Government of South Australia
South Australian Murray-Darling Basin
Natural Resources Management Board

South Australian Murray-Darling Basin

Natural Resources Management Plan

Volume B | Board Business and Operational Plan
2016/17-2018/19
Version 4.0

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South Australian

Murray-Darling Basin

Natural Resources Management Plan

Volume B Board Business and Operational Plan

2016/17-2018/19

Version Control

Version	Author	Date	Changes
1.0	Amy Goodman	February 2016	First release
2.0	Alyson Modlinksi	28 April 2016	Updated section 3 to reflect income proposal for 2016-17 financial year
3.0	Alyson Modlinksi	31 August 2017	Updated section 3 to reflect income proposal for 2017-18 financial year
4.0	Lyz Risby Kim Arnott	8 December 2017	Updated section 5 Water Affecting Activities policies have been updated to comply with the Basin Plan Formatting updated

South Australian Murray-Darling Basin Natural Resources Management Plan

I, Ian Hunter, Minister for Sustainability, Environment and Conservation, hereby adopt this Natural Resources Management Plan Volume B; Business and Operational Plan pursuant to section 80(3)(a) of the *Natural Resources Management Act 2004*.

Hon Ian Hunter

Minister for Sustainability, Environment and Conservation

6/4/16

Foreword

Sharon Starick - Presiding Member

The landscape of the Murray-Darling Basin is one of national and international renown characterised by the mighty River Murray, Lower Lakes and Coorong, extensive native vegetation on public and private lands, Ramsar sites, rangelands and a huge diversity of native species.

The region is an incredibly important food bowl to the state producing premium wine, food and fibre for both the domestic and export markets as well as making a significant contribution to the State's economy. Healthy soils, good quality water and healthy bush are vital in sustaining this production, now and for our children and their children.

The productive and natural environments are interlinked and dependent on each other. They support our diverse regional economy including primary production, tourism and processing and make our region a great place to live.

No entity or individual alone can deliver all that is needed to have a healthy, productive landscape. It is only by working together can we secure a healthy environment that supports a diverse and flexible economy as well as the well-being of our communities, ecosystems, soils and water resources.

The people in our region are our most valuable asset. They have proven to be resilient and innovative during times of hardship such as drought. By continuing to embrace change and new approaches to business we will be ready to take on future challenges and opportunities.

Our communities will need to continue to drive innovation by embracing new technology, research and development and new approaches to business to access world markets, ensuring that we can overcome future challenges and be ready to take advantage of opportunities.

As a Board, we want our community to be excited about the management of natural resources, actively making a difference at home, in business, locally and region-wide. There is great potential for our community to be more involved in making decisions for the region. Working with and influencing the Board, government and business will create a better economic, environmental, social and cultural future for the SA Murray-Darling Basin.

Acknowledgements

The Business and Operational Plan would not be possible without the valuable contribution of many committed individuals and organisations in the South Australian Murray-Darling Basin (SAMDB) region over many years. Special thanks go to the individuals, whose expertise, guidance, general assistance and advice has been pivotal throughout the review and amendment of the plan and includes:

- Community members who provided comment and ideas, and feedback on the business and operational plan.
- South Australian Murray-Darling Basin Natural Resources Management Board (SAMDB NRM Board) and the district Natural Resources Management Group members for strategic direction and oversight
- Natural Resources SAMDB staff for technical advice and administrative support
- Community at the Centre Collective for engagement ideas and strategy
- Department of Environment, Water and Natural Resources (DEWNR) staff for information, knowledge, technical advice, guidance and support.

Recognition of Aboriginal people

The Board acknowledges that for traditional owners the land, waters and all living things are connected and are part of the cultural landscape formed during the creation. Aboriginal peoples' interests in being involved in natural resources planning and implementation processes are also respected.

The Natural Resources Management Plan for the SAMDB region seeks to enable partnerships between traditional owners, the Board and other stakeholders which are built upon mutual respect and trust. Traditional owners seek partnerships to protect and maintain their culture, cultural sites and the natural resources of land and water through the involvement of Aboriginal people. In order for this to happen, the traditional owners' rights, interests and obligations to speak and care for their traditional lands, in accordance with their customary laws, customs, beliefs and traditions, needs to be recognised and respected.

There are differences between traditional owner groups and other Aboriginal people in the region and their preferred approaches for engagement. The Ngarrindjeri, represented by the Ngarrindjeri Regional Authority, have entered into the Kungun Ngarrindjeri Yunnan Agreement with the State Government of South Australia. The First Peoples of the River Murray and Mallee Region were recognized as native title holders and have entered into an Indigenous Land Use Agreement. Both of these agreements identify a consultation and negotiation framework, the preferred approach to engagement and collaboration between the parties that aims to strengthen the on-going relationship.

Under the terms of these agreements, the SAMDB NRM Board recognises and promotes traditional owners and Aboriginal peoples' role in and knowledge of the conservation and ecologically sustainable use of the region's biodiversity.

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1 Introduction

The SAMDB NRM Board (the Board) is established by the Minister for Sustainability, Environment and Conservation through the appointment of community members from across the SAMDB region. The Board is the peak body responsible for ensuring the region's natural resources are managed appropriately.

The Board is responsible for developing the Natural Resources Management Plan for the region. The Natural Resources Management Plan is developed and delivered in partnership with the community and stakeholders, and aims the sustainable use of natural resources in the region, and is delivered by a range of different organisations through a diverse range of programs and projects.

More on the Natural Resources Management Plan for the SAMDB Region 2014-2024 (Volume A) can be found at http://www.naturalresources.sa.gov.au/samurraydarlingbasin/about-us/our-regions-plan .

As a major partner in the delivery of the Natural Resources Management Plan, the Board is committed to the long-term vision for the future of the SAMDB region:

A healthy living landscape meeting the social, environmental, economic and cultural needs of the community, and ensuring the rights and wellbeing of future generations

The Board will be an active contributor to the delivery of the resource condition targets outlined in the Natural Resources Management Plan (detailed in Figure 1).

The purpose of the Business and Operational Plan is two-fold:

1. Sections 2, 3 and 4 represent the Business element and outline the implementation program and supporting income proposal that is the Board's contribution to implementing the Natural Resources Management Plan for the region.

2. Section 5 represents the Operational element and outlines the Board approved policies for Water Affecting Activities. The Board has a statutory function under Section 75(3)(k) of *The Natural Resources Management Act 2004* (the Act) to set out matters that should be taken into account when a relevant authority is exercising a power to grant or refuse permits under Chapter 7 Part 2 of the Act. The Water Affecting Activities section has been included in the Business and Operational Plan to ensure these policies are reviewed regularly and can be modified as required.

1.1 Board Values, Mission and Guiding Principles

A set of values, a mission statement, and guiding principles are used by the Board to strongly guide how it works with its regional community and in developing and delivering the Business Plan.

Values

Collaboration and Connection

We create solutions together through shared responsibility

Integrity

We act honestly, fairly and consistently

Tenacity

We are courageous, determined and never give up on finding a way

Innovation

We approach our work with energy, creativity and a healthy dose of perspective.

The Board's Mission

Advancing natural resources management with and for the SAMDB community.

Guiding Principles

1. Work together for success

   Partnering with the community, government and industries to reach goals and targets for our region.

2. Build knowledge

   Sound decision making using an evidence based approach to managing natural resources is supported by increased awareness and knowledge that is valued by the region.

3. Strive for balance

   Undertaking natural resources management activities that support a healthy economy that is meeting social and environmental objectives

4. Think innovatively

   Using creativity and leadership to manage our natural resources for the future.

5. Manage holistically

   Ensuring integrated landscape management by managing landscape components and processes together rather than dealing with issues in isolation

6. Work within the limits to ensure the future

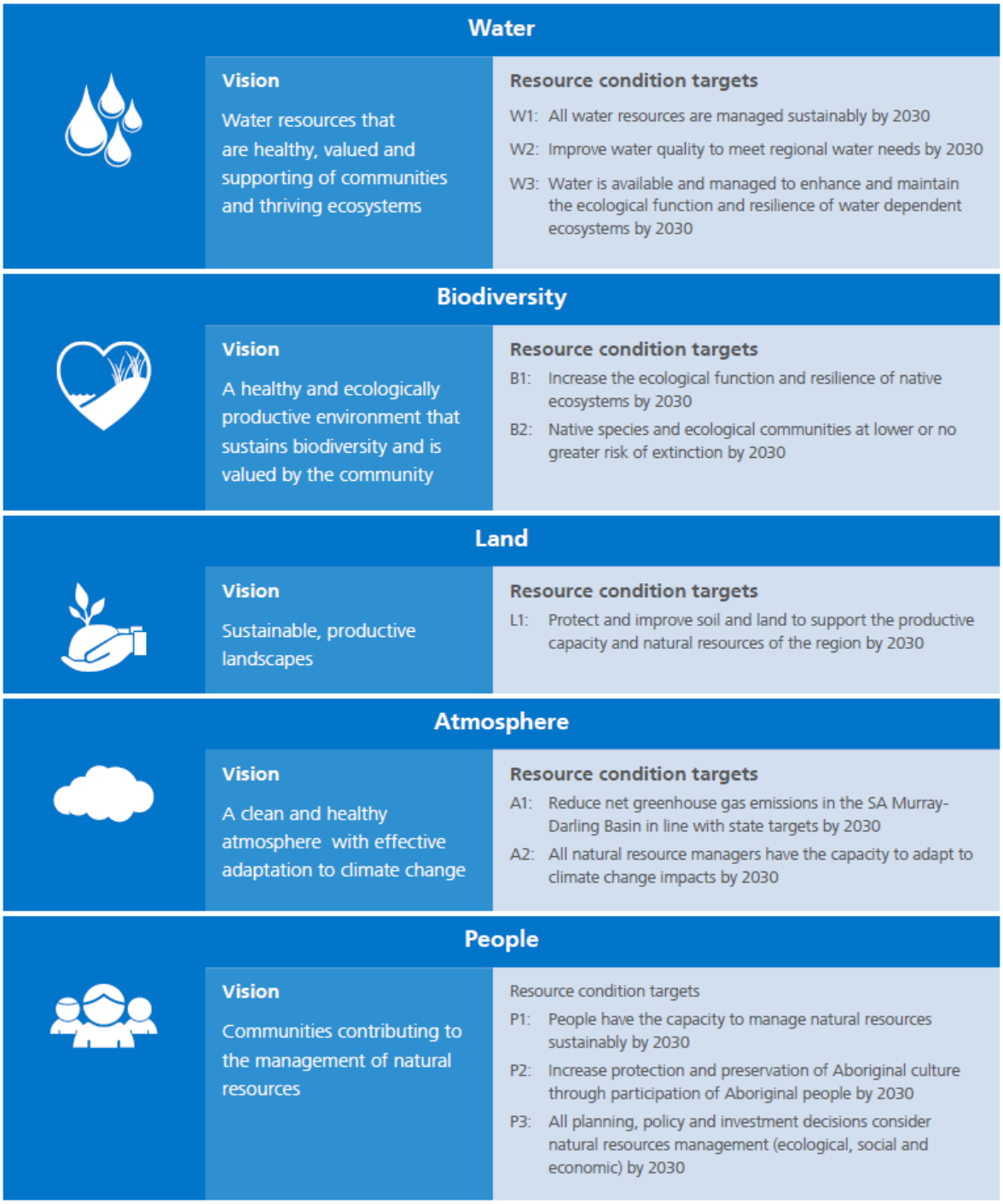
   Working within the sustainable limits to protect the capacity of our resources to provide services for the wellbeing of current and future generations.

7. Prevent rather than cure
8. Preventing the degradation of natural resources by dealing with causes is preferable to rehabilitation and treating symptoms

9. Continuous improvement and adaptive management

Past success should be built upon, while past mistakes and new information should be considered as opportunities for learning and informing the iterative processes that support future decisions. A precautionary approach should be taken where there is insufficient scientific or technical evidence on which to base a decision.

Figure 1. Resource Condition Targets (2009 – 2030)



2 The Board's focus and strategic directions

The Board contributes to the Natural Resources Management Plan, through 4 strategic directions:

1. More people doing more NRM
2. Working with farmers, irrigators and industry
3. Landscape scale change
4. Leadership and Continuous Improvement

More people doing more NRM

Effective management of natural resources relies on everyone doing their bit. How and why individuals, groups and businesses manage natural resources is guided by what is important to them. The Board will make decisions about actions and investment in natural resources with these values in mind.

The work of the Board aims to deliver long term outcomes by building the confidence and capacity of people to take responsibility for managing natural resources in their parts of the region.

