Australian Government

MURRAY–DARLING BASIN AUTHORITY

ANNUAL REPORT 2015-16

ACKNOWLEDGEMENT OF THE TRADITIONAL OWNERS OF THE MURRAY–DARLING BASIN

The Murray–Darling Basin Authority acknowledges and pays respect to the Traditional Owners, and their Nations, of the Murray–Darling Basin, who have a deep cultural, social, environmental, spiritual and economic connection to their lands and waters. The MDBA understands the need for recognition of Traditional Owner knowledge and cultural values in natural resource management associated with the basin.

The approach of Traditional Owners to caring for the natural landscape, including water, can be expressed in the words of Darren Perry (Chair of the Murray Lower Darling Rivers Indigenous Nations)

'The environment that Aboriginal people know as Country has not been allowed to have a voice in contemporary Australia. Aboriginal First Nations have been listening to Country for many thousands of years and can speak for Country so that others can know what Country needs. Through the Murray Lower Darling Rivers Indigenous Nations and the Northern Basin Aboriginal Nations the voice of Country can be heard by all.'

BARAPA BARAPA
BARKINDJI (PAAKANTYI)
BARUNGGAM
BIDJARA
BIGAMBUL
BUDJITI
DHUDHUROA
DJA DJA WURRUNG
EUAHLAYI
GAMILAROI
GITHABUL
GUNGGARI
GWAMU (KOOMA)
JAROWAIR
KAMBUWAL
KUNJA
KWIAMBUL
LATJI LATJI
MALJANGAPA
MANDANDANJI
MARAURA
MARDIGAN
MURRAWARRI
MUTTI MUTTI
NARI NARI
NGARRINDJERI
NGEMBA
NGINTAIT
NGIYAMPAA
NYERI NYERI
TATTI TATTI
TAUNGURUNG
WADI WADI
WAILWAN
WAMBA WAMBA
WAKKA WAKKA
WAYWURRU
WEGI WEGI
WERGAIA
WIRADJURI
WOLGALU
WOTJABALUK
YAITMATHANG
YITA YITA
YORTA YORTA

This report may contain photographs or quotes by Aboriginal people who have passed away. Most Aboriginal words can be spelt more than one way in English so spellings may vary in this publication. Aboriginal names for rivers have been added in some places.

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Australian Government

MURRAY–DARLING BASIN AUTHORITY

Office of the Chief Executive

TRIM Ref: D16/31108

The Hon. Barnaby Joyce MP
Minister for Agriculture and Water Resources
Parliament House
Canberra ACT 2600

Dear Minister

It is my pleasure to present the annual report of the Murray–Darling Basin Authority (MDBA) for the year ended 30 June 2016.

During the year the MDBA has continued to play its role in implementing the Basin Plan, and associated water reform.

The report has been prepared in accordance with the requirements for annual reports prepared by the Joint Committee of Public Accounts and Audit under s. 63 of the *Public Service Act 1999* and as required under section 46 of the *Public Governance, Performance and Accountability Act 2013*.

Under ss. 214(1) of the *Water Act 2007*, the Chief Executive must, as soon as practicable, prepare and give to the Minister, and to each other member of the Murray–Darling Basin Ministerial Council, a report on the MDBA's operations during that year. This annual report must include contents listed under ss. 214(3) of the Water Act.

In accordance with the Commonwealth Fraud Control Framework I certify that the MDBA has prepared fraud risk assessments and fraud control plans, and has in place appropriate fraud prevention, detection, investigation, reporting and data collection procedures and processes that must meet the MDBA's specific needs. I certify also that I have taken all reasonable measures to minimise the incidence of fraud in the MDBA.

I also take this opportunity to acknowledge the dedication of MDBA staff and their continuing commitment to supporting the government's objectives. I also warmly acknowledge the efforts of my predecessor, Dr Rhondda Dickson, whose term as Chief Executive ended on 30 September 2015.

Yours sincerely

Phillip Glyde

17 October 2016

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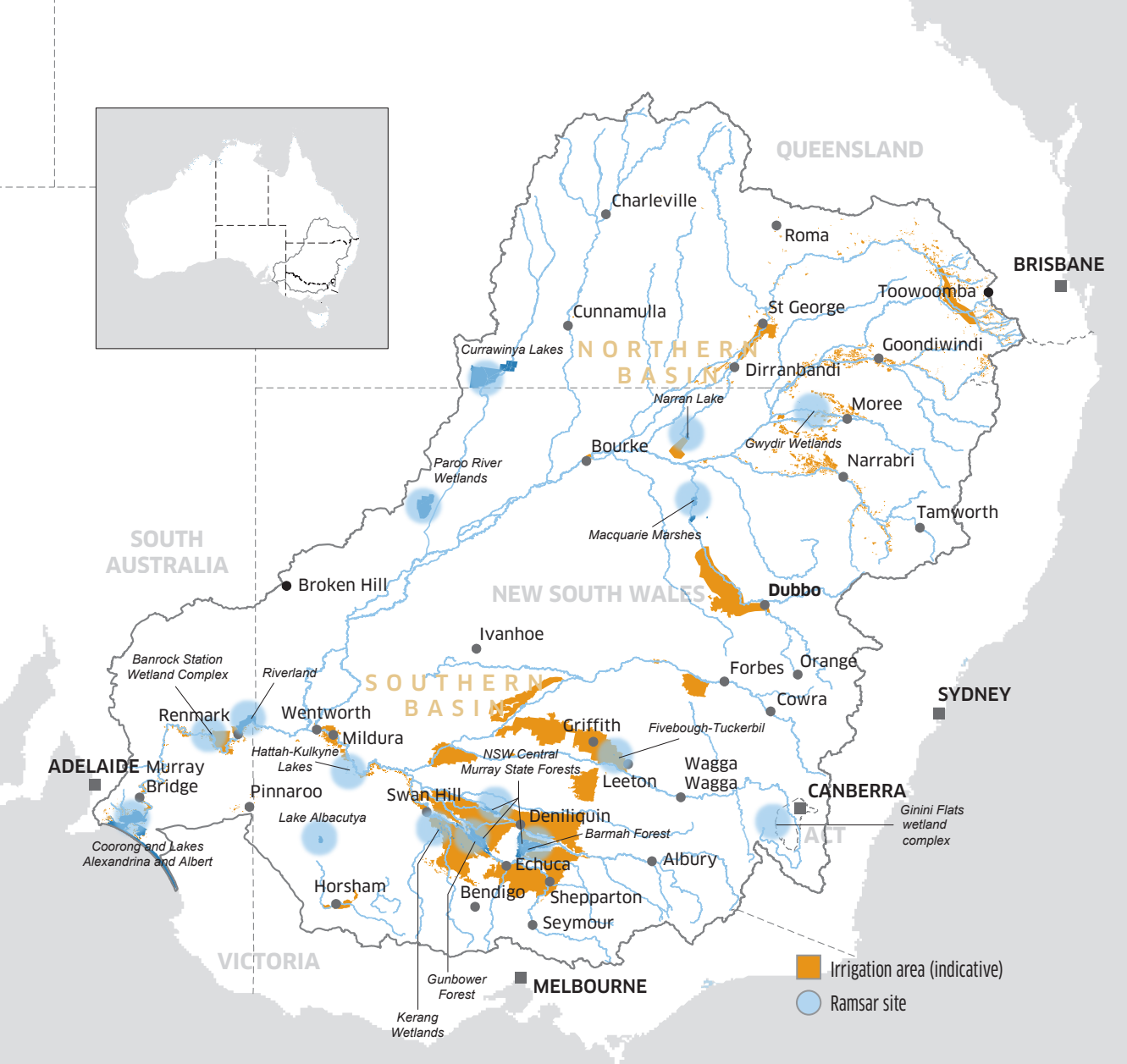


Murray–Darling Basin snapshot

Within the basin, there are over **46 Aboriginal Nations**

Gross value of agricultural production **$19.4 billion** (of this **$7.1 billion from irrigation**)

Around **40% of all farms in Australia** are in the basin – almost 51,000 farms

50% of Australia's irrigated produce, area of irrigated production – **1.6 million hectares**

There are **16 wetlands listed as internationally significant** (Ramsar sites)

Population of over **2 million people** (around 10% of Australia's population)

MDBA staff set up a week long display at Questacon (the National Science and Technology Centre) around World Water Day (photo by Brayden Dykes).

01
ABOUT THE MDBA

ABOUT US

The Murray–Darling Basin Authority establishes and monitors the sustainable and integrated management of the water resources of the Murray–Darling Basin. We do this in a way that best meets the social, economic and environmental needs of the basin and its communities.

We work in collaboration with other Australian Government agencies, basin state governments, local governments, regional bodies, industry groups, landholders, environmental organisations, scientists, research organisations and Murray–Darling Basin communities, including Aboriginal communities, and the broader Australian community.

Our vision

To achieve a healthy working basin through the integrated management of water resources for the long-term benefit of the Australian community.

Our mission

We lead the planning and management of basin water resources in collaboration with partner governments and the community.

Our guiding principles

We adhere to the Australian Public Service Values and Code of Conduct, meaning we are apolitical, impartial, professional, accountable, respectful, careful and diligent.

We value and support collaboration and have shown this by working closely with communities, governments and industries. We have continued to work with the basin states (which includes the Australian Capital Territory), the Commonwealth Environmental Water Office, other Australian Government agencies and basin communities to implement the Basin Plan. We continue to make changes to our strategies and frameworks based on feedback we receive.

Photo by Alisha Caldwell

Our role

The primary roles of the MDBA include:

- preparing, implementing and reviewing an integrated plan for the sustainable use of the basin's water resources
- operating the River Murray system and efficiently delivering water to users on behalf of partner governments
- measuring, monitoring and recording the quality and quantity of the basin's water resources and the condition of associated rivers, wetlands and floodplains
- supporting, encouraging and conducting research and investigations about the basin's water resources and dependent ecosystems
- disseminating information about the basin's water resources and dependent ecosystems
- engaging and educating the Australian community about the basin's water resources.

Our legislation

The *Water Act 2007*[1] establishes the MDBA as a statutory authority. The Act also sets out the role of the MDBA in developing a Basin Plan and performing functions under the Murray–Darling Basin Agreement 2008, in particular the management of River Murray Operations.

In addition to our functions under the Water Act, the MDBA has functions under the Murray–Darling Basin Agreement, which forms Schedule 1 to the Act. These include giving effect to decisions of the Murray–Darling Basin Ministerial Council and the Basin Officials Committee in relation to the basin governments' joint programs.

The MDBA delivers its functions under the Agreement in conjunction with and on behalf of the contracting governments – the Australian Government and the governments of Victoria, South Australia, New South Wales, Queensland and the Australian Capital Territory.

1 Unless otherwise indicated, all Acts referred to in this publication are Commonwealth Acts.

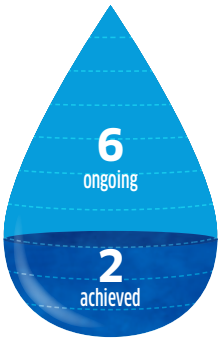
OUR PERFORMANCE SNAPSHOT

Performance outcome

Equitable and sustainable use of the Murray–Darling Basin by governments and the community including through development and implementation of a Basin Plan, operation of the River Murray system, shared natural resource management programs, research, information and advice.

Strategic goal 1

Implement the Basin Plan to achieve a healthy working basin



8 key performance indicators – 2 achieved, 6 ongoing

- reviewed and enhanced the science and socio-economic knowledge base for surface water sustainable diversion limits in the northern basin
- advised basin state governments on completing water resource plans for accreditation
- completed and published the basin environmental watering outlook and the 2016–17 basin annual environmental watering priorities
- implemented collaborative working arrangements to deliver environmental water
- progressed the assessment of sustainable diversion limit adjustment proposals

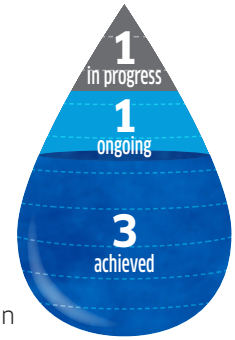
Strategic goal 2

Strengthen engagement with the community

3 key performance indicators – 2 achieved, 1 ongoing

- information was collected from local communities about changes in local rivers to inform models as well as descriptions of social, economic and environmental change in the basin
- worked closely with the two peak Traditional Owner-based organisations in the basin
- the Chief Executive toured the basin to meet with stakeholders including local government officials, industries, peak bodies and the general public
- the education program delivered education and awareness programs related to sustainable water resource management in the basin

Strategic goal 3



Evaluate the outcomes of basin water reforms

5 key performance indicators – 3 achieved, 1 ongoing, 1 in progress

- published the Basin Plan annual report for 2014–15
- monitored the effect of environmental watering, in conjunction with the basin state governments and the Commonwealth Environmental Water Holder
- monitored the social and economic effects of Basin Plan implementation, which included an extensive consultation process
- worked with basin state governments to ensure compliance with Basin Plan water trading rules

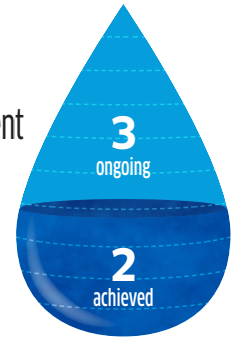
Strategic goal 4

Operate the River Murray system efficiently for partner governments

7 key performance indicators – 6 achieved, 1 ongoing

- all assets achieved a good or high standard, with significant improvements observed at sites that had previously required attention
- the Independent River Operations Review Group reported favourably on the performance of River Operations
- the basin states adopted the next 15 year salinity management strategy which outlines how salinity will be managed until 2030
- the salt interception schemes diverted 524,728 tonnes of salt from the River Murray
- determined state water entitlements in accordance with the Murray–Darling Basin Agreement

Strategic goal 5



Improve the knowledge base to support sustainable water resource management

5 key performance indicators – 2 achieved, 3 ongoing

- in partnership with the CSIRO and basin state governments, good progress has been made on documenting better practice for developing flood inundation models in the basin
- completed all commissioned environmental science investigations as part of the Northern Basin Review
- the Use-and-Occupancy Mapping project in the northern basin included interviews with 107 Aboriginal participants
- a new MDBA website was rolled out and was well received by basin stakeholders
- successfully negotiated overarching research collaboration frameworks with key knowledge brokers

CHIEF EXECUTIVE'S REVIEW

I am pleased to present my first annual report as the Chief Executive of the Murray–Darling Basin Authority. Since taking on the role in January 2016, I have had the honour of meeting and working with a great many people who have been generous enough to pass on some of their knowledge of the basin, its communities, industries and ecosystems to me.

