trade has only occurred with sale of a property. There has been no allocation trade to a new location.

Section 5.8.2.1 outlines how the transfer principles in the Peake, Roby and Sherlock WAP apply.

### Table 19  Explanation of how requirements of section 12.25 of the Basin Plan are met for the Peake, Roby and Sherlock SDL resource unit (GSS) – confined and unconfined aquifer

<table>
<thead>
<tr>
<th>Basin Plan requirement to be met</th>
<th>How requirement is met</th>
</tr>
</thead>
</table>
| **12.25(a): Sufficient hydraulic connectivity between two locations** | • There is sufficient hydraulic connectivity between the Peake, Roby and Sherlock confined and unconfined aquifers (refer to section 1.5 of the Peake, Roby and Sherlock WAP).  
• As there is sufficient connectivity between the two SDL resource units, trade is permitted. |
| **12.25(b): Any resource condition limits in the SDL resource unit specified in a water resource plan will not be exceeded as a result of the trade** | • AAV for management areas keep total water use in a management zone within sustainable limits, ensure that acceptable water levels are maintained and unacceptable impacts on underground water resources are prevented.  
• A trade will not be permitted if there is not a sufficient volume of water available within the AAV in the new location, i.e. an application may be refused in accordance with section 157(5)(a) of the NRM Act which provides that a decision of the Minister to grant or refuse approval for transfer of a water allocation must be consistent with the relevant WAP. This also covers matters outlined in section 5.4.5 and 5.4.6. |
| **12.25(c): Measures are in place to account for trade** | • A trade between management zones is accounted for by increasing the volume of water available within the AAV in the originating location and reducing the volume of water available within the AAV in the destination location. Accounting is required for the purposes of principle 15 of the WAP which requires that the transfer of water into any management zone shall not cause the AAVs to be exceeded. |
### Addressing Chapter 10 Requirements

s10.38 Circumstances in which conditions in section 12.25 are met

<table>
<thead>
<tr>
<th>Basin Plan requirement to be met</th>
<th>How requirement is met</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.25(d): Either:</td>
<td></td>
</tr>
<tr>
<td>(i) water access rights in the two locations have substantially similar characteristics of timing, reliability and volume; or (ii) measures are in place to ensure that the water access right to be traded will maintain its characteristics of timing, reliability and volume</td>
<td>- Underground water allocations and licences in the Peake, Roby and Sherlock (confined and unconfined) SDL resource unit (GS5) do not have timing characteristics, so the requirement to maintain such characteristics is not applicable. There are no provisions in the Peake, Roby and Sherlock WAP that relate to timing of taking groundwater allocations. The Minister’s decision on the variation of the conditions of a water licence or allocation must not be seriously at variance with the relevant WAP (NRM Act section 149 (3)(a)(ii) and 156 (3)(a)(iii)), so a trade would not result in new conditions being placed relating to timing.</td>
</tr>
<tr>
<td></td>
<td>- As water rights are bundled, the volume of water allocations is not subject to allocation announcements and the holder of a water licence is entitled to a water allocation equal to the relevant amount provided on the licence (Regulation 47(1)(c) of the Natural Resources Management (General) Regulations 2005).</td>
</tr>
<tr>
<td></td>
<td>- Underground water allocations in the Peake, Roby and Sherlock PWA have substantially similar characteristics of volume throughout the area. The allocation volume does not change as a result of trade (i.e., volume is always traded 1:1 with no conversion rates). If the proposed trade volume is higher than what would be approved under the WAP principles, the application would be refused. An amended trade application for a smaller volume that meets the WAP principles may be considered instead</td>
</tr>
</tbody>
</table>

| 12.25(e): Measures are in place to address the impact, as a result of trade, on water availability in relation to a water access right held by a third party | - The following principles of the Peake, Roby and Sherlock WAP provide measures to address the impact on water availability in relation to a water access right held by a third party: |
|                                  | a) Water allocation objectives and AAV limits set for management areas (Part 5 of WAP); |
|                                  | b) Transfer objectives (Part 6 of WAP), i.e., to ensure that the taking of underground water does not have the potential to detrimentally affect the ability of other persons to lawfully take from the underground water; |
|                                  | c) Principle 16: Accounting provisions aim to prevent the potential for water to be over-allocated from an originating management area during the term of a temporary transfer; and |
|                                  | d) Principle 17 relating to buffer zones. |
10.39 **Circumstances in which conditions in section 12.26 are met**

5.8.4 **Accredited Text**

Surface water within the SA Murray Region is not prescribed and cannot be traded under State law. Therefore, there are no circumstances where trade between a groundwater SDL resource unit and a surface water SDL resource unit is permitted in the SA Murray Region.

There are no circumstances where surface water and groundwater trade will occur between water resources in the SA Murray Region WRP area and water resources of other water resource plan areas.
5.9 Part 9 – Approaches to addressing risks to water resources

10.40 Definitions

5.9.1 Accredited Text

Not applicable

5.9.1.1 Supporting Information

Section 10.40 is a statement of fact and is therefore not assessed.

10.41 Risk identification and assessment methodology

5.9.2 Accredited Text – 10.41(1)

The preparation of the SA Murray Region WRP has had regard to current and future risks to the condition and continued availability of the water resources of the SA Murray Region WRP area.

5.9.2.1 Supporting Information

The risk assessment report identifies 352 potential risks. As set out in the risk assessment report in section 2.2 – Establishing context, and again in section 2.3.2 – Risk analysis, the time period over which risks are assessed and reported is the ten-year timeframe of a WRP.

As all the risks identified in the risk assessment process were assessed having regard to current and future risks, wherever the SA Murray Region WRP has regard to a risk identified by the risk assessment process, then regard is being had to current and future risks.

Regard has been had to ‘condition and continued availability’, in particular, in the risk assessment10, the risk statements have the following generic format:

‘There is the potential that [RISK SOURCE] leads to [EVENT] which results in [CONSEQUENCE]’

- where a risk source is an element which alone or in combination has the intrinsic potential to give rise to risk;
- an event is an occurrence or change of a particular set of circumstances; and
- a consequence is the outcome of an event affecting objectives and may be expressed quantitatively or qualitatively.

The risk identification used two classes of water resource events:

- Change in water quality – a change in the quality of the resource attributes outside the bounds of current known qualities. Water quality attributes may include salinity, sediment load, temperature, pH, pollutants, toxicants, nutrients and dissolved oxygen; and
- Change in water quantity – a change in the amount of water available (including the pattern or regime of availability over time), outside that currently available, including either an increase or decrease in the amount available.

These two classes are combined into a single event statement which was used for all risk statements. Consequently, all risk statements were of the form:

‘There is the potential that [RISK SOURCE] leads to a decline in water quality and/or availability of water which results in [CONSEQUENCE].’

10 As set out in the SA Murray Region Risk Assessment - section 2.3.1 – Risk Identification, and in accordance with definitions of AS/NZS ISO 31000:2009.
Consequently, the consideration of each risk included consideration of the condition and continued availability of the water resources.

Chapters 2 and 3 of the risk assessment report provide further information on the risk assessment methodology and the outcomes of the risk identification process.

Table 20 below sets out the specific instances where the SA Murray Region WRP has been prepared having regard to current and future risks to the condition and continued availability of the water resources of the WRP area. It does not provide full details of how regard has been had or the outcome of having regard, as these are provided in the relevant SA Murray Region WRP section.

Table 20    Where the WRP has had regard to risks

<table>
<thead>
<tr>
<th>Basin Plan section</th>
<th>SA Murray Region WRP section</th>
<th>Where regard to risks has been had</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.05 – Regard to other water resources</td>
<td>5.2.4 5.2.4.1</td>
<td>In having regard to other water resources, section 5.2.4 of the SA Murray Region WRP relies on the risk assessment’s consideration of risks related to connected water resources.</td>
</tr>
<tr>
<td>10.14 – Effects, and potential effects, on water resources of the water resource plan area</td>
<td>5.3.7</td>
<td>Section 5.3.7 of the SA Murray Region WRP considers whether the effects of the issues identified in the Basin Plan paragraphs 10.14(1)(a) and (b) occur or potentially occur. In doing so, it relies on the risk assessment’s consideration of risks related to each of the water resource connections, their significance and management as provided under SA Murray Region WRP section 5.2.4.1.</td>
</tr>
<tr>
<td>10.17 – Priority environmental assets and priority ecosystem functions</td>
<td>5.4.2</td>
<td>In having regard as to whether it is necessary for the SA Murray Region WRP to include rules which ensure that the operation of the plan does not compromise the meeting of environmental watering requirements of priority environmental assets and priority ecosystem functions, the SA Murray Region WRP relies on the risk assessment’s consideration of the risks to water-dependent ecosystems.</td>
</tr>
<tr>
<td>10.19 – Groundwater and surface water connections</td>
<td>5.4.4</td>
<td>In having regard as to whether it is necessary for the SA Murray Region WRP to include rules which ensure that, for groundwater that has a significant hydrological connection to surface water, the operation of the plan does not compromise the meeting of environmental watering requirements, the SA Murray Region WRP relies on the risk assessment’s consideration of the risks to water-dependent ecosystems in the Northern Mount Lofty Ranges and the Olary Ranges watercourses.</td>
</tr>
<tr>
<td>10.20 – Productive base of groundwater</td>
<td>5.4.5</td>
<td>In having regard as to whether it is necessary for the SA Murray Region WRP to include rules to manage the issues listed in the Basin Plan sections 10.20(1) and (2), the SA Murray Region WRP relies on the risk assessment’s consideration of the risks to groundwater resources.</td>
</tr>
<tr>
<td>10.21 – Environmental outcomes relating to groundwater</td>
<td>5.4.6</td>
<td>In having regard as to whether it is necessary for the SA Murray Region WRP to include rules to prevent elevated levels of salinity and other types of water quality degradation within a groundwater SDL resource unit, the SA Murray Region WRP relies upon the risk assessment process for the SA Murray Region which considered the potential for water quality degradation and increases in groundwater salinity.</td>
</tr>
<tr>
<td>Basin Plan section</td>
<td>SA Murray Region WRP section</td>
<td>Where regard to risks has been had</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>10.23 – Listing types of interception activity</td>
<td>5.5.1</td>
<td>The SA Murray Region WRP has been developed having regard to the risk identification and assessment conducted for section 10.41 of the Basin Plan, to specify whether there are any types of interception activity in the SA Murray Region WRP area which have the potential to have a significant impact on the water resources or hydrologically connected water resources (whether on an activity-by-activity basis or cumulatively). The risk assessment report has identified the following interception activities occurring within the SDL resource unit: runoff dams, commercial plantations and mining.</td>
</tr>
<tr>
<td>10.31 – Measures addressing risks arising from water quality degradation</td>
<td>5.7.3</td>
<td>In preparing section 5.7.3 of the SA Murray Region WRP, regard was had to the risk assessment, which identified risks arising from water quality degradation, as well as a number of current measures/strategies that are in place to mitigate or address the risks.</td>
</tr>
<tr>
<td>10.33 – WQM Plan to identify measures</td>
<td>5.7.7</td>
<td>The risk assessment process considered a two-part risk event, one part of which was water quality. In doing so, the risk assessment was undertaken having regard to the causes or likely causes of water quality degradation considered relevant to the SA Murray Region WRP area (refer to Appendix A of the risk assessment report).</td>
</tr>
<tr>
<td>10.41 – Risk identification and assessment methodology</td>
<td>5.9.2, 5.9.2.1, 5.9.3, 5.9.3.1, 5.9.4, 5.9.4.1, 5.9.5, 5.9.6, 5.9.7</td>
<td>In preparing the SA Murray Region WRP, regard was had to current and future risks to the condition and continued availability of the water resources of the WRP area initially through the risk assessment process as set out in the document: Risk Assessment for the SA Murray Region WRP area, and subsequently through incorporation of the outcomes of the assessment into the WRP, as set out in this table.</td>
</tr>
<tr>
<td>10.42 – Description of risks</td>
<td>5.9.10</td>
<td>In describing the risks in the manner required by the Basin Plan section 10.42, the SA Murray Region WRP has regard to those risks.</td>
</tr>
<tr>
<td>10.43 – Strategies for addressing risks</td>
<td>5.9.11</td>
<td>In describing strategies for addressing risks defined as having a medium or higher risk, the SA Murray Region WRP has regard to the two risks so defined.</td>
</tr>
<tr>
<td>10.51 – Measures in response to extreme events</td>
<td>5.13.1, 5.13.1.1</td>
<td>In describing measures in response to extreme events, the SA Murray Region WRP is informed by the risk assessment report which considers the risk of both climate extremes and water quality events as they relate to: critical human water needs; water-dependent ecosystems; economic use of water; and connected water resources.</td>
</tr>
<tr>
<td>10.53(f) – Risks to Indigenous values and uses from the use and management of water resources</td>
<td>5.14.1</td>
<td>In describing Aboriginal interest in water through directly representing Nations objectives and outcomes for the management of water on their Country, and through the commitment continue engaging meaningfully with SA MDBA Aboriginal Nations in all levels of water resource planning processes.</td>
</tr>
</tbody>
</table>
5.9.3  Accredited Text – 10.41(2)

Regard has been had to risks to the capacity to meet environmental watering requirements through the assessment of those risks with a consequence of ‘water-dependent ecosystems impacted’. A full list of those risks is provided in Appendix B of the risk assessment report.

Regard has been had to risks arising from the matters referred to in section 10.20(1) of the Basin Plan as follows. For the purpose of the risk assessment, the water resources of the SA Murray Region were divided into 11 sub-areas. Four of these are unconfined groundwater resources and four are confined groundwater resources. The risk sources considered for each sub-area included ‘demand within sub-area’ and ‘management of connected water resources’. The risk consequences included ‘connected water resources impacted’. There was expert hydrogeological input for both phase 1 and phase 2 assessment of these risks. The matters referred to in the Basin Plan sections 10.20(1)(a) (structural damage to an aquifer) and 10.20(1)(b) (maintenance of hydraulic relationships) were not considered to be significant contributors to risk due to the inherent nature of the groundwater system (aquifer depth, thickness and salinity) or because the risks are adequately managed through current management arrangements which include hydraulic modelling in prescribed wells areas (refer to 10.12.2).

Regard has been had to risks arising from potential interception activities through consideration of the risk source ‘demand within sub-area’ which includes demand supplied via interception activities. Potential future interception activities were included in the consideration due to the ten-year time period over which the assessment process assessed and reported risks.

Regard has been had to risks arising from elevated levels of salinity or other types of water quality degradation during the consideration of all risk statements, as each of the initial potential risk statements includes the event: ‘a decline in water quality and/or availability of water’.

5.9.3.1  Supporting Information

In the risk assessment report, Chapter 2 and Appendix A describe how risks have been identified.

Further details on the matters referred to in the Basin Plan section 10.20(1) are provided in section 5.4.5.