The Board is committed to collaborating with other NRM investors to ensure efficient use of the resources available for managing natural resources.

Working with farmers, irrigators and industry

The SAMDB region encompasses 5.7 million hectares, of which 70 per cent is privately owned and primarily managed for agricultural and horticultural enterprise. With such a large amount of land privately owned and managed, it is essential that the Board's actions and investment decisions focus on developing partnerships with private land owners and building their capacity to deliver good natural resources management outcomes on their land. The region's farmers and irrigators must be supported to adopt and create innovative primary production techniques that support their ongoing productivity as well as a healthy and sustainable landscape.

Landscape scale change

The Board advocates taking a landscape approach to the management of natural resources. This means thinking about the region as linked systems, rather than individual natural resources assets. A landscape approach also recognises the complexity, uncertainty and natural variability in the region's natural resources. We will continue to work with the community to identify what we value about these landscapes, what is driving their current condition, and what we need to do to manage them. We will support threat abatement and landscape restoration activity to ensure the continued survival of species, and we will look to recognise and guide the efforts to halt the decline, or promote the recovery, of ecosystems across the landscape.

Leadership and Continuous Improvement

Natural resources management policy, planning and delivery occurs in a dynamic environment that will change throughout the life of the Natural Resources Management Plan and this business plan. To ensure a timely response to these sources of change, the Board will continue to lead a rigorous continuous improvement process that is evidence-based and supported by a monitoring, evaluation, reporting and improvement framework. The Board will demonstrate leadership by being inclusive, accessible and innovative in the way that it approaches the management of natural resources.

2.1 Developing the 2016/17 – 2018/19 Business Plan

In developing the Business Plan the Board committed to finding out community thinking about what's important for natural resources management in the SAMDB region.

The Board believes that there are dynamic and significant changes occurring within the natural resources management sector, society and economy. There are changes in what the community values, changes to the way people seek out information and choose to be involved in things that are important to them, changes in climate and changes in the requirements placed on Board's through the State Government. The threats to and impact on our natural resources also continue to evolve.

In the 2015-16 State Budget the South Australian Government announced that it would partially recover the costs of government Water Planning and Management activities through the regional NRM Boards. In addition to this measure, the Department of Environment, Water and Natural Resources (DEWNR) announced increased costs for the delivery of services and programs on behalf of NRM Boards.

In response to these changes,-the Board resolved to work inclusively with a wide and diverse range of people within the SAMDB community – a cross section of the regional community. One initiative was working with a Community Deliberative Panel to work through the dilemma arising from these cost pressures. The Board also sought opinions, information and ideas from the whole community via the South Australian Government's Your SAy website and by directly approaching key stakeholders.

This input provided the Board with a deeper insight into the values of the SAMDB community. The Community Deliberative Panel members provided specific advice to the Board on the importance of natural resource assets to them and the value they assign to projects and services funded by the Board from the levy, State and Australian Governments. The input from this randomly selected cross section of the SAMDB community provided very strong guidance to the Board in considering the program and funding option and ultimately the investment program decision outlined in this Business Plan.

The Board spent considerable time deliberating on the information from the Community Panel, the Your SAy website input and advice directly from key stakeholders. From this the Board made the decision to amend the levy proposal to raise additional revenue through the NRM land and water levies. This additional revenue will ensure valued projects and services continue to be delivered for priority natural resources issues and assets to manage key threats, and to realise significant opportunities for the region. The additional revenue will also fund the region's share of the water planning and management charges required by the State Government, and the DEWNR corporate cost increases. In response to the input received, the Board will continue to actively pursue innovation, adapt and modify its work program and actively find and implement efficiencies in the business.

2.2 Investment proposal

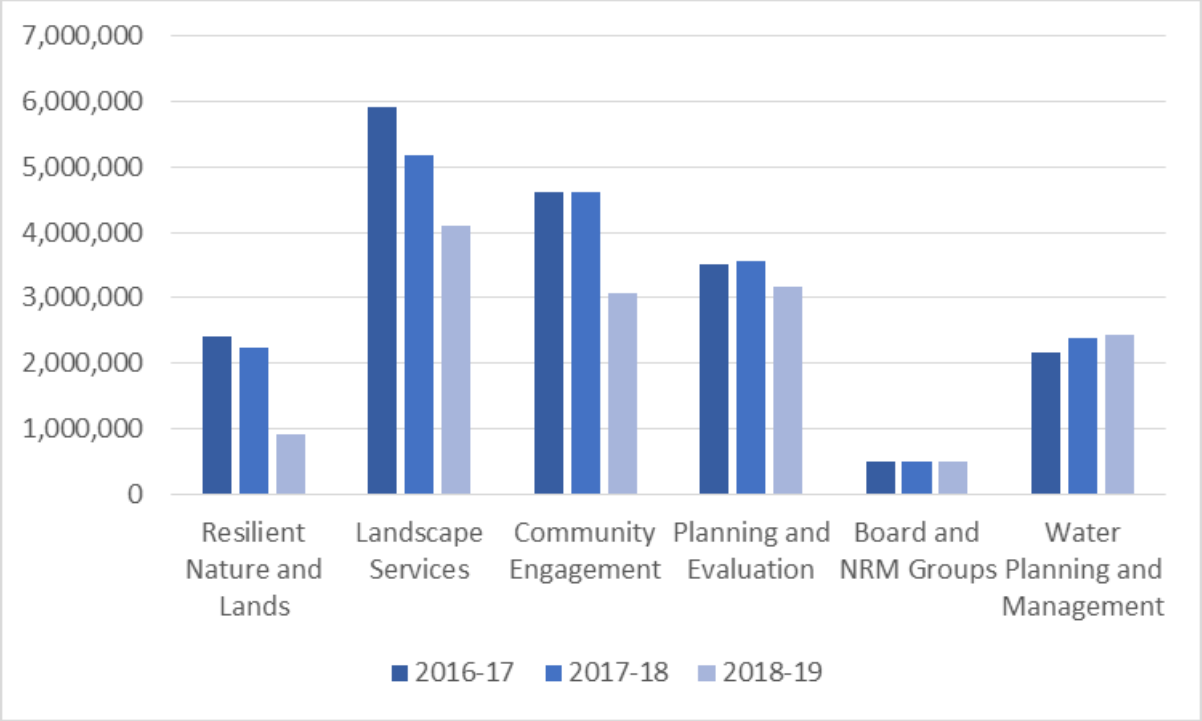
The Board's work program has been developed based on the required action for the region, with guidance from the Board's strategic directions and the Natural Resources Management Plan for the region. This investment will be delivered through a range of approaches, including direct investment, contracts for works and services, and grants to community organisations. The investment is complementary to the investment of other organisations and individuals within the region, which collectively advances progress towards the goals of the Natural Resources Management Plan for the region.

Table 1. 2016-17 Proposed Investment and Board Strategic Directions

Program Area	Sub-Program	Investment in Sub-Programs – all funding sources	More People Doing More NRM	Working with Farmers, Irrigators and Industry	Making Landscape Scale Change	Leadership and Continuous Improvement
Resilient Nature and Lands	Floodplains and Wetlands	1,029,309	✓	✓	✓	✓
	Regional Conservation Programs	219,368	✓	✓	✓	✓
	Landscape Resilience	1,159,236	✓	✓	✓	✓
Landscape Services	Sustainable Production	2,278,417	✓	✓	✓	✓
	Regional Operations	274,215	✓	✓	✓	✓
	Riverland District	931,757	✓	✓	✓	✓
	Mallee Coorong District	1,072,208	✓	✓	✓	✓
	Ranges to River District	995,057	✓	✓	✓	✓
	Rangelands District	358,340	✓	✓	✓	✓
Community Engagement	Communications	615,520	✓	✓	✓	✓
	NRM Communities	2,902,206	✓	✓	✓	✓
	NRM Education	469,148	✓	✓	✓	✓
	Community Engagement	630,671	✓	✓	✓	✓
Planning and Evaluation	Water Resource Management	1,725,715	✓	✓	✓	✓
	Monitoring, Evaluation, Reporting and Improvement	550,550	✓	✓	✓	✓
	Planning and Policy	583,986	✓	✓	✓	✓
	Investment and Information	643,942	✓	✓	✓	✓
Board	NRM Groups	225,938	✓	✓	✓	✓
	Board	265,295	✓	✓	✓	✓
	Water Planning and Management	2,151,370	✓	✓	✓	✓
		19,082,247				

✓ **Primary Outcome** ✓ Secondary Outcome

Figure 2. 3 Year Implementation Program



3 Income proposal

The Board expects to receive funds to deliver the Implementation Program, outlined in Chapter 2 of the Business Plan adopted by the Minister on 6th April 2016, from a range of sources. These include the regional NRM levy, the NRM water levy and various State and Australia Government funding programs.

Table 2. Funding sources for the implementation of the Business Plan

	Adopted Budget 2015-16	Adopted Budget 2016-17	Estimated Budget 2017-18	Estimated Budget 2018-19
NRM Levies	**9,333,534**	**13,432,247**	**13,641,731**	**13,737,505**
Division 1 Regional NRM levy	2,253,752	5,634,400	5,674,000	5,714,000
Division 2 NRM water levy	7,079,782	7,797,847	7,967,731	8,023,505
Other Income	**280,000**	**280,000**	**280,000**	**280,000**
Animal and plant control contracts	180,000	180,000	180,000	180,000
Interest	100,000	100,000	100,000	100,000
Grants - State Government	**0**	**0**	**0**	**0**
Other				
Grants - Australian Government	**20,348,834**	**5,370,000**	**4,366,000**	**0**
National Landcare Program Regional allocation	3,658,364	3,659,000	3,713,000	
Caring for Our Country - Other	444,000			
On-Farm Irrigation Efficiency Program	15,021,486	981,000	50,000	
Working on Country	542,880	553,000	563,000	
Clean Energy Futures Biodiversity Fund	619,000	177,000		
Stream 1 funding for Climate Ready NRM Plans	34,522			
Other	28,582		40,000	
Grants - Other	**0**	**0**	**0**	**0**
Other				
Total Income	**29,962,368**	**19,082,247**	**18,287,731**	**14,017,505**

Note: A number of Australian Government Programs conclude over the life of this Business Plan.

3.1 NRM Levies

The NRM levy is a primary source of funding for the management of the region's natural resources with and for the region's community and industries. Funds raised through the NRM levy ensure that works are undertaken to achieve the region's vision of '*a healthy living landscape meeting the social, environmental, economic and cultural needs of the community and ensuring the rights and wellbeing of future generations*'. The NRM levy also provides the Board with a unique opportunity to leverage into the region significant amounts of external funding from government programs.

Section 92 of the NRM Act 2004 (the Act) enables the Board to specify the amount to be contributed by constituent councils (Division 1 regional NRM levy) towards the cost of performing its functions under the Act. Section 101 of the Act enables the Minister to declare a water levy or levies that will return an amount as stated in the Regional NRM plan (Division 2 NRM water levy).

The NRM levy is collected from rate payers and water licence holders throughout the SAMDB region as follows:

Division 1 Regional NRM Levy – collected by councils as part of rates notices to rate payers

Division 2 NRM Water Levy - collected by Department of Environment, Water and Natural Resources.

The Act requires the Business Plan outlines the amount of funds to be collected through NRM levies in the SAMDB region.

The NRM levy proposal for 2016-17 marked a significant change from the levy proposal presented in the 2015-16 Business Plan. The NRM levies were increased to allow valued projects and services to continue and the Board to contribute its share of the required Water Planning and Management costs to the State Government. At the same time the Board made adjustments to its work program, and actively continued to promote and pursue innovation, and within its business, efficiencies.

At the time of preparing the Business Plan adopted by the Minister on 6th April 2016, an estimate of Consumer Price Index (CPI) was used to calculate the levy to be raised in 2017-18 and 2018-19. The Business Plan included a statement to the effect that the increases to the levy rate in year two (2017-18) and year 3 (2018-19) of the business plan be limited to CPI (All Groups Index for Adelaide). The CPI at June 2016 (which is the quarter the NRM Act requires be used in calculating the NRM Levies) was 0.7%. Therefore the estimate of the funds raised through the NRM levies for 2017-18, and 2018-19, has been adjusted.