One of the highlights so far has been the opportunity to travel throughout the basin and see and hear first hand how people are experiencing the Basin Plan. I am committed to ensuring that the MDBA keeps the lines of communication with communities, industries and key interest groups open and improves these relationships in the coming years. I thank everyone who has given their time and shared their passion and knowledge with me, other Authority members and MDBA staff.

Making the most of every drop of water

The MDBA continues to meet its milestones for implementing the Basin Plan. In May 2016, we were notified of 36 supply measure proposals from basin state governments (which included six notifications for constraints measures) and two efficiency measures as part of the sustainable diversion limit adjustment process. We worked closely with the state governments to achieve this milestone by providing advice on the potential adjustment volume for different options. The sustainable diversion limit adjustment mechanism is an important opportunity to make the most of every drop of water by using available water more efficiently and effectively.

In a similar vein, we made substantial progress on our review of Basin Plan settings in the northern basin. The research and socio-economic assessment work was all but finalised, many consultations occurred, and the Authority is now turning its mind to a possible amendment to the Basin Plan in the coming year.

We also delivered the Basin Salinity Management 2030 Strategy, which builds on the successes of the past to deliver a strategic, cost-efficient and streamlined program of coordinated salinity management for the next 15 years. It will enable partner governments, and their communities, to manage salinity during a period of transition, as Basin Plan water reforms take effect.

Partnering with Aboriginal Nations

Another aspect of our work I am particularly proud of is our partnership with Aboriginal Nations across the basin, through the Northern Basin Aboriginal Nations and Murray Lower Darling River Indigenous Nations. One of the highlights that has emerged from those relationships is the Use-and-Occupancy Mapping project. Use-and-Occupancy Mapping can be used by Aboriginal people to negotiate for the protection of land and water to meet cultural, social, environmental, spiritual and economic obligations. It also helps non-Aboriginal people to better understand Aboriginal peoples' life on Country.

Although we have a long way to go, I am also pleased to report that the MDBA has been able to increase opportunities to deliver outcomes for Aboriginal people as part of the organisation's business. For instance we have a target of having 3% of staff who self-identify as Aboriginal by 2018 and as at 31 March 2016 that figure is just above 1% (a four-fold increase from 0.3% in June last year).

Environmental watering

Since 2013, we have been publishing our watering outlook and basin-wide annual watering priorities. These are the result of many meetings with state agencies, natural resource management authorities, water managers and land managers. We are aiming to continually improve how the priorities are prepared and this year saw considerable gains in the way we determine the water availability scenario and how we engage with Aboriginal people.

Environmental water holders had excellent results from watering events this year including a great example in the Barmah–Millewa Forest. Cooperation with the New South Wales Office of Environment and Heritage, the Victorian Environmental Water Holder, The Living Murray and the Commonwealth Environmental Water Office resulted in growth of Moira grass, a critical wetland species which has been in decline. Environmental water provided throughout spring and summer made sure that waterbird chicks were able to fledge. The water also sustained an estimated 200 Australasian bitterns (an endangered species) which were nesting in the forest.

Running the River Murray

Finally, the program to manage, maintain and improve the dams, locks and weirs that help deliver water in the River Murray system continues to work to high standards. This is a result of the strong relationships between the MDBA and state constructing authorities, making sure that maintenance and renewal is proactive, decision making is by consensus, and issues are raised sufficiently early to enable a quick resolution.

It has been a fascinating time for me so far, and I look forward to continuing to work with all those who wish to achieve the equitable and sustainable use of the Murray–Darling Basin in the coming years.

FINANCIAL OVERVIEW

During 2015–16 the MDBA reported a much reduced operating deficit of $0.3 million, which compared favourably with our approved operating deficit of $17.7 million. This result was achieved despite continuing uncertainty surrounding future levels of funding from contributions from basin state governments.

Programs were delivered during 2015–16 at a cost of $164.4 million. We continued to manage over $4 billion in assets (gross value), including River Murray Operations infrastructure and water entitlements under The Living Murray program.

Key financial challenges included:

- maintaining the condition of River Murray Operations infrastructure assets without creating a funding burden for future generations
- managing the outcomes of the Functional Efficiency Review and other strategic reviews
- effectively implementing productivity improvements and planning for other structural changes
- effectively enhancing systems capabilities to identify efficiencies in business processes.

The new *Public Governance, Performance and Accountability Act 2013*, which took effect from 1 July 2014, has brought about significant changes to our reporting processes and content. The MDBA refined its internal Resource Management Framework during the year to further realise the benefits of these reforms.

The Chief Finance Officer's report on page 116 provides more detailed information on our financial performance for 2015–16.

PLACES WE VISITED

ALBURY, ANGLEDOOL, ARMIDALE, BALRANALD, BARHAM, BARMERA, BERRIGAN, BOURKE, BREWARRINA, CANBERRA, COHUNA, COLEAMBALLY, COLINGUILLE, COLLARENEBRI, CUNNAMULLA, CURRAWARNA, DARLINGTON POINT, DENILIQUIN, DIRRANBANDI, DUBBO, EUBERTA, FINLEY, GOODOGA, GOOLWA, GOONDIWINDI, GOULBURN, GUNDAGAI, GUNNEDAH, HAY, INVERELL, LIGHTNING RIDGE, MANSFIELD, MOREE, MOULAMEIN, MUNGINDI, MURRAY BRIDGE, NANGUS, NARRABRI, NARRAN LAKE, NARRANDERA, NARROMINE, NYNGAN, OURA, RENMARK, SHEPPARTON, ST GEORGE, SWAN HILL, TAMWORTH, TENANDRA, TEXAS, TOCUMWAL, TOOWOOMBA, WAGGA WAGGA, WAKOOL, WALGETT, WARREN, WEE WAA, WEILMORINGLE

Photo by Otis Williams

02
OUR PERFORMANCE

OUR REPORTING APPROACH

This is a transition time for Australian Government departments and agencies for reporting under the *Public Governance, Performance and Accountability Act 2013* (PGPA Act), which commenced on 1 July 2014. The PGPA Act consolidates the governance, performance and accountability requirements contained in the *Financial Management and Accountability Act 1997* and the *Commonwealth Authorities and Companies Act 1997*. It also establishes a performance reporting framework for all Commonwealth entities and companies, Figure 2.1.

From 1 July 2015 the requirements of the enhanced Commonwealth performance framework came into effect. As 2015–16 is a transition year this means that:

- there is no change to the performance information requirements for 2015–16
- the existing key performance indicator based framework will still apply
- corporate plans for 2015–16 will be the starting point for entities to implement more flexible approaches to performance measurement.

As a corporate Commonwealth entity the MDBA has developed a new performance framework in response to the introduction of the PGPA Act and the Australian Government's Regulator Performance Framework. For the first time we will be providing annual performance statements, see pages 70 to 79, and Appendix A for the joint programs.

The MDBA's funding is outlined in the Australian Government's portfolio budget statements. Figure 2.2 provides an overview of how the portfolio budget statements align with our corporate goals.

We manage our performance against a single outcome. To provide a more detailed indication of our performance against this outcome, our deliverables and key performance indicators are measured against the five strategic goals in our corporate plan:

- lead the implementation of the Basin Plan to achieve a healthy working basin
- strengthen engagement with the community
- evaluate and report the social, economic and environmental outcomes of basin water reforms
- operate the River Murray system efficiently for partner governments
- improve the knowledge base to support sustainable water resource management.

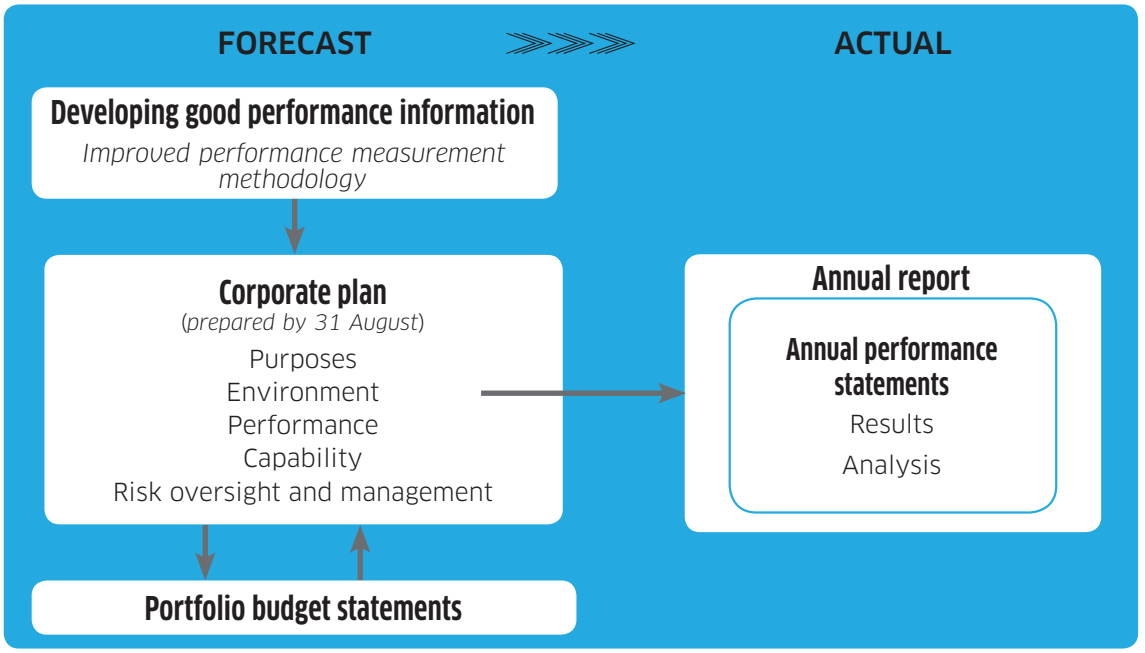


Figure 2.1 The enhanced Commonwealth performance framework

Outcome 1
Equitable and sustainable use of the Murray–Darling Basin by governments and the community including through development and implementation of a Basin Plan, operation of the River Murray system, shared natural resource management programs, research, information and advice

Program 1.1 Equitable and sustainable use of the Murray–Darling Basin

	Goals				
Portfolio budget statements	Integrated water management		Restoring river and ecosystem health	Managing River Murray assets	Knowledge into action
Corporate plan 2015–16	Lead the implementation of the Basin Plan to achieve a healthy working basin	Strengthen engagement with the community	Evaluate and report the social, economic and environmental outcomes of basin water reforms	Operate the River Murray system efficiently for partner governments	Improve the knowledge base to support sustainable water resource management

Figure 2.2 Alignment of the portfolio budget statements 2015–16 and the MDBA Corporate Plan 2015–16

Corporate Commonwealth entities

A corporate Commonwealth entity is a body corporate that has a separate legal personality from the Commonwealth and can act in its own right exercising certain legal rights, such as entering into contracts and owning property.

Some provisions of the PGPA Act apply to corporate Commonwealth entities differently to non-corporate Commonwealth entities because of their different legal status, for example the provisions relating to appropriations, banking, investments and the use of indemnities.

STRATEGIC GOAL 1

Lead the implementation of the Basin Plan to achieve a healthy working basin

Implementing the Basin Plan will lead to a healthy working basin to benefit all and deliver:

- communities with sufficient and reliable water supplies that are fit for a range of intended purposes, including domestic, recreational and cultural use
- productive and resilient water-dependent industries and communities with confidence in their long-term future
- healthy and resilient ecosystems with rivers and creeks regularly connected to their floodplains and ultimately the ocean.

Highlights

- A three year review of science, social and economic information to determine whether or not to amend the sustainable diversion limits in the northern basin, almost finalised.
- Advised basin governments on sustainable diversion limit adjustment measures and progressively advised on the potential adjustment amount associated with the evolving package of agreed measures.
- Developed policies and advised state governments on accreditation requirements for their water resource plans, with one Queensland plan almost ready for accreditation.
- Published the basin environmental water outlook and the 2016–17 basin annual environmental watering priorities.
- Continued to ensure the coordinated management of environmental water in the basin through chairing the Southern Connected Basin Environmental Watering Committee.
- In April 2016 ministers agreed to progress constraints measures for the Murray, Murrumbidgee and Goulburn rivers, under the sustainable diversion limit adjustment mechanism.

Overview

This year we achieved solid progress in three key areas – the Northern Basin Review, the sustainable diversion limit adjustment mechanism, and the basin states developing water resource plans for accreditation under the Basin Plan.

Compiling environmental, social and economic information for the Northern Basin Review was all but completed. This task was guided by advice from the Northern Basin Advisory Committee and assisted by New South Wales and Queensland governments to make sure that we developed and compared realistic options for modifying the sustainable diversion limits in the north. By the end of June 2016 we are well positioned to continue informal consultation with stakeholders, and by the end of 2016 aim to propose a formal amendment to the Basin Plan.

We continued to assess the 36 supply measure projects that governments have nominated for the sustainable diversion limit adjustment mechanism. While some projects may be further refined by the states, an independent stocktake, completed in August 2015, indicated that an adjustment of 500 GL was a plausible outcome from these projects.