5.9.4  Accredited Text – 10.41(3)

(a)  The SA Murray Region WRP has been prepared having regard to the risks identified in the Basin Plan section 4.02. For the purposes of section 4.02, non-Aboriginal cultural risks are considered to have been included within the social considerations of the risk assessment.

The SA Murray Region WRP Risk Assessment does not explicitly evaluate risks to Aboriginal values and uses. However, where Aboriginal values and uses overlap with environmental values and uses, they have inherently been considered in that part of the risk assessment. It is widely acknowledged that some Aboriginal cultural values overlap with ecological values and this is reflected by the general support from the Ngarrindjeri Regional Authority (NRA) and First Peoples for the use of water allocation plans to manage the use of water to ensure potential risks to the water resources are minimised and water remains available for the environment. Management of the risks to environmental values will contribute to the management of risks to Aboriginal values and uses.

For those Aboriginal cultural values and uses outside those that are also environmental, further work has commenced, as outlined in section 5.14.2, to firstly articulate those values and uses in a culturally appropriate way; to assess the water flow and volume requirements; and then to assess the risk to those values and develop appropriate strategies to mitigate those risks.

(b)  Not applicable
5.9.4.1 Supporting Information

(a) The risks identified in s. 4.02 of the Basin Plan are:
   
   i. insufficient water available for the environment (risks to the capacity to meet environmental water requirements);
   
   ii. water being of a quality unsuitable for use (risks arising from elevated levels of salinity or other types of water quality degradation); and
   
   iii. poor health of water-dependent ecosystems.

Table 16 of the risk assessment report sets out categories of risk sources, the events and the risk consequences used to generate the initial 352 potential risks. For all risks, the event is ‘a change in water quality or a change in water quantity’. Risks (i) and (iii) are included in the assessment of those risks where the consequence is ‘water-dependent ecosystems impacted’. Due to the wording of the event statement, risk (ii) is considered as part of all risk statements.

(b) At the time of writing the MDBA has not published any guidelines pursuant to Basin Plan section 10.41(2)(b).

5.9.5 Accredited Text – 10.41(4)

The risk assessments process identified 352 potential risks. The phase 1 assessment and review of risk statements reduced this number to 43 risks for phase 2 assessment. In the risk assessment report, the 352 potential risks are set out in Appendix B, and the 43 phase 2 risks are set out in Appendix K.

5.9.6 Accredited Text – 10.41(5)

Appendix B of the risk assessment report provides the results of the phase 1 assessment, and Appendix K provides the results of the phase 2 assessment. The risk assessment methodology is set out in Chapter 2 of the risk assessment report. Appendix C-J demonstrates the assessment of each risk.

5.9.7 Accredited Text – 10.41(6)

Section 2.4.3 of the risk assessment report sets out how ‘low’, ‘medium’ and ‘high’ risk levels are assigned to risks.

5.9.8 Accredited Text – 10.41(7)

Chapter 2 of the risk assessment report (Risk Assessment Methodology) describes the data and methods used to identify and assess the risks.

5.9.9 Accredited Text – 10.41(8)

The risk assessment report describes the analysis of uncertainties in sections:

- 2.4.4 – Evaluation of uncertainty, and
- 4.2 – Risk uncertainty.

10.42 Description of risks

5.9.10 Accredited Text

The descriptions required by Basin Plan section 10.42 are provided as follows:

(a) Two risks have been defined in accordance with section 10.41(6) of the Basin Plan as having a medium or higher level of risk. These risks are set out in Table 21 below.
### Table 21  Risk assessed as having either a medium or high level of risk

<table>
<thead>
<tr>
<th>Sub-area</th>
<th>Risk ID</th>
<th>Risk Statement</th>
<th>Phase 2 Risk level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coorong surface water</td>
<td>r844</td>
<td>There is the potential for management of connected water resources to cause changes to inflows of water in turn leading to water quality changes impacting water-dependent ecosystems.</td>
<td>High</td>
</tr>
<tr>
<td>Coorong, Lower Lakes and River Murray unconfined groundwater</td>
<td>r700</td>
<td>There is the potential for climate extremes to cause increased evaporative discharge (and/ or reduced recharge) leading to an impact on groundwater level such that groundwater-dependent ecosystems are impacted.</td>
<td>Medium</td>
</tr>
</tbody>
</table>

(b) The factors that contribute to those risks are set out in the risk assessment report as follows:
- For risk r844, in Appendix J, Coorong Surface Water Sub-Area; and
- For risk r700, in Appendix G, Coorong, Lower Lakes, River Murray (unconfined groundwater) Sub-Area.

### 10.43 Strategies for addressing risks

#### 5.9.11 Accredited Text – 10.43(1)

The SA Murray Region WRP does not include measures to address risk r844 as the SA Murray Region WRP area does not contain any significant surface or groundwater systems that are connected to the Coorong, and consequently there are no opportunities to mitigate or manage the risk through the South Australian Murray Region WRP. The risk assessment process found that the high risk to the water-dependent ecosystems of the Coorong is being caused by the management of connected water resources, which include the entire southern connected Murray-Darling Basin. Consequently, treatment relies on full and timely delivery of the measures of the Basin Plan to deliver sufficient environmental water to reduce the risk to this Basin environmental asset. The LTWPs of each of the connected resources; coordination of appropriate decision making with upstream states, the SA River Murray WRP area and the Commonwealth Environmental Water Holder; and the implementation of effective monitoring and evaluation strategies are all critical to addressing this risk.

Risk r700 is also not addressed through the SA Murray Region WRP as there are no cost-effective strategies that can be put in place to manage or mitigate the impact of climate extremes on the unconfined groundwater in the Coorong, River Murray and Lower Lakes risk assessment sub-region. The location of the ecosystem (between the ocean and inland water bodies), and the fact the unconfined groundwater is recharged by local rainfall onto the dunes limits mitigation. Some mitigation of the risk is can be linked to the ability to maintain water levels in the River Murray and Lower Lakes to reduce impacts on the unconfined groundwater. This is a matter for the SA River Murray WRP and WRPs in the southern connected Murray-Darling Basin upstream of South Australia.

The above risks (r844 and r700) also pose a risk to NRA values and as such the management of the connected resources are of critical importance and interest. Further work through the Ngarrindjeri Yannarumi research project will assist in assessing and articulating cultural risks that are beyond the ecological risk outlined in the risk assessment and develop appropriate strategies to mitigate those risks.

#### 5.9.12 Accredited Text – 10.43(2)

This section does not apply to the SA Murray Region WRP area.

#### 5.9.12.1 Supporting Information

The SA Murray Region WRP does not include strategies to address risks r844 or r700.
5.9.13 Accredited Text – 10.43(3)

(a) The SA Murray Region WRP has been prepared having regard to the strategies listed in the Basin Plan section 4.03(3).

(b) Not applicable

5.9.13.1 Supporting Information

a) Table 22 below sets out how the SA Murray Region WRP has been prepared having regard to the strategies listed in the Basin Plan section 4.03(3).

b) At the time of writing, the MDBA has not published any guidelines in accordance with the Basin Plan section 4.04.

<table>
<thead>
<tr>
<th>Strategy listed in section 4.03(3) of the Basin Plan</th>
<th>How regard has been had</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) to implement the Basin Plan, including its following key elements:</td>
<td></td>
</tr>
<tr>
<td>(i) the environmental watering plan;</td>
<td>(i) This water resource plan provides for environmental watering to occur in a way that is consistent with the environmental watering plan as set out in the response to the Basin Plan section 10.26(1)(a)(i). Refer to section 5.6.1.</td>
</tr>
<tr>
<td>(ii) the water quality and salinity management plan;</td>
<td>(ii) The responses to the Basin Plan Chapter 10, Part 7 – Water quality objectives (refer 5.7.1 – 5.7.9) form the SA Murray Region WRP WQM Plan.</td>
</tr>
<tr>
<td>(iii) the water trading rules; and</td>
<td>(iii) The responses to the Basin Plan Chapter 10, Part 8 – Trade of water access rights (refer sections 5.8.2 – 5.8.4) support the water trading rules</td>
</tr>
<tr>
<td>(iv) water resource planning;</td>
<td>(iv) This document is the South Australian Murray Region Water Resource Plan and includes a wide range of water management strategies.</td>
</tr>
<tr>
<td>(b) to develop water resource plans and amendments to the Basin Plan based on best available knowledge and in consultation with relevant stakeholders;</td>
<td>The SA Murray Region WRP has been developed based on best available knowledge as set out in section 5.12.1.</td>
</tr>
<tr>
<td></td>
<td>The SA Murray Region WRP has been developed in consultation with relevant stakeholders as set out in section 5.2.6.</td>
</tr>
<tr>
<td>(c) to promote a risk-based approach to water resource planning and management;</td>
<td>The SA Murray Region WRP has been developed using a risk-based approach as described in section 5.9 (Approaches to addressing risks to water resources).</td>
</tr>
<tr>
<td>(d) to manage flows to optimise outcomes across the range of water uses in the Murray-Darling Basin;</td>
<td>The SA Murray Region WRP contributes to the management of the surface water limits for the South Australian Non-Prescribed Areas SDL resource unit (SS10) outlined in schedule 2 of the Basin Plan through the controls on take outlined in sections 5.3.1, 5.3.3 and 5.3.4.</td>
</tr>
<tr>
<td>Strategy listed in section 4.03(3) of the Basin Plan</td>
<td>How regard has been had</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>(e) to ensure effective monitoring and evaluation of the implementation of the Basin Plan;</td>
<td>This SA Murray Region WRP will ensure effective monitoring as set out in the responses to the Basin Plan Chapter 10, <em>Part 10—Measuring and monitoring</em> (refer section 5.10.3). This monitoring will enable South Australia to fulfil its reporting obligations under the Basin Plan section 13.14, including reporting on four core matters that require monitoring of water resources, namely:</td>
</tr>
<tr>
<td></td>
<td>• Matter 8 – The achievement of environmental outcomes at an asset scale;</td>
</tr>
<tr>
<td></td>
<td>• Matter 9 – The identification of environmental water and the monitoring of its use;</td>
</tr>
<tr>
<td></td>
<td>• Matter 12 – Progress towards the water quality targets; and</td>
</tr>
<tr>
<td></td>
<td>• Matter 19 – Compliance with WRPs.</td>
</tr>
<tr>
<td></td>
<td>Section 71 of the Water Act in combination with Schedule 12 of the Basin Plan provides a comprehensive set of requirements for the evaluation of the implementation of the Basin Plan. Consequently, it is not necessary for the SA Murray Region WRP to include additional evaluation and implementation provisions.</td>
</tr>
<tr>
<td>(f) to promote and enforce compliance with the Basin Plan and water resource plans;</td>
<td>The response to the Basin Plan section 10.04(2) (refer section 5.2.3) identifies instruments or texts that constitute the SA Murray Region WRP. Where a provision under Chapter 10 of the Basin Plan requires that a WRP impose an obligation on a person (including a body politic or corporate as well as an individual), then the SA Murray Region WRP has used instruments, which are legally enforceable under state law, to fulfil that requirement.</td>
</tr>
<tr>
<td>(g) to improve knowledge of water requirements within the Murray-Darling Basin, including the following: (i) environmental watering requirements;</td>
<td>(i) The response to the requirements of the Basin Plan Chapter 10, <em>Part 10—Measuring and monitoring</em> (refer section 5.10.3) provides for monitoring to support the evaluation and reporting of:</td>
</tr>
<tr>
<td></td>
<td>• Matter 8 – The achievement of environmental outcomes at an asset scale; and</td>
</tr>
<tr>
<td></td>
<td>• Matter 9 – The identification of environmental water and the monitoring of its use.</td>
</tr>
<tr>
<td></td>
<td>To the extent that water is sourced from within the SA Murray Region, over time these monitoring and evaluation processes will improve knowledge of environmental water requirements within the SA Murray Region WRP area.</td>
</tr>
</tbody>
</table>
### Addressing Chapter 10 Requirements

**s10.43 Strategies for addressing risks**

<table>
<thead>
<tr>
<th>Strategy listed in section 4.03(3) of the Basin Plan</th>
<th>How regard has been had</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ii) requirements relating to the social, spiritual and cultural uses of Basin water resources by Indigenous people;</td>
<td>(ii) The consultation with Aboriginal Nations set out in section 5.14.2 has improved the knowledge of water requirements relating to the social, spiritual and cultural uses of SA Murray Region water resources by Indigenous people;</td>
</tr>
<tr>
<td>(iii) the impact of climate change on water requirements;</td>
<td>(iii) The state level WAPs for the Mallee PWA and for the Peake, Roby and Sherlock PWA are reviewed on a ten-year cycle. The SA Murray Region WRP is also reviewed on a ten-year cycle. At that time, changes to the water resources, including changes due to climate change, are considered. Given this review process, it is not considered necessary to include additional measures to improve knowledge of water requirements in relation to climate change in the SA Murray Region WRP.</td>
</tr>
<tr>
<td>(iv) the water required to deliver social and economic benefits to Basin communities;</td>
<td>(iv) The process of developing regional NRM Plans and WAPs includes assessing the social, economic and environmental needs for water. Consideration is also given to the threats to the water resources. This assessment underpins the management principles in the plans.</td>
</tr>
</tbody>
</table>

**h)** **to improve knowledge of the impact on Basin water resources of the following:**

- (i) interception activities and land use change;
- (ii) floodplain harvesting and peri-urban and industrial take;
- (iii) climate change;

- (i) As there is no potential for significant impacts from interception or land use change identified, there is no requirement to improve knowledge of the impact of interception activities or land use change in the SA Murray Region WRP area. Refer to section 5.5.2.
- (ii) Flood plain harvesting does not occur in South Australia. There are no peri-urban areas within the SA Murray Region WRP area. Data on allocation and actual use includes purpose categories, including industrial use which would allow analysis of the impact of industrial take.
- (iii) In South Australia WAPs are reviewed at ten yearly intervals. This time frame allows monitoring data to be analysed for the impacts of climate change.