Table 3. Funds proposed to be raised through the NRM levies

	2016-17 ($)[1]	2017-18 ($)[2]	2018-19 ($)[2]
Division 1 Regional NRM Levy	5,634,400	5,674,000	5,714,000
Division 2 NRM Water Levy	7,797,847	7,967,731	8,023,505
Total	**13,432,247**	**13,641,731**	**13,737,505**

1. NRM Levy adopted in the 2016-17 Business Plan (adoption date 6th April 2016)
2. NRM Levy adjusted to reflect the Consumer Price Index (All Groups Index for Adelaide) at June 2016

3.1.1 Basis for the NRM levy

In setting the NRM levies, the Board uses the following principles:

Fairness

- User/Beneficiary pays – people who are the beneficiaries of natural resources management in the region should pay accordingly;
- Shared responsibility - the responsibility to achieve ecologically sustainable development is a shared responsibility between the public sector, the private sector and the community groups;

Efficiency

- Certainty – the levy arrangement should deliver a certain outcome for both the managers of the natural resources of the region and the 'users' of the natural resources, so that they can plan and budget accordingly;
- Resource use efficiency – the basis for determining the levy should encourage efficient and sustainable use and the protection and enhancement of the region's natural resources;
- Administrative efficiency – the levy collection and management procedures should operate at minimum cost.

Governance

- Accountability – the natural resource managers financed by the levy (i.e. the Board) should be publicly accountable for their use of funds;
- Transparency – the process for calculating the levy and the amount paid by users should be readily observable, subject to individual user confidentiality constraints.
- Reasonable basis – costs incurred in managing the natural resources of the region should be contained at an economic level.

3.1.1.1 Division 1—Regional NRM Levy

The NRM Act provides a range of options as the basis for calculating the Regional NRM levy. Based on the principles established by the Board, the value of rateable land was used to determine the Regional NRM levy.

Table 4 outlines each Council's share of the total Regional NRM Levy. The table shows that the average Regional NRM levy per property will be 18 cents per day ($65 per year).

Consistent with the Business Plan adopted by the Minister for Environment and Conservation on 6th April 2016, the increase to the levy rate in year three (2018-19) of this business plan will be limited to the Consumer Price Index (All Groups Index for Adelaide).

Table 4 also provides advice on the amount that the Board considers appropriate for each council to receive with respect to the recovery of on-going costs related to the collection of the Regional NRM Levy.

Table 4. Indicative Council share of regional NRM Levy, Average regional NRM levy per property and Council Levy Collection Fee in 2017-18

COUNCIL AREA	Indicative Council Share of Total Levy ($)	Average levy per property ($)	Council Levy Collection Fee ($)
Adelaide Hills	6,302	134	2,413
Alexandrina	1,324,397	85	6,035
Barossa	63,877	85	2,577
Berri Barmera	315,037	47	3,957
Coorong	195,828	51	3,301
Goyder	173,022	45	3,299
Karoonda East Murray	65,687	44	2,750
Loxton Waikerie	448,724	51	4,474
Mid Murray	539,630	48	5,056
Mount Barker	1,364,232	94	5,782
Murray Bridge	731,814	60	5,266
Onkaparinga	4,315	131	572
Renmark Paringa	327,430	57	3,751
Southern Mallee	109,807	56	2,863
Victor Harbor	3,898	186	892
Total	**5,674,000**	**65**	**52,987**

3.1.1.2 Division 2—NRM water levy

The NRM Act provides a range of options as the basis for calculating the NRM water levy. For the River Murray Prescribed Watercourse, option 7 (the share of the water that makes up the relevant water resource) will be applied by the SAMDB NRM Board as the basis for calculating the NRM Water Levy. For all other prescribed water resources within the SAMDB region, option 2 (the quantity of water allocated) will be applied as the basis for calculating the NRM Water Levy.

The NRM water levy will be payable by persons authorised by a water licence to take water from the prescribed resources identified in Table 4 either:

- at the rate indicated in Table 4; or
- A levy of $200;

whichever is the greater.

The levy does not apply where the water is taken for domestic purposes or for the watering of stock not subject to intensive farming. The levy will also not apply where the water is allocated to Taking LABA (Flood Delivery) in the Eastern Mount Lofty Ranges. The levy for water allocated as Taking LABA (Flood) in the Eastern Mount Lafty Ranges will only be applied at the rate indicated in Table 4 (the levy of $200 will not apply).

The rates for the NRM water levy are outlined in Table 5. The rates for 2016-17 were increased by 10%. The increases to the levy rate for 2017-18 and 2018-19 will be limited to the Consumer Price Index (All Groups Index for Adelaide). The rates for 2017-18 and 2018-19 have adjusted in Table 4 to be based on the CPI rate at June 2016 (0.7%).

Table 5: NRM water levy rates

PRESCRIBED RESOURCE	2016-17	2017-18	2018-19*
	Rate	Rate	Rate
River Murray class 2 and class 6 water access entitlements[1]	1.960 cents per unit share	1.974 cents per unit share	1.988 cents per unit share
River Murray class 3a, class 4 and class 5 water access entitlements[2]	0.630 cents per unit share	0.634 cents per unit share	0.639 cents per unit share
River Murray class 3b water access entitlements[3]	0.600 cents per unit share	0.604 cents per unit share	0.608 cents per unit share
Angas Bremer	$6.30/ML	$6.34/ML	$6.39/ML
Noora[4]	$6.30/ML	$6.34/ML	$6.39/ML
Mallee – reticulated	$19.60/ML	$19.74/ML	$19.88/ML
Mallee	$6.30/ML	$6.34/ML	$6.39/ML
Mineral Sands Mining[5]	$6.30/ML	$6.34/ML	$6.39/ML
Peake, Sherlock & Roby	$6.30/ML	$6.34/ML	$6.39/ML
Marne Saunders	$6.30/ML	$6.34/ML	$6.39/ML
Eastern Mount Lofty Ranges	$6.30/ML	$6.34/ML	$6.39/ML
Taking LABA (Flood)[6]	$1.50/ML	$1.51/ML	$1.52/ML

*Estimated based on Consumer Price Index (All Groups Index for Adelaide) for June 2016.

1. River Murray class 2 water access entitlements (Consumptive Pool B) = Urban water use – country towns. River Murray class 6 water access entitlements (Consumptive Pool D) = Urban water use – metro Adelaide.
2. River Murray class 3a water access entitlements (Consumptive Pool E) = Irrigation and Holding. River Murray class 4 water access entitlements (Consumptive Pool E) = Recreation. River Murray class 5 water access entitlements (Consumptive Pool C) = Industrial and Industry (Dairy).
3. River Murray class 3b water access entitlements (Consumptive Pool E) = Irrigation & Holding (Qualco Sunlands Groundwater Control Trust)
4. The only licence issued in this resource is for environmental purposes and is exempt from the levy.
5. The levy amount collected for Mineral Sands Mining is based on the volume of water taken under section 128(b) of the Act.
6. Taking LABA (Lower Angas Bremer Allocation) (Flood) means an allocation granted to take water sourced from a watercourse in surface water management zones 426AR026 and/or 426BR062, or that flows from these zones, and to be taken by means of a pump or flood gate as a delivery supplement for the purpose of flood irrigation.. A levy does not apply where water is allocated as Taking LABA (Flood Delivery), and where the water is taken for domestic purposes or for the watering of stock not subject to intensive farming.

3.1.2 Impact of the levy

The Board commissioned an independent third party assessment of the expected social and economic impacts of the 2016-19 levy proposal.

3.1.2.1 Division 1—Regional NRM Levy

The assessment found that Regional NRM Levy equates to 0.15% of average after tax personal income in the region.

Using the representative farm financial models, the assessment found that the regional NRM levy is less than one percent of the total costs of running a farm based on the models analysed. The assessment also found that the impacts of the land levy will be minor for dryland farm operations (reduces EBIT by less than 1%), and moderate to significant for sheep specialists (reduces EBIT by around 6%). For non-farm businesses-the assessment indicated to the Board that the NRM levy will have a minimal impact across the majority of industries. However, for a small number of businesses the maximum levy could have moderate to significant impact.

3.1.2.2 Division 2—NRM water levy

The impact of the NRM Water Levy was assessed based on representative farm financial models. The models were designed to be broadly representative of growers of the main irrigation crops in the region. However, careful interpretation and use of the models is required as the diversity of farm size, enterprise mix, cost structure and prices received cannot be adequately represented in models of this type.

The key outcome of the assessment was that the NRM Water Levy is less than one per cent of the total costs of running a farm based on the models analysed. The impact of the levy on earnings before interest and tax (EBIT) was also assessed, with the impact categorised minor if the levy reduced EBIT by less than 1%, moderate if it reduced EBIT by between 1% and 5%, and significant if it reduced EBIT by more than 5%. For the modelled farm businesses experiencing positive returns and lower water use requirements, the impact of the levy was minor (around -0.7%). For modelled farm business experiencing positive returns with higher water use requirements, the impact of the levy was moderate (around 1.3%). For modelled farm business experiencing negative returns with lower water use requirements the impact was moderate (around -2.5%). However, the maximum levy could have moderate to significant impacts for some industries.

3.1.2.3 Combined land and water levy impacts

Landholders that pay a NRM Water levy on their water allocation are also required to pay the Regional NRM Levy. Therefore, the combined impacts of the levies on the financial performance were modelled.

The Regional NRM Levy increases the aggregate levies paid by landholders, but only marginally increases the impacts of both levies. The impact of both levies on water licence holders was assessed as having a minor to moderate impact (ranging between -0.4% to -2.6% impact on EBIT).

Gross regional product (GRP) for the SAMDB region for 2013/14 was estimated to be $6.81 billion. The assessment showed that the amount to be collected through both levies would be less than 0.2% of the SAMDB region's GRP.

3.2 Other Income

3.2.1 Interest

It is anticipated that interest of $100,000 will be received during 2017-18.

3.2.2 Cost recovery

The Board will continue to implement a cost recovery program to partially offset the costs of pest plant and animal programs implemented throughout the region. It is estimated that the Board will recover approximately $180,000 in the 2017-18 financial year.

3.2.3 State NRM Fund

The State Natural Resources Management Fund is a recurrent budget allocation that supports business operations and the necessary administration of the *Natural Resources Management Act 2004* (the Act). Allocation of these funds is agreed to by all regional NRM Boards in line with an agreed set of principles that include capacity to access other funds, financial position, funding justification, and funding certainty. Following assessment in line with these principles the Board will not receive funding from the South Australian Government during 2017-18 from the Natural Resources Management Fund.

3.2.4 National NRM programs

3.2.4.1 National Landcare Programme

The National Landcare Program is comprised of two funding streams: national and regional. Over the four years of the program (2014-15 to 2017-18), $1 billion will be invested in projects to help drive sustainable agriculture as well as supporting the protection, conservation and rehabilitation of Australia's natural environment.

Under the regional funding stream, $450 million will be invested in Australia's 56 NRM organisations over the life of the program. Regional NRM organisations will be expected to engage their local landcare communities in prioritising and delivering NRM activities across their NRM region, including assisting them through partnerships and cooperative arrangements. All regional NRM organisations will be required to direct a minimum of 20 per cent of their annual regional allocation to small, on ground projects and related activities that are delivered by, or directly engage with, the local landcare community.

2017-18 is the last year in the currently approved National Landcare Programme and will see the SAMDB NRM Board continue delivering the projects across the region to deliver the programmes outcomes. The funding allocation in 2017-18 financial year will be $3,713,000.

3.2.4.2 On-Farm Irrigation Efficiency Program

The On-Farm irrigation Efficiency Program is part of the Commonwealth Government's Sustainable Rural Water Use and Infrastructure Program. The On-Farm Irrigation Efficiency Program is aimed at assisting irrigators within the southern connected system of the Murray-Darling Basin to modernise their irrigation infrastructure and return water savings to the environment. In 2016-17 the Commonwealth Government will invest approximately $980,000 in the SAMDB region with approximately $50,000 in 2017-18.

3.2.5 Funds carried forward

The Board does not expect to carry forward any funds into 2016-17 or the subsequent 2 financial years.

3.3 Physical resources

The Board currently owns office buildings at Lameroo and Burra and sheds at Berri, Burra, Cambrai, Karoonda, Lameroo, Murray Bridge and Waikerie. The depot site at Berri is in the process of being sold due to amalgamation of two depots at Berri. The Murray Bridge shed has been moved from the local council depot to DEWNR's State Flora site. The head office is located in Murray Bridge. These and other leased buildings support the activities of the DEWNR field and project staff assigned to the Board. The Board does not plan to purchase any additional land or infrastructure assets during the life of the Business and Operational Plan.

4 Leadership in NRM

4.1 The Board

The SAMDB NRM Board is a statutory board formed under the provisions of *The Natural Resources Management Act 2004*. The Board comprises nine members from the general community who are appointed by the Minister for Sustainability, Environment and Conservation on the basis of their skills and knowledge in natural resources management. The Board is also supported by a members representing state agencies and local governments in the region. Current members of the Board are listed on the Natural Resources SAMDB website www.naturalresources.sa.gov.au/samurraydarlingbasin.