We also made good progress in providing guidance to state agencies on the requirements of the Basin Plan for developing compliant state water resource plans. The first of 36 state water resource plans due for accreditation is the Warrego–Paroo–Nebine plan in south-western Queensland.

We are grateful to the Northern Basin Aboriginal Nations who provided us with independent advice that the level of consultation with Aboriginal people, carried out by the Queensland Government in preparing this plan, was positive.

We will work with Queensland, and the other states, to streamline our work on future plans. It is likely that the Warrego–Paroo–Nebine plan will be recommended to the minister for accreditation in late 2016.

During 2015–16 we took steps to strengthen the role the MDBA plays in delivering basin-scale improvements in river and ecosystem health. One improvement included working with the Murray Lower Darling Rivers Indigenous Nations and the Northern Basin

Aboriginal Nations to incorporate Aboriginal perspectives into the annual environmental watering priorities. This approach recognises that Aboriginal peoples' knowledge of Country can inform better water management.

We also took the initiative to seek direct feedback from regional stakeholders on the approach to developing environmental priorities for the next watering year.

This year also highlighted the important role we have in leading the transition to the Basin Plan arrangements, and the role we've been asked to play in facilitating the coordination of environmental water holders. This year was the first full year of operation for the Southern Connected Basin Environmental Watering Committee.

There has been substantial progress in integrating the committee's planning with the planning for MDBA-managed river operations. This is proving to be crucial for the effective and efficient management of environmental water in a working river system.

Challenges and the year ahead

Water reform is complex, involving local communities, government agencies and interest groups. In finalising the review of the northern basin we are working with governments and industry to take actions that would complement the recovery of water for the environment. This includes measures such as protecting environmental releases along river systems or developing innovative water trading mechanisms.

Similarly, in the southern basin we will need to work with governments to maximise the opportunities available under the sustainable diversion limit adjustment mechanism. This means identifying opportunities to allow better environmental outcomes to be achieved with less water.

The basin state governments and the MDBA have a real challenge in accrediting 36 water resource plans by June 2019. Significant effort will need to be made by the states and the MDBA to meet this deadline. New South Wales has a significant challenge as it has the largest share of plans to complete (22). We are assisting by providing guidance on how states can best satisfy the requirements of the Basin Plan.

Implementing the Basin Plan

At the heart of the Basin Plan is the need to balance the water available for industries, farmers and communities while leaving enough water in the basin's river systems to ensure a healthy environment. To do this the Basin Plan put a limit on the amount of water that can be taken from the Murray–Darling Basin for consumptive use – the sustainable diversion limit.

The Basin Plan takes a whole-of-basin approach to achieving sustainable water resource management. It is being implemented over seven years, from 2012 to 2019, to allow time for communities, the basin state governments (which includes the Australian Capital Territory) and the Australian Government to work together to manage the changes required for achieving a healthy working basin. Key implementation steps are outlined in Figure 2.3.

Northern Basin Review

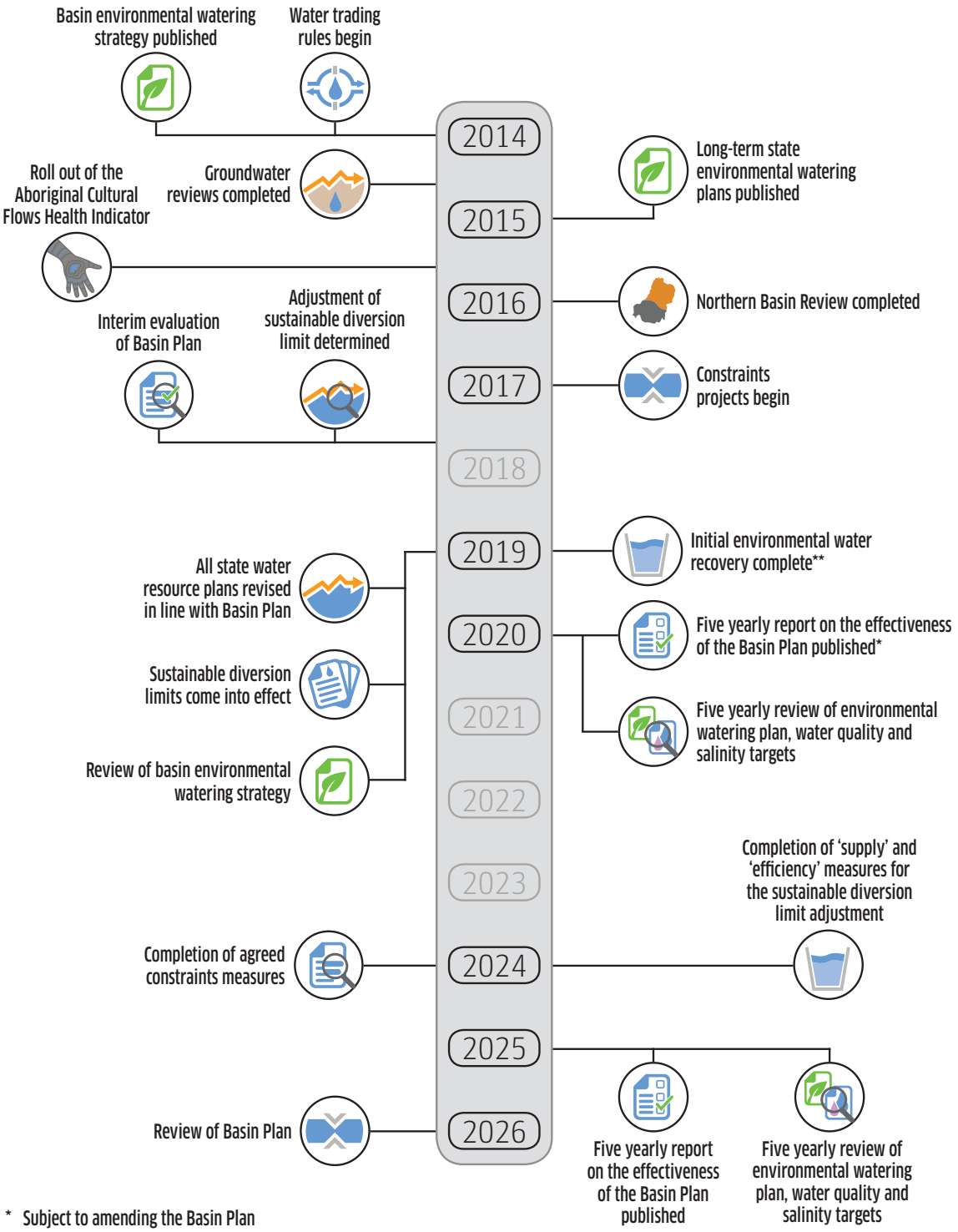
The MDBA has been carrying out an extensive program of research and investigations as part of the Northern Basin Review. The work is aimed at improving the information available, to see if there was a case for changing the Basin Plan settings in the north.

The work has focused on three areas: environmental, economic and social research. We have improved our understanding of the environmental needs of the Barwon–Darling and Condamine–Balonne river systems and the challenges of providing additional environmental water in these systems. We are also looking at the costs and benefits for communities and industries as a result of potential changes to diversion limits.

The Northern Basin Advisory Committee and an intergovernmental working group, are advising the Northern Basin Review. It is expected to be finalised in late 2016.

Social and economic research

The social and economic work in the northern basin is about improving our understanding of the likely impacts of the sustainable diversion limits. Three major social and economic projects are being conducted to provide additional information about the effects of



* Subject to amending the Basin Plan

** Environmental water recovery for initial 'bridging the gap' commitment is completed

Figure 2.3 Basin Plan timeline

different water recovery options on industries and communities.

The first project looks in detail at 21 northern basin communities including:

- social and economic condition reports and community narratives that document the views of locals on changes in their communities
- developing land use change and employment models to measure the social and economic effects of water recovery scenarios in each community.

For the second project, we developed an economic model to test the impacts of water recovery on production and profitability of floodplain grazing systems in the Lower Balonne.

Both projects involve working with farmers, non-farm businesses, industry and community groups, and local governments from 21 communities in the northern basin as well as floodplain graziers in the Lower Balonne.

The third project involves a cross-cultural partnership between the MDBA and the Northern Basin Aboriginal Nations to find out about the importance of environmental water to Aboriginal Nations in the north.

> The research has shown that Aboriginal populations in the north of the basin see a direct relationship between environmental watering and improved Aboriginal wellbeing. It has quantified the importance of environmental water to this group for the first time.
>
> At a regional scale of landscape, as defined by the three surveyed communities (Brewarrina, St George and Dirranbandi), 202 respondents over the age of 14 years assessed environmental water to have a 92% importance rating. The report, Our water, our life, is available on our website.

Hydrologic modelling

We are examining changes in flow in the northern basin under a number of sustainable diversion limit options. Six scenarios, covering all northern basin catchments, were modelled. The models explored the likely outcomes from water recovery volumes between 278 GL (the estimated water recovery to date) and 415 GL.

The model scenarios allow a more detailed characterisation of the pattern of flows by looking at:

- the length of dry periods
- changes in patterns of take
- changes in connectivity between upstream tributaries and the Barwon–Darling.

This work will help to understand how hydrologic changes could impact the environmental, social and economic outcomes associated with each recovery option.

The hydrologic modelling work has informed the Authority, and will be used in conjunction with other findings to determine whether settings in the northern basin need to change. The hydrologic reason will be fully documented and released in late 2016.

Environmental research

To address knowledge gaps about the Condamine–Balonne and Barwon–Darling river systems we designed and implemented a program of environmental research projects, in collaboration with state government agencies.

The projects were selected following an independent science review and advice from the community. The research projects have improved understanding of the relationship between flows and the response of native fish, waterbirds, and vegetation.

The information has fed into the review of the water requirements for the Condamine–Balonne and Barwon–Darling systems. An ecological outcomes report is being prepared summarising results and environmental water requirements for the Condamine–Balonne and Barwon–Darling catchments.

The reports will make sure that any decisions are transparent. They will also support public consultation on proposed changes to the sustainable diversion limits in the northern basin. This work has been independently reviewed and was found to be robust, and suitable for its intended advice purpose. The work will be published in late 2016.

Consulting communities about the Northern Basin Review

Key stakeholders have been involved in the Northern Basin Review since it began in 2012.

Research projects

- Fish and flows in the northern basin: responses of fish to changes in flows in the northern Murray–Darling Basin
- Waterhole refuge mapping and persistence analysis in the Lower Balonne and Barwon–Darling rivers
- Review of water requirements for key floodplain vegetation for the northern basin: literature review and expert knowledge assessment
- Vegetation of the Barwon–Darling and Condamine–Balonne floodplain systems of New South Wales.

In 2015 we began to consult with the broader community through various means including tours of the northern basin by the MDBA Chair and the Parliamentary Secretary to the Minister for the Environment.

Private landholders allowed access to their properties so that scientists could accurately map vegetation across the Condamine–Balonne and Barwon–Darling.

We shared waterhole maps for the Lower Balonne and Barwon–Darling with Aboriginal community members to get feedback and traditional knowledge perspectives about waterholes and rivers.

In early 2016 Lower Balonne landholders helped review our inundation mapping and provided local insights into the way water runs across the Lower Balonne floodplain.

Our key stakeholders and advisory committees also provided valuable local knowledge about the way we talk about environmental science projects, including identifying how we could improve our mapping to better reflect local peoples' understanding of the landscape.

In 2016 we significantly increased our engagement with communities in the northern basin in order to raise awareness of the work, share results of the new environmental science, social and economic research that has taken place since 2012, and obtain feedback from communities and industries.

Sustainable diversion limit adjustment mechanism

The Basin Plan provides an opportunity to adjust the sustainable diversion limits up or down by up to 5% as long as environmental, social and economic outcomes are maintained or improved. Adjustments can be achieved through supply measures – projects which allow equivalent environmental outcomes to be achieved using less water, or efficiency measures – projects which allow more water to be recovered for the environment without negative social or economic impacts. The basin state governments are responsible for developing and implementing the supply measures that achieve their local needs.

We have been working with the basin state governments to assess the environmental works and altered river operations which aim to deliver equivalent environmental outcomes using less water. We have provided modelling advice on how large the adjustment volume could be for the projects.

This year, along with the CSIRO, we published a framework for assessing the success of these projects. We also published the result of trialling the framework. Completing the trial was critical for assuring water ministers, as well as communities, that the sustainable

diversion limits can be varied without adversely affecting the reliability of supply for water users or environmental outcomes.

In early 2015–16 independent experts completed a stocktake of the potential sustainable diversion limit adjustment from the projects under consideration, as well as the prospect of any new supply proposals. The independent assessment was published in August 2015 and found that, based on all the possible supply measures identified in the report, a supply measure adjustment of around 500 GL was possible.

The final adjustment will depend on the ability of supply measures to maintain equivalent environmental outcomes compared to a Basin Plan with 2,750 GL of water recovery.

In April 2016 the Murray–Darling Basin Ministerial Council agreed to a package of proposals that could be considered for sustainable diversion limit adjustment. In May 2016, based on the Ministerial Council agreement, the Basin Officials Committee formally notified the MDBA of:

- 36 proposals for supply measures submitted by the basin states, which included notifications of six constraints measures
- two efficiency measures submitted by the Australian Government.

As part of our obligations set out under the Basin Plan, we have published a register of notified sustainable diversion limit adjustment proposals. All were for projects in the southern basin. Queensland and New South Wales investigated the potential for supply measures in the north, but did not notify the MDBA of any measures to be considered. They are working with us on possible adjustment opportunities in the north through the Northern Basin Review.

We continued to devote considerable resources to modelling of the sustainable diversion limit adjustment projects and how they affect river flows in the basin. This work will help the states better understand the size of the adjustment available from their projects, and how the projects affect river flows and water availability. They can then use this information to refine their proposals.