**i)** **to improve knowledge of:**

- (i) groundwater and surface water resources, including through improved measurement; and
- (i) The monitoring of ground water and surface water resources in the SA Murray Region WRP area is set out in section 5.10.3.
<table>
<thead>
<tr>
<th>Strategy listed in section 4.03(3) of the Basin Plan</th>
<th>How regard has been had</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ii) the causes of water quality degradation and the effects of water quality on environmental assets and ecosystem functions.</td>
<td>(ii) The key causes of water quality degradation in the SA Murray Region are discussed in section 5.7.2. Monitoring outlined in section 5.10.3 will assist in understanding impacts of water quality degradation should targets or thresholds be exceeded.</td>
</tr>
</tbody>
</table>
## 5.10 Part 10 – Measuring and monitoring

### 10.44 Information relating to measuring take—water access entitlements

#### 5.10.1 Accredited Text

Table 23  Long-term annual average take and method used to calculate for each class of water access right

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Class of water access right</th>
<th>Measured / not measured</th>
<th>Long-term Annual Average of Take 10.44(a) and 10.44(b) of the Basin Plan</th>
<th>Calculation – 10.44(c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Non-prescribed Surface Water (SS10)</td>
<td>General right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL; and The long-term annual average quantity of water taken that is not measured = 23.34 GL (21.22 x 1.1).</td>
<td>Method the same as for annual actual take; refer to section 5.3.8, Table 16</td>
</tr>
<tr>
<td>Mallee Pliocene Sands (GS3)</td>
<td>Basic Right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL; and The long-term annual average quantity of water taken that is not measured = 0 GL.</td>
<td>No take from this SDL resource unit</td>
</tr>
<tr>
<td>Mallee Murray Group Limestone (GS3)</td>
<td>Licence</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 35.56 GL.</td>
<td>Compilation of groundwater use data as reported in WAPs, Annual Water Use reports and the State Water Licensing system averaged over the 10-year period from 2005/06 to 2014/15</td>
</tr>
<tr>
<td>Mallee Murray Group Limestone (GS3)</td>
<td>Basic Right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is not measured = 2.25 GL.</td>
<td>Upper estimated value from the Mallee WAP (based on stocking rates and household domestic use estimate)</td>
</tr>
<tr>
<td>SDL Resource Unit</td>
<td>Class of water access right</td>
<td>Measured / not measured</td>
<td>Long-term Annual Average of Take 10.44(a) and 10.44(b) of the Basin Plan</td>
<td>Calculation – 10.44(c)</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------</td>
<td>-------------------------</td>
<td>-------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Mallee Renmark Group (GS3)</td>
<td>General Right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is not measured = 0.028 GL</td>
<td>Number of active wells in the Noora Groundwater Management Area x 2 ML</td>
</tr>
<tr>
<td></td>
<td>Authorisation</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL</td>
<td>No take from this SDL resource unit using this class of water right</td>
</tr>
<tr>
<td></td>
<td>Licence</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL</td>
<td>No take from this SDL resource unit</td>
</tr>
<tr>
<td></td>
<td>Basic Right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is not measured = 0 GL</td>
<td>No take from this SDL resource unit</td>
</tr>
<tr>
<td></td>
<td>Authorisation</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL</td>
<td>No take from this SDL resource unit</td>
</tr>
<tr>
<td></td>
<td>Licence</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 1.27 GL</td>
<td>Compilation of groundwater use data as reported in WAPs, Annual Water Use reports and the State Water Licensing system averaged over the 10-year period from 2005/06 to 2014/15</td>
</tr>
<tr>
<td></td>
<td>Basic Right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is not measured = 0.41 GL</td>
<td>Method the same as for annual actual take; refer to section 5.3.8, Table 16 (calculation used in WAP and for the BDL)</td>
</tr>
<tr>
<td></td>
<td>Authorisation</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL</td>
<td>No take from this SDL resource unit using this class of water right</td>
</tr>
<tr>
<td>Peake, Roby and Sherlock Confined (GS5)</td>
<td>Licence</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = &lt;0.001 GL</td>
<td>Compilation of groundwater use data as reported in WAPs, Annual Water Use reports and the State Water Licensing system</td>
</tr>
<tr>
<td></td>
<td>Basic Right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is not measured = 0.018 GL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Authorisation</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = &lt;0.001 GL</td>
<td></td>
</tr>
</tbody>
</table>
### Addressing Chapter 10 Requirements

**s10.44 Information relating to measuring take—water access entitlements**

<table>
<thead>
<tr>
<th>SDL Resource Unit</th>
<th>Class of water access right</th>
<th>Measured / not measured</th>
<th>Long-term Annual Average of Take 10.44(a) and 10.44(b) of the Basin Plan</th>
<th>Calculation – 10.44(c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconfined (GS5)</td>
<td>Basic Right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is not measured 0.19 GL.</td>
<td>Method the same as for annual actual take; refer to section 5.3.8, Table 16 (calculation used in WAP and for the BDL)</td>
</tr>
<tr>
<td></td>
<td>Authorisation</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL.</td>
<td>No take from this SDL resource unit using this class of water right</td>
</tr>
<tr>
<td></td>
<td>General Right</td>
<td>Not measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL; and The long-term annual average quantity of water taken that is not measured = 1.8 GL.</td>
<td>Method used as outlined in Attachment 2</td>
</tr>
<tr>
<td>SA Murray (GS6)</td>
<td>General Right</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 10.77 GL.</td>
<td>Long-term annual average take = average of take from all SIS schemes over the period 2011/12 – 2015/16 Note: This five-year period was considered most representative as the Pike and Murtho schemes started pumping in 2011/12 and 2014/15 respectively</td>
</tr>
<tr>
<td></td>
<td>General Right</td>
<td>Measured</td>
<td>The long-term annual average quantity of water taken that is measured = 0 GL.</td>
<td></td>
</tr>
</tbody>
</table>

For the purpose of 10.44(d) of the Basin Plan, at the time this WRP was submitted, the MDBA and Basin States were working through the implementation arrangements for standards relating to measuring. Once these arrangements have been settled, SA will consider whether this section of the SA Murray Region WRP needs amendment to reflect the agreed arrangements.
10.45  **Supporting measuring**

5.10.2  **Accredited Text**

All licensed take in the Mallee and Peake, Roby and Sherlock Prescribed Wells Areas is required to be metered. Licences are issued with a condition that a meter must be installed. The Natural Resources Management (Financial Provisions) Regulations 2005 under the NRM Act set out the rules associated with metering. The following parts of the instrument operates to ensure that meters are installed and the measurement of take is maintained:


Any special purpose authorisations issued are required to meter take.

The NRM Financial Provisions Regulations impose an obligation on the licence holder with regards to metering requirements.

There is no intention to change the standard to which water take is measured due to the existing high standards within the regulation identified above, unless deemed necessary through the agreed approach to the implementation of standards for measuring between the Commonwealth and Basin States.

There is no intention to measure unlicensed (basic or general rights) take in the SA Murray Region. The current estimates of take are considered fit-for-purpose based on the level of take and the low likelihood of widespread further development of the non-prescribed resources.

As all licensed take and special purpose authorisations are already required to be measured, no measures to improve the proportion of take that is measured have been included in the SA Murray Region WRP.

10.46  **Monitoring water resources**

5.10.3  **Accredited Text**

**Table 24  Relationship between monitoring of water resources and reporting under section 13.14 of the Basin Plan**

<table>
<thead>
<tr>
<th>Basin Plan Schedule 12 Matters to be reported on by Basin States</th>
<th>Monitoring of the water resources of the SA Murray Region to enable South Australia to fulfil its reporting obligations under section 13.14 of the Basin Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Matter 8:</strong> The achievement of environmental outcomes at an asset scale</td>
<td>Monitoring of the Coorong, Lower, Lakes and Murray Mouth (CLLMM) priority environmental asset is undertaken (at least annually) through the implementation of an adaptive condition monitoring program for the area. When intervention activities are undertaken in the CLLMM, specific intervention monitoring is undertaken. A salinity monitoring network provides critical information which directly links to the health of the Coorong. Generally, water quality parameters and biota such as wading birds, fish, aquatic vegetation and macro invertebrates are monitored, although this may not be on an annual basis. The Northern Mount Lofty Ranges PEA, identified in the Long-Term Watering Plan, may be monitored on an irregular basis. However, monitoring of the surface water is often not possible or not considered necessary due to the ephemeral nature of the water resource.</td>
</tr>
<tr>
<td><strong>Matter 9:</strong> The identification of environmental water and the monitoring of its use</td>
<td>There is no HEW in the SA Murray Region and therefore it is not applicable to identify available HEW or report the use of HEW. River Murray HEW which contributes to Coorong outcomes will be identified on a HEW register and outcomes documented as part of the annual environmental watering report.</td>
</tr>
</tbody>
</table>
### Basin Plan Schedule 12
### Matters to be reported on by Basin States

<table>
<thead>
<tr>
<th>Matters to be reported on by Basin States</th>
<th>Monitoring of the water resources of the SA Murray Region to enable South Australia to fulfil its reporting obligations under section 13.14 of the Basin Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flows in the Northern Mount Lofty Ranges are highly irregular and PEW is a result of the rules stated in section 5.3.2. Therefore, there are no relevant circumstances to monitor a volume of PEW in this area.</td>
<td>The monitoring of water, which once in the Coorong is considered PEW, is outlined for matter 8 reporting. In addition to this monitoring, the volume of water which flows over the barrages is monitored, as is the volume of water that flows from the South East drains into the South Lagoon of the Coorong.</td>
</tr>
<tr>
<td><strong>Matter 12:</strong> Progress towards the water quality targets in Chapter 9</td>
<td>Risk-based approaches to monitoring the water resources in the SA Murray Region are considered appropriate. Surface water monitoring is limited in most areas of the SA Murray Region WRP area due to the ephemeral nature of its waterways. There is currently no monitoring undertaken specific to water quality targets for water-dependent ecosystems (section 9.16) or recreational water (section 9.18). Targets for irrigation water do not apply in the SA Murray Region – refer to section 5.7.8.</td>
</tr>
<tr>
<td></td>
<td>Monitoring of the salt interception wells in the SA Salt Interception Schemes SDL resource unit (GS7) is undertaken on a regular basis (at least annually) consistent with the Basin Salinity Management Plan 2030 and as part of the State’s commitments under Schedule B of Schedule 1 in the Water Act 2007.</td>
</tr>
<tr>
<td></td>
<td>As outlined for Matter 8, there is a surface water salinity monitoring network throughout the Coorong as salinity is a well-defined and accepted indicator of risk to the health of the Coorong (Coorong salinity: South Lagoon salinity less than 100g/L).</td>
</tr>
<tr>
<td></td>
<td>A network of groundwater monitoring wells throughout the SA Murray Region forms part of the State’s baseline surveillance to inform long-term trends of the water resources.</td>
</tr>
<tr>
<td><strong>Matter 19:</strong> Compliance with water resource plans</td>
<td>All licensed take is measured (metered) as outlined in section 5.10.2 at least annually and recorded in the State’s water licensing database. Other monitoring, as outlined for matters 8 and 12, contributes to enabling South Australia to demonstrate compliance with water resources plans.</td>
</tr>
<tr>
<td><strong>All other matters in Schedule 12 on which Basin States are required to report (section 13.14)</strong></td>
<td>To the extent that monitoring undertaken for another matter in this table is relevant to fulfilling a reporting obligation in relation to any other matter in Schedule 12 (including another matter listed in this table), that monitoring may also be used by South Australia to fulfil reporting obligations in relation to other matters.</td>
</tr>
</tbody>
</table>

### 5.10.3.1 Supporting Information

The waters of the Coorong and Murray Mouth are not used for consumptive purposes but there are key water quality indicators to maintain the health of the ecology which require ongoing monitoring and reporting to ensure that the Basin plan and local management maintain the ecological character of the Ramsar site.

It is recognised that salinity is a well-defined and accepted indicator of risk to the health of the Coorong (Coorong salinity: South Lagoon salinity less than 100 g/L), and determines the quality of the habitat throughout the system (Higham, 2012) and, as such, a network of surface water salinity monitoring stations is positioned throughout the Coorong.
Nutrient values are emerging as an equivalent issue to salinity for indicating the health of the ecology of the Coorong; however, defining appropriate targets for the Coorong and the associated monitoring required is complex and is still under development (DEWNR, personal communications, 26 October 2017). Further work is currently underway defining the Ecological Character Description for 2015 in response to the 2006 Article 3.2 Notification of a Change in Ecological Character for the site.

Improved information regarding nutrient targets or, more accurately, upper limits, and recommended monitoring, is likely to evolve out of this work and other investigations presently underway.

Condition monitoring of the CLLMM is undertaken on a regular basis to inform the outcomes of environmental watering and whether additional intervention programs are necessary. The monitoring will inform a number of reporting functions including Ramsar, Living Murray and Basin Plan together with site management.

There are a number of networks monitoring the non-prescribed groundwater resources in the SAMDB NRM Region. These networks monitor the impacts of a number of different processes including:

- drainage beneath irrigated areas adjacent to the River Murray;
- increased recharge following the clearance of native vegetation;
- the groundwater level decline due to extractions from salt interception schemes (SIS); and
- the groundwater response to the pumping of SIS water into disposal basins.

Due to the high groundwater salinities within the non-prescribed areas, there is no significant irrigation. Consequently, monitoring the impacts of irrigation extractions only occurs in the prescribed areas.

Surface water monitoring is limited due to the ephemeral nature of the SA Murray Region. A flow monitoring station is located on the Burra Creek and monitoring of the Coorong occurs through various programs such as the Living Murray. The monitoring of the Coorong varies from year to year subject to funding and management arrangements at the time, i.e. barrages opened for a period or closed for an extended period.

Water meters are required in prescribed areas and meter readings for the water year must be made within a specified time of the end of the water year. Where a water meter fails for part of the year, the method discussed in sections 5.3.8 and 5.3.8.1 is used to calculate take. In addition to monitoring take, licence holders must submit a water sample from each active well on an annual basis for salinity testing.

Groundwater status reports are produced on a regular basis for the PWAs and can be accessed on the South Australian Government website: https://www.waterconnect.sa.gov.au

Monitoring of water affecting activity permits (dams, pumps on watercourses or wells) and development applications for the construction of new dams, along with proposed purpose and estimate of take, enable take by farm dams, pumps on watercourses and wells to be monitored, recorded and reported.

Groundwater monitoring throughout the SA Murray Region is undertaken on a regular basis as part of the baseline surveillance. A broader network may be monitored subject to project specific and operational needs. All data contributes to informing on the status of the water resources.

The monitoring included above provides adequate relevant information to inform any required Basin Plan reporting.
5.11 Part 11 – Reviews of water resource plans

10.47 Review of water resource plans

5.11.1 Accredited Text
If the SA Murray Region WRP (or a part of the Plan) is reviewed, the report of the review must be given to the MDBA within 30 days after the report is complete.

10.48 Amendment of water resource plan

5.11.2 Accredited Text
If the Government of South Australia proposes an amendment to the SA Murray Region WRP arising from a review, the South Australian Government must give the reasons to the Murray-Darling Basin Authority.
5.12  Part 12 – Information used to prepare water resource plan

10.49  Best available information

5.12.1  Accredited Text

The SA Murray Region WRP has been developed using the best available information to develop appropriate management policies and methodologies for the water resources within the region.

The level of technical and scientific information which underpins the SA Murray Region WRP is demonstrated through the following key documents which either form part of the WRP or are supporting information to the SA Murray Region WRP.