The Board contracts the services of Natural Resources SAMDB (a regional branch of DEWNR) to deliver the Implementation Program of this Plan. The Regional Manager works with the Board and DEWNR to oversee program implementation. For the 2016/17 financial year, there are 82.01 full-time equivalent (FTE) positions that deliver services to the Board through Natural Resources SAMDB.

4.2 NRM Groups

Under the provisions of the NRM Act, the Board identified the following four areas within the region for the operation of NRM Groups:

- Ranges to River
- Mallee - Coorong
- Rangelands
- Riverland.

Each NRM Group consists of up to seven members appointed by the Board on the basis of their knowledge, skills and experience. The NRM Groups strengthen the Board's connection with the community, industry and local government. They are the primary mechanism for raising awareness of local issues, priorities and actions, and add value to regional decision making and program delivery by facilitating two-way communication with key stakeholders. The NRM Groups are provided with executive and technical support from DEWNR staff assigned to the Board. Current members of the NRM Groups are listed on the Natural Resources SAMDB website www.naturalresources.sa.gov.au/samurraydarlingbasin.

4.3 Committees

Five committees were established by the Board to oversee the implementation of its business. These are the Financial Governance, Executive, Community at the Centre Collective, Grant Assessment and Review, and NRM Group Chairs. The River Murray Advisory Committee was also established by the Board to provide advice on the review, development and implementation of the River Murray Water Allocation Plan and other issues relating to this water resource. The Board also establishes specialist advisory committees when needed.

The Board also contributes to the operations of the Box Flat Dingo Control Committee. This is a joint activity with the South East Natural Resources Management Board. The Committee has responsibility for baiting and monitoring works for wild dogs and foxes in the Box Flat area including the Conservation Parks. The activities of this committee will continue to be supported by the Board.

5 Water Affecting Activities

5.1 General policies

Section 75(3)(k) of the Act requires a regional NRM plan to set out matters that should be taken into account when a relevant authority is exercising a power to grant or refuse permits under Chapter 7 Part 2 of the Act.

A permit is required for water affecting activities (WAAs) contained within section 127(3) of the Act, and may be required for activities listed in section 127(5) of the Act. Table 5.1 sets out the activities that require a permit in the SAMDB NRM region, subject to the exclusions set out in the Act and below. Table 5.1 also identifies the relevant authority for assessing permit applications for each type of activity.

A number of activities are excluded from requiring a permit under section 129 of the Act; this includes some activities which are approved under other legislation, such as the *Environment Protection Act 1993* or the *Development Act 1993*. Some activities are also excluded from requiring a permit under section 127(7) of the Act. In addition, the Board has identified some instances where activities that would otherwise require a permit are excluded. These activities are shown in Table 5.1 (columns 'WAAs excluded from requiring a permit – general exclusions' and 'WAAs excluded from requiring a permit – specific exclusions'), and discussed further in sections 5.1.2 and 5.1.3 in some cases.

The steps in assessing a WAA permit application are as follows:

1. Ascertain the nature and scope of the WAA with reference to section 127(3) and 127(5) of the Act.
2. Precisely define the affected site and determining if it is affected by a Water Allocation Plan (WAP).
3. Ensure sufficient information has been provided by the applicant to enable the relevant authority to make an informed decision.
4. Determine if the WAA permit application qualifies as an exclusion. If the application does not qualify, it will be assessed via the 'on merit' process.
5. 'On merit' applications will be assessed against the WAA permit policies contained in this Plan, and/or the relevant WAP as appropriate.

Public notification is not required for any WAA permit applications in the SAMDB NRM region.

5.1.1 Best Practice Operating Procedures

The Board has determined a process for granting exemptions for local government and other statutory authorities for particular Water Affecting Activities that would otherwise require a permit.

An exemption to requiring a permit may be granted when all of the following points are met:

- Where the Council or authority is able to present to the Board a Best Practice Operating Procedure (BPOP) in relation to the WAA; and
- The person proposing to undertake the activity has obtained written approval from the Board to undertake the activity or activities in accordance with the BPOPs; and
- The activity is undertaken in accordance with the BPOPs

Further information on the development of a BPOP will be available on the Natural Resources SAMDB website.

5.1.2 Current Recommended Practice

A Current Recommended Practice (CRP) sets out what the Board considers to be the most appropriate approach, methodology and/or design for undertaking particular water affecting activities. In addition, a CRP may further clarify the standards required to discharge the specific duty pursuant to section 133 of the Act.

In some instances, a CRP may negate the requirement for a WAA permit (see Table 5.1). The Board requires to be notified prior to the commencement of an activity undertaken in accordance with a CRP in such cases. A list of approved CRPs is published on the Natural Resources SAMDB website.

5.1.3 Undertaken as part of an NRM endorsed work plan

An exemption from requiring a WAA permit will be provided for some activities where the Board has a contract with an applicant/financial deed pursuant to section 42 of the Act that specifies that there is an exclusion from requiring a WAA permit, for a specific work plan. All Board endorsed work plans will follow any relevant Current Recommended Practice for that WAA activity.

5.1.4 Water allocation plan interface

A water allocation plan may set out additional policies that the relevant authority will take into account when considering an application for a WAA permit. The policies in a water allocation plan may be different to the policies in the Regional NRM Plan. To the extent that a water allocation plan includes different policies, the policies in the regional NRM Plan will not apply to that prescribed water resource.

Table 5.1. Water affecting activity exclusions

Act definitions of water affecting activities	Examples of WAAs	WAAs excluded from requiring a permit – general exclusions	WAAs excluded from requiring a permit – specific exclusions	Relevant authority
127(3)(a) Drilling, plugging, backfilling or sealing of a well	Well drilling or closure	As specified in the Act	None—all applications assessed on merit	Minister
127(3)(b) Repairing, replacing or altering the casing, lining or screen of a well	Well maintenance or upgrade	As specified in the Act	None—all applications assessed on merit	Minister
127(3)(c) Draining or discharging water directly or indirectly into a well	Managed aquifer recharge	As specified in the Act	None—all applications assessed on merit	Minister
127(3)(d) The erection, construction, modification, enlargement or removal of a dam, wall or other structure that will collect or divert, or collects or diverts— (i) water flowing in a prescribed watercourse; or (ii) water flowing in a watercourse in the Mount Lofty Ranges Watershed that is not prescribed; or (iii) surface water flowing over land in a surface water prescribed area or in the Mount Lofty Ranges Watershed	Dam, wall or other structure; Piping a watercourse; Channelling a watercourse; Stormwater harvesting/ treatment wetland	As specified in the Act	Desilting a dam in some circumstances, provided it is carried out consistently with principle 48, and does not involve a WAA pursuant to 127(5)(d)	Board
127(5)(a) The erection, construction, modification, enlargement or removal of a dam, wall or other structure that will collect or divert, or collects or diverts, water flowing in a watercourse that is not in the Mount Lofty Ranges Watershed and that is not prescribed or flowing over any other land that is not in a	Dam, wall or other structure; Piping a watercourse; Channelling a watercourse; Stormwater harvesting/ treatment wetland	As specified in the Act	Desilting a dam in some circumstances, provided it is carried out consistently with principle 48, and does not involve a WAA pursuant to 127(5)(d)	Board

Act definitions of water affecting activities	Examples of WAAs	WAAs excluded from requiring a permit – general exclusions	WAAs excluded from requiring a permit – specific exclusions	Relevant authority
surface water prescribed area or in the Mount Lofty Ranges Watershed				
127(5)(b) The erection, construction or placement of any building or structure in a watercourse or lake or on the floodplain of a watercourse	Buildings or structures <10m^2; Pump house; Horse shelter; Culvert; Crossing point or bridge; Fencing	As specified in the Act Activity where the proponent has written authorisation to carry out the activity in accordance with Board endorsed **Best Practice Operating Procedures (BPOP)** addressing the activity Activity that is undertaken in accordance with a Board endorsed **Current Recommended Practice** addressing the activity and notification has been received by the Board prior to commencement Activity that is undertaken as part of a **Board endorsed work plan** that specifies that there is an exclusion from requiring a WAA	Activity that is proposed to be undertaken beyond the 1-in-100 year average recurrence (ARI) flood level, where flood mapping is available, or a distance of 10 metres or more from the banks of the nearest watercourse where flood mapping is not available	Board
S127(5)(c) Draining or discharging water directly or indirectly into a watercourse or lake	Stormwater from buildings; Pipes; Culverts; Side entry pits		Activity that involves draining or discharging water of better quality than the receiving waters at a rate not exceeding 1 ML/y	Board
S127(5)(d) Depositing or placing an object or solid material in a watercourse or lake	Island in dam in a watercourse; Ripraps; Rocks; Tyres; Snags; Filling a watercourse			Board
S127(5)(e) Obstructing a watercourse or lake in any other manner	Planting vegetation			Board
S127(5)(f) Depositing or placing an object or solid material on the floodplain of a watercourse or near the bank or shore of a lake to control flooding from the watercourse or lake	Levee; Depositing fill			Board

Act definitions of water affecting activities	Examples of WAAs	WAAs excluded from requiring a permit – general exclusions	WAAs excluded from requiring a permit – specific exclusions	Relevant authority
		permit for that activity		
S127(5)(g) Destroying vegetation growing in a watercourse or lake or growing on the floodplain of a watercourse	Removal or destruction of trees, shrubs, grasses	As specified in the Act		Board
127(5)(h) Excavating or removing rock, sand or soil from— (i) a watercourse or lake or the floodplain of a watercourse; or (ii) an area near to the banks of a lake so as to damage, or create the likelihood of damage to, the banks of the lake	Desilting dam in a watercourse; Desilting wetlands, swamps and springs; Realignment or alteration of a watercourse; Groundwater access trench (GAT) construction	Activity where the proponent has written authorisation to carry out the activity in accordance with Board endorsed **Best Practice Operating Procedures (BPOP)** addressing the activity Activity that is undertaken in accordance with a Board endorsed **Current Recommended Practice** addressing the activity and notification has been received by the Board prior to commencement Activity that is undertaken as part of a **Board endorsed work plan** that specifies that there is an exclusion from requiring a WAA	Desilting a dam in some circumstances, provided it is carried out consistently with principle 48, and does not involve a WAA pursuant to 127(5)(d)	Board
127(5)(i) Using water in the course of carrying on a business in an NRM region at a rate that exceeds the rate prescribed by an NRM plan if the water has been brought into the region by means of a pipe or other channel	Use of imported water for irrigation; Use of imported water for industrial purposes		Where imported water is used on the land at a rate of up to 1 ML/ha/y; or up to 1 ML/y for non-irrigated activities Where the water is sourced from an SA Water owned or operated mains water supply network	Minister
s127(5)(j) Using effluent in the course of carrying on a business in an NRM region at a rate that exceeds a rate prescribed by an NRM plan	Use of treated effluent (e.g. Community Waste Management System (CWMS)) for irrigation. Use of treated		Where effluent is used on the land at a rate of up to 1 ML/ha/y; or up to 1 ML/y for non-irrigated activities Where a person or business undertaking a WAA is legally obligated to comply	Minister

Act definitions of water affecting activities	Examples of WAAs	WAAs excluded from requiring a permit – general exclusions	WAAs excluded from requiring a permit – specific exclusions	Relevant authority
	effluent for industrial purposes	permit for that activity	with a mandatory code of practice for the use of effluent that is consistent with the principles in this plan (for example, but not limited to, the EPA *Code of Practice for Milking Shed Effluent 2003*)	

5.2 Whole of SAMDB NRM region water affecting activity permit policies

The general objectives and principles which all 'on-merit' WAA applications will be assessed against within the SAMDB NRM Region are outlined below.

For the purposes of section 5.2 and 5.3:

- Any terms used that are defined in the Act carry the meaning given by the Act; and
- Any terms used in this plan that are defined in the 'Water affecting activity definitions' section (section 5.4) carry the meanings given in that section, unless otherwise specified, or where used in a general sense.

Terms that are given in italics are defined in section 5.4. Italics are generally only used the first time a term is used within a principle. Note that commonly used terms defined in section 5.4 are generally not italicised for the sake of visual clarity.

5.2.1 Objectives

A. Support development and use of water resources in a sustainable and equitable manner to maximise productive use, while providing for the needs of natural ecosystems and other water uses, in the long-term.