Accrediting the state water resource plans

Water resource plans are essential to achieving the outcomes of the Basin Plan. They set out arrangements to share water for consumptive use. They also establish rules to meet environmental and water quality objectives and take account of potential and emerging risks to water resources.

The MDBA is working with the basin state governments to support and advise them on developing their water resource plans. We also provide recommendations to the minister about whether to accredit the plans. By 30 June 2019 the 36 water resource plans across the basin need to be consistent with the requirements nationally agreed to in the Basin Plan.

We have:

- provided comments to the state governments on the draft plans
- convened discussions to assist state governments with developing the plans and promoting consistent approaches to managing the basin's water resources
- hosted workshops with Aboriginal organisations so that Aboriginal objectives and outcomes based on values and uses can be better accommodated in water resource plans
- convened the third annual water planners' forum to share knowledge and improve our approach to water planning.

Queensland was the first state to submit a water resource plan for accreditation, in March 2016. This plan, for the Warrego–Paroo–Nebine area, was reviewed and by 30 June 2016 we were finalising our recommendation to the Minister for Agriculture and Water Resources.

The Australian Capital Territory released a draft water resource plan for public consultation in May 2016. South Australia is developing its first two water resource plans, and Victoria has begun a risk assessment process that will be used for its five water resource plans. New South Wales is scheduled to have 22 water resource plans accredited by 30 June 2019 and has made some progress.

Recognising the significant challenges in developing and accrediting 36 water resource plans by 2019 the Basin Plan Implementation

Committee is preparing a completion plan to coordinate and guide this work. The plan will provide a common approach for all parties to manage the task, and provide clear protocols for resolving issues.

Improving our approach to water planning

The third annual water planners' forum was attended by almost 50 water planners, and included representatives from the basin states and the MDBA. The forum was held in May 2016, in Goolwa, South Australia.

The annual forum is an important opportunity for officers who work with water resource planning on a day-to-day basis to meet and share experiences, as well as to discuss current challenges, such as ways of collaborating across state boundaries.

As with past years there was an emphasis on engaging and consulting with Aboriginal communities to develop water resource plans.

The forum is valued by the participants as an opportunity to network, learn from each other and discuss solutions. The outcomes from the forum will be used to inform further discussions with the basin states about how to best assist and provide guidance on water resource planning.

Transitioning to sustainable diversion limits

Progress towards implementing the sustainable diversion limits continued this year with more water recovered for the environment. Under the Basin Plan these limits apply to both surface and groundwater use, including water that is intercepted by farm dams and commercial property.

We provided technical and policy advice to the Department of Agriculture and Water Resources (Australian Government) in relation to their water recovery strategy, and published quarterly updates of the estimated water recovered.

Although sustainable diversion limits do not come into effect until 1 July 2019, we worked with the basin state governments to improve annual reporting requirements set out in the *Water Act 2007*. This annual reporting includes water taken for consumptive purposes by all forms of take, including watercourse diversions and interceptions, and the use of held environmental water. Take is the removal of water from, or the reduction in flow of water into, a water resource.

Using the annual reporting information, the MDBA has prepared a trial register of take. This trial register tests the concepts of annual permitted take, annual actual take and diversion limits. This trial register also supports testing the method for sustainable diversion limit compliance.

During 2014–15, we reached agreement with the basin state governments on how to treat environmental water for the purposes of determining the annual permitted take. We will address a number of other technical and policy issues during the remaining transition period to 2019.

A challenge for the MDBA is to improve knowledge of all forms of take under the Basin Plan particularly when it is not determined using the hydrological models. This includes take by floodplain harvesting, runoff dams, commercial plantations and basic rights. Improving our understanding of these forms of take could help improve timely collection and reporting of take.

Groundwater

For the first time, under the Basin Plan, limits have been set on the amount of groundwater that can be taken from the basin. The Basin Plan also required three groundwater resource areas to be reviewed.

The recommendations from the groundwater reviews, completed in 2014–15, will require an amendment to the Basin Plan to put them into effect. This amendment will be proposed in conjunction with any changes required from the Northern Basin Review.

The trial register of take also includes groundwater information and is the first time that whole-of-basin groundwater take has been reported. We will continue to work with the basin state governments to refine groundwater reporting.

Identifying annual watering priorities for the Murray–Darling Basin

The basin-wide environmental watering strategy outlines the expected environmental outcomes for the Murray–Darling Basin over the long term. The strategy also guides environmental water holders, basin state governments and waterway managers in planning and managing environmental watering at a basin scale.

The environmental watering strategy sets out our best assessment of how four important components of the basin's rivers, wetlands and floodplains are expected to respond over the coming decades:

- river flows and connectivity
- native vegetation
- waterbirds
- native fish.

These components respond to environmental watering and are good indicators of the health of river systems.

Every year we publish an environmental watering outlook for the coming year. The outlook describes the prevailing and forecast environmental conditions (i.e. ecological, climatic and hydrological) as a step towards identifying basin annual environmental watering priorities.

The outlook is an opportunity for environmental water holders and managers to provide feedback on the watering opportunities. This year we also asked for feedback from the wider community, using an online survey.

On 30 June 2016 we published the 2016–17 basin annual environmental watering priorities. They were identified in anticipation of dry conditions, with additional priorities also identified should conditions become wetter. The priorities are aimed at ensuring rivers, wetlands and floodplains across the basin maintain their basic functions and resilience by:

- supporting the survival and viability of threatened species and communities
- maintaining rivers, wetlands and floodplains as well as ecosystem functions, for example by allowing drying to occur, consistent with natural wetting-drying cycles
- maintaining refuges.

Developing the priorities involves consultation with Australian Government and state agencies, natural resource management authorities, water managers and land managers. We work with these stakeholders to understand regional conditions and priorities.

Each year we work to improve how the priorities are prepared. This year we worked more extensively with Aboriginal people. We also improved how water availability was determined and included a case study on the social and economic benefits of environmental watering.

We are continuing to develop tools to improve the objectivity, robustness and scientific validity of the watering priorities. We are looking at whether multi-year priorities can help to improve environmental outcomes. We are also working to identify where environmental outcomes may result in improved social and economic outcomes.

Coordinating environmental water delivery

At the beginning of the 2015–16 watering year, the total volume of held environmental water in the southern connected basin was about 1,700 GL. This water is owned and managed by a number of different environmental water holders, including:

- the Commonwealth Environmental Water Holder
- the Victorian Environmental Water Holder
- the New South Wales Office of Environment and Heritage
- the South Australian Department of Environment, Water and Natural Resources
- the joint governments (The Living Murray portfolio).

The Southern Connected Basin Environmental Water Committee is made up of basin state and Australian Government environmental water holders, water managers and key river operators. The committee:

- coordinates the delivery of all environmental water to maximise environmental outcomes in the southern connected basin
- makes decisions on the use of water available under The Living Murray portfolio, River Murray Increased Flows, and River Murray Unregulated Flows
- coordinates the operational planning for the delivery of environmental water consistent with the Basin Plan Environmental Management Framework and guided by operational scenarios developed for the start of the water year. Scenarios are based on proposals submitted by the basin states and MDBA modelling that assesses the proposed water actions and identifies opportunities for alignment. These scenarios are reviewed and updated throughout the year in response to changing conditions and environmental watering priorities.

Better ways to manage environmental water – addressing constraints

On behalf of the basin states we are investigating better ways to manage environmental water to ensure that water is delivered as efficiently and effectively as possible.

Water can only be delivered at certain flow rates and at certain times so that there are no unacceptable impacts on local communities – these limitations are known as 'constraints'. Constraints can be physical structures along or near a river, such as bridges and roads, or rules or practices that can limit how water can be delivered. Further information can be found in the 2015 annual report of the Constraints Management Strategy 2013 to 2024.

Our focus during 2015–16 has been on collecting information on the impacts of proposed flows and the costs of managing those impacts for key reaches.

A significant body of work has been carried out to inform the development of state government-led business cases that aim to overcome constraints which will build the case for Australian Government investment in these projects.

Business case development has focused on what needs to be done to 'top up' current flows to increase either their peak or duration, and how this can be done without adverse impacts on landholders. This will help achieve environmental outcomes and targets using water as efficiently as possible.

In April 2016 Australian and state government ministers agreed to progress constraints measures for the Murray, Murrumbidgee and Goulburn rivers. However there is still further work to be done, including further analysis and community engagement to assist in refining the nominated flow rates. The state government proposals are for a multi-year program of consultation and implementation.

Even if constraints measures are approved, higher environmental flows will not be delivered until all management strategies are in place, which may take until 2024.

Basin Plan compliance and assurance

We continued to implement our compliance strategy which outlines our approach to compliance and assurance in relation to the Water Act and Basin Plan.

In March 2016, to support our commitment to risk-based compliance, we finalised our Compliance Risk Management Framework. The framework outlines an approach to compliance risk identification and management that can be customised for different aspects of our work.

Our internal Compliance Governance Committee met twice in 2015–16 to provide guidance, advice and recommendations on how to manage issues of potential non-compliance.

Along with the basin state governments and the Commonwealth Environmental Water Office, we agreed to publish voluntary statements of assurance. The statements make it easier for the community to see how parties to the Basin Plan are meeting their obligations. The 2014–15 statements of assurance showed that all parties are making good progress in meeting their obligations.

This year also marked the start of the Australian Government's Regulator Performance Framework. Implementing this framework will help us to minimise the impact of the Basin Plan water trading rules on individual traders and irrigation infrastructure operators.

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STAFF SNAPSHOT

Meet Arika – *why I work where I work*

Growing up in the Murray-Darling Basin.

The birthplace of my great great grandfather, Ban Ban Springs, is located at the junction of the Burnett and Isis highways and was the first location in Queensland to have been formally recognised as a cultural heritage place for my people. It is within the Murray–Darling Basin, so working here at the MDBA is not just a job, it's a part of my spirit and connection to my lands and my people.

STRATEGIC GOAL 2

Strengthen engagement with the community

Sustaining a healthy working basin relies on effective engagement with the community to identify knowledge and common interests, formulate policy, enforce governance and manage the rivers and its assets.

Highlights

- Met with hundreds of people in more than 73 towns and farms to learn about their water needs, preferences and the impact of water policy on their industries and communities.
- Developed indicators for Aboriginal cultural, social and economic interests in water, in partnership with the Northern Basin Aboriginal Nations, and carried out the Use-and-Occupancy Mapping project.
- Significant increase in the number of people accessing our education resources.
- Developed communication products to make information available to a wide range of stakeholders. We also substantially increased our communication efforts in the northern basin.

Overview

This year we substantially increased our communication efforts and interactions in the northern basin.

Our advisory committees provided valuable insights and knowledge. They also challenged us and helped us to improve our knowledge, approaches and relationships with stakeholders. This included working closely with the Northern Basin Aboriginal Nations and the Murray Lower Darling Rivers Indigenous Nations, who are collaborating with state agencies to incorporate Aboriginal objectives and outcomes based on Aboriginal water values and uses into state water resource plans. We also conducted the northern basin Use-and-Occupancy Mapping project in partnership with the Northern Basin Aboriginal Nations.

The Basin Community Committee, as well as research and advisory groups are all valued by the MDBA. We also continue to work closely with the basin governments, including the Commonwealth Environmental Water Office, to implement the Basin Plan.

This year we also continued to increase our work in the education area, talking to almost 20,000 students, teachers and members of the public and producing digital teaching resources, which are available on our website.

Challenges and the year ahead

We are continuing to work with communities throughout the basin to identify and understand the factors leading to changes in communities and regions, while also providing information to stakeholders about the Basin Plan. This all takes time and effort on both sides to make sure that local knowledge and solutions continue to inform the implementation of the Basin Plan.

Engaging communities, governments and interest groups

Input from stakeholders and community members, as well as our government partners, has helped us to better understand the sources of change across the basin, and the effects of those changes at both community and industry levels.

In the past year, we have actively engaged with stakeholders to evaluate the effectiveness of

water reform programs to determine if they are achieving what they set out to achieve and if there are any unanticipated or unintended impacts. This information will inform how the Basin Plan is implemented and how the MDBA will carry out its role.

Our community advisory committees include the Basin Community Committee and Northern Basin Advisory Committee (see Appendix C), and Traditional Owner based organisations, such as the Murray Lower Darling Rivers Indigenous Nations and Northern Basin Aboriginal Nations. These committees continue to provide an important link to the basin's communities and tell us about community issues and concerns. They also provide advice to make sure our engagement activities are appropriate and effective

The Advisory Committee on Social, Economic and Environmental Sciences continues to make sure that our work program and our scientific methods are rigorous, robust and consistent with best practice. Based on the committee's advice we hosted a scenario planning workshop in 2016, bringing together 50 key community stakeholders as well as academics and senior staff to consider future challenges in the basin. The findings will inform our future research and knowledge priorities.

In meetings throughout the basin, and in particular the northern basin, we sought to connect with businesses, irrigators, farmers, local government representatives, chambers of commerce, local tourism operators, recreation and environmental non-government organisations. The views and concerns shared by participants at these meetings were incorporated into our work and informed the Northern Basin Review.