- Assessment for the groundwater resources in the non-prescribed areas of the South Australian Murray-Darling Basin (2015)
- The Water Allocation Plan for the Mallee Prescribed Wells Area (2017)
- Water Allocation Plan for the Peake, Roby and Sherlock Prescribed Wells Area (2017)

The above documents are underpinned by the documents identified in reference or bibliography sections (where provided) of these documents or in the case of the regional NRM plans, the main NRM Plan document.

In addition to scientific and technical documents, the SA Murray Region WRP has been materially influenced by various Acts, regulations, policies and internal procedures.

Complete references and additional sources of supporting information used for the SA Murray Region WRP are provided in section 6 of this document.

Aboriginal information to fulfil chapter 10, part 14 of the Basin Plan for the SA Murray Region WRP has been obtained from a range of sources including a review of literature and through a combination of workshops, meetings and on-country visits with Nations. Written sources of information that underpin Part 14 are also included in section 6 (bibliography) of this document.

5.12.1.1  Supporting Information

DEW has a long-running program of monitoring water resources, data analysis and publishing of results. In addition to published information, DEW also holds large amounts of water resource monitoring data in databases and GIS datasets (much of this is publicly available), has developed numerous models to provide scenario information, and employs technical experts who are leaders in their fields. This knowledge base guides the various plans and policies that form key components of the SA Murray Region WRP.
10.50  Methods used to develop water resource plan

5.12.2  Accredited Text

While no models have been specifically developed for Basin Plan purposes, a number of models exist that underpin key elements that form part of the SA Murray Region WRP.

The development of WAPs requires assessments of the water resource. For the purpose of determining the permissible annual volumes that can be sustainably taken in the Mallee and Peake, Roby and Sherlock PWAs, MODFLOW numerical groundwater models have been developed and used to model predictive scenarios to determine sustainable extraction limits. These are:

- Mallee Groundwater Model 2006
- Peake Groundwater Model 2008

Model reports describing the outcomes of the modelling have also been produced.

Groundwater flow models have been used extensively within the salt interception scheme areas to improve estimates of salinity impacts to the River Murray. These models help to improve the understanding of the aquifers and are used for broad-scale management of the salt interception schemes. Models include:

- Noora Groundwater Model 2007
- Lock 3 – Morgan Groundwater Model 2005
- Woolpunda Groundwater Model 2013
- Pike – Murtho Groundwater Model 2014
- Loxton – Bookpurnong Groundwater Model 2011
- Waikerie – Morgan Groundwater Model 2012

The methods used to determine annual permitted take and actual take for the SA Murray Region WRP area are outlined in sections 5.3.3 and 5.3.8 respectively.

The method used for identifying risks to the water resources of the SA Murray Region WRP area are identified in section 5.9.8.

5.12.2.1  Supporting Information

The methodology used to determine stock and domestic take during the development of the Mallee WAP is outlined in the document “Estimation of stock, domestic and other exempt purpose water consumption in the Mallee Prescribed Wells Area” (DWLBC, 2005). The method considered the take at a point in time and, given the variability, was provided as a range in the Mallee WAP. For the purpose of estimating the BDL, the upper limit of stock and domestic take was used as the estimate of take.
5.13 Part 13 – Extreme events

10.51 Measures in response to extreme events

5.13.1 Accredited Text

The water resources in the SA Murray Region will be managed in extreme dry periods consistent with the rules that apply to the various types of water access rights outlined in section 5.3.1 and the rules for take as outlined in section 5.3.4, Table 15. It is not considered necessary to manage the water resources during an extreme dry period in a different manner as:

- take from the confined aquifers within the prescribed wells areas is at an agreed rate of depletion (mining) of the water in the aquifer;
- groundwater in the confined aquifers is not influenced by extreme climatic events
- groundwater salinity levels outside of the prescribed wells areas, and in the unconfined aquifers of the prescribed wells areas, prevents extensive expansion of use during dry periods; and
- the surface water resources of the region are self-limiting in that if it is dry, the farm dams do not fill and watercourses do not flow and therefore take is limited to the water available.

It should be noted that the decisions on managing the Coorong and Murray Mouth may be different during an extreme dry period due to the connection with the Lower Lakes and River Murray. Decisions around management will depend on water availability, prevailing seasons and other potential issues that may be being experienced during the drought period.

As outlined in section 5.4.6, the developed aquifers are mostly confined and the likelihood of a water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values is very low.

However, in the highly unlikely event that alternative management is required in response to either an extreme dry period or an extreme water quality event, the following provisions apply:

NRM Act

- Sections 132(1) outline the triggers for the Minister to take action in case of inadequate supply or overuse of water;
- Sections 132(1) provide broad powers to reduce or prohibit take where necessary; and
- Sections 169(1)-(7) provides for the prohibition, restriction or regulation of water use.

These provisions also operate to protect critical human water needs, as defined by section 86A(2) of the Commonwealth Water Act 2007, should it be deemed necessary to reduce or prohibit use for other purposes.

During an extreme event when there is not sufficient water available to provide for critical human water needs, the water retailers such as SA Water would consider options for providing supply to customers. These options may include trucking in water from alternate sources to fill up tanks on site, providing bottled drinking water, or adding additional filtration or treatments to deal with contaminants.

There have been no suspensions of statutory water plans in South Australia. While the Minister may prohibit or reduce take of water in the circumstances outlined in sections 132(1), the suspension of a plan in its entirety is not provided for within the NRM Act. Therefore, there are no events that would result in the suspension of a statutory water management plan.
South Australia will consider whether water resources should be managed in a different way to the current arrangements under the SA Murray Region WRP if new reputable and robust scientific information suggests a change in the likelihood of the following types of events occurring (for example, due to climate change):

- an extreme dry period;
- a water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values; or
- any type of event that has resulted in the suspension of a statutory regional water plan in the past 50 years (including a transitional WRP or interim WRP).

This may result in a review consistent with section 5.11.1 of the SA Murray Region WRP and potentially an amendment consistent with section 5.11.2 to the SA Murray Region WRP.

5.13.1.1 Supporting Information

Consistent with the *Handbook for Practitioners; Water resource plan requirements*, extreme events in the SA Murray Region are considered to be: extreme dry periods that are outside of the range of experience contained in the 114-year historical climate base; or an extreme water quality event that results in water being acutely toxic or unable to be used for its established values and uses, i.e. critical human water needs, irrigation, industrial, recreation or environmental.

The risk assessment undertaken for the SA Murray Region considered the risk of both climate extremes and water quality events as they relate to critical human water needs; water-dependent ecosystems; economic use of water; and connected water resources. One medium risk associated with climate extremes was identified, and no high or medium events were identified for water quality. A number of low risks were identified for both climate extremes and water quality.

Extreme dry periods are unlikely to impact on take from the groundwater resources due to the nature of the resources. However, should an unforeseeable event occur, the NRM Act provides for appropriate management as discussed in section 5.13.1. In particular, section 169 of the NRM Act allows both short-term measures and longer-term measures to be undertaken in response to an event.

Surface water resources are already highly ephemeral and landholders have adapted to extended periods of low water availability.

Throughout the SA Murray Region WRP area, critical human water needs are met from a range of sources including:

- mains water (supplied to townships);
- rainwater;
- dams and watercourses; and
- wells (including windmills that extract groundwater).

Many people in the SA Murray Region WRP area are not connected to mains water. These people are holders of the various types of water access rights as identified in section 5.3.1 and are responsible for supplying their own water for critical human water needs. In the extreme events where there is no available water or water is not of a suitable quality, it is the responsibility of the individual to access water from alternative sources such as purchasing water and trucking water in from alternative sources. While the Minister has powers under section 132 of the NRM Act to restrict or prohibit take, for those reliant on surface water, the use of section 132 of the NRM Act is unlikely to increase the availability of water for critical human water needs.
Where water is supplied through a mains system to townships by a commercial water retailer (for example, SA Water and local councils), the retailer is bound by either the Water Retail Code – Major Retailers (applies to SA Water) or Water Retail Code – Minor and Intermediate Retailers (applies to all other water industry entities). Each of the codes states that retailers must use their best endeavours to provide a reliable supply of retail services to customers (sections 16.3 and 4.2 respectively). Water providers are also required under section 13 of the Safe Drinking Water Act 2011 to develop a risk management plan. The risk management plan must:

- identify the risks to the quality of the water and the risks that may be posed by the quality of the water;
- assess the risks;
- identify steps to be taken to manage those risks (including the development and implementation of preventative strategies);
- outline monitoring and testing requirements associated with the quality of the water; and
- detail incident identification, notification and response procedures.

Figure 8 below outlines an indicative flow chart on the process that is generally undertaken in an extreme event. Depending on the issue identified, some of the steps may operate concurrently or there may be additional steps such as additional consultation, meeting of cross-agency representatives to discuss the issue and additional briefings with the Minister.
Figure 8  Indicative flow chart for managing extreme dry periods or water quality events
5.14 Part 14 – Indigenous values and uses

Freshwater systems are considered the lifeblood of Country for Aboriginal people and are central to the unique cultures and identities of South Australia’s Aboriginal Nations. Aboriginal epistemologies are characterised by holistic conceptions of Country where water, the land and all living things are inextricably connected. Existing water resource management processes and instruments in South Australia largely fail to recognise the connectedness and special character of freshwater systems in Aboriginal culture or to recognise the interests of Aboriginal Nations to access and use water resources on their Country. The South Australian Government acknowledges that this lack of representation in water resource management is a result of the history of marginalisation and exclusion of Aboriginal people and seeks to build meaningful and effective partnerships with South Australia’s Aboriginal Nations to better represent their interests in the management of water resources to meet their customary rights and obligations to care for Country.

Water resource planning and management in the SA Murray Region is done through a variety of processes and instruments outlined in section 3. These processes and instruments create governance boundaries that are problematic for Aboriginal Nations. Each Nation’s traditional lands is divided among separate planning processes and instruments failing to recognise the interconnectedness that is core to Aboriginal worldviews. For Aboriginal Nations in the south-east of the SA Murray Region, the separation of the Coorong from the River Murray and exclusion of ground and surface water flow from the south east toward the Coorong create risks to the sustainable management of water resources and will require explicit consideration of connected water resources outside the SA Murray Region WRP area. Out of respect for these fundamental worldviews, South Australia is adopting an approach that encompasses the entire SA Murray-Darling Basin and the Country of those Aboriginal Nations within it. Therefore, part 14 of the SA Murray Region WRP refers to water resources management processes and instruments across the State’s three WRP areas and even beyond on parts of Country of Aboriginal Nations that are outside of the Murray-Darling Basin.

The South Australian Government engages with the Aboriginal Nations in the SA Murray Region through various mechanisms based on the needs, interests and capacity of each Nation. Engagement in water resource planning and management is well-progressed for those Nations closely associated with Murrundi (the River Murray) given the significant Commonwealth and State investment in restoring environmental flows to the River as well as the profound cultural significance of Murrundi to the River Nations, which include the First Peoples language groups, Peramangk, Nganguruku, and Ngarrindjeri. For those Nations that are not so closely associated with Murrundi, their engagement, and representation of their interests, in water resource planning and management varies and, in some cases, has been non-existent until now.

SA Murray Region Aboriginal Nations were engaged in the development of this WRP primarily to identify their objectives and outcomes for water resource management in the SA Murray Region. The State has regard to the values and uses of SA Murray Region Aboriginal Nations to varying degrees in all levels of water resource planning processes and instruments based on the needs and interests of the Nations and their previous opportunities to engage in water resource management (i.e. heavily associated with Murrundi management).

Having full and proper regard to Aboriginal values and uses and more precisely, representing Aboriginal water interests in SA water resource planning, is an iterative process that will require investment in Aboriginal Nation capacity over time, beyond the development of WRPs under the Basin Plan. The intent of the SA Murray Region WRP is to have regard to Aboriginal values and uses by committing to continued meaningful engagement with

11 As defined under the Basin Plan, the Coorong is included in the SA Murray Region WRP area while the River Murray (and lower lakes) are included in the SA River Murray WRP area. Groundwater below the River Murray is not included in the SA River Murray WRP area, but rather in the SA Murray Region WRP area.

12 For the purpose of the SA Murray Region WRP the term ‘Aboriginal Water Interests’ is used to describe native title rights and interests or other uses of water that are currently permitted under the NRM Act. It also includes aspirations to other legal interests in water that are not currently permitted under existing law including to the “cultural flow” as a separate and distinct entitlement. The term also describes the outcomes and objectives to the use and management of water that accords with the social, cultural and spiritual values of Aboriginal people as expressed by them.
Aboriginal Nations in the development, review and implementation of the State’s water resource management processes and instruments.

The South Australian Department for Environment and Water (DEW) has established the SA Murray Lower Darling Rivers Indigenous Nations (MLDRIN) – DEW Working Group to provide advice on engagement in the development of the SA Murray Region WRP. The Working Group consists of the five South Australian delegates of MLDRIN. High-level engagement was also done through three joint-Nations workshops that were attended by all relevant Nations within the SA Murray Region. Engagement with individual Nations was then tailored to the specific needs, interests and capacity of each Nation. For those Nations with little previous engagement in water resource management, the engagement processes focussed on building knowledge and capacity to engage in water resource management. Engagement outcomes were far more progressed for Nations that have had significant experience in water resource management, particularly the River Nations.

The term “Aboriginal” is used throughout the SA Murray Region WRP instead of “Indigenous” as endorsed by the former SA Aboriginal State-wide Advisory Committee. “Aboriginal Nations” is also used throughout the report and is defined in the SA Murray Region WRP as a group or community of Aboriginal people who identify as descendants of the original inhabitants of the plan area and may share a single common territory, or it may be located as a Nation within another larger Nation. This recognises the members of the Nation as holding the authority and responsibility with respect to Aboriginal culture and heritage.

### 10.52 Objectives and outcomes based on Indigenous values and uses

#### 5.14.1 Accredited Text

Through the consultation undertaken, as outlined in section 5.14.2, the SA Murray Region Aboriginal Nations have identified the following objectives for management of water on their Country:

- To see our lands and waters healthy
- To maintain our cultural connections between Nations and to the lands and waters and all living things
- To achieve a just settlement of our a priori Aboriginal rights to water resources
- To achieve the social and economic outcomes and wellbeing desired by the Nation
- To establish and maintain strong and productive relationships and partnerships built on mutual respect and agreement-making
- To secure long-term support and resources for Aboriginal Nations to engage and take a major role in water resource management, development and implementation
- To expand Aboriginal decision-making jurisdictions through greater control and decision-making authority over water resources
- To have our own Nation-based plans that identify our priorities and long-term strategies relating to Country, including water resource management
- To ensure Aboriginal water interests are equitably recognised with those of other stakeholders in water resources plans, research and policy
- To build professional and culturally appropriate skills and capacity of our people and our organisations in caring for Country, including water resource management.