B. Prevent activities which could lead to unacceptable deterioration in the quality and quantity of water resources.

C. Minimise adverse impacts of activities on other natural resources and the community.

D. Protect aquifer integrity, and geomorphology of watercourses, lakes and floodplains.

E. Protect the long-term integrity of ecological functions and dependent biodiversity.

5.2.2 Principles

1. A WAA must be undertaken in such a way that, in both the short-term and the long-term, it ensures:

    a) maintenance or improvement of water quality

    b) capture of water is within sustainable limits

    c) equitable sharing of the water available for consumptive use

    d) maintenance of natural hydrological and hydrogeological systems, and environmental water requirements

    e) preservation of water-dependent ecosystems

    f) protection against the risk of harm to public and private assets and public safety from flooding

    g) continued monitoring of potential impacts from the activity where appropriate.

2. A WAA must not:

    a) cause or exacerbate soil erosion or bank destabilisation of a watercourse or lake, or erosion of a floodplain

    b) be located in ecologically sensitive areas where the activity will or is likely to have a significant detrimental impact

    c) have adverse impacts on water resources, other natural resources, or communities at both local and regional levels

    d) have adverse impacts on biodiversity and habitat preservation, water-dependent ecosystems, environmental water requirements and migration of aquatic biota

    e) cause or exacerbate unnatural waterlogging or rising watertables

    f) cause unacceptable deterioration in the quality of surface water, underground water or water in a watercourse or lake

    g) create or exacerbate the incidence or intensity of local or regional flooding or increase the flood risk to public and private assets, communities or individuals

    h) impact on authorised devices or activities for scientific purposes

    i) cause damage to the integrity of an aquifer or aquifers.

5.3 Objectives and principles for specific water affecting activities

In addition to the general objectives and principles set out in section 5.2, the relevant authority will consider the following objectives and principles when determining whether to grant or refuse a permit for an activity that will be assessed 'on merit', and when considering best practice operating procedures.

5.3.1 Taking water - section 127(2)

Section 127(2) of the Act provides that a person must not take water from a watercourse, lake or well that is not prescribed or take surface water from land that is not in a surface water prescribed area in contravention of an NRM plan that applies in relation to that water.

The following principles apply to the taking of water in the Noora Groundwater Management Area – Zone 11A North (as defined by the *Groundwater (Border Agreement) Act 1986*, and shown in Figure 5.1).

These principles will only have effect in the event that the regulation prescribing wells within the Noora Groundwater Management Area – Zone 11A North is revoked.

Objective

F. To ensure compliance with limits and reporting requirements as stated in relevant State and Commonwealth legislation.

Principles

3. The total volume of water taken from wells within the Noora Groundwater Management Area – Zone 11A North shall not exceed the permissible annual volume as determined by the *Review Committee* from time to time.

4. Water taken from wells within the Noora Groundwater Management Area – Zone 11A North (refer to Figure 5.1) must be taken through a meter supplied, installed and maintained in accordance with the South Australian Licensed Water Use Meter Specification, as may be amended from time to time.

5. If a person takes water from any well within the Noora Groundwater Management Area – Zone 11A North, the annual groundwater extraction volume data must be provided to the Minister's delegate when requested[1].

6. Principles 3-5 do not apply to water that is taken for:

    a) domestic purposes or for watering stock (other than stock subject to intensive farming);

    b) native title purposes;

    c) road-making, where the water has a salinity greater than 5,000 total dissolved salts measured in mg/L;

    d) fire-fighting;

[1] At the time of writing these principles, the major extraction of groundwater in Border Zone 11A North is for salt interception schemes (SIS) for the purpose of River Murray salinity management. All current and future SIS wells are metered for State salinity reporting requirements.

e) application of chemicals for the control of pest plants and animals; and

f) application of chemicals to non-irrigated crops or non-irrigated pasture.

5.3.2 Constructing, backfilling or repairing wells—section 127(3)(a) and (b)

The objectives and principles that follow apply specifically to an activity under the following sections of the Act:

- 127(3)(a): drilling, plugging, backfilling or sealing of a well; and
- 127(3)(b): repairing, replacing or altering the casing, lining or screen of a well;

referred to here as the 'activity' or 'activities'.

Objectives

In addition to the general objectives outlined in section 5.2.1;

G. Ensure the integrity of headworks are maintained.

H. Ensure wells are constructed in the correct aquifer system.

Principles

In addition to the general principles outlined in section 5.2.2;

7. Well construction must be in accordance with the General Specification for Well Construction, *Modification and Abandonment in South Australia* (or any subsequent or related policy), as provided by the relevant authority.

8. The equipment, materials and method used for the activity shall not adversely affect the quality of the underground water resource.

9. Aquifers shall be protected during the activity to prevent adverse impacts on the integrity of an aquifer.

10. Where a well passes through two or more aquifers, an impervious seal must be made and maintained between the aquifers to prevent leakage between aquifers.

11. Wells drilled for the drainage or discharge of water into a well shall be pressure cemented along the full length of the casing.

12. The activity shall not adversely affect the quality, quantity and accessibility of water for supply from existing wells operated by other landholders.

13. The activity shall not adversely affect water-dependent ecosystems.

14. The activity shall not significantly increase local drawdown.

15. Where the volume of water taken from wells within the Noora Groundwater Management Area – Zone 11A North has reached or exceeded the permissible annual volume as determined by the *Review Committee* from time to time, no further well drilling permits shall be granted, if to do so is likely to result in a net increase in volume of groundwater extracted from the Noora Groundwater Management Area – Zone 11A North.

16. A well may be deepened provided that it does not penetrate a different aquifer.

17. Despite principles 12-15, a replacement well may be drilled provided that:

    a) the original well is backfilled in accordance with a permit issued pursuant to section 127(3)(a) of the Act;

    b) the replacement well is within 20 metres of the original well; and

    c) the replacement well takes water only from the same aquifer as the original well.

5.3.3 Drainage or discharging water into a well—section 127(3)(c)

The objectives and principles that follow apply specifically to an activity under section 127(3)(c) of the Act, comprising draining or discharging water directly or indirectly into a well.

In addition to the objectives and principles outlined in this section, the requirements of the *Environment Protection Act 1993*, and associated relevant policies such as the *Environment Protection (Water Quality) Policy*, should be considered.

Objectives

I. In addition to the general objectives outlined in section 5.2.1;Ensure the integrity of headworks are maintained.

J. Ensure the sustainable operation and management of managed aquifer recharge schemes (also known as aquifer storage and recovery schemes).

Principles

In addition to the general principles outlined in section 5.2.2;

18. Water that is drained or discharged into a well must comply with the Environmental Protection Act 1993 and any associated policy.

19. A permit to drain or discharge water into a well will not be issued unless a risk assessment is undertaken to the satisfaction of the relevant authority.

    This risk assessment must be consistent with the *National Water Quality Management Strategy—Australian Guidelines for Water Recycling: Managing Health & Environmental Risks, Phase 1 2006* and *Phase 2 2009,* and other related documents current at the time, including:

    a) an investigation into the sustainability of the drainage or discharge site, including but not limited to, tests for transmissivity, maximum injection pressures and calculated likely impacts on the integrity of the well and confining layers, and impacts of potentiometric head changes to other underground water users

    b) an appropriate operation or management plan demonstrating that operational procedures and monitoring regimes are in place to protect the integrity of the aquifer, minimise the wastage of water and protect the discharge site on an ongoing basis

    c) a water quality assessment which identifies hazards in the source water

d) a report on the consequences and impacts to the ambient underground water resource where the water quality characteristics (salinity and chemistry composition) of the water to be discharged differs to that of the ambient underground water.

20. Water that is drained or discharged into a well only by means of gravity is exempt from meeting the requirements of principle 19 a).

21. Roof runoff that is drained or discharged into a well via a closed system of capture and transport is exempt from meeting the requirements of principles 19 a), b) and d), provided that the system is equipped with a mechanism to divert first flush water.

22. Further to principle 19 b), continuation of draining and discharge is dependent on an annual report that addresses the impacts to the ambient underground water at the draining or discharge site. Roof run-off captured in a closed system and then drained or discharged into a well is exempt from this principle.

23. For the purposes of principles 18 and 19, the relevant concentrations, levels or amounts shall be measured in sufficient representative samples of:

    a) the water to be drained or discharged

    b) ambient underground water collected from the proposed point of injection, or as near as possible to the proposed point of injection.

    For the purpose of this principle, 'sufficient representative samples' means suitable samples, collected with equipment appropriate for the substance, material or characteristic to be measured and taken at suitable locations and times to accurately represent the quality of the relevant water.

24. The draining or discharging of water directly or indirectly into a well must not degrade ecosystems dependent on the underground water or detrimentally affect the ability of other persons to lawfully take from that underground water.

25. The headworks for the draining or discharge of water shall be constructed so that extraction, draining and discharge operations can be metered without interference.

26. The headworks for the draining or discharge of water shall be constructed so that water cannot leak if the well becomes clogged.

27. Wells constructed for the draining or discharge of water at pressures greater than gravity must be pressure cemented along the full length of the casing. This does not exempt the need to follow the general specifications for well construction.

5.3.4 Water diversion and collection—sections 127(3)(d) and 127(5)(a)

The objectives and principles that follow apply to an activity under the following sections of the Act:

- 127(3)(d): the erection, construction, modification, enlargement or removal of a dam, wall or other structure that will collect or divert, or collects of diverts—

  (i) water flowing in a prescribed watercourse; or

  (ii) water flowing in a watercourse in the Mount Lofty Ranges Watershed that is not prescribed; or

(iii) surface water flowing over land in a surface water prescribed area or in the Mount Lofty Ranges Watershed; and

- 127(5)(a): the erection, construction, modification, enlargement or removal of a dam, wall or other structure that will collect or divert, or collects or diverts, water flowing in a watercourse that is not in the Mount Lofty Ranges Watershed and that is not prescribed or flowing over any other land that is not in a surface water prescribed area or in the Mount Lofty Ranges Watershed.

Note: Catching and holding dams

Dams have traditionally been constructed across watercourses and drainage paths to directly capture water for a variety of purposes.

A dam that directly catches runoff or flow typically inhibits all flow until the dam is filled. Once filled, water spills over and flows further downstream. Such catching dams have been shown to reduce the rate and volume of streamflow, and change the pattern of streamflow, from natural undeveloped conditions. Catching dams may create problems for both other users and ecosystems downstream as they can reduce flow duration and total yield, and lengthen periods of no flows. There is little flexibility in the management of catching dams as they generally capture all runoff or flow until full.

Greater flexibility is provided by *holding dams*, where water is stored in a holding dam after being diverted from a catchment area or watercourse via a mechanism like a weir, pump or channel, rather than directly capturing runoff or flow with the dam. This is because the mechanism used to divert runoff or water from a watercourse can be varied more easily to allow capture of water at different times or flow rates.

Note – Basin Plan limits for non-prescribed surface water management zone

This section includes principles that contribute to meeting South Australia's responsibilities under the Commonwealth's Basin Plan. The SAMDB NRM region includes part of the South Australian Non-Prescribed Areas surface water sustainable diversion limit (SDL) resource unit, a planning unit within the Basin Plan's South Australian Murray Region water resource plan area (see Figure 5.2). This surface water SDL resource unit also includes parts of the South Australian Arid Lands and South East NRM regions.

The Basin Plan sets a sustainable diversion limit for this SDL resource unit that caps allowable surface water taking in the area. The allowable future dam development capacity within the sustainable diversion limit for this SDL resource unit has been apportioned across the three NRM regions by agreement between the regions' NRM Boards. The NRM Boards have also agreed to be open to re-negotiating the apportionment of available dam development capacity in future.

The dam capacity limit that applies to the part of the SA Non-Prescribed Areas SDL resource unit in the SAMDB NRM region applies to the total dam capacity, including existing dam capacity and future dam development. The existing dam capacity in the part of the SAMDB NRM region within this SDL resource unit prior to the adoption of this plan is estimated to be 16,295 ML.

Objectives

In addition to the general objectives outlined in section 5.2.1;

K. Ensure that dams, walls or any other water collection or diversion mechanisms are sited, constructed and operated in a manner which:

   a) protects the rights of downstream water users (including the environment) to access those water resources; and

   b) maintains amenity.

Principles

In addition to the general principles outlined in section 5.2.2;

Siting

28. A dam, wall or other structure for the storage, collection or diversion of water must not:

   a) be constructed in areas prone to erosion

   b) contribute to dryland salinity or intrusions of saline underground water into watercourses

   c) be constructed or enlarged in ecologically sensitive areas, where this will cause or be likely to cause significant detrimental impacts.