Working with Aboriginal Nations

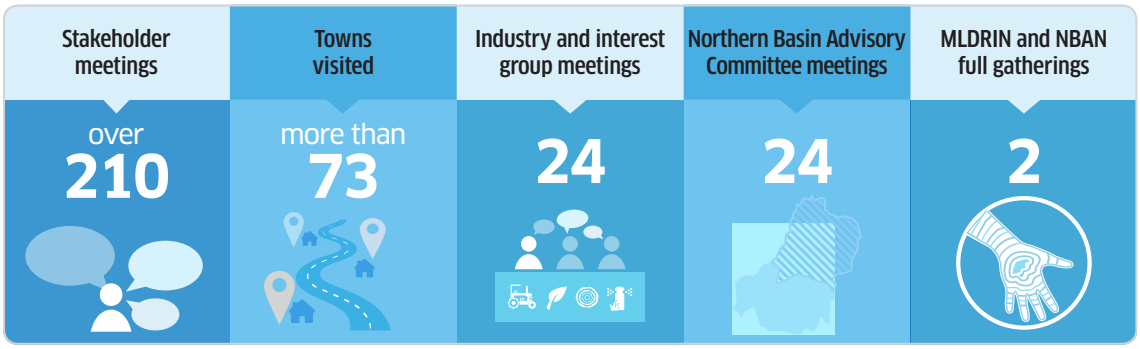
We recognise the importance of independent, culturally authoritative and strategic input from Aboriginal people to help achieve our aims. To help with this we work closely with the Northern Basin Aboriginal Nations (NBAN) and the Murray Lower Darling Rivers Indigenous Nations (MLDRIN). They are two peak Traditional Owner-based organisations in the basin with a primary focus on natural resource management.

The Murray Lower Darling Rivers Indigenous Nations was formed in 1998 and the Northern Basin Aboriginal Nations was formed in 2010. They are independent, self-determining organisations collectively comprised of delegates from 46 member Nations across the basin.

These organisations seek greater recognition and respect for Aboriginal knowledge and values in managing land and water. They also promote the views and perspectives of Aboriginal people on water research, policy and management

Within the Basin Plan framework MLDRIN and NBAN guide our work in relation to Aboriginal water interests. They provide strategic guidance on projects and development of tools, including the development of the Aboriginal Waterways Assessment and the Aboriginal sociocultural survey. NBAN and MLDRIN also provide editorial direction with MDBA corporate plans; for example Strengthening Connections – MDBA's Reconciliation Action Plan.

Involving Aboriginal communities in statutory water planning and management is new for both water planners and Aboriginal people. Up until recently efforts have largely focused on the protection of cultural heritage. Investment is needed on all sides to bring together traditional and contemporary Aboriginal



perspectives into water governance and government policy structures. For example, both NBAN and MLDRIN together with state agencies are collaborating to incorporate Aboriginal objectives and outcomes based on Aboriginal water values and uses into state water resource plans.

A map showing Aboriginal Nations in relation to water resource planning was developed by NBAN and MLDRIN, see mdba.gov.au.

In partnership with the Northern Basin Aboriginal Nations we also conducted the northern basin Use-and-Occupancy Mapping project. Use-and-Occupancy Mapping is a respected way of doing research with Aboriginal people. It has been widely used with Canadian Aboriginal peoples, and now in the Murray–Darling Basin.

Use-and-Occupancy Mapping can be used by Aboriginal people to negotiate for the protection of land and water to meet cultural, social, environmental, spiritual and economic obligations. It also helps non-Aboriginal people to better understand Aboriginal peoples' life on Country.

The research team visited Brewarrina, Walgett, Goodooga, Lightning Ridge, Dirranbandi, St George, Mungindi, Thallon and Collarenebri during April and May 2016. Both NBAN and the MDBA worked with local Aboriginal town organisers to coordinate the project locally.

Biography maps were overlaid to create Use-and-Occupancy map sets based on themes such as fishing or plant harvesting which describe Aboriginal peoples' use of a region (photo by Jackie Luethi).

The northern basin Use-and-Occupancy research project included interviews with 107 Aboriginal participants. Traditional Owners from the Barkindji, Bigambul, Euahlayi, Gamilaroi, Gwamu, Murrawarri, Ngemba, Wiradjuri and Yorta Yorta Nations participated in the survey.

During a personal face-to-face interview, a researcher sits with an Aboriginal person and asks them questions about their uses of Country. From the answers they map hunting, fishing, harvesting and other cultural uses of Country on a 'biography map'.

All participants have full ownership of the intellectual property produced during the project.

Working with governments

We work closely with the basin state governments (which includes the Australian Capital Territory) and Australian Government agencies, including the Commonwealth Environmental Water Office and the Department of Agriculture and Water Resources, to implement the Basin Plan.

This work is guided by the Implementation Agreement and overseen by the Basin Plan Implementation Committee – a high-level intergovernmental forum to monitor, review and make decisions about implementing the agreement, see Appendix C.

Communications

Media and social media

Regional media continues to play an important role in helping us to provide information to communities about our work. Our staff are regularly interviewed on regional radio and we also provide comments for local newspapers.

We provide numerous contributions to regional newspapers across the basin and also write news stories for the MDBA website. Our social media platforms allow us to reach new audiences and to share information and stories about the work we are doing. We're getting an ever increasing following.

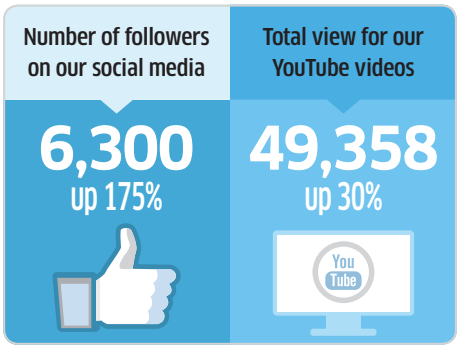
Through Twitter and Facebook we inform people about upcoming meetings, opportunities to provide feedback, new information and data on

Local media is an important way for us to share information about what we're up to. Our Chief Executive, Phillip Glyde, talks to ABC Western Plain's Sally Bryant (photo by Kirsten Henderson).

our website, and we respond to questions. It is great to hear from people across the basin, and social media allows us to share their photos and stories, as well as our own insights about how activities and programs are helping to improve basin health.

Social media is also a great way to connect with Australian and state government agencies in the basin who have had success with environmental watering, and other projects that benefit the health of the basin. We share with our followers examples of how environmental water, through the Basin Plan, is helping to improve the condition and resilience of areas across the basin.

Our followers are particularly interested in fish stories, updates on river operations and knowing what is happening in their community.



Communication products

Our annual report for 2014–15 received a silver award at the Australasian Reporting Awards. We also published our second full year Basin Plan annual report, which was distributed widely to communities across the basin. This year, for the first time, we produced supporting videos for the release of the report.

We continued to use online videos to communicate our work to a broad audience. Videos produced this year included waterbird monitoring, the Aboriginal Waterways Assessment and the Basin Community Committee.

In recognition of the need to increase basin communities' understanding of the Northern Basin Review, and to support community participation, we have substantially increased our communication efforts in the northern basin. We have worked with the Northern Basin Advisory Committee to produce five committee newsletters and communiques, conveying the scope of their work and their deliberations. We have also published eight fact sheets covering the environmental science projects, the social and economic work, research with Aboriginal communities and our hydrological modelling work in the northern basin.

A new Chief Executive newsletter – 'Basin connect' has also been produced. This is another channel to provide information and updates about the Basin Plan to stakeholders and those living within the basin. For a full list of our communication products for this year see Appendix D.

Peer reviewed journals

Peer-reviewed journals are another way for us to share knowledge and experience with the research community. Publishing enables us to demonstrate to professional audiences that decisions relating to the Basin Plan incorporate the best available science, social and economic information. In 2015–16 one journal article has been published and we submitted two papers for publication.

education@MDBA

Across the basin, and Australia, the education@MDBA program uses traditional and innovative education initiatives, partnerships and sponsorships to build awareness and understanding of the water resources of the Murray–Darling Basin and the work of the MDBA.

This year we focused on developing new digital and smart device resources to support learning in schools and with general public audiences. We established and maintained partnerships to increase reach and accessibility of our programs, and targeted remote and under-served audiences in an ongoing process of strengthening links with the Australian Curriculum. New content, that includes the agricultural component of water resource management, was also developed.

New digital resources were developed during the year to build on the success of digital resources developed in previous years. These included:

- online interactive lesson plans for years 1–7, with pre- and post-lesson quizzes to assist learning assessment
- an augmented reality app Water Weed Wipeout, which allows students to learn about using river operations to manage the aquatic weed *Egeria sp*., in Lake Mulwala, while optimising social, economic and environmental outcomes.

We also continued work on developing:

- a smart device simulation app that challenges users to optimise social, economic and environmental outcomes in a largely unregulated river system, such as in the northern basin
- an interactive e-book to engage audiences about the basin and water management.

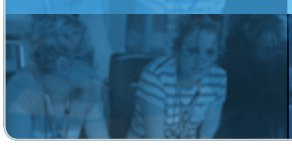
The team continued to work with the Australian Curriculum and Reporting Authority to develop an integrated year 6 unit on water quality and availability driving food and fibre production. This unit covers curriculum content in design and technologies, science, humanities and social sciences, and mathematics learning areas as well as the sustainability cross curriculum priority. This unit will be available on the Australian Curriculum and Reporting Authority's Curriculum Connections website, as an example of a best practice integrated learning unit using authentic data.

Events and programs with other partners were used as a way to increase opportunities to directly work with broad audiences. These included a week long display at Questacon surrounding World Water Day, participation in the Kids Teaching Kids event in Tamworth, presenting a video-conference lecture for hydrology students at the University of Sydney, as well as sponsored conferences. We funded partners to deliver local and MDBA-based water resource management content at Wirraminna Environmental Education Centre (New South Wales), Amaroo Environmental Centre and Coolumboola Environmental Education Centre (both in Queensland).

Our basin champions video conference-based program provided an opportunity for remote and regional communities to participate and investigate a local water-related issue. We continued to provide support for the successful Murray–Darling Basin natural resource management and environmental educators' network and several environmental education centres. This helped educators (particularly in regional areas) to share best practice, and investigate opportunities for joint activities.

The Trickle Down: Water and The Murray–Darling Basin science show was developed jointly with Questacon, and presented five times a week by their staff. It is designed to raise awareness of the water resources of the basin and the challenges faced in managing these resources. Around 11,350 people from around Australia saw the show in 2015–16.

Number of students, teachers and members of the public who attended our face-to-face programs	Number of unique visits to the MDBA education web pages	Number of downloaded Run the River app	Number of people who saw the water show at Questacon
19,863	24,600	5,568	11,347





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STAFF SNAPSHOT

Meet Siobhan – *why I work where I work*

Working at the MDBA has been one of the most interesting and challenging times in my career. My background is stakeholder engagement, and I've worked in the water world for a while – even on flood risk projects up in the north-east of England. Being able to work on this hugely important piece of water reform is why I joined the MDBA in 2009.

I've been very lucky to have travelled widely across the basin and seen how diverse and beautiful it is. I have also been fortunate in this time to meet and work with some of the most committed, passionate and knowledgeable people – both my colleagues and the people across all the towns and communities that we work with.

Earlier this year I took part in the Jawun Aboriginal secondment program. This saw me living and working in Shepparton, Victoria for six weeks, working and mentoring within the Rumbalara Aboriginal Cooperative. This was such a fantastic opportunity to share some of my skills and to also really try to better understand the Aboriginal community in this area, their history, the issues they face and their connection to Country and water.

A storm brewing on Ned's Corner (photo by Siobhan Leslie, MDBA). This photo was the winning entry in the MDBA's annual report photo competition for staff.

F TRAVELLING NORTH

The northern part of the Murray–Darling Basin is different to the southern basin. It is drier and much flatter. It receives most of its rain during summer, while the south receives most of its rain in winter. The rainfall in the north is not only lower, but also more inconsistent than in the south. The north also faces higher levels of evaporation, and the rivers are largely unregulated.

These differences mean that we needed to approach implementing the Basin Plan in the north differently.

In 2015–16 we travelled throughout the northern basin meeting with and listening to communities. We wanted to know if the results of our three-year review into the north aligned with what communities in the north knew, and to find out if there were any gaps in our knowledge.

Background photo by Otis Williams, others by Alisha Caldwell, Sandra Walpole and Irene Dowdy

Aboriginal people told us

that all elements of cultural life are significantly affected by the availability of water in the system

that they value environmental water and seasonal flows for the benefits they have on their cultural and spiritual life – but it is their value to maintaining biodiversity (health to Country) that is of greatest importance

that they are concerned non-Aboriginal society fails to understand that Aboriginal people need both environmental water to help deliver Aboriginal environmental outcomes and water for Cultural Flows – that is water owned by Aboriginal people.

Communities and farmers told us

that when there are changes to the agricultural sector it affects the whole town

that the Basin Plan has arrived after many other changes that communities are still working through

that water plays an important role culturally, socially and environmentally

that a healthy river is paramount to their lives and everything else

that when water flows it breathes life into their communities.

As more studies are completed, and we talk to more people, we are learning more about what a healthy river system needs. We are also gaining a much better understanding of what the effects are on communities when water is recovered. The balance that we need to get right will consider the economy, the community and the environment.

STRATEGIC GOAL 3

Evaluate and report the social, economic and environmental outcomes of basin water reforms

We are tracking progress of the triple bottom line outcomes from the basin water reforms. Measuring the impact of the reforms is fundamental to gaining community confidence in the implementation process and supporting the reforms into the future.

We will focus on building knowledge on whether the expected outcomes are being achieved, understanding any unintended consequences, addressing problems as they are identified and adjust accordingly (adaptive management). As more elements of the Basin Plan are in place and more effects can be tracked, the depth of this work will increase.

Highlights

- Published the second full-year Basin Plan annual effectiveness report, which showed that major milestones had been met and progress had been made on important components of water reform.
- Managed The Living Murray water portfolio, as well as associated monitoring and evaluation and Aboriginal engagement, on behalf of the basin governments.
- Collaboration between water holders and river operators resulted in an extended environmental watering of Barmah–Millewa Forest, and around 200 endangered Australasian bitterns breeding.
- Carried out the River Murray Water Quality Monitoring Program, supported by basin governments. Worked with basin governments to respond to an algal bloom in the River Murray.
- Developed the next 15 year basin salinity management program.
- Major environmental monitoring and evaluation projects were successfully completed.

Overview

During 2015–16 our social and economic program progressed well, with a particular focus this year on developing a detailed understanding of different scenarios for water availability and agricultural production, as well as the flow-on impacts in communities in the northern basin. We are also preparing for the 2017 evaluation of the Basin Plan and associated water reforms.