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13 The Aboriginal Nation may include the native title holder or claimant body. All decisions and consultation about native title matters that impact on the WRP must be done with the native title body. An Indigenous Land Use Agreement (ILUA) may provide that the native title holder or claimant is acknowledged as representing the Nation on all matters dealt within the ILUA over all land and water within the ILUA area. Otherwise the representative body of the Nation will be a body that demonstrates that it represents the members of the Nation that hold the authority and responsibility with respect to Aboriginal culture and heritage for the specified area. This recognises the members of the Nation as holding the authority and responsibility with respect to Aboriginal culture and heritage.
SA Murray Region Aboriginal Nations have identified the following desired outcomes from management of water on their Country:

- Availability and flow of water of appropriate quantity and quality is returned to our water sources to support Aboriginal culture, economy and wellbeing
- Legal recognition of Aboriginal Nations’ sovereign water rights
- Nations owning water entitlements for cultural, spiritual and economic use
- Increased number of Aboriginal owned enterprises that utilise or manage water resources are established
- Increased numbers of Aboriginal people employed in the caring for Country sector, including water resources management
- Nations own the water allocation to wetlands of cultural significance on their Country
- WRPs and planning processes, including for natural resources management, water allocation, environmental water management, and wetland and floodplain management recognise Aboriginal Nations’ cultural values and worldviews
- Agreements are established between Aboriginal Nations and water planning authorities to guide engagement, outline Aboriginal Nation priorities and partnership activities
- Future legislative reforms better recognise and promote Aboriginal interests, including the social, spiritual and economic benefits associated with water resource management
- Aboriginal Nations’ Cultural Knowledge and Intellectual Property recognised and protected in water resource management and planning
- Aboriginal Nations are represented and their members are participating on governance structures relating to water management and planning on their Country
- Nation-based caring for Country programs established and their core operating capacity funded to engage in water planning and management
- Regional Natural Resources Management and key Water Resource business plans investing in Aboriginal Nation engagement in water resource planning and management
- Increased number of Aboriginal Nation-led water resource projects that support Nation-led planning and management
- The contribution of Aboriginal Nations to caring for Country, including water resources management, is valued
- Aboriginal rangers and associated training programs are engaged in on-ground water management and planning activities
- The Aboriginal cultural heritage values and sacred water sites are protected and enhanced in the planning and implementation of water resource management activities.

South Australia has regard to Aboriginal values and uses for water resources throughout all levels of water resource planning processes and instruments. South Australia recognises that, given the long history of marginalisation of Aboriginal people and their effective exclusion from engaging in the State’s water resource planning processes and instruments, properly representing Aboriginal interests in water resource planning is an iterative process that requires investment over time.

South Australia will continue to engage meaningfully with SA MDB Aboriginal Nations in all levels of water resource planning processes and in the development, review and amendment of all water resource planning instruments, according to the following engagement principles:

1. Water planning processes and instruments will consider and promote the spiritual, cultural, environmental, social and economic benefits of sustainable water management to Aboriginal Nations in the SA Murray Region.
2. Water entitlements that are legally and beneficially owned by Aboriginal Nations in the SA Murray Region will be pursued by considering the existing and future demand for water to improve the spiritual, cultural, natural, environmental, social and economic conditions of those Nations and, where water resources are not yet fully allocated, consider mechanisms to allocate water for these purposes. Where water resources are fully allocated, mechanisms to assist Aboriginal Nations to acquire water rights will be explored. It is imperative that existing water rights are respected in this process.

3. Engagement opportunities will be prioritised by Nations based on their needs, interests and capacity as well as the State’s resources available to facilitate the engagement.

4. Engagement processes will be designed to build capacity within Nations to input meaningfully in water planning in the future.

5. Engagement processes will give effect to the Objectives and desired Outcomes of Aboriginal Nations, wherever possible.

6. South Australia will establish Cultural Knowledge agreements with each Aboriginal Nation to recognise the ownership of the cultural knowledge and protect its use by the State, particularly in public documents.

These principles will be upheld when the South Australian Government engages Aboriginal Nations in:

1. development and review of Long-Term Watering Plans;

2. development and review of WAPs;

3. development and review of water affecting activity policies in regional NRM Plans;

4. setting annual environmental watering priorities;

5. development and review of wetland management plans;

6. development and review of The Living Murray Icon Site Management Plans and Ramsar Management Plans; and

7. development and review of operations plans for regulators, weirs, barrages and all water management infrastructure.

5.14.1.1 Supporting Information

For the purposes of engagement principle 3 listed in section 5.14.1, the “State’s resources available to facilitate the engagement” is meant to include the available resources and capacity both within DEW and the regional NRM Boards to facilitate engagement.

The SA MLDRIN / DEW Working Group or similar will be maintained beyond the development of South Australia’s three WRPs to provide oversight of Nation engagement and advice on policy development relating to Aboriginal water interests articulated above.

Several SA MDB Aboriginal Nations restrict the sharing of the cultural knowledge of Aboriginal values and uses of their water resources. Therefore, very little information on actual Aboriginal values and uses are provided here except for non-specific examples. Instead, examples are provided where Aboriginal values and uses for water are given regard in the State’s water resource planning processes and instruments, and identify the engagement processes that have resulted in those outcomes.

Having regard to Ngarrindjeri values and uses.

The NRA, comprising a range of member organisations including the Mannum Aboriginal Community Association Incorporated (MACAI), is a leading Nation-based organisation in South Australia’s Murray-Darling Basin in relation to water resource management. Intensive engagement between NRA and South Australia during the Murray Futures program has generated a range of innovative engagement approaches that have influenced South Australia’s approach to Aboriginal engagement in WRP development. The importance of this work and the
Addressing Chapter 10 Requirements
s10.52 Objectives and outcomes based on Indigenous values and uses

innovation created was recognised, when the NRA, in partnership with DEW, won the 2015 Australian Riverprize\textsuperscript{14}. http://riverfoundation.org.au/our-programs/riverprize/australasian-riverprize/

The innovative elements include the use of Cultural Knowledge agreements, country-based planning approaches and integration of Aboriginal wellbeing and cultural values into water resource risk assessment. The breadth of Ngarrindjeri input into natural resources management and planning and the engagement approaches used to develop these have also informed the WRP engagement approach.

This engagement has continued as part of monthly Ngarrindjeri Water Resource Planning Statement of Commitment (SOC) Working Group meetings.

DEW and the NRA have established a Ngarrindjeri Yarluwar-Ruwe section of the CLLMM Site Operations Manual. This is an online catalogue that supports the retrieval of information relating to the management of the CLLMM site. The inclusion of Ngarrindjeri-related engagement protocols, agreements, plans, strategies and position papers aims to support improved and consistent engagement between site managers and Ngarrindjeri. Search for ‘Ngarrindjeri’ using the portal here:


A range of Ngarrindjeri engagement protocols have also been made available to other Aboriginal Nations via DEW’s website.

Ngarrindjeri engagement in Murray Futures

In 2009, the NRA and the SA Government entered into the Kungun Ngarrindjeri Yunnan Agreement\textsuperscript{15} (KNYA), meaning ‘listening to Ngarrindjeri people speaking’. The KNYA established a consultation and negotiation framework between the parties regarding natural resource and cultural heritage management.

The KNYA established and funded a joint taskforce that created a formal context for the NRA to negotiate with the SA Government regarding programs on Ngarrindjeri Ruwe/Ruwar (country/body/spirit). The Agreement recognises Ngarrindjeri traditional ownership and the NRA as the Ngarrindjeri peak body. It also includes consultation mechanisms related to the management of natural resources (including water); and an agreement to negotiate on key, long-held Ngarrindjeri objectives, such as hand-back of the Coorong National Park.

The KNYA underpins Ngarrindjeri engagement in key SA Government water resource management initiatives, including the Murray Futures program, Riverine Recovery Project (RRP) and Coorong, Lower Lakes and Murray Mouth (CLLMM) Recovery Project.

The project design for both the RRP and CLLMM Recovery Project was negotiated to reflect Ngarrindjeri objectives, in particular to take a leading role in caring for Ngarrindjeri. Both the CLLMM Recovery Project and RRP were/are focussed on building Ngarrindjeri capacity, skills and experience in integrated river management, and influencing State Government policy arrangements regarding the integration of Aboriginal interests.

DEW and NRA collaborated to develop an engagement strategy for both the RRP and CLLMM Recovery Project, aligning where possible to implement the Ngarrindjeri Yarluwar-Ruwe (NYR) Plan. The six-year partnership has been delivering high-level Ngarrindjeri engagement in River Murray wetland management planning, including the


Coorong and Lakes Alexandrina and Albert Ramsar site Ecological Character Description (in preparation). It has supported the establishment of an engagement framework to support Ngarrindjeri input into Basin Plan implementation in SA. It has also facilitated the development of the Aboriginal-led wetland management plan for the Sugar Shack Wetland Complex under the RRP. Twelve other River Murray wetland management plans were also reviewed to reflect Ngarrindjeri, Ngunguraku and Ngaiyang values and uses at those sites.

These projects have built significant experience and capability within the NRA and its NYR Program. It has also clearly identified the breadth of NRM engagement initiatives underway in the Ngarrindjeri Nation and documented a clear engagement framework for future Ngarrindjeri partnership.

RRP and CLLMM engagements have been framed by project specific Statements of Commitment (SOCs) and associated Cultural Knowledge Agreements. The SOCs acknowledge Ngarrindjeri traditional ownership, and include engagement frameworks that reflect the interests of both parties and joint activities to support Ngarrindjeri engagement. These have generally enabled the sharing and integration of Ngarrindjeri interests (connection, history, worldviews, values and contemporary matters) into water resource and broader natural resource management and planning.

Emerging SA Government projects funded under the CLLMM Recovery Project have also allocated resources to support Ngarrindjeri engagement. These include development of a Lower Lakes and Barrage operating policy (for the Coorong and Murray Mouth) and the update to the CLLMM Ramsar Management Plan. Both projects hold significant potential to have regard to Ngarrindjeri interests.

Ngarrindjeri are also engaged in the Variable Lower Lakes and South East Flows Restoration Project (SEFRP). The projects will develop a Barrage Operating Strategy and an Operation Plan for the South East drainage network to deliver water to manage the environmental and cultural health of the Coorong.

The Ngarrindjeri (and First Peoples of the River Murray and Mallee) were involved in reviewing and providing input into the development of the Long Term Environmental Watering Plan (LTWP) for the SA River Murray WRP area. The plan recognises the importance of incorporating Aboriginal values and uses in the development of environmental water plans and outlines the management consideration of Aboriginal values to be taken into account in future annual and long-term planning and decision-making.

The long-term partnerships between SA Government and NRA provided the NRA with the capacity and experience to engage the Commonwealth Environmental Water Holder (CEWH) and develop the NRA and CEWH Water Delivery Agreement, 2015. DEW is working with the NRA to discuss the implementation of the Agreement, provision of technical support and further partnership opportunities.

Ngarrindjeri Speaking as Country Deed, 2014

In 2014 the NRA and DEW entered into the Ngarrindjeri Speaking as Country Deed in relation to the registered ‘Meeting of the Waters’ heritage site. The Agreement was negotiated as part of Ngarrindjeri engagement in dredging of the Murray Mouth.

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The Deed seeks to promote the importance of an open Murray Mouth, and for the parties to work together to align end-of-system flow objectives with the maintenance of the cultural health of the registered ‘Meeting of the Waters’ heritage site. The Deed has enabled a broadened understanding of the ‘Meeting of the Waters’ site and strategies to maintain its cultural health beyond conventional cultural heritage management. This has been reflected in a range of on-ground Caring for Country actions to manage the site during dredging operations. A works agreement between DEW and the NRA is currently being negotiated.

Having regard to First Peoples’ values and uses.

First Peoples’ NRM working group establishment

In 2013, the River Murray and Mallee Aboriginal Corporation (RMMAC) and DEW established the First Peoples’ NRM working group. The group was set up to facilitate greater collaboration with and participation of First Peoples in cultural and natural resource management and planning activities within the First Peoples’ Native Title boundary. The group is an advisory and engagement body, with formal decision-making resting with the RMMAC Directors. The establishment of the group aligned well with RMMAC’s Strategic Plan for 2013-16.

The working group supports regular and clear information exchange between First Peoples and DEW staff with proper consideration being given to First Peoples’ cultural heritage and NRM matters. The group has been critical to First Peoples’ intensive engagement in RRP and the South Australian Riverland Floodplains Integrated Infrastructure Program (SARFIIP) and now coordinates all First Peoples’ engagement in NRM planning and projects. In partnership with RMMAC, DEW has recruited a First Peoples’ Coordinator in 2014 to facilitate the working group meetings, and on-Country tours and workshops with the broader First Peoples’ community. DEW has also supported RMMAC to build their corporate capacity and the water resource planning capacity of the community by engaging the First Peoples’ Water Coordinator to coordinate First Peoples’ engagement in water resource planning processes and instruments and the development of the SA Murray Region WRP.

Coupled with planning sessions, on-Country tours and research partnerships, First Peoples’ NRM working group members have had the opportunity to build knowledge and experience in water resources management. Having reviewed the RRP Wetland Management Plans (WMP) in 2013, First Peoples have now requested a second review process where they aim to influence wetland management by integrating cultural objectives and associated targets into the WMPs and to further that work in the Operations Plans of the Chowilla, Pike and Katarapko floodplain where newly built and planned infrastructure can help to achieve First Peoples’ cultural objectives on those floodplains.

First Peoples use of the Aboriginal Waterways Assessment tool

In September 2015, DEW entered into a funding agreement with the MDBA to use the Aboriginal Waterways Assessment (AWA) tool with one of SA’s Aboriginal Nations; First Peoples. The AWA tool is a tool for Aboriginal communities to measure the health of rivers and wetlands. The AWA measures a site’s cultural significance and current use of the place and builds capacity among Aboriginal communities to input into water resource planning.

The First Peoples’ NRM Working Group identified six sites to roll out the AWA tool: Putjeda Creek, Eckert’s Creek (Katarapko), Spectacle Lakes, Gurra, Pilby wetland Complex and Disher’s Creek.

The initial workshop conducted at Eckert’s Creek was used as a trial of how the assessment process worked. The objective of the AWA process was explained to First Peoples and then the worksheets were completed by each participant. During this workshop, participants commented that although the tool was helpful, there were some difficulties associated with understanding and completing sections of the form. Based on these comments, the AWA form was modified to make it more relevant to First Peoples. The structure of the assessment process (in the field) was also modified following the first workshop to give participants more time to “get a feel” for the site and reflect on its significance. Time was allocated to allow participants to share stories about the site which enabled younger participants to learn about the site’s cultural significance from older members.

Following these modifications, the modified AWA tool was rolled out at the remaining sites with the exception of Spectacle Lakes. The visit to Spectacle Lakes was cancelled at the last minute due to extreme fire danger. However, 20

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participants decided to use the time to engage in the review of the WMP that First Peoples have previously had input into. This provided an opportunity to identify how the values and uses identified in the AWA process could be incorporated into the WMPs that First Peoples have already had input into.