29. Catching dams must not be constructed or enlarged in or across watercourses with a stream order of three or higher, except in exceptional circumstances where the proponent can demonstrate, to the relevant authority's satisfaction, that there is no reasonably practical alternative approach on the property to collect or access sufficient water to meet the reasonable requirements of the proponent.

30. In all other cases, holding dams should be constructed in preference to catching dams, unless it is not reasonably practical to do so.

Non-prescribed surface water management zone

31. A dam, wall or other structure that collects or diverts water must not be constructed or enlarged in the *non-prescribed surface water management zone* if that activity would cause the total volume of dam capacity in that zone to exceed the non-prescribed surface water management zone limit of 38,600 ML.

32. For the purposes of principle 31:

    a) the *non-prescribed surface water management zone* is shown in Figure 5.3.

    b) the dams and their capacities in the non-prescribed surface water management zone considered to exist prior to 30 June 2009 are given in Topography Water Bodies dataset Number 902 archived by the Department for Environment, Water and Natural Resources for the purposes of Basin Plan compliance.

Sub-catchment limits

33. A dam must not be constructed or enlarged if that activity would cause the total volume of dam capacity in a sub-catchment zone shown in Figure 5.4 to exceed (or further exceed) the sub-catchment dam capacity limit specified in column 7 of Table 5.2 for that zone (where relevant).

34. When the sub-catchment dam capacity limit for a sub-catchment zone has been reached or exceeded, any other methods of surface or watercourse water diversions or harvest shall not be permitted in that zone, if it may result in a net increase in the volume of water to be collected or diverted.

Property limits

35. A dam must not be constructed or enlarged if that activity would cause the total volume of dam capacity on a property to exceed (or further exceed) the property dam capacity limit for that property.

    The property dam capacity limit for a given property is calculated as follows:

    0.3 (30% of) X the area of the property (km^2) X long term average rainfall between the months of May and November (mm) for the locality X 0.1 (10% run-off coefficient)

Exception to limits

36. Principles 33, 34 and 35 do not apply where the diversion is solely for the purpose of improving water quality, and/or mitigating flooding, prior to returning the diverted water to the same watercourse or drainage path within three days (or other period as determined by the relevant authority), with loss of water volume only allowed via minimised evaporation and seepage from the water body.

37. Principles 33, 34 and 35 do not apply to authorised structures for the specific purpose of measuring streamflow. For the purpose of this principle, an 'authorised structure' means a structure authorised by the Board, a local government authority or the Minister.

38. Where a dam (the 'original dam') has been washed away, a permit may be granted to construct a replacement dam of the same capacity as the original dam, despite principles 33, 34 and 35, provided that:

    a) the capacities of the original and replacement dams are demonstrated to the relevant authority's satisfaction; and

b) the replacement dam is constructed in the same location as the original dam, or on a part of the same *property* that is *hydrologically continuous* with the original dam within the property.

39. New dam capacity may be allowed in addition to the limits set out in principles 33, 34 and 35 to collect additional runoff generated from human-made areas of low permeability (such as hard surfaces created by urban or industrial development), provided that:

    a) it can be demonstrated to the relevant authority's satisfaction by a suitably qualified expert that collecting the additional runoff will not compromise the provision of water requirements of water-dependent ecosystems and existing consumptive users; and

    b) pre-development runoff and recharge from the site is returned to the environment:

        i. as close as reasonably practical to the natural flow path;

        ii. as soon as reasonably practical following precipitation, unless detained on-site for water quality remediation and/or mitigation of flooding, in which case the pre-development runoff and recharge must be returned to the environment within three days of collection or diversion (or other period as determined by the relevant authority);

        iii. in a manner that maintains the natural flow regime and aquifer recharge;

        iv. in a manner that does not cause significant detrimental impacts to the environment, including but not limited to erosion and detrimental impacts to stream bed and bank stability

40. For the purposes of principle 39:

    a) Pre-development runoff and recharge is the mean annual volume expected to return to water resources from the site under conditions prior to the creation of the low permeability surfaces that give rise to additional runoff.

    b) Pre-development runoff and recharge, and the volume of additional runoff generated by low permeability areas, will be determined to the satisfaction of the relevant authority by a suitably qualified hydrologist or engineer.

Flow regime

41. A dam, wall or other structure that collects or diverts surface water flowing over land or water from a watercourse must include a device that ensures any water present at or below the threshold flow rate will:

    a) not be collected or diverted; or

    b) be bypassed around the dam, wall or other structure, or otherwise returned to the same watercourse or surface water drainage path immediately downstream of the dam, wall or other structure as soon as reasonably practical AND the water will be of an equivalent or better quality.

42. For the purposes of this plan:

    a) the threshold flow rate (in litres/second) is calculated by multiplying:

    the *unit threshold flow rate* (in litres/second/km^2), by the area of *catchment area* (in km^2) above the point where the water is diverted from the watercourse or drainage path

b) The unit threshold flow rate is determined as follows:

i. where the dam, wall or other structure lies within a sub-catchment zone as shown in Figure 5.4, the unit threshold flow rate is that given for that zone in Table 5.2, column 8; or

ii. in all other cases, the unit threshold flow rate will be determined by the relevant authority.

43. A device that will achieve the outcomes required by principle 41 shall:

a) be designed and constructed to ensure its correct operation is automated and, as far as reasonably practicable, cannot be manually overridden

b) not be obstructed or tampered with in any way

c) be maintained in such a condition that it continues to be effective in meeting principle 41.

Dam design features

44. Dams, walls, or other structures for the collection, storage or diversion of water should, where appropriate and practicable, be designed and constructed to incorporate a range of features to improve water quality and enhance ecological values. Such features include, but are not limited to:

a) an irregular edge

b) a variety of depths to increase habitat for a variety of plants and animals

c) well vegetated edges

d) minimal stock access

e) an upstream silt trap for catching dams (one-tenth the size of the dam)

f) provision for aquatic biota migration where appropriate

g) provision of an island at least 0.5 metres above the maximum dam water level in water at least 0.5 metres deep.

Dam construction

45. The erection, construction, enlargement, modification or removal of a dam, wall or other structure to collect or divert water must be undertaken in a manner that minimises the removal or destruction of riparian and in-stream vegetation (e.g. via inundation of area).

46. The erection, construction, enlargement, modification or removal of a dam, wall or other structure to collect or divert water must be undertaken in a manner that prevents silt or sediments from entering the watercourse, including but not limited to the use of erosion and sediment control measures such as diversion drains, revegetation, straw bale barriers, filter fences, sediment traps and detention basins.

47. The erection, construction, enlargement, modification or removal of a dam, wall or other structure to collect or divert water must ensure a minimum 20-year design life in accordance with best practice guidelines (endorsed by the Board) for all watercourse flow conditions up to the 100-year average recurrence interval (0.01 annual exceedance probability) flow rate for the proposed location.

Dam maintenance

48. A WAA permit is not required where the desilting of a dam meets all of the following provisions:

    a) desilting only involves the removal of unconsolidated material deposited since construction of the dam or material deposited since the dam was previously desilted;

    b) desilting does not enlarge the dam capacity or increase the dam wall height beyond their original dimensions;

    c) the dam is not on a watercourse with a *stream order* of 3 or higher;

    d) the excavated material is not placed in or near a watercourse, floodplain or lake;

    e) the excavated material does not:

        i. adversely affect native vegetation;

        ii. impede the natural flow of surface water;

        iii. re-enter any water body; or

        iv. facilitate the spread of pest plants or pathogenic material; and

        v. appropriate measures are taken to minimise water quality impacts arising from desilting.

5.3.5 Building or structure in a watercourse, lake or floodplain—section 127(5)(b)

The objectives and principles that follow apply specifically to an activity under section 127(5)(b) of the Act, comprising the erection, construction or placement of any building or structure in a watercourse or lake or on the floodplain of a watercourse.

Objectives

As per the general objectives outlined in section 5.2.1.

Principles

In addition to the general principles outlined in section 5.2.2;

49. Construction and placement of structures—including roads—in a watercourse, floodplain of a watercourse, lake, wetland or area subject to inundation:

    a) shall be designed to minimise the risk of erosion resulting from the construction and location of the structure;

    b) must not adversely affect the provision of environmental water requirements (e.g. by impeding flows);

    c) must not adversely affect the migration of aquatic biota;

    d) must not result in flooding, either upstream or downstream; and

    e) must not be constructed where it, or any debris collected by it, would increase the risk of damage to property or the risk to safety of persons.

50. Structures that impede the flow of water must be designed to bypass or otherwise return water present at or below the threshold flow rate in accordance with principles 41–43.

51. Principle 50 does not apply to structures authorised by the Minister or the relevant authority for the specific purpose of measuring stream flow, or for managing water flow to assist with maintenance, rehabilitation or restoration of locally indigenous water-dependent ecosystems, habitats, communities or species.

5.3.6 Drainage or discharge of water into a watercourse or lake—section 127(5)(c)

The objectives and principles that follow apply specifically to an activity under section 127(5)(c) of the Act, comprising draining or discharging water directly or indirectly into a watercourse or lake.

In addition to the objectives and principles outlined in this section, the requirements of the *Environment Protection Act 1993*, and associated relevant policies such as the *Environment Protection (Water Quality) Policy*, should be considered.

Objectives

In addition to the general objectives outlined in section 5.2.1;

L. Manage drainage or discharge water such that contaminants are contained and managed on-site to minimise the conveyance of contaminants into watercourses or lakes.

Principles

In addition to the general principles outlined in section 5.2.2;

52. Drainage or discharge of water into a watercourse or lake must only be undertaken where suitable protective measures have been provided to minimise degradation in the quality of the receiving water. Suitable protective measures may include, but are not limited to:

    a) detention basins to regulate the rate, volume and quality of water discharged

    b) reuse of drainage or discharge water that occurs under conditions that would not present a risk to public or environmental health

    c) litter traps

    d) pre-treatment of the water before discharge

    e) a requirement that the quality of water drained or discharged into a watercourse lake or floodplain is of a quality similar to or better than that of the receiving water environment

    f) discharge into the receiving waters occurs at times of naturally high flow.

53. All treatment devices must be appropriately managed to ensure that they continue to function according to their design, particularly in the removal of accumulated sediment and litter.

54. The rate, location and timing of discharge or drainage of water must occur such that:

    a) the geomorphology of the watercourse or lake is protected;

    b) water-dependent ecosystems (including their environmental water requirements), and migration of aquatic biota, are not adversely affected;

c) the flow capacity of the watercourse or lake is considered; and

d) there is no increase in the risk of flooding.

55. Storage of any contaminated water must only be undertaken in storage vessels with no natural catchment that are constructed to prevent leakage or overflow of any contaminated water.

Note: Waste stream from desalination processes

The discharge of a waste stream (brine and other chemicals) from desalination processes directly or indirectly to a watercourse or lake would be considered under this section of these policies for the control of WAAs.

5.3.7 Management of obstructions—sections 127(5)(d), (e) and (f)

The objectives and principles that follow apply specifically to an activity under the following sections of the Act:

- 127(5)(d): depositing or placing an object or solid material in a watercourse or lake;
- 127(5)(e): obstructing a watercourse or lake in any other manner; and
- 127(5)(f): depositing or placing an object or solid material on the floodplain of a watercourse or near the bank or shore of a lake to control flooding from the watercourse or lake.

Objectives

As per the general objectives outlined in section 5.2.1.

Principles

In addition to the general principles outlined in section 5.2.2;

56. Any object or solid material to be used in the control or prevention of watercourse erosion must be designed with consideration of the local-scale and catchment scale landscape and hydrological processes.

57. The depositing or placing of an object or solid material in a watercourse or lake, or obstructing a watercourse in any other manner, must not:

a) cause or increase erosion;

b) cause detrimental offsite impacts, for example, but not limited to, flooding;

c) adversely affect water-dependent ecosystems; or

d) adversely affect the migration of aquatic biota.

58. Objects or solid materials or other obstructions that impede the flow of water must be designed to bypass or otherwise return water present at or below the threshold flow rate in accordance with principles 41-43.

59. Principle 58 does not apply to structures authorised by the Minister or the relevant authority for the specific purpose of measuring stream flow, or for managing water flow to assist with maintenance, rehabilitation or restoration of locally indigenous water-dependent ecosystems, habitats, communities or species.

60. Depositing or placing an object or solid material on the floodplain of a watercourse, or near the bank or shore of a lake, to control flooding from the watercourse or lake shall not:

a) adversely affect the natural flow of a watercourse

b) increase the risk of flooding (upstream or downstream), or

c) cause or increase erosion.