The positive outcomes which can be achieved by coordinating the use of environmental water were clearly highlighted by watering the Millewa floodplain in 2015–16. Initial plans were scaled up when River Murray operational transfers provided an opportunity to conduct a larger-scale watering, involving four environmental water holders. This resulted in significant plant growth. The watering was extended to support a small, but important, waterbird breeding event. Around 200 Australasian bitterns[2], which are an endangered species, were able to nest in the forest.

Challenges and the year ahead

We understand that we cannot generalise about communities and change. Information we have gathered and analysed to date suggest that many things drive changes in regional and rural communities and industries; both inside and outside the basin. The evidence collected so far also suggests that some communities might be more influenced by water reform than others.

Every water year proves to be different. The early signs were that the 2016–17 water year would probably be relatively dry, and planning was carried out accordingly. Planning included an expanded set of options should the season turn out to be slightly wetter. The early signs are that 2016–17 may turn out to be wetter than expected which will test the effectiveness of the Southern Connected Basin Environmental Watering Committee in being able to adapt and respond to emerging watering opportunities.

The coordination of monitoring and evaluation in the MDBA and basin governments has recently been improved by the joint monitoring and evaluation initiative. However, more needs to be done and the review of the environmental watering priorities will provide clear direction for the future. This is particularly important as we approach a major evaluation of the Basin Plan, scheduled for late 2017.

2 Scientific names of plants and animals are on page 177.

Reporting on the effectiveness of the Basin Plan

The Basin Plan sets out the objectives for reporting on the effectiveness of the Basin Plan and provides for annual reporting. With basin governments and the Commonwealth Environmental Water Office, we coordinate monitoring and evaluation reporting on progress against social, economic and environmental outcomes.

This year we started work on 'counterfactual modelling' for the Commonwealth Environmental Water Holder's water portfolio. The modelling helps us to report on the effectiveness of the Basin Plan. An initial report on the River Murray for the 2014–15 water year was completed in January 2016.

> Counterfactual modelling is the process of producing a model run that represents what river flows would have occurred in each valley before the Basin Plan. These results can then be compared to what is happening as a result of the Basin Plan at the same locations.

We are developing tools and processes to assess the impact of the Basin Plan on the hydrology and inundation patterns throughout the basin. It is anticipated that a joint government team will work together to develop consistent, agreed counterfactual model scenarios that each jurisdiction will update yearly. This work is ongoing and will become a major part of the work in assessing the effectiveness of the Basin Plan.

In 2016 we published the second full report on how the Basin Plan and associated reforms were progressing. The Basin Plan annual report contained early indications that environmental watering benefited native fish, native vegetation, waterbirds and river flows. It also noted that some communities are more vulnerable than others and face particular challenges. Many are feeling the stress of economic, climate and policy changes that have occurred over recent decades.

The next step will be to identify causes of long-term trends and changes and isolate those which are likely to have been influenced by the Basin Plan. This will contribute to a more detailed evaluation of the Basin Plan in 2017. This evaluation will help us to identify information requirements to conduct a full evaluation in 2020.

Social and economic analysis

Our social and economic analysis is designed to uncover the actual effects of the Basin Plan and associated water reforms, as distinct from other drivers of change in basin communities. It will also help us to understand how investments, such as irrigation infrastructure modernisation, may help to offset the potential impacts that have been identified.

We are gathering:

- direct evidence, by interviewing Aboriginal communities and farmers about changes they have made in response to the Basin Plan. So far we have interviewed farmers from the Murrumbidgee, Lachlan, Victorian Murray, Goulburn, Campaspe, and South Australian Murray catchments. Some key themes reported in the interviews have been identified, and will be combined with information about changes in social and economic conditions to help understand how basin communities are adapting
- Regional Wellbeing Survey data, by supporting the third year of the survey conducted by the University of Canberra. We are particularly interested in how people think the Basin Plan might affect them and their community. The survey has also helped us begin to uncover the relationship between farm business performance and the Basin Plan
- data about irrigation farms and industries from the Australian Bureau of Agricultural and Resource Economics and Sciences, by continuing to support their survey and analysis of changes in the irrigation industry. Reports that examine basin-wide and industry-level data collected through irrigated farm surveys since 2006–07 have been published in 2016
- data and information on water markets, irrigation water providers, Australian Bureau of Statistics Census and Agricultural Census data, housing and rural land value data. This data help us to better understand the policy changes, demographics, economic, water, technology and agricultural production trends and drivers of change in rural communities.

We cannot generalise about communities and change. Information we have gathered and analysed to date suggest that many things drive changes in regional and rural

communities and industries; both inside and outside the basin. These include structural changes in regional economies, changes to the irrigated agricultural sector, and changes to water availability and water access arrangements. The evidence collected so far also suggests that some communities might be more influenced by water reforms than others. Our analysis is now moving towards trying to separate out the effects of the Basin Plan from other factors that may be having an influence on how communities are tracking.

Monitoring the environmental health of the basin

Surveying vegetation, fish and waterbirds across the Murray–Darling Basin

Environmental monitoring was successfully carried out at a basin-wide scale as well as for sites along the River Murray (see page 40).

Satellite-based monitoring was used for woody vegetation across the basin. This work is based on the tree stand condition assessment used by The Living Murray program, that has been in operation since 2009. It is being extended across the major floodplains of the basin.

The satellite monitoring uses Geoscience Australia's data cube and field training data from hundreds of sites across the basin. The data will be used to track progress toward the expected outcomes for red gums, black box and coolabah. The vegetation field work is being carried out in a collaborative manner to ensure that data collection is efficient and can be used by the MDBA, Commonwealth Environmental Water Office and the basin states for their reporting.

The annual fish survey provided data across the basin. Sampling in the Coorong was added to the survey this year to improve the coverage and relevance of the survey to the Basin Plan. The fish data now extends back more than 10 years and will be used to provide a whole-of-basin perspective on the important native fish breeding sites and potential for habitat improvement.

The annual waterbird survey data was received. This year improvements were made to the survey protocols and data documentation to address

Healthy rivers benefit tourism

The mid-Murrumbidgee wetlands are an important tourism and recreation destination for Riverina residents and other visitors. The area is used for fishing, boating, camping and waterskiing.

The Leeton Bidgee Classic Fishing Competition has been held for the past eight years along a stretch of the Murrumbidgee River. The catch and release competition attracts hundreds of anglers and encourages the catch and release of native species, such as Murray cod and golden perch, and the capture of carp. Proceeds from the event are used to restock the Murrumbidgee River system with native fingerlings. Leeton Shire Council regards this as one of their most important tourism events in terms of flow-on benefits for the local economy.

The University of Canberra's regional wellbeing survey included questions about environmental watering related to fish, and found that:

- 74% of all survey respondents and 67% of New South Wales respondents supported environmental watering to support native fish populations
- 68% of respondents agreed that environmental watering improved fishing conditions, while 64% agreed that environmental watering increased native fish populations
- however 54% also agreed that environmental watering increased the spread of pest fish species.

While fishing isn't the main purpose of prioritising environmental watering in the mid-Murrumbidgee, successful implementation of this priority will support the continuing success of the Leeton Bidgee Classic Fishing Competition by providing flows that deliver increased opportunities for native fish to complete critical stages in their life cycles.

Environmental water will also provide increased opportunities for people interested in other recreational and tourism activities in the mid-Murrumbidgee wetlands, such as swimming and boating.

the challenges of surveying wetland complexes under varying water levels. Results of the survey indicate that total waterbird abundance has remained similar to the previous year, with an estimated 300,000 birds observed across 38 wetland complexes. These abundance figures and the fact that the only group of birds seen breeding during the spring sampling were herbivores (plant eating birds like swans), reflect a drying basin characterised by many dry wetlands.

The joint program monitoring and evaluation program

The joint government ministers (ministers from the Australian Government, New South Wales, Victoria, South Australia, Queensland and Australian Capital Territory) made a decision to begin a monitoring and evaluation program in 2015–16. A group, with members from all the basin states and the Australian Government, steers the program and the MDBA implements the decisions.

The joint governments have agreed that there are common monitoring needs at regional, state and basin scales that are most efficiently done collectively. In its first year the program has added native fish and vegetation projects that enhance current monitoring, for example providing additional sampling in the Coorong as part of the basin-wide fish survey, and field work as part of the basin tree stand condition assessment.

To ensure that the investment targets the requirements of the Basin Plan a review will be completed in early 2016–17.

Monitoring at sites of high environmental value along the River Murray

Monitoring is also conducted at individual sites as part of The Living Murray monitoring program. It includes:

- site condition monitoring which provides information about the health of target sites, including how the condition changes through time. This monitoring focuses on fish, waterbirds and vegetation
- intervention monitoring which assesses ecological and other responses to watering and management actions. It provides the major link to understanding how specific environmental management actions result in changes at target sites, enabling adaptive management.

Floodplain tree-stand condition monitoring, now in its eight year (2009 to 2016), combines field measurements, satellite imagery and other data to calculate the condition of river red gum, and black box forests and woodlands at the target sites. This monitoring allows conditions across the sites to be compared, as well as changes within the sites, and across the Murray system, to be assessed.

In 2016 this monitoring approach was used to assess the condition of river red gum and black box forests, and woodland communities in target sites. Early results showed that the condition of the black box and river red gum communities have been maintained across the sites. This work has also been adopted at the basin scale.

Fish movement monitoring at target sites, including Hattah, provided important learnings about how best to use environmental water, and water management structures, to cue native fish movement between the River Murray and the floodplain, as well as how to manage the movement of carp.

Monitoring at the newly constructed fishway at the Mullaroo Creek regulator, Lindsay Island, showed an increased movement of native fish, such as Murray cod, golden perch and freshwater catfish, from the River Murray into the creek over spring and early summer for breeding. At the Lower Lakes, winter attractant flows through the barrage fishways facilitated the upstream movement of pouched lampreys. Fifty-seven adult pouched lampreys were recorded at the fishways in winter 2015, the largest number since 2006.

In response to multiple years of environmental watering a variety of wetland plants and animals were recorded in Gunbower Forest. This included the re-emergence of two threatened species, the wavy marshwort and river swamp-wallaby grass. Inundation of higher level Lower Lakes wetlands resulted in a strong aquatic vegetation and zooplankton response, which was utilised by frogs and native fish including the threatened Yarra pygmy perch.

What has been achieved?

It takes time for the full benefits of environmental watering to be realised, because of biological time lags. The full amount of environmental water has not yet been recovered and the Basin Plan will not be fully implemented

Involving Aboriginal people in water planning and management

Chair of the Northern Basin Aboriginal Nations Fred Hooper (Murrawarri Nation) with Neil Ward (MDBA) (photo by Charmain McDonald).

Independent, culturally authoritative and strategic input from Aboriginal people can enhance the outcomes from environmental watering decisions. Aboriginal environmental outcomes are where ecological benefits from environmental watering also support Aboriginal objectives, values and uses. Management of environmental water that encompasses Aboriginal values and uses will enhance wellbeing and cultural resilience. This approach also recognises that Aboriginal peoples' knowledge of Country can inform better water management.

The Basin Plan identifies the Murray Lower Darling Rivers Indigenous Nations and the Northern Basin Aboriginal Nations as key engagement partners in water resource planning. In collaboration with the MDBA, they are developing approaches to integrate Aboriginal values and uses into environmental water planning. Talks have begun on how to integrate this input into the annual environmental watering priorities process to strengthen and improve it over time. This will continue to occur with input into the priorities each year building on the progress already made.

During the year the MDBA attended a Northern Basin Aboriginal Nations full gathering to start talks on integrating Traditional Owners' input into the priorities process. Talks are continuing on how Aboriginal people can provide input into the 2017–18 priorities, and how the MDBA can identify where environmental watering has provided Aboriginal environmental outcomes. There may be opportunities to use the findings of the Aboriginal Waterways Assessment and the Use-and-Occupancy Mapping in the northern basin for the priorities process.

This year The Living Murray Indigenous Partnerships Program employed Aboriginal representatives and facilitators to assist in planning, managing and monitoring sites, to make sure that Aboriginal knowledge and cultural values were considered and protected.

In Victoria, facilitators were based with the Goulburn–Broken, North Central and Mallee catchment management authorities. In South Australia they were based with the Department of Environment, Water and Natural Resources and the Ngarrindjeri Regional Authority and in New South Wales, at the Moama Local Aboriginal Land Council.

Key highlights for 2015–16 included:

- Ngarrindjeri, Yorta Yorta, Barapa Barapa and other groups providing input into water planning for 2016–17, as well as site and cultural heritage management
- Indigenous facilitators participating in meetings of the Murray Lower Darling Rivers Indigenous Nations advisory groups
- Traditional Owners receiving updates on The Living Murray activities
- Ngarrindjeri people providing input into new and emerging ecological research programs in the Lower Lakes, Coorong and Murray Mouth
- Ngarrindjeri people providing assistance with sampling activities for the Lower Lakes threatened fish monitoring program
- providing capacity-building and training activities on topics such as communication writing and ecological monitoring, for example a turtle monitoring project at Koondrook–Perricoota Forest
- targeting local Aboriginal communities for an open day at Millewa Forest to showcase management activities.

until 2019. Up to 2019 we are aiming to maintain ecological conditions; after 2019 we expect to see improved ecological conditions.