A key outcome of the First Peoples’ use of the AWA was the clear identification of the contemporary cultural value of Putjeda Creek near Gerard Community, which helped to build an argument to direct $130,000 of investment through First Peoples’ engagement in the RRP. The funding will be used to undertake planning and works to restore flow to the creek to restore its cultural and ecological health.

**Having regard to Peramangk and Nganguraku values and uses.**

**Sugar Shack Wetland Complex Management Plan**

The Sugar Shack wetland complex is a floodplain complex of wetlands and anabranch creeks located on the lower River Murray, immediately upstream of Swan Reach. The complex includes 10 km of river frontage and consists of a series of 13 wetlands owned and managed by the MACAI (a founding NRA member) and the Sugar Shack Aboriginal Corporation (with support from the NRA). In mid-2013, the NRA and MACAI made the decision to nominate additional wetlands of the Sugar Shack complex for further on-ground works under the RRP.

A previous WMP written in 2006 existed for Sugar Shack wetland #10. However, in partnership with DEW, the NRA hosted an out-posted DEW wetland ecologist to work with MACAI and together develop a WMP for the entire Sugar Shack complex. The plan incorporates western scientific knowledge and begins the process that values Cultural Knowledge, Ngarrindjeri/Nganguraku aspirations and a Ngarrindjeri/Nganguraku understanding of the relationship between healthy lands and waters and all living things in the long-term management of this significant wetland complex.

One of the key objectives of the plan is to return flow conditions to the complex to as close as possible to those experienced by the ancestors who lived along the wetlands and depended on them for their livelihoods.

While the plan still reflects a non-indigenous perspective, the intention is that as the Ngarrindjeri organisations, MACAI and Sugar Shack Aboriginal Corporation develop more experience with wetland planning and a healthier future for the Sugar Shack complex, the WMP will become increasingly Ngarrindjeri/Nganguraku focused.

In partnership with DEW, MACAI also undertakes monitoring activities of the Sugar Shack complex with community members. Monitoring includes fish, frog and tree health and water quality. Turtle monitoring is being undertaken by MACAI to investigate a drop in turtle numbers due to foxes and other factors. As part of developing the Ngarrindjeri Yannarumi assessment, MACAI and NRA are also incorporating the monitoring of specific cultural health indicators as part of the ongoing cultural health assessment of Murrundi.

**Having regard to Tanganekald, Meintangk and Bunganditj values and uses.**

The South East Clan Groups (members of the Tanganekald, Meintangk and Bunganditj language groups) are engaged in natural resource management and planning through the South East Aboriginal Focus Group (SEAFG), an Aboriginal advisory group to the Natural Resources South East (NR SE) Management Board. The group engages through a Memorandum of Understanding with the Board and has developed the Lartara-wirkeri cultural governance framework for how they operate as a Focus Group and with other Aboriginal organisations in the South East.

SEAFG engagement in water resource planning in the NR SE has centred on the cultural valuation of wetlands in the [Lower Limestone Coast Water Allocation Plan](http://www.naturalresources.sa.gov.au/files/sharedassets/south_east/water/llc-wap-amended-20nov2015-no-appendices.pdf). In this process, management areas with wetlands identified as having been used for a food source or for a waterway within living memory and /or wetlands that have creation stories associated with them were identified as having cultural significance and an associated cultural score for the risk assessment. More recently, the SEAFG have input into the review process for the Tatiara WAP that is currently being drafted. As WAPs and other water resource management instruments come up for review, the SEAFG will be
engaged in the process and their previous input, as well as that of other Nations, will be used as a basis for that engagement.

The SEAFG (along with Ngarrindjeri) are currently engaged in the South East Flows Restoration Project (SEFRP) through the delivery of Aboriginal heritage surveys of the designs and the associated monitoring of on-ground works and in the development of an Operation Plan for the South East drainage network and its flows into the Coorong. The SEFRP is supporting a part-time position in the Burrundies Aboriginal Corporation to coordinate SEAFG engagement in the SEFRP.

**Having regard to Ngadjuri values and uses.**

Ngadjuri have had very little engagement in water resource management and planning on their Country. Engagement in the development of the SA Murray Region WRP included Ngadjuri participation in an Aboriginal Waterways Assessment with DEW and Natural Resources Adelaide, Mount Lofty Ranges (NR AMLR) staff. That engagement process has built awareness and capacity for Ngadjuri to engage more meaningfully in water resource planning and management into the future, for example with the engagement workshops in the review and amendment of the Barossa and Eastern Mount Lofty Ranges WAPs planned and underway (due for completion in December 2017). The engagement process has been developed in consultation with Ngadjuri, and the approach will continue to involve Kaurna and Peramangk Nations. The approach shares knowledge and experience, provides support for each of the Nation representatives and ensures that engagement is equitable.

**Having regard to Kaurna values and uses.**

Kaurna have had very little engagement in water resource management and planning on their Country. Engagement in the development of the SA Murray Region WRP included Kaurna participation in an Aboriginal Waterways Assessment with DEW and NR AMLR staff. That engagement process has built awareness and capacity for Kaurna to engage more meaningfully in water resource planning and management into the future, for example with the engagement workshops in the review and amendment of the Barossa and Eastern Mount Lofty Ranges WAPs planned and underway (due for completion in December 2017). Locations identified for the Aboriginal Waterways Assessment were chosen because they aligned with ongoing NR AMLR water resource project sites. Outcomes from the assessments will inform Kaurna engagement in these projects into the future.

**Having regard to Adnyamathanha values and uses.**

Adnyamathanha are engaged in NRM through Co-Management agreements between the South Australian Government and the Adnyamathanha Traditional Lands Association (ATLA). The interest in NRM includes co-management of Ikara-Flinders National Park and smaller conservation parks on their Country and in eco-tourism ventures. To date Adnyamathanha interest in water resource management and planning related to the Murray-Darling Basin Plan has been minimal having only attended one of the three joint-Nations meetings and unable to take up the opportunities for Adnyamathanha specific water workshops on Country.

**Having regard to Wilyakali values and uses.**

Wilyakali are a relatively new Native Title group and have had very little engagement in water resource management and planning on their Country. Being at the northern extremity of the SA Murray-Darling Basin, very little water resource management and planning occurs on Wilyakali Country given the ephemeral nature of water resources. Wilyakali have notified that their interests lie elsewhere at the present moment, but that they are eager to engage in natural resource management more broadly into the future, including any water resource management and planning that may occur on their Country. Being a language group of the broader Barkindji Nation, Wilyakali Country straddles South Australia and New South Wales up to the Darling River. An on-Country tour of part of Wilyakali Country in South Australia was undertaken in early 2017.
10.53 Consultation and preparation of water resource plan

5.14.2 Accredited Text

South Australia has engaged with all relevant SA Murray Region Aboriginal Nations in the development of the SA Murray Region WRP following an engagement approach developed at three joint-Nations workshops held in April and December 2016 and in April 2017. The workshops were attended by representatives from all of the SA Murray Region Aboriginal Nations, MLDRIN delegates and in some instances by Aboriginal Nation representatives from neighbouring states. The engagement approach centred on the following principles:

1. Engagement funding should be invested in building the capacity of Aboriginal Nations to engage in water planning in the future.
2. A country-based planning approach provides a method for planning for Aboriginal cultural objectives and builds the capacity of Nations to engage in water planning in the future.
3. Equity in engagement across groups tailored to their specific needs, interests and capacity.

During the various levels of engagement, discussions which included the matters outlined in sections 10.52, 10.53(1)(a)-(e), and 10.54 of the Basin Plan, were held with the Nations as evidenced by the objectives and desired outcomes identified in section 5.14.1. Section 5.14.2.1 provides further detail on how regard has been had with respect to each of the matters identified in section 10.53(a)-(e) of the Basin Plan.

For the purpose of section 10.53(1)(f), it is widely acknowledged that some Aboriginal cultural values overlap with ecological values (refer section 5.9.4) and this is reflected by the general support from the NRA and First Peoples for the use of Water Allocation Plans to manage the use of water to ensure potential risks to the water resources are minimised and water remains available for the environment. Where Aboriginal values and uses overlap with environmental values and uses, they have inherently been considered in the ecological component of the risk assessment. The risks to environmental values and uses within the SA Murray Region Water Resource Plan area have been assessed to be low with the exception of one high risk (r844) which directly relates to connected water resources, and one medium risk (r700) was identified is directly related to the management of the connected resources. Risk r844 relates to the Coorong and r700 to the Lower Lakes and as such, the management of these risks needs to be considered in both the ecological and cultural context.

For those Aboriginal cultural values and uses outside of those that are also environmental, more work is needed to first articulate those values and uses in a culturally appropriate way, assess the water flow and volume requirements and then to assess the risk to those values and develop appropriate strategies to mitigate those risks. This work has commenced for Ngarrindjeri water interests through the Ngarrindjeri Yannarumi research project and with other SA Murray Darling Basin nations through the implementation of Aboriginal Waterways Assessments and development of their own culturally appropriate assessment tools. This work will continue through DEW’s implementation of the Cultural flows guide for community and water managers when engaging with Nations in all levels of water resource management and planning according to the principles outlined in section 5.14.1. This will ensure that risks to Aboriginal cultural values and uses for water are considered across all water planning in the SA Murray Region.

The SA MLDRIN / DEW Working Group was also established to provide high-level advice and guidance on engagement approaches with individual Nations and to provide clear visibility of the State’s approach to having regard to Aboriginal values and uses and achieving Aboriginal objectives and outcomes for water resource planning. The Working Group consists of five MLDRIN representatives that identify as First Peoples, Peramangk, Nganguraku and Ngarrindjeri and include the Ngarrindjeri and First Peoples’ Water Coordinators.

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5.14.2.1 Supporting Information

South Australia has developed its approach to engaging Aboriginal Nations in the development of WRPs through several key joint-Nation water workshops and the SA MLDRIN – DEW Working Group.

- KNYA Water Workshops in February 2013 (Camp Coorong) and February 2014 (Roonka)
  - Improving Ngarrindjeri engagement in water-related matters is a key objective of the KNYA Taskforce Strategic Implementation Plan. NRA and DEW collaborated in 2014 to deliver the second Water Workshop, held at Roonka on the 25-26 February. The workshop identified a number of opportunities to improve the recognition of Aboriginal interests in water, established relationships and endorsed the establishment of an agreement between South Australia and the NRA to guide the Ngarrindjeri engagement in Basin Plan implementation.

  The workshop was the basis for the development of the Ngarrindjeri Water Resource Planning Statement of Commitment (SOC) between the NRA, DEW and the South East and SA Murray-Darling Basin (SAMDB) NRM Boards in June 2015. This includes an accompanying Cultural Knowledge Agreement, 2015, signed between the NRA and the Minister for Water and the River Murray. This approach has been promoted widely, on DEW’s website and at presentations to the International River Symposium. It was also a component of the NRA’s 2015 Australian Riverprize win.

- Murray-Darling Basin Aboriginal Nations Water Workshops in April 2016 (Calperum Station), December 2016 (Warriparinga) and in April 2017 (Camp Coorong)
  - DEW coordinated the SA Aboriginal Nations Water Workshops in 2016 and 2017 to bring together Nations within the SA Murray-Darling Basin to discuss the Basin Plan and clarify how Nations wanted to be engaged. Three representatives from each Nation were supported to attend each workshop. Workshops were promoted directly to representative Nation organisations. Outcomes were provided back to attendees and posted on DEW’s website: http://www.environment.sa.gov.au/about-us/aboriginal-partnerships/water-resource-planning.

  The multi-day workshops documented a range of objectives and desired outcomes in relation to both the Basin Plan engagement process but also water resource management and recognition of the Nations’ customary water rights. The Department has used the workshop outcomes to guide SA’s ongoing engagement approach. At the second workshop, representatives drafted a Water Statement to promote their Nations’ water-related interests, and reiterated their desired engagement approaches. A video of workshop participant perspectives can be viewed at https://www.youtube.com/watch?v=2GNMBnyW4Sk. This video was shared through MLDRIN and DEW’s social media and has received 374 views.

  Following the second workshop, nominated Nation representatives met with DEW’s Chief Executive and Group Executive Directors responsible for Basin Plan implementation to discuss the Water Statement.

  The third joint-Nations workshop focused upon sharing knowledge between Nations in relation to water resources management. Nation-based approaches, governance and agreement making were showcased through presentations and panel discussions.

- SA MLDRIN – DEWNR Working Group
  - Since mid-2016, DEW and the South Australian representatives of MLDRIN (from the Ngintait, Maraura, Peramangk and Ngarrindjeri Nations) have been meeting on a regular basis. Terms of Reference for these meetings have been developed and the forum is used by South Australia to share updates on Basin Plan engagement and implementation, and to seek SA MLDRIN representative advice on the State’s Aboriginal engagement approach. SA MLDRIN representatives have also assisted in formulating the agenda for the joint-Nations workshops and comment on South Australia’s budgets and schedules relating to 2017/18 and 2018/19 Aboriginal engagement.
DEW also met with the MLDRIN Executive in mid-2016 and again in August 2017 to present its approach to WRP engagement with Aboriginal Nations.

The engagement approach used in the joint-Nations workshops resulted in the following action on the principles:

- Engagement funding was directed to employ the Ngarrindjeri and First Peoples’ Coordinator until 30 June 2019 as well as the temporary MACAI Water Coordinator position. The positions were hosted in the NRA, the River Murray Mallee Aboriginal Corporation and the Mannum Aboriginal Community Association Incorporated.
- Country-based plans are being developed with MACAI and First Peoples to provide a plan for Nations to advocate for when engaging with DEW on water and other NRM planning activities.
- Individual Nations have been engaged through existing mechanisms where possible (refer Table 25 and Table 26). Where necessary, DEW has established Basin Plan engagement mechanisms with a view to establish long-term engagement mechanisms with the Nation. Where Nations have had little experience in engaging in water resource planning, DEW has sought to build that water planning experience through implementing Aboriginal Waterways Assessment projects.

### Table 25  Summary of agreements between Aboriginal Nations and the SA Government, and their preferred engagement forums.