61. Depositing or placing an object or solid material on the floodplain of a watercourse, or near the bank or shore of a lake, to control flooding from the watercourse or lake should:

a) provide for the needs of ecosystem processes (including the migration of aquatic biota); and

b) minimise the impact or risk of flooding on human communities.

5.3.8 Management of vegetation removal and excavation—sections 127(5)(g) and (h)

The objectives and principles that follow apply specifically to an activity under the following sections of the Act:

- 127(5)(g): destroying vegetation growing in a watercourse or lake or growing on the floodplain of a watercourse; and
- 127(5)(h): excavating or removing rock, sand or soil from—

  (i) a watercourse or lake or the floodplain of a watercourse; or

  (ii) an area near to the banks of a lake so as to damage, or create the likelihood of damage to, the banks of the lake.

Note: Native vegetation controls

In most cases, destruction of, damage to and removal of native vegetation requires approval under the South Australian *Native Vegetation Act 1991*. Issuing a water affecting activity permit does not negate the need to comply with the provisions of the *Native Vegetation Act 1991*.

Objectives

As per the general objectives outlined in section 5.2.1.

Principles

In addition to the general principles outlined in section 5.2.2;

62. Alteration to the alignment of a watercourse, or destruction of vegetation within a watercourse, lake or floodplain shall only occur where it is for the protection of existing infrastructure or rehabilitation of a watercourse, lake or floodplain, and the activity does not result in any of the following:

a) increased erosion

b) increased flooding

c) bed and bank instability

d) downstream sedimentation

e) destruction of significant habitat for native fauna

f) decline in water quality

g) alteration to the natural flow regime of a watercourse.

63. The excavation and removal of rock, sand or soil, or destruction of vegetation within a watercourse, lake or floodplain, must not adversely affect either:

a) the ecology of a watercourse, lake or floodplain, or

b) migration of aquatic biota.

5.3.9 Use of imported water and effluent—sections 127(5)(i) and (j)

The objectives and principles that follow apply specifically to an activity under the following sections of the Act:

- 127(5)(i): using water in the course of carrying on a business at a rate that exceeds one megalitre per hectare per year, or one megalitre per year for non-irrigated activities, if the water has been brought into the region by means of a pipe or other channel ('imported water'); and
- 127(5)(j): using effluent in the course of carrying on a business at a rate that exceeds one megalitre per hectare per year, or one megalitre per year for non-irrigated activities.

In addition to the objectives and principles outlined in this section, the requirements of the *Environment Protection Act 1993*, and associated relevant policies such as the *Environment Protection (Water Quality) Policy*, should be considered where relevant.

Objectives

In addition to the general objectives outlined in section 5.2.1;

M. Ensure that effluent is used in such a manner that risks to public health are minimised.

N. Protect the productive capacity of the land.

Principles

In addition to the general principles outlined in section 5.2.2;

64. A permit is not required for the use of imported water and effluent where the water or effluent is used on the land at a rate of up to one megalitre per hectare per year, or up to one megalitre per year for non-irrigated activities.

65. A permit is not required where a person or business undertaking a WAA is legally obligated to comply with a mandatory code of practice for the use of effluent that is consistent with the principles in this plan (for example, but not limited to, the EPA Code of Practice for Milking Shed Effluent 2003 or its successors).

66. The use of effluent must be undertaken in a manner that minimises risks to human health.

67. The use of imported water or effluent must not cause a rise in underground water levels that would adversely affect land, public and private assets, other water resources or natural resources and their beneficial uses.

68. The use of imported water or effluent must not adversely affect the natural flow regime or ambient quality of the receiving waters.

69. The use of imported water or effluent must not adversely affect the productive capacity of the land by impacts including, but not limited to, increasing salinity, water logging, sodicity, toxicity, nutrient concentrations or watertables.

70. The use of imported water or effluent must not adversely affect the condition, biodiversity or extent of a water-dependent ecosystem.

71. Any dams constructed for the storage of chlorine-treated imported water or effluent must be constructed so as to prevent:

    a) leakage from the dam through the soil

    b) overflows from the dam onto the surface of the land surrounding the dam

    c) overflow from the dam into a watercourse or lake.

72. Any dams constructed for the storage of chlorine-treated imported water or effluent must not be located in a watercourse, floodplain, lake, or drainage path.

73. The use of imported water or effluent will not be permitted where its use will adversely affect the environment.

Figure 5.1. Noora Groundwater Management Area – Zone 11A North

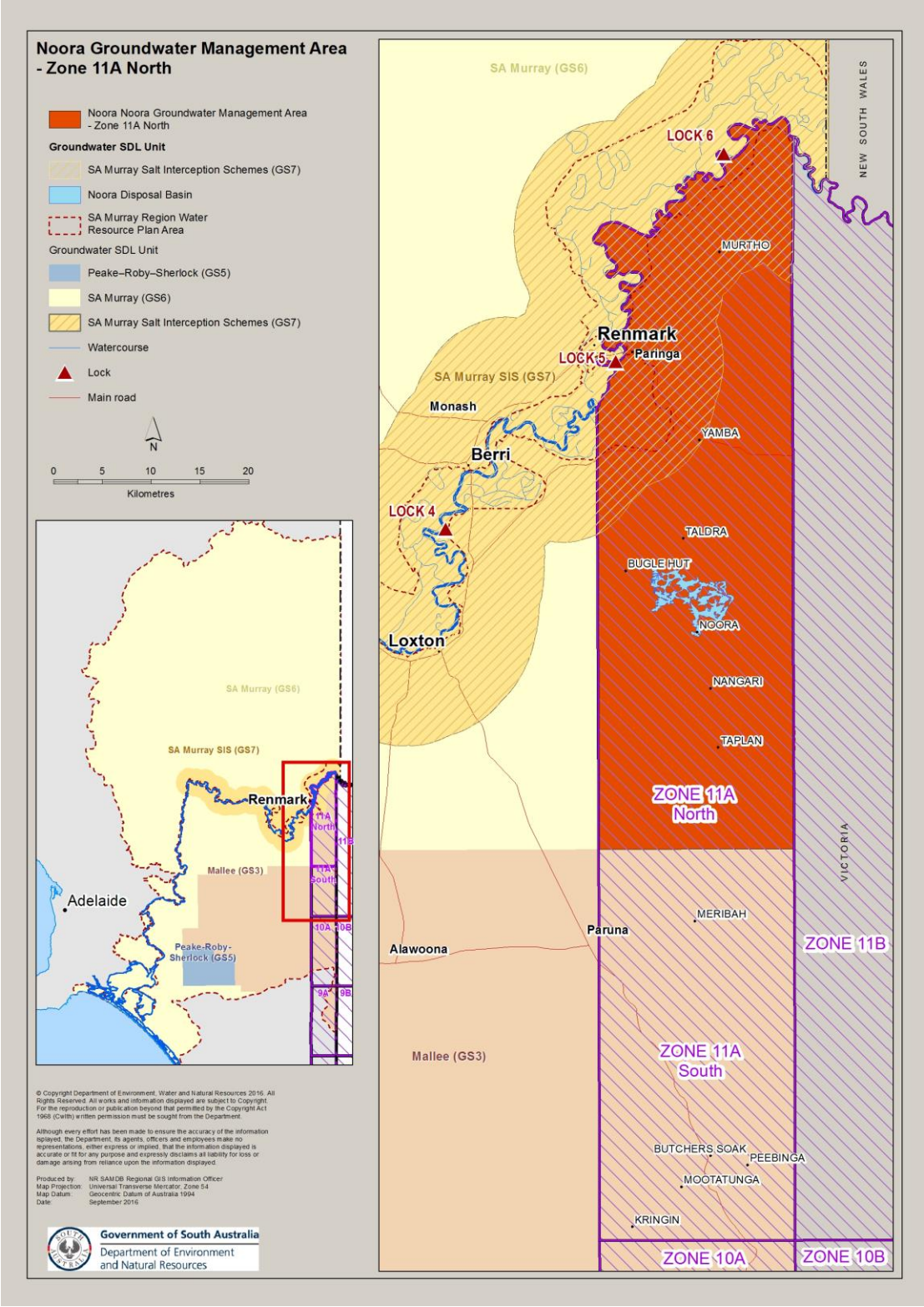


Figure 5.2. The South Australian Non-Prescribed Areas surface water sustainable diversion limit (SDL) resource unit, a planning unit within the Basin Plan's South Australian Murray Region water resource plan area.

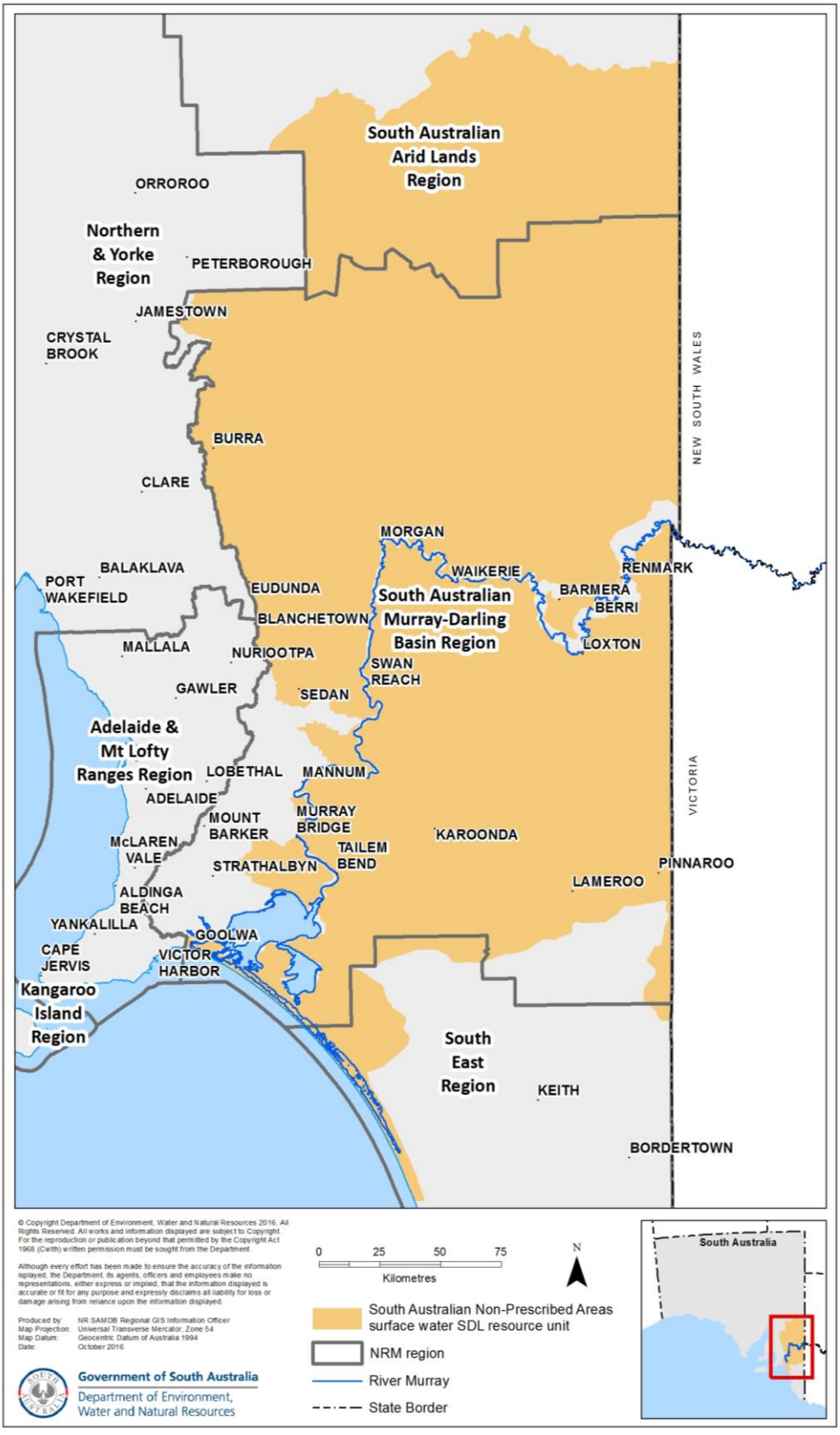


Figure 5.3. Non-prescribed surface water management zone map

Figure 5.4. Sub-catchment zone map

Table 5.2. Sub-catchment zone data

	1	2	3	4	5	6	7	8
Catchment	**Sub-catchment zone code**	**Sub-catchment zone area (km^2)**	**Average annual rainfall (mm)**	**Average May-November rainfall (mm)**	**Average May-Nov runoff (10% of May - Nov rainfall) (mm)**	**30% of May-November runoff (mm)**	**Sub-catchment dam capacity limit (ML)**	**Unit threshold flow rate ($L/s/km^2$)**
Baldina Creek	BA	99	415	306	31	9	909	1
Burra Creek—Razorback	BU1	53	420	309	31	9	491	1
Burra Creek—Mount Bryan TS	BU2	64	440	330	33	10	629	1
Burra Creek—Firewood Creek	BU3	99	462	347	35	10	1,031	1
Burra Creek—Springbank Valley	BU4	40	462	346	35	10	415	1
Burra Creek—Upper Burra Creek	BU5	90	439	325	32	10	876	1
Burra Creek—Logan Creek	BU6	66	473	356	36	11	700	1
Burra Creek—Lagoon Hill	BU7	48	473	356	36	11	510	1
Burra Creek—Worlds End	BU8	83	315	223	22	7	553	1
Burra Creek—Mid Burra Creek	BU9	61	315	223	22	7	409	1
Burra Creek—Lower Burra Creek	BU10	335	235	157	16	5	1,583	1
Caroona Creek	CA	19	261	181	18	5	104	1
Craigie Plain	CP	145	303	209	21	6	910	1
Keynes Plain	KP	468	321	225	23	7	3,163	1
Levi Creek	LC	90	442	327	33	10	888	1
Narcoota - Deep Creek	NC	248	380	269	27	8	1,999	1
Newikie Creek	NE	248	415	306	31	9	2,274	1
Piltimitiappa Creek	PC	10	235	148	15	4	45	1