Monitoring has shown that using environmental water wisely on the back of natural events and normal river operations is helping river, wetland and floodplain ecosystems recover from drought in some areas. More information will be available in an evaluation report to be published in 2017. Some environmental outcomes observed to date are:

- positive responses were observed between 2013 and 2015 in core wetland vegetation in the Gwydir Wetlands, Macquarie Marshes and lower Lachlan, where environmental water had been provided. The marsh club-rush sedgeland community in the Gwydir Wetlands has recovered from drought and fire in response to environmental water
- environmental water has been delivered to wetlands and rivers to benefit waterbirds across the basin from 2013 to 2015. Water delivered to the Mallowa Wetlands in northern New South Wales in 2014 provided a refuge for waterbirds in the northern basin. There was an increase in bird breeding in 2014–15 after environmental water was delivered to Yanga National Park. This resulted in eastern great egrets breeding in the area for the first time since 2011. Waterbird breeding was also recorded in Barmah Forest and in the Gingham and Gwydir wetlands in response to environmental water
- numbers of Murray hardyhead and other small-bodied native fish species increased in Lake Alexandrina in response to environmental water delivered between 2013 and 2015. Increased numbers of congolli, lamprey and common galaxias moved through the barrages from the Lower Lakes into the Coorong and Southern Ocean. Lampreys were also detected moving through the barrages upstream into the River Murray.

Each year, the owners and managers of environmental water report on how water has been used and on early indications of outcomes, noting that it can take some time for scientifically measured results to become available. Similarly, environmental watering carried out as part of The Living Murray program in 2015–16 is showing early signs of positive outcomes.

Case study: Environmental watering benefits Moira grass and the endangered Australasian bittern

Given the dry outlook at the start of the 2015–16, only a small in-creek watering to protect critical drought refuge was planned for Millewa Forest. River Murray operational transfers in August–September, provided an opportunity to use a moderate volume of environmental water to target between 12,000 to 15,000 ML/day at Yarrawonga throughout September and October.

The New South Wales Office of Environment and Heritage, the Victorian Environmental Water Holder, The Living Murray and the Commonwealth Environmental Water Office coordinated delivery of environmental water, which included 68 GL from The Living Murray portfolio and 351 GL from the Commonwealth Environmental Water Holder.

This larger coordinated environmental water event inundated around 20% of the floodplain, with 80% of water delivered returning to the River Murray for downstream watering actions. Moira grass responded positively propagating by nodule growth. Environmental water provided throughout spring and summer made sure that waterbird chicks were able to fledge. The water also sustained an estimated 200 Australasian bitterns (an endangered species) which were nesting in the forest. These bittern numbers represented 8 to 20% of the known global population.

Transitioning from the Cap to the sustainable diversion limit

With the adoption of the Basin Plan, the monitoring and reporting obligations under the Water Act came into effect for the first time for the 2012–13 water year. The Cap reporting will continue until Basin Plan sustainable diversion limit compliance begins in the 2019–20 water year. We have worked closely with the basin state governments to make sure that both requirements (the Cap and the Basin Plan) were met through a combined reporting process. The Murray–Darling Basin transitional period water take report for 2014–15 will present information about the use of all basin water resources, including groundwater and the updated Cap Register for that year.

In 2015–16 joint environmental watering events involving: the New South Wales Office of Environment and Heritage; the South Australian Department of Environment, Water and Natural Resources; the Victorian Environmental Water Holder; the Commonwealth Environmental Water Holder; and The Living Murray, were coordinated for six target sites. These events also benefited other key areas across the southern basin and the River Murray channel and helped meet the 2015–16 Basin Plan watering priorities. For early results see Figure 2.5.

Barmah–Millewa Forest

Moira grass growth in the Millewa floodplain, significant colonial waterbird breeding events and habitat for an estimated 200 Australasian bitterns (see case study, page 39). Also observed 230 pairs of royal spoonbills, 325 pairs of Australian white ibis, 430 pairs of straw-necked ibis, 65 pairs of eastern great egrets and little pied cormorants.

Gunbower Forest

Improvement in wetland vegetation condition and habitat for native fish including the Australian smelt and carp gudgeon, with return flows providing nutrients and carbon to the River Murray.

Hattah Lakes

Improved condition of aquatic vegetation and flows that promoted the movement of native fish between the lakes and River Murray.

Wallpolla east

Improvements in the diversity and extent of the littoral zone and habitat for waterbirds.

Chowilla Floodplain

Improved riparian vegetation condition in the Chowilla anabranch and at wetlands watered by pumping, 45 southern bell frogs, a threatened species, were detected.

Lower Lakes, Coorong and Murray Mouth

Improved aquatic vegetation condition, frog response and colonial waterbird nesting in the Lower Lakes, with flows through the barrage fishways supporting the migration of fish between the Coorong and Lower Lakes. There were also significant colonial waterbird nesting events including royal spoonbills, cormorants and straw-necked ibises.

Figure 2.5 Early results from environmental watering at sites along the River Murray

There were delays in publishing the transition period water take reports to allow time to reach an agreement with the states on the approach for accounting for environmental water recovery (both for the Cap and transition to sustainable diversion limit arrangements). An agreement on this approach was reached in late 2015 and so information to support this agreed approach is now being compiled.

From the 2019–20 water year, the use of all basin water resources will be monitored and reported for compliance against the sustainable diversion limit and the Register of Take which will replace the Cap Register.

Auditing the Cap during the transition period

We are in the process of auditing the performance of the basin state governments in implementing the Cap and reporting under section 71 of the Water Act. This section requires basin state governments to report on their water resource plan areas, including quantity of water available, quantity of water taken or traded, the details of water allocations, and if there has been any non-compliance with any long-term diversion limit.

The key findings for the 2014–15 water year were:

- total diversions of 7,270 GL were the sixth lowest on record (in 32 years of records, 1983–2015)
- all Cap valleys are expected to remain in cumulative Cap credit as at June 2015. Further work is required during 2016–17 to finalise this auditing.

The status of models for Cap compliance to 2019

Of the 24 Cap valleys, there are 23 models needed – some models, such as the Murray model, cover more than one valley while other valleys, such as the Barwon–Darling and lower Darling, require two models. No model is required for two valleys in South Australia – 'country towns' and 'all other purposes'.

Seventeen Cap models have been accredited to 2019. The MDBA recognises that states have limited modelling resources which are now better dedicated to implementing the Basin Plan given the transition period from the Cap to sustainable diversion limits. The MDBA remains available to assist in maintaining and accrediting the Cap models should state governments want a Cap model to be accredited during the transition period.

Actions taken to support the implementation and reporting for the sustainable diversion limits are:

- improving annual data collection and handling
- improving data quality for new forms of take, including groundwater and interceptions
- improving accounting and reporting of held environmental water
- updating estimates of water recovered to 'bridge the gap'
- developing suitable hydrological models for operation under the Basin Plan
- developing a register of take for each sustainable diversion limit resource unit maintained by the MDBA
- agreeing to a process to accredit state water resource plans
- agreeing to a process to support basin state governments with annual reporting of annual permitted take and annual actual take to the MDBA.

Water trade

The Basin Plan water trading rules began on 1 July 2014 and have been in effect for two years. The rules set out a consistent framework for water trading across the states, without duplicating state rules. They are designed to reduce barriers to trade, improve access to information and improve confidence in the operation of the market.

In 2015–16 we published a strategic priorities paper on water trade to inform the MDBA's risk-based approach to compliance, and guide effective use of our resources to address the most significant compliance risks. The focus is on areas where there is a greater potential impact on the water market. The key priority issues addressed included: restrictions on trade, disclosure and management of water announcements, information and reporting requirements for basin states; and price reporting by individual sellers.

We worked with the basin state governments on issues unique to their jurisdictions, and started to resolve any possible inconsistencies with the water trading rules. Staff attended field and industry days to provide information on the water trading rules. These included AgQuip in Gunnedah, New South Wales, and the Riverland field days in Barmera, South Australia. We also continued our coordination role of managing interstate water trade in the southern connected basin.

Trade was restricted through the Barmah Choke for all of 2015–16. The choke presents a challenge for river management because it limits the delivery of irrigation water during periods of peak demand. The online Barmah Choke trade balance tool, developed to assist river managers and water users track available Choke capacity in real time, was in constant use.

River Murray Water Quality Monitoring Program

Under the Murray–Darling Basin Agreement, the River Murray water quality monitoring program was established to monitor water quality on an ongoing basis. This program is unique in its coverage (2,500 km of the River Murray) and its duration (35 years and ongoing). The program is implemented in partnership with New South Wales, Victoria and South Australia. Extensive sampling (mostly weekly during the year) and analysis was carried out at 28 sites and phytoplankton was surveyed at 12 sites.

During 2015–16 the River Murray water quality parameters, with respect to recreation, irrigation and drinking water needs, were within acceptable limits except for blue-green algae (phytoplankton). There was a widespread blue-green algal bloom along the River Murray between February and June 2016, Figure 2.6. The data collected will be crucial for further investigations on the causes of this year's blue-green algal bloom and determining possible management options.

Under the Murray–Darling Basin Agreement, the basin state governments need to refer any development proposals, that may significantly affect the flow, use, control or quality of River Murray water, to the MDBA for assessment. During 2015–16, we received 37 proposals from within the basin. None of them had any significant impacts on the quality and quantity of River Murray water.

Case study: blue-green algal bloom in the River Murray 2016

Blue-green algae are a group of photosynthetic organisms which are actually bacteria not true algae. When present in large numbers they pose a significant water quality risk. This year an unusual species, *Chrysosporium ovalisporum*, a small nitrogen fixing tropical blue-green algae bloomed across the southern Murray rivers system between mid-February and end of June 2016, Figure 2.6.

Although this species is present in the Murray system, it had never bloomed during the 37 years of algae monitoring. The bloom first appeared in Lake Hume and then spread over 1,700 km to Lock 9. Cold temperatures in June saw a decline in the bloom and with continuing cool weather, rain and wind the system was finally freed from the bloom.

The incidence of algal blooms in the southern connected basin is not uncommon but it has significantly increased in the last decade. Generally most blooms originate in Lake Hume and then move downstream. Until this year blue-green algal blooms only formed when the level in the Lake Hume fell below 10% capacity. This year Lake Hume was at 30% when the bloom was first reported. The reason for this year's unusual bloom is not fully understood but we observed a few unusual developments during the bloom such as slightly elevated average maximum and minimum air temperatures around Lake Hume; and above average solar irradiance during the bloom. Another interesting observation was that no toxins were detected.

We worked closely with the Murray Regional Algal Coordinating Committee during the 2016 blue-green algae event in monitoring and managing public information and concerns. The coordinating committee issued many media releases, put public alerts and signage at sites, provided direct advice to river users to make sure water users were aware of problems and knew to avoid direct contact with the water.

Managing pest fish

Tilapia is one of the worst invasive freshwater pest fish threats to Australia's aquatic ecosystems. At least four catchments adjoining the northern basin are known to have tilapia.

In 2015–16, we engaged the River Health and Habitat Restoration consultancy to implement the Northern Basin Tilapia Exclusion Strategy. A range of tilapia awareness raising and educational activities have been delivered to community stakeholders. Selected stakeholders have been trained in tilapia identification and reporting, to aid early detection. Earlier this year, the basin states developed a joint action strategy for the management of tilapia should an incursion occur in the basin.

Showcasing river restoration – demonstration reaches

The MDBA provided a small investment in activities showcasing river restoration along the Ovens River (Victoria), upper Murrumbidgee (Australian Capital Territory) and Katfish (South Australia). Demonstration reaches help to communicate positive monitoring results for native fish. This included improved populations of Murray cod and trout cod in the Ovens demonstration reach and an increase in native fish in the Katfish demonstration reach. The upper Murrumbidgee demonstration reach delivered improved riparian rehabilitation through community and stakeholder engagement. We supported the Victorian Arthur Rylah Institute to develop a special flyer for each demonstration reach showing the benefit of river rehabilitation.

With our support the Australian Rivers Restoration Centre hosts and maintains the Finterest website <finterest.com.au> and promotes it through social media.

Managing salinity

Salinity remains a significant management challenge and poses ongoing risks to the Murray–Darling Basin. Landscapes in the basin will continue to export salt to rivers, and salinity is forecast to continue to increase over time and requires careful ongoing management.

The MDBA continues to coordinate the response to the salinity risk through a partnership with the Australian and basin state governments. The MDBA developed the Basin Salinity Management 2030 Strategy, which was approved by the Murray–Darling Basin Ministerial Council in November 2015.

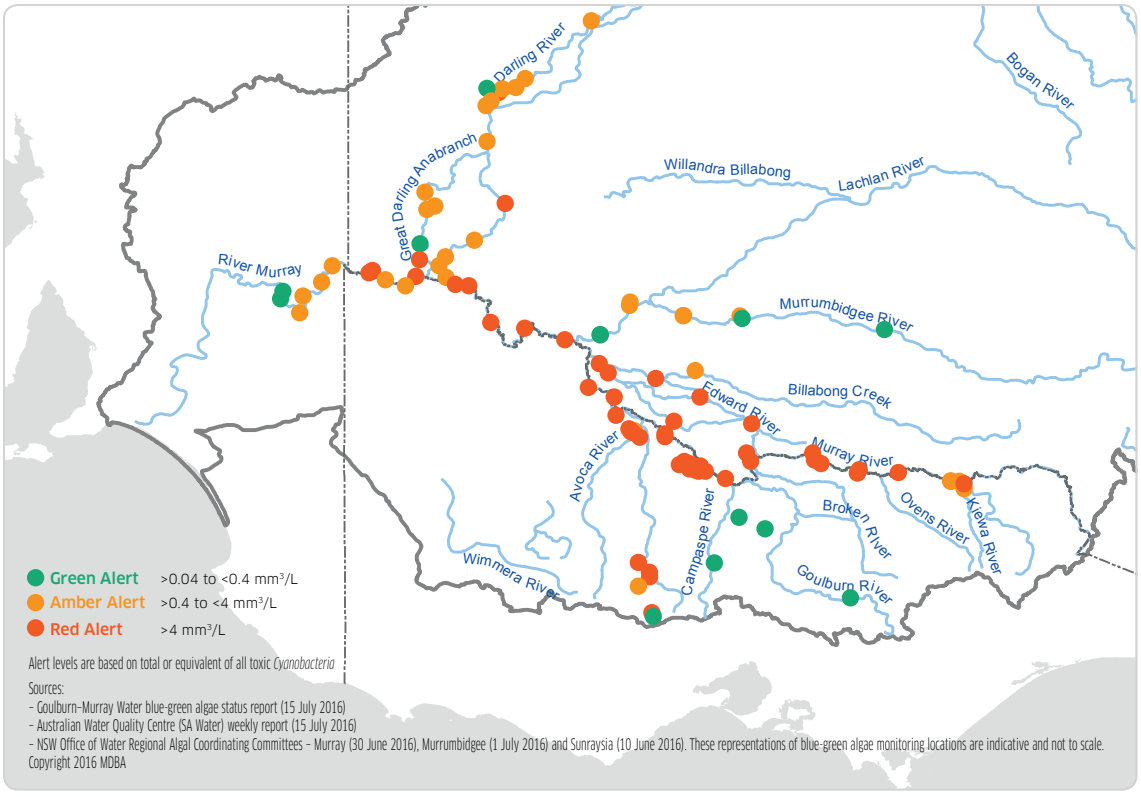

Figure 2.6 2016 algal blooms in the River Murray system

This strategy builds on the long history of joint salinity management by basin governments since 1988, and follows on from the Basin Salinity Management Strategy 2001–15. It extends the joint effort up to 2030. One of the key activities implemented includes preparing drafting instructions to revise Schedule B of the Murray–Darling Basin Agreement.

The joint effort over the past 28 years has helped achieve the basin salinity target at Morgan, which aims to maintain salinity below 800 EC for 95% of the time, see Table 2.1. The benefits of salinity management through the partnership can be seen in Figure 2.7. In 2015–16, the average salinity at Morgan was 271 EC with a short peak of 380 EC.

Salt interception

A significant achievement of salinity management in the basin has been commissioning strategically located salt interception schemes to divert hyper-saline water from entering the River Murray system. In 2015–16 salt interception schemes diverted about 524,728 tonnes of salt away from the River Murray system and nearby landscapes, see page 62.

Registering the impacts of actions on salinity

Under the basin salinity management strategy actions that increase and decrease average river salinity are accounted as debits and credits which are recorded in a salinity register. For example, actions such as new irrigation developments may generate a debit on the register because they may increase salt loads to the River Murray. By comparison, actions such as commissioning salt interception schemes and improving irrigation practices may generate credits.

Each entry in the register covers salinity impacts on the river arising from recent actions (Register A) as well as from major historical land and water use decisions (Register B) in tributary valleys. Each year the basin state governments inform the MDBA about reviews of existing register entries and new activities that have significant salinity effects.

Table 2.1 Summary of salinity levels (EC) recorded at Morgan, South Australia

Period	Time interval	Average	Median	95th percentile	Peak	% time >800 EC
1 year	July 2015–June 2016	71	273	343	380	0%
5 years	July 2011–June 2016	314	290	493	650	0%
10 years	July 2006–June 2016	371	346	622	768	0%
25 years	July 1991–June 2016	461	436	753	1,087	3%

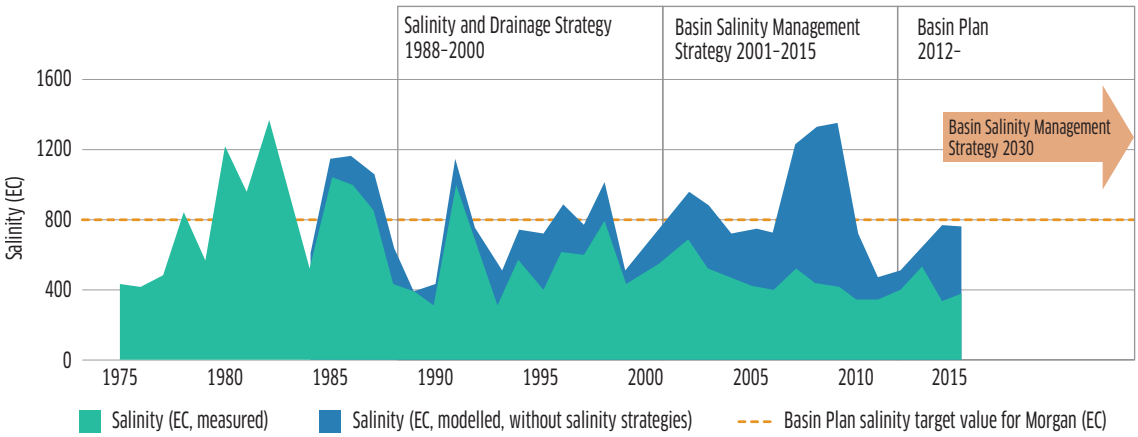

Figure 2.7 River Murray salinity at Morgan and impact of management strategies

We calculate the salinity debits and credits of these activities and update the salinity registers to be reviewed by independent salinity auditors. In November 2015 the auditors confirmed that the contracting governments of New South Wales, Victoria and South Australia remained in net credit on the salinity register (the Australian Capital Territory and Queensland do not have significant salinity impacts). These outcomes were reported to the Murray–Darling Basin Ministerial Council and published on our website <mdba.gov.au>.

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STAFF SNAPSHOT

Meet Willem – *why I work where I work*

I work at the MDBA because I am passionate about managing water – irrigation, drainage and flood management. I am originally from the Netherlands, with a PhD from Utah State University, in the United States.

I started work as a civil engineer, designing and supervising the construction of drainage pumping stations, then moved on to designing, constructing and implementing irrigation systems.

My work at the MDBA involves analysing environmental flows and managing flood inundation modelling and mapping projects using Landsat imagery and model outputs. The models are evolving every year as new, and better flood mapping becomes available.

My goal is to develop tools and apps to make the information more widely available without the need for expensive software. I also continue to write research articles on topics such as balancing water, food, energy and ecology.

STRATEGIC GOAL 4

Operate the River Murray system efficiently for partner governments

The MDBA in partnership with basin governments will ensure the efficient, cost effective and transparent governance and delivery of the joint programs to safeguard the sustainable use of the basin's water resources in a manner that protects the environment, as well as benefits the communities and industries that depend on it.

Highlights

- Carried out annual planned maintenance and renewals program according to contemporary best practice, including delivery of three state-based programs delivered by state constructing authorities (New South Wales, Victoria and South Australia) to efficiently construct, operate, maintain and renew water storage and regulation, salinity management and environmental water assets.
- Operated and maintained existing salt interception schemes and diverted about 524,728 tonnes of salt from the River Murray.
- Maintained salinity at Morgan South Australia within the range 199 EC to 380 EC.
- Managed risks associated with joint venture assets to acceptable levels in accordance with jurisdictional dam safety regulations through the Dam Improvement Program.
- Continued to plan and direct the operation of the River Murray to ensure the equitable and efficient sharing of the water resources.
- Transparently determined state water entitlements in accordance with the Murray–Darling Basin Agreement.
- Began work on the South Australian Riverland Floodplain Integrated Infrastructure Program.
- Completed construction of four new fishways at the barrages at the Murray Mouth.
- Renewed the Aboriginal Heritage Impact Permit for operating Lake Victoria.

Overview

Consecutive years of below average rainfall and above average temperatures had depleted soil moisture throughout most of the Murray–Darling Basin. With record high temperatures in 2015–16 in the River Murray catchment and despite near average rainfall, inflows into the River Murray system were in the lowest 10% of historic inflows.

Having started the year with storages about 1,000 GL below long term average and with low inflows, water allocations were low in New South Wales and took many months to reach 100% allocation in Victoria.

With no water available in Menindee Lakes to supplement Murray water use and with well above average temperatures, we needed to call on inter-valley trade accounts in the Goulburn and Murrumbidgee valleys and utilise irrigation channels to by-pass the Barmah Choke in order to meet daily demands in Sunraysia and deliver flows to South Australia.

Dredging the Murray Mouth to maintain a connection with the ocean had begun in January 2015. In the absence of any large flood to flush significant volumes of sand from inside the Mouth back out to sea, dredging continued throughout the year and achieved the target levels of connectivity.

Operation of some salt interception schemes was carried out to be more responsive to the actual salinity levels being recorded. With responsive management, when salinity is low, some quick responding bores are switched off. However, in the event of salinity levels approaching the 800 EC target at Morgan all bores will be fully functioning.

Even with the reduction in salt interception effort, salinity at Morgan remained in the range 199 EC to 380 EC throughout the year. This is the result of more than three decades of efforts to reduce in-river salinity and is a significant improvement to the 1980s when salinity at Morgan was often above 1,400 EC.

Construction activities focused on four new fishways at the Murray Mouth barrages. By the end of the year construction had also begun on the Margaret Dowling Regulator, upstream of Lock 5 near Renmark, which is the first structure to be built under the $155 million South Australian Riverland Floodplains Integrated Infrastructure Program.

Challenges and the year ahead

By the end of 2015–16 there had been a dramatic shift in River Murray inflows from well below average conditions, that had applied through most of the year, to above average. Yet active storage volumes at the end June 2016 were only about 3,200 GL compared with the long term average of this time of year of about 5,500 GL.

Most opening allocations will be low and will rely mainly on inflows upstream of Hume Dam for improvements, particularly if there continues to be no water available for the River Murray in Menindee Lakes.

With the Bureau of Meteorology forecasting a strong bias towards above average rainfall in winter and spring, it is possible that operators will need to focus on both flood operations in winter and spring but also continuing low water availability operations through summer and autumn.

Continuing effort will be applied to delivering environmental water in ways to enhance environmental outcomes while making sure the needs of consumptive water users are also met.

Maintaining and improving River Murray infrastructure

The structures that are managed and maintained by River Murray Operations include Hume and Dartmouth dams, Lake Victoria, 14 weirs (with 13 locks), barrages at the Lower Lakes, 13 salt interception schemes, and water management structures built under the Environmental Works and Measures Program. The structures are jointly controlled by the Australian Government and the governments of New South Wales, Victoria and South Australia. The governments' control is exercised through the Murray–Darling Basin Ministerial Council and the Basin Officials Committee.

By agreement of the four governments, the MDBA manages the River Murray Operations structures in accordance with the functions, powers and duties set out in the Murray–Darling Basin Agreement. The constructing authorities, appointed by the state governments to carry out investigation, design, construction, operation, maintenance and renewal of River Murray Operations assets, are:

- Water NSW. The New South Wales Department of Primary Industries also currently carries out works relating to salt interception schemes, river improvement, hydrometric and water quality monitoring, and land management
- Goulburn–Murray Water, Victoria
- South Australian Minister for the River Murray, including the operating agents South Australian Water Corporation (SA Water) and the South Australian Department for Environment, Water and Natural Resources.

A strong relationship has developed between the MDBA and state constructing authorities, making sure that maintenance and renewal is proactive, decision making is generally by consensus and issues are raised sufficiently early to enable timely resolution.

The Environmental Works and Measures Program

The Environmental Works and Measures Program aims to improve the health of the River Murray system by building and operating water management structures that deliver and manage environmental water at important target sites, see page 40.

Major water management structures have been constructed and tested at six locations to assist in delivering water to environmentally significant areas within the target sites.

Complementary environmental works

We have provided support and input to other environmental works programs that will impact on River Murray assets.

This year work began on the Australian Government-funded $155 million South Australian Riverland Floodplain Integrated Infrastructure Program, to improve the health of the River Murray below locks four and five. New structures will use the level of the weir pools to direct water onto the floodplains.

Improving the physical assets base

Hume Dam

This year we published the results from a study we commissioned to refine the characteristics of extreme rainfalls for both the Hume and Dartmouth catchments. This is the first study

of its type carried out in Australia, building on similar studies undertaken in North America and previous research in Australia. An improved understanding of the extreme rainfall characteristics will inform the assessment of the flood related risk at Hume Dam and in turn the nature and priority of any upgrade works.

This year additional geotechnical site investigations were carried out on the main embankment of Hume Dam. This information has informed further studies which will continue into 2016–17. These studies, along with our improved understanding of extreme rainfall characteristics, will inform the options for addressing the flood capacity and be used in preparing the detailed design of any associated works.

Dartmouth Dam

The annual dam safety inspection of Dartmouth Dam in May 2016 confirmed that the dam and associated infrastructure is in good condition, well maintained and performing as expected. Inspections are carried out annually at each of the MDBA's major dams in accordance with guidelines issued by the Australian National Committee on Large Dams.

The recently completed study into extreme rainfalls for the Hume and Dartmouth catchments has provided an improved understanding of the flood related risk at Dartmouth. With a reduced extreme flood risk the scope and priority of any upgrade works at Dartmouth will be reassessed. Funding for an upgrade is expected to depend on partner governments first addressing higher priority dam safety risks within their states.

Lake Victoria

This was an important year for the ongoing cultural heritage management of Lake Victoria. In August 2015 the New South Wales Office of Environment and Heritage renewed the Lake Victoria Aboriginal Heritage Impact Permit until August 2020. The permit allows us to continue to operate the lake for water storage, recognising that ancient burial sites and cultural heritage may be impacted, as long as specific conditions relating to cultural heritage and environmental management are met.

A fundamental part of the management of Lake Victoria is working with the Barkindji and Maraura Elders Council who provide advice and assist with works and monitoring aimed at protecting cultural heritage sites around the lake.

This year, along with SA Water, and the New South Wales Department of Primary Industries, we supported major events. These included the Rufus River Memorial Day and a special recognition day to acknowledge the significant contributions of Aboriginal Elders, as well as Aboriginal employees with SA Water, to managing Lake Victoria. Artefacts and new displays were added to the Lake Victoria Keeping Place, which is a safe space for storing important cultural heritage items discovered at the lake.

For the third year we used drones to map the lake foreshore as part of a trial to monitor lake-bed vegetation and shoreline erosion. This trial has been endorsed by the Lake Victoria Advisory Committee as it aims to fully integrate the shoreline