<table>
<thead>
<tr>
<th>Nation</th>
<th>Formal engagement protocols</th>
<th>Preferred engagement forum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adnyamathanha</td>
<td>N/A</td>
<td>• Adnyamathanha Traditional Lands Association (ATLA) Board meetings</td>
</tr>
<tr>
<td>First Peoples (Ngaiawang,</td>
<td>River Murray and Crown Lands Indigenous Land Use Agreement (RM ILUA), 2012</td>
<td>• ILUA Liaison Committee meetings; River Murray Mallee Aboriginal Corporation (RMMC) Directors meetings; First Peoples NRM Working Group meetings</td>
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<tr>
<td>Ngawait, Ngaguruku,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erawirung, Ngintait,</td>
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<td></td>
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<tr>
<td>Ngaralte, Ngarkat</td>
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<tr>
<td>language groups)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaurna</td>
<td></td>
<td>• Kaurna Nation Cultural Heritage Association (KNCHA) Board meetings</td>
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<tr>
<td>Ngadjuri</td>
<td></td>
<td>• Ngadjuri Nation Aboriginal Corporation (NNAC) Board meetings</td>
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<tr>
<td>Ngarrindjeri</td>
<td>Kungun Ngarrindjeri Yunnan Agreement (KNYA), 2009</td>
<td>• KNYA Taskforce meetings; Ngarrindjeri Water Planning SOC Working Group meetings; Leaders-to-Leaders meetings; NRA Board meetings; Yarluwar-Ruwe Program meetings; Ngarrindjeri Aboriginal Corporation Board meetings.</td>
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<tr>
<td></td>
<td>Ngarrindjeri Speaking as Country Deed, 2014</td>
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<td></td>
<td>Ngarrindjeri Water Planning Statement of Commitment (SOC), 2015 Cultural Knowledge Agreement</td>
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<tr>
<td>Peramangk / Nanguraku</td>
<td></td>
<td>• Mannum Aboriginal Community Association Inc (MACAI) Board meetings</td>
</tr>
<tr>
<td>SE Clan Groups (Tanganekald, Meintangk and Bunganditj language groups)</td>
<td>Memorandum of Understanding between South East Aboriginal Focus Group (SEA FG) and South East Natural Resources Management Board, 2008</td>
<td>• SEA FG meetings</td>
</tr>
<tr>
<td>Wilyakali</td>
<td></td>
<td>• Wilyakali Native Title claimants No.1 and No.2 meetings</td>
</tr>
</tbody>
</table>
Each Nation was then engaged independently through mechanisms that were tailored to their existing engagement arrangements where possible and according to their needs, interests and capacity.

Ngarrindjeri engagement (NRA)
Ngarrindjeri engagement in WRP development was coordinated through the NRA Water Statement of Commitment Working Group (SOC WG) established under the Statement of Commitment. The preferred engagement approach included:

1. building Ngarrindjeri organisational capacity by funding the employment of the Ngarrindjeri Water Coordinator (this includes NRA building capacity with other Nations);

2. continued and improved engagement in the review and amendment of the State’s water resource planning processes and instruments, particularly WAPs; and

3. a joint Goyder Research project: Yunnarumi to research and develop an approach to assessing risk to Ngarrindjeri values and uses of water resources.

First Peoples engagement (RMMAC)
First Peoples’ engagement in WRP development was coordinated through the First Peoples’ NRM Working Group. The preferred engagement approach was to build First Peoples’ organisation capacity by funding the employment of the First Peoples’ Water Coordinator and through continued and improved engagement in the review and amendment of the State’s water resource planning processes and instruments, particularly WAPs. First Peoples input has been included into the Peake, Roby and Sherlock and Mallee WAPs as part of Ministerial amendments to the WAPs under section 89(2) of the NRM Act. The First Peoples’ Water Coordinator was employed in September 2017 and provided comment on the draft SA Murray Region WRP Part 14 content. A large part of the engagement focussed on developing First Peoples’ input (along with Ngarrindjeri) into the Peake, Roby and Sherlock and Mallee WAPs and the commencement of developing their input into the River Murray WAP.

Peramangk and Nganguraku engagement (MACAI)
Peramangk and Nganguraku engagement in WRP development was coordinated through engagement meetings with MACAI. The preferred engagement approach included participation in the three-Nations Aboriginal Waterways Assessment with Kaurna and Ngadjuri Nations and the employment of the MACAI Water Coordinator to facilitate the development of the Peramangk Country Plan. The Peramangk Country Plan is scheduled to be complete by July 2018. As described above, MACAI values and uses for water are relatively well represented in WMPs and their existing relationship with DEW is strong and productive. These engagement processes identified a need to invest in organisation capacity to engage in water resource planning processes and instruments into the future. Peramangk and Nganguraku are also represented on the SA MLDRIN/DEWNR Working Group and are involved in the review and development of the SA Murray Region WRP. A larger part of Peramangk and Nganguraku engagement focussed on their engagement in the amendments to the Eastern Mount Lofty Ranges, Marne Saunders and Barossa WAPs as well as their engagement in the review of the River Murray WAP.

Tanganekald, Meintangk and Bunganditj engagement (South East Aboriginal Focus Group)
The Tanganekald, Meintangk and Bunganditj engagement in theSA Murray Region WRP development was coordinated through attendance and presentations at three meetings of the South East Aboriginal Focus Group. The preferred approach to engagement was the two-day SEAFG Water Workshop held on 11-12 May 2017 that provided an overview of the Basin Plan and the WRP development process and identified SEAFG Objectives and Outcomes for water resources. Most importantly, the workshop identified where SEAFG wishes to engage further in water resource planning processes and instruments and strengthened the partnership arrangements with regional Departmental staff responsible for the development, review and amendment of water resource planning processes and instruments in the NR SE Region. A follow-up workshop was held on 9 November 2017 to present the drafted Part 14 component of the SA Murray Region WRP. SEAFG engagement in the development of the SA WRP.

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23 This research project is a three way partnership between DEW, Flinders University and the NRA. Goyder Project HE.17.03 ‘Translating Ngarrindjeri Yannarumi into water resource risk assessments’.
Murray WRP also assisted in progressing input water planning instruments outside of the Basin including into the Tatiara WAP and progressing the approach to incorporating cultural values in the Lower Limestone Coast WAP Risk Assessment.

Ngadjuri engagement (NNAC)
Ngadjuri engagement in SA Murray Region WRP development was coordinated through presentations and discussion at four Ngadjuri Nation Aboriginal Corporation Board meetings. The preferred approach for engagement was to participate in the three-Nations Aboriginal Waterways Assessment and broader Aboriginal Waterways Assessments across Ngadjuri Country. The presentations and discussion built capacity of Ngadjuri Nation to better engage in water resource planning activities into the future and strengthened the partnership arrangements with regional DEW staff responsible for the development, review and amendment of water resource planning processes and instruments.

Kaurna engagement (KNCHA)
Kaurna engagement in SA Murray Region WRP development was coordinated through attendance and presentations at the Kaurna Nation Cultural Heritage Association (KNCHA) Board meetings. The preferred approach for engagement was to participate in the three-Nations Aboriginal Waterways Assessment workshop. The workshop built capacity of Kaurna Nation to better engage in water resource planning into the future and strengthened the partnership arrangements with regional Departmental staff responsible for the development, review and amendment of water resource planning processes and instruments.

Adnyamathanha engagement (Adnyamathanha Traditional Lands Association)
Adnyamathanha were engaged in the development of the SA Murray Region WRP through their attendance at the Warriparinga joint-Nations workshop in December 2016. Funding and resources were offered to ATLA to run Adnyamathanha-specific Basin Plan Water Workshops. However, there was no interest or capacity to engage in the process.

Wilyakali engagement (Wilyakali Native Title Claim groups)
Wilyakali engagement in SA Murray Region WRP development was coordinated through attendance at and presentations to the Wilyakali Native Title claimants No. 1 and No. 2 meetings. The preferred approach for engagement was the Wilyakali Water Workshop on 31 June to 2 July at the Bimbowie Conservation Park. Wilyakali participants were very new to water planning and management and while they didn’t necessarily identify Wilyakali values and uses for water, they expressed a desire to be more involved in on-Country NRM activities with DEW. Participants all resided in New South Wales (predominantly Broken Hill) and identified more strongly with the Darling River than with the Murray in South Australia.
### Table 26  Summary of meetings with Aboriginal Nations for the preparation of the SA Murray Region WRP.

<table>
<thead>
<tr>
<th>Nation</th>
<th>Meeting dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adnyamathanha</td>
<td><strong>Individual Nation Meetings:</strong> 23/9/16 &lt;br&gt; <strong>Joint-Nations Workshop:</strong> Warriparinga workshop 15 to 16/12/16</td>
</tr>
<tr>
<td>First Peoples (Ngaiawang, Ngawait, Ngaguruku, Erawirung, Ngintait, Ngaralte, Ngarkat language groups)</td>
<td><strong>Individual Nation Meetings:</strong> 25/9/14, 25/2/15, 14/11/15, 14/11/15, 5 to 6/12/15, 15/3/16, 17/5/16, 28/6/16, 12/10/16, 9/11/16, 18/1/17, 19/1/17, 13/2/17, 14/2/17, 21/3/17, 27/4/17, 28/6/17, 16/8/17, 21/8/17, 22/9/17 27/9/17, 11/10/17 &lt;br&gt; <strong>Aboriginal Waterways Assessment:</strong> 14 to 15/11/15 and 19/4/16 &lt;br&gt; <strong>Joint-Nations Workshop:</strong> Calperum Station 1 to 3/4/16, Warriparinga 15 to 16/12/16, and Camp Coorong 16 to 17/5/17</td>
</tr>
<tr>
<td>Kaurna</td>
<td><strong>Individual Nation Meetings:</strong> 15/3/16, 31/10/16, 23/1/17, 6/2/17, 10/4/17 &lt;br&gt; <strong>Aboriginal Waterways Assessment:</strong> 8 to 10/6/17 &lt;br&gt; <strong>Three Nations WAP workshops:</strong> Tanunda 3 to 4/12/17, Sugar Shack 23 to 24/03/18.</td>
</tr>
<tr>
<td>Ngadjuri</td>
<td><strong>Individual Nation Meetings:</strong> 22/2/16, 31/10/16, 15/11/16, 10/4/17 &lt;br&gt; <strong>Aboriginal Waterways Assessment:</strong> 8 to 10/6/17 &lt;br&gt; <strong>Joint-Nations Workshop:</strong> Calperum Station 1 to 3/4/16, Warriparinga 15 to 16/12/16, and Camp Coorong 16 to 17/5/17 &lt;br&gt; <strong>Three Nations WAP workshops:</strong> Tanunda 3 to 4/12/17, Sugar Shack 23 to 24/03/18.</td>
</tr>
<tr>
<td>Ngarrindjeri</td>
<td><strong>Individual Nation Meetings:</strong> 13/3/14, 20/3/14, 3/4/14, 3/4/14, 1/5/14, 31/7/15, 3/9/15, 1/10/15, 5/11/15, 3/12/16, 16/3/16, 7/4/16, 5/5/16, 2/6/16, 19/7/16, 26/7/16, 2/9/16, 20/10/16, 27/10/16, 22/12/16, 25/1/17, 1/2/17, 9/2/17, 15/3/17, 21/6/17, 20/7/17, 17/8/17 &lt;br&gt; <strong>Joint-Nations Workshop:</strong> Calperum Station 1 to 3/4/16, Warriparinga 15 to 16/12/16, and Camp Coorong 16 to 17/5/17 &lt;br&gt; <strong>KNYA Water Workshop:</strong> 25 to 26/2/14</td>
</tr>
<tr>
<td>Peramangk / Nanguraku</td>
<td><strong>Individual Nation Meetings:</strong> 31/10/16, 22/9/17 &lt;br&gt; <strong>Joint-Nations Workshop:</strong> Warriparinga 15 to 16/12/16. &lt;br&gt; <strong>KNYA Water Workshop:</strong> 25 to 26/2/14 &lt;br&gt; <strong>Aboriginal Waterways Assessment:</strong> 8 to 10/6/17 &lt;br&gt; <strong>Three Nations WAP workshops:</strong> Tanunda 3 to 4/12/17, Sugar Shack 23 to 24/03/18.</td>
</tr>
<tr>
<td>SE Clan Groups (Tanganekald, Meintangk and Bunganditj language groups)</td>
<td><strong>Individual Nation Meetings:</strong> 19/11/14, 21/10/16, 19/12/16, 11 to 12/5/17, 15/9/17, 9/11/17 &lt;br&gt; <strong>Joint-Nations Workshop:</strong> Calperum Station 1 to 3/4/16, Warriparinga 15 to 16/12/16, and Camp Coorong 16 to 17/5/17</td>
</tr>
<tr>
<td>Wilyakali</td>
<td><strong>Individual Nation Meetings:</strong> 4/2/17, 5/2/17, 31/6 to 2/7/17 &lt;br&gt; <strong>Joint-Nations Workshop:</strong> Camp Coorong 16 to 17/5/17</td>
</tr>
<tr>
<td>SA MLDRIN Meetings (Ngintait, Maraure, Ngarrindjeri, First Peoples, Peramangk)</td>
<td><strong>Individual Nation Meetings:</strong> 28/9/15, 15/7/16, 20/9/16, 10/10/16, 7/11/16, 9/12/16, 27/2/17, 24/4/17, 31/8/17, 21/9/17, 14/5/18, 19-20/6/18 &lt;br&gt; <strong>Presentation to MLDRIN Board:</strong> 8/8/17, 1/2/18</td>
</tr>
</tbody>
</table>
Addressing Chapter 10 Requirements
s10.53 Consultation and preparation of water resource plan

Native title rights, native title claims and Indigenous Land Use Agreements provided for by the Native Title Act 1993 in relation to the water resources of the SA Murray Region WRP area.

In recognition of the need to engage Aboriginal Nations at all levels of water resource management and planning, South Australia has committed to a set of engagement principles that will be followed in routine water resource management processes and instruments. This approach will ensure that all Native title holders and claimants, including those groups that hold Indigenous Land Use Agreements (ILUAs) under the Native Title Act, will be engaged meaningfully in the management of water resources on their Country. South Australia’s approach is amenable to new claim groups coming on board as well as Determinations being finalised and the establishment of new ILUAs. At the time of writing, the only Nations with Native Title Determination are the First Peoples of the River Murray and Mallee region and Ngarrindjeri. However, determinations are likely for several other SA Murray Region Nations over the coming years.

Aboriginal heritage relating to the water resources of the SA Murray Region WRP area.

Aboriginal heritage is protected under the Aboriginal Heritage Act 1988 and relevant Commonwealth legislation. Engaging with Aboriginal Nations at all levels of water resource management according to the engagement principles in section 5.14.1 will strengthen the recognition of Aboriginal heritage sites and their protection under the Aboriginal Heritage Act 1988. Nation engagement in water resource planning will result in specific arrangements to protect heritage sites similar to the Speaking as Country Deed held with Ngarrindjeri recognising the registered ‘Meeting of the Waters’ heritage site at the Mouth of the Murray River.

Inclusion of Indigenous representation in the preparation and implementation of the plan

South Australia’s approach to the preparation of the SA Murray Region WRP was determined by Aboriginal Nations through joint-Nation workshops and through guidance provided by the SA MLDRIN Working Group. The approach to commit to meaningful engagement with Nations throughout all levels of water resource management according to the principles outlined in section 5.14.1 will ensure that Aboriginal Nations will be represented in the implementation of the WRP.

Indigenous social, cultural, spiritual and customary objectives, and strategies for achieving these objectives.

Throughout their engagement with water resource management and planning, the Ngarrindjeri strategy has been to audit all of the water resource management processes and instruments on their Country and then prioritise where to exert their influence. This strategy recognises the need to build capacity within their own Nation and that full and proper representation of Ngarrindjeri interests in water is an iterative process.

South Australia is adopting a similar strategy in meeting Basin Plan requirements for Aboriginal engagement across its water resource management processes and instruments. There is a clear commitment to engage with Nations across all levels of water resource management processes and instruments according to the principles in section 5.14.1. These principles also recognise the need to build capacity of Nations to meaningfully engage in water resource management and the iterative nature that will be required to articulate and then recognise those interests to the fullest.

Encouragement of active and informed participation of Indigenous people.

The engagement principles outlined in S.14.1 will encourage active and informed participation of Aboriginal Nations while building capacity of those Nations to make the engagement more meaningful over time.
Risks to Indigenous values and Indigenous uses arising from the use and management of the water resources of the SA Murray Region WRP area.

Risks to Indigenous values and uses are discussed in part 5.9.4 and 5.14.2 of the SA Murray Region WRP. Engagement of SA Murray Region Aboriginal Nations throughout all levels of water resource management and planning according to the principles outlined in section 5.14.1 will ensure that risks to Aboriginal values and uses for water will be identified and incorporated into that management. The inclusion of a SEAFG cultural risk assessment in the Lower Limestone Coast WAP and the Ngarrindjeri Yannarumi research project are two different approaches for the assessment of risks to Aboriginal interests in water (including values and uses). Other Nations are considering their approach using tools such as the Aboriginal Waterways Assessment (AWA).

10.54 Cultural flows

5.14.3 Accredited Text

Cultural flows were discussed as part of the consultation outlined in section 5.14.2. From these conversations, it was evident that cultural flows mean different things to different people and Nations, but also that some don’t have formal definitions. The South Australian Government recognises the outcomes of the National Cultural Flows Research Project and will work with SA MLDRIN / DEW Working Group to implement those findings within the South Australian context.

The South Australian Government will pursue opportunities for water entitlements that are legally and beneficially owned by Nations for prescribed water resources. The pathways to achieving this will differ for each water resource, depending on whether a resource is fully allocated or not.

The South Australian Government seeks to improve the spiritual, cultural, natural, environmental, social and economic conditions of SA Murray Region Aboriginal Nations through their full and proper engagement in water resource planning processes and instruments according to their needs, interests and capacity.

5.14.3.1 Supporting Information

The MLDRIN Echuca Declaration defines cultural flows as water entitlements that are legally and beneficially owned by the Indigenous Nations of a sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations and declare that cultural flows are their inherent right.24 Throughout implementation of SA Basin Plan Aboriginal engagement, this definition has been in line with the objectives and outcomes identified by SA Murray Region Aboriginal Nations.

Engagement of Aboriginal Nations in WAP processes for prescribed water resources provides a mechanism for Aboriginal Nations to identify their existing and future needs for water and develop pathways with the South Australian Government to support and improve the spiritual, cultural, environmental, social and economic conditions of their Nations. Where those needs and interests are not fully articulated by Nations, engagement in WAP review and amendment will ensure that the potential future needs are recognised.

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10.55  Retention of current protection

5.14.4  Accredited text

The transitional plans for the SA Murray Region WRP area provided limited Aboriginal context and did not outline the Indigenous values or Indigenous uses of the water resources in the WRP area. As such, there were no protections for Indigenous values or uses provided within those plans. The transitional plans for the SA Murray Region were as follows:

- Mallee Prescribed Wells Area Water Allocation Plan (South Australia) (2012);
- Natural Resources Management Plan for the South Australian Murray-Darling Basin Natural Resources Management Region (2009);
- Peake, Roby and Sherlock Prescribed Wells Area Water Allocation Plan (2011); and

The Aboriginal heritage sites and native title interests of SA Murray Region Aboriginal Nations are protected under the Aboriginal Heritage Act 1988 (SA) and the Native Title Act 1993 (Cwlth). The commitment in section 5.14.1 to engage with SA Murray Region Aboriginal Nations in all water resource planning processes and instruments facilitates greater recognition of Aboriginal heritage and native title interests in the SA Murray Region water resource planning processes and instruments.

5.14.4.1  Supporting Information

Engaging Aboriginal Nations in water resource management processes and instruments according to the principles outlined in section 5.14.1 will progressively articulate and recognise more Aboriginal values and uses for water. At the highest level, these interests are protected under the Aboriginal Heritage Act 1988 and the Native Title Act 1993. Through their iterative articulation and recognition in legislative documents like WAPs and WMPs, Aboriginal values and uses for water will be protected to a greater extent than previously.
6 Bibliography

Aboriginal Heritage Act 1988 (SA)


(DOI: http://dx.doi.org/10.3366/dls.2016.0239)


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Development Regulations 2008 (SA)


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Environment Protection (Water Quality) Policy 2015 (SA)

*Environment Protection and Biodiversity Conservation Act 1999 (Cth)*


*Groundwater (Border Agreement) Act 1985 (SA)*

Hemming, S., Trevorrow, T. & Rigney, M. 2002, ‘Ngarrindjeri Culture’ In M. Goodwin & S. Bennett (eds) The Murray Mouth: Exploring the implications of closure or restricted flow, Department of Water, Land and Biodiversity Conservation, Adelaide, Chapter 1, 13-19. This published report featured the Ngarrindjeri perspectives of connection to Country and featured the words of Tom Trevorrow ‘the land and waters is a living body’. Ngarrindjeri Tendi, Ngarrindjeri Heritage Committee and Ngarrindjeri Native Title Management Committee on behalf of the Ngarrindjeri Nation 2006 Ngarrindjeri Nation Yarluwar-Ruwe Plan: Caring for Ngarrindjeri Sea Country and Culture, Ngarrindjeri Lands and Progress Association, Meningie.


Mining Act 1971 (SA)


Native Title Act 1993 (SA)

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Natural Resources Management (General) Regulations 2005 (SA)

Natural Resources Management (Financial Provisions) Regulations 2005 (SA)


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South Australian Public Health (Wastewater) Regulations 2013


*Water Act 2007 (Cth)*

### 7 Attachments

**Attachment 1**  
Summary of consultation on statutory instruments amended for consistency with Basin Plan as part of the development of the SA Murray Region WRP *(excluding consultation with Aboriginal Nations – refer Table 27)*

<table>
<thead>
<tr>
<th>Date</th>
<th>Stakeholder Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various</td>
<td>SAMDB NRM Board meetings</td>
</tr>
<tr>
<td>Various</td>
<td>SAAL NRM Board meetings</td>
</tr>
<tr>
<td>Various</td>
<td>SE NRM Board meetings</td>
</tr>
<tr>
<td>15/10/16</td>
<td>NE District NRM Group (SAAL Board) 15th October. Yunta. Group only preliminary briefing</td>
</tr>
<tr>
<td>2/11/16</td>
<td>Mallee and Coorong NRM Group, Lameroo</td>
</tr>
<tr>
<td>8/11/16</td>
<td>Riverland NRM Group</td>
</tr>
<tr>
<td>10/11/16</td>
<td>NE District NRM group and community members at Olary</td>
</tr>
<tr>
<td>11/11/16</td>
<td>RMAC</td>
</tr>
<tr>
<td>15/11/16</td>
<td>Coorong Council Meeting</td>
</tr>
<tr>
<td>15/11/16</td>
<td>Coorong and Tatiara LAP staff</td>
</tr>
<tr>
<td>16/11/16</td>
<td>Conservation Council and members</td>
</tr>
<tr>
<td>18/11/16</td>
<td>Loxton Waikerie Council Meeting</td>
</tr>
<tr>
<td>22/11/16</td>
<td>Better Water Planning and Management workshop</td>
</tr>
<tr>
<td>22/11/16</td>
<td>Renmark Paringa Council Meeting</td>
</tr>
<tr>
<td>23/11/16</td>
<td>ABC Riverland</td>
</tr>
<tr>
<td>25/11/16</td>
<td>Upper SE NRM Group</td>
</tr>
<tr>
<td>5/12/16</td>
<td>Rangelands NRM Group</td>
</tr>
<tr>
<td>8/12/16</td>
<td>Pastoral Board meeting</td>
</tr>
<tr>
<td>9/12/16</td>
<td>River Murray Advisory Committee</td>
</tr>
<tr>
<td>13/12/16</td>
<td>Tatiara Council</td>
</tr>
<tr>
<td>13/12/16</td>
<td>Ranges to River NRM Group</td>
</tr>
</tbody>
</table>
Written Correspondence

- Letters to stakeholder regarding the NR SE NRM Plan
- Letter to stakeholders regarding the Peake, Roby and Sherlock WAP
- Letter to stakeholders regarding the Mallee WAP
- Letter to stakeholders regarding the proposal to revoke the proclamation of underground water in the Noora Proclaimed Region:
  - Renmark Paringa Council
  - Loxton Waikerie Council
  - Tim Whetstone
  - Murraylands and Riverland Regional Development Board
  - Renmark to the Border LAP
  - Murray Mallee LAP
  - Nature Conservation Society of SA
  - Conservation Council SA
  - Nature Foundation SA

Site visit

- Meeting with landholder adjacent to Noora PWA

Media

- Advertorial in Renmark Murray Pioneer and Loxton News regarding the proposal to revoke the proclamation of underground water in the Noora Proclaimed Region
- Advertisement in Public Notices section of Adelaide Advertiser, Renmark Murray Pioneer and Loxton News regarding the proposal to revoke the proclamation of underground water in the Noora Proclaimed Region
- Notice in Government Gazette regarding the proposal to revoke the proclamation of underground water in the Noora Proclaimed Region

Online

- Animation – animated video created explaining the water resource planning process, posted on YouTube and DEW website
- Created webpage for proposal to revoke the proclamation of underground water in the Noora Proclaimed Region
- Updated DEW water resource planning page and added sub-pages for each WRP
Attachment 2  Method for estimating take by general right in SA Murray groundwater SDL resource unit (GS6)

The non-prescribed groundwater unit (GS6) covers the majority of the South Australian Murray-Darling Basin NRM region, and small areas within both the South East NRM region and the South Australian Arid Lands NRM region. As data within South Australia is grouped by NRM region, the following methodology was used for determining annual average take from the non-prescribed groundwater resource (GS6).

South Australian Murray-Darling Basin NRM region
Wells data with a purpose of domestic, stock, stock and domestic combined, irrigation and industrial, that were still deemed operational within the dataset, was extracted for the entire region.

Data was sorted by hundreds. The hundreds that fell outside of the non-prescribed groundwater unit (GS6), including those that were within prescribed wells areas, were excluded. Where a hundred was split between a prescribed area and the non-prescribed area, it was assumed that the stock and domestic wells were in the non-prescribed area and remained in the dataset. Irrigation and industrial wells were only small in number and could easily be checked visually against the State envirodata website map.

South East NRM region
Wells data with a purpose of domestic, stock, stock and domestic combined, irrigation and industrial, that were still deemed operational within the dataset, was extracted for the entire region.

Data was sorted by hundreds and only the few hundreds that fell within the non-prescribed groundwater unit GS6 remained in the dataset.

South East data was combined with the SA Murray-Darling Basin data to establish a non-prescribed groundwater dataset which included a worksheet for stock and domestic (this also includes combined domestic and irrigation), a worksheet for irrigation and a worksheet for industrial.

Non-prescribed groundwater dataset (combined SAMDB and SE datasets)
Each data worksheet was sorted by age and old wells (over 70 years) were excluded as these are unlikely to still be viable operational wells.

The stock and domestic data was sorted by salinity and any well with a salinity of greater than 10,000 mg/L (TDS) was removed from the dataset as this concentration is considered the maximum concentration at which good condition might be expected for sheep (far less for cattle, pigs, etc).25

The irrigation data was sorted by salinity and any well with a salinity of greater than 4,000 EC or 2,200 mg/L was removed from the dataset as this concentration is considered the maximum concentration at which a salt tolerant crops such as wheat and canola can be grown without loss to yields26.

No exclusions based on salinity were made for the industrial data as well data showed generally suitable levels for all stock other than poultry.

South Australian Arid Lands
As most of the SA Arid Lands are out of hundreds, extraction and sorting of data in the same manner as the SA Murray-Darling Basin and South East could not be done. Therefore, a visual count using the well map on the State envirodata website was undertaken.

The stock and domestic well count was added to the well count for the non-prescribed groundwater dataset to establish a full non-prescribed groundwater wells estimate.


26 Department for Primary Industries (2014b) Salinity tolerance in irrigated crops. Primefact, 1345 first edition, Agriculture NSW Water Unit.
**Estimating take**

To calculate the estimated annual volume of take, the following approach was undertaken:

The stock and domestic take estimate was assumed the same as was used for the Peake, Roby and Sherlock Prescribed Wells Area. That is, for each stock and domestic well, an estimated take of 2 ML was attributed. Where the well was listed as domestic only, a nominal value of 500 kL or 0.5 ML was assigned in line with the DEW procedure for estimating stock and domestic water use. Where a well was only listed as stock, a nominal value of 1.5 ML was assigned consistent with the Peake, Roby and Sherlock estimate for stock and domestic (1.5 ML stock and 0.5 ML domestic).

Irrigation wells exist in the non-prescribed area although known irrigation is limited. As much of the land in the area is extensively used for livestock and broad acre cropping, a nominal value of 10 ML per well was assigned for irrigation.

A small number of industrial wells occur within the non-prescribed area. It is assumed that these industrial users are for intensive animal keeping including washdown and fire protection. A nominal value of 10 ML per well was assigned as this would provide for a 300-400 head cattle feedlot, 250 head dairy or 2000 head piggery.

The following table outlines estimated take based on purpose in the dataset and the assigned nominal values.

**Table 1. Estimated take based on purpose**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Estimated number of operational wells</th>
<th>Assigned nominal value (ML/well)</th>
<th>Total Estimated Take (ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>81</td>
<td>0.5</td>
<td>40.5</td>
</tr>
<tr>
<td>Stock and Domestic</td>
<td>262</td>
<td>2</td>
<td>524</td>
</tr>
<tr>
<td>Stock only</td>
<td>574</td>
<td>1.5</td>
<td>861</td>
</tr>
<tr>
<td>Irrigation only</td>
<td>31</td>
<td>10</td>
<td>310</td>
</tr>
<tr>
<td>Industrial Only</td>
<td>4</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Irrigation and Domestic</td>
<td>5</td>
<td>10.5</td>
<td>52.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>957</strong></td>
<td></td>
<td><strong>1828</strong></td>
</tr>
</tbody>
</table>

Based on the above calculation, the BDL for the non-prescribed groundwater GS6 was estimated at 1.8 GL.