	1	2	3	4	5	6	7	8
Catchment	**Sub-catchment zone code**	**Sub-catchment zone area (km^2)**	**Average annual rainfall (mm)**	**Average May-November rainfall (mm)**	**Average May-Nov runoff (10% of May - Nov rainfall) (mm)**	**30% of May-November runoff (mm)**	**Sub-catchment dam capacity limit (ML)**	**Unit threshold flow rate ($L/s/km^2$)**
Pine Creek	PN	58	362	258	26	8	452	1
Red Creek	RC	135	380	273	27	8	1,110	1
Robertstown Lagoon	RL	107	476	352	35	11	1,130	1
Stone Chimney Creek	SC	51	396	283	28	8	436	1
Sedan	SE	152	412	304	30	9	1,387	1
Spring Hut Creek	SH	280	314	219	22	7	1,842	1
Stonefield	ST	119	342	242	24	7	860	1
Towitta Creek	TC	94	363	263	26	8	745	1
Truro Creek	TR	194	400	291	29	9	1,693	1
Waupunyah Creek	WA	221	264	168	17	5	1,116	1
Wonna Creek	WC	329	395	288	29	9	2,847	1
Wild Dog	WD	26	354	254	25	8	197	1
Witto Creek	WI	164	248	164	16	5	808	1
Williams Reservoir	WR	30	261	181	18	5	162	1
Marne River	M1	113	619	482	48	14	1,631	2
Marne River	M2	109	499	389	39	12	1,270	1.5
Marne River	M3	28	373	291	29	9	248	1.5
Saunders Creek	S1	25	488	380	38	11	291	1.5
Saunders Creek	S2	33	474	369	37	11	366	1.5

	1	2	3	4	5	6	7	8
Catchment	**Sub-catchment zone code**	**Sub-catchment zone area (km^2)**	**Average annual rainfall (mm)**	**Average May-November rainfall (mm)**	**Average May-Nov runoff (10% of May - Nov rainfall) (mm)**	**30% of May-November runoff (mm)**	**Sub-catchment dam capacity limit (ML)**	**Unit threshold flow rate ($L/s/km^2$)**
Saunders Creek	S3	26	379	296	30	9	228	1.5
Saunders Creek	S4	8	391	305	30	9	77	1.5
Milendella Creek	L1	37	412	321	32	10	352	1.5
Long Gully	Y1	58	364	284	28	9	490	1.5
Bees Knees	K1	41	364	284	28	9	346	1.5
Reedy Creek	R1	44	590	461	46	14	606	1.5
Reedy Creek	R2	38	599	468	47	14	531	1.5
Reedy Creek	R3	66	533	416	42	12	821	1.5
Reedy Creek	R4	51	421	328	33	10	506	1.5
Reedy Creek	R5	22	446	348	35	10	234	1.5
Reedy Creek	R6	33	403	314	31	9	316	1.5
Reedy Creek	R7	57	360	280	28	8	480	1.5
Salt Creek	N1	201	363	283	28	8	1,710	1.5
Preamimma Creek	P1	73	359	280	28	8	609	1.5
Rocky Gully Creek	G1	99	362	283	28	8	843	1.5
Bremer River	B1	200	496	386	39	12	2,315	2
Bremer River	B2	78	637	497	50	15	1,168	3
Bremer River	B3	86	715	558	56	17	1,438	3.5
Bremer River	B4	45	572	446	45	13	606	3

	1	2	3	4	5	6	7	8
Catchment	**Sub-catchment zone code**	**Sub-catchment zone area (km^2)**	**Average annual rainfall (mm)**	**Average May-November rainfall (mm)**	**Average May-Nov runoff (10% of May - Nov rainfall) (mm)**	**30% of May-November runoff (mm)**	**Sub-catchment dam capacity limit (ML)**	**Unit threshold flow rate ($L/s/km^2$)**
Bremer River	B5	64	539	421	42	13	808	3
Bremer River	B6	29	478	373	37	11	321	3
Bremer River	B7	68	410	320	32	10	650	3
Angas River	A1	62	714	557	56	17	1,039	4
Angas River	A2	39	719	561	56	17	658	4
Angas River	A3	20	650	507	51	15	303	4
Angas River	A4	16	563	439	44	13	212	4
Angas River	A5	44	505	394	39	12	523	4
Sandergrove	E1	56	510	398	40	12	673	1.5
Finniss River	F1	28	806	629	63	19	526	7.5
Finniss River	F2	142	813	634	63	19	2,701	7.5
Finniss River	F3	23	804	627	63	19	431	7.5
Finniss River	F4	71	641	500	50	15	1,059	7.5
Finniss River	F5	46	783	611	61	18	842	7
Finniss River	F6	29	591	461	46	14	407	4
Finniss River	F7	36	475	371	37	11	398	7.5
Tookayerta Creek	T1	42	803	626	63	19	786	7.5
Tookayerta Creek	T2	33	798	622	62	19	622	7.5
Tookayerta Creek	T3	25	658	514	51	15	391	7.5

	1	2	3	4	5	6	7	8
Catchment	Sub-catchment zone code	Sub-catchment zone area (km^2)	Average annual rainfall (mm)	Average May-November rainfall (mm)	Average May-Nov runoff (10% of May - Nov rainfall) (mm)	30% of May-November runoff (mm)	Sub-catchment dam capacity limit (ML)	Unit threshold flow rate ($L/s/km^2$)
Deep Creek	D1	34	579	452	45	14	459	7
Currency Creek	C1	58	737	575	57	17	993	7
Currency Creek	C2	32	596	465	46	14	442	7

5.4 Water affecting activity definitions

Terms that are defined in the Act have the meaning as given by the Act. Definitions given for such terms in this section are provided for information, and the definition given in the Act takes precedence in the event of inconsistency.

Allotment: has the same meaning as in the *Real Property Act 1886*.

Ambient underground water: in relation to draining or discharging water into a well, means the underground water that occurs at the proposed site of injection in the relevant aquifer, prior to the commencement of the proposed drainage or discharge of water into a well.

Annual exceedance probability (AEP): the probability that a given flow or rainfall event will be exceeded in any one year.

Average recurrence interval (ARI): the average value of the periods between exceedances of a given flow or rainfall event.

Catching dam: a dam, wall or other structure placed on or constructed across a watercourse or drainage path for the purpose of holding back and storing the natural flow of that watercourse or the surface water flowing along that drainage path.

Catchment area: the catchment area of a particular point means all of the land, determined by natural topographic features, from which runoff has the potential to naturally drain to that point.

Community Wastewater Management System (CWMS): an effluent collection, treatment and disposal/reuse system for a community.

Contaminants (and indicators of contaminants): may include, but are not limited to, nutrients, metals, biological organisms (for example, *Escherichia coli*), temperature, dissolved oxygen, colour, turbidity, suspended sediments, leachate, hydrocarbons, and litter.

Desilting: the removal of unconsolidated material deposited in a dam since construction, or material deposited since the dam was previously desilted.

Detention basin: a pond or basin constructed for the temporary detention of water to provide time for suspended sediments and other heavy pollutants to settle before discharge into a watercourse, lake, or other water storage, and/or to regulate the rate and volume of water discharged.

Domestic wastewater: has the same meaning as in section 3(1) of the Act, meaning water used in the disposal of human waste, and water used for personal washing, and water used for washing clothes or dishes, and water used in a swimming pool.

Drainage path: the path that surface water naturally flows along over land.

Effluent: has the same meaning as in section 3(1) of the Act, meaning domestic wastewater or industrial wastewater.

Environmental water requirements: those water requirements that must be met in order to sustain the ecological values of ecosystems that depend on the water resource, including their processes and biodiversity, at a low level of risk.

Geomorphic characteristics: features of a landform or landscape including, but not limited to, bed and banks of a watercourse, floodplain of a watercourse or lake, cliffs, soils, rocks and other mineral forms.

Groundwater access trench (GAT): shallow trenches excavated to allow direct access to underground water.

Headworks: any assembly on top of a well and located between the well casing and the water delivery system.

Holding dam: a dam that is not constructed across a watercourse and is primarily designed to hold water from a source other than the catchment area of the dam. Other water sources may include, but are not limited to, underground water and water diverted or pumped from a watercourse or drainage path that is not in the catchment area of the dam. Holding dams may capture a limited volume of surface water from the catchment area of the dam (up to 5% of its total capacity).

Hydrologically continuous: two or more points in the landscape directly connected by the same drainage path or watercourse.

Industrial wastewater: has the same meaning as in section 3(1) of the Act, meaning water (not being domestic wastewater) that has been used in the course of carrying on a business (including water used in the watering or irrigation of plants) that has been allowed to run to waste or has been disposed of or has been collected for disposal.

Non-prescribed surface water management zone: the area identified as the non-prescribed surface water management zone in Figure 5.3

Property: an allotment or contiguous allotments owned or occupied by the same person, persons or body, and operated as a single unit. Allotments will be considered to be contiguous if they abut at any point, or are separated only by a road, street, lane, footway, court, alley, railway, thoroughfare, easement, right-of-way, watercourse, channel or a reserve or similar open space.

Review Committee: *The Committee e*stablished for the purpose of the *Groundwater (Border Agreement) Act 1985*.

Stream order: a method of classifying the size of a part of a watercourse, based on the hierarchy of connecting watercourse segments. The Strahler stream ordering system is used in this plan. The most upstream part of a watercourse is a first order stream. Two first order watercourses join together to become a second order watercourse. Two second order watercourses join together to become a third order watercourse and so on. For the purposes of determining stream order for this plan, the network of watercourses is defined in the basis of current 1:50,000 topographic maps produced by the State Government.

Structure (in relation to a body of water or watercourse): something built or constructed, including, but not limited to, a ford, causeway, culvert, fence, jetty, boat mooring, weir or retaining wall.

Sub-catchment zone: a zone defining the area within which the total allowable dam volume is limited. The zone boundary is based upon the sub-catchment boundary, with adjustments to align the sub-catchment boundary to the nearest practicable allotment boundaries. These zones are shown in Figure 5.4.

Threshold flow rate: the flow rate at or below which water must not be taken, or if taken is to be returned to the same watercourse or drainage path immediately downstream of the structure, as soon as reasonably practical (in accordance with principles 41, 50 and 58). The value of the threshold flow rate for a given location is calculated in accordance with principle 42.

Transmissivity*:* a parameter indicating the ease of underground water flow through a metre width of aquifer section.

Unit threshold flow rate: used to determine the threshold flow rate in accordance with principle 42. The unit threshold flow rate is determined as follows:

a) where the dam, wall or other structure lies within a sub-catchment zone as shown in Figure 5.4, the unit threshold flow rate is that given for that zone in Table 5.2, column 8; or

b) in all other cases, the unit threshold flow rate will be determined by the relevant authority.

Water-dependent ecosystems: those parts of the environment, the species composition and natural ecological processes, that are determined by the permanent or temporary presence of flowing or standing water, above or below ground. The in-stream areas of rivers, riparian vegetation, springs, wetlands, floodplains, estuaries, lakes and aquifer ecosystems are all water-dependent ecosystems.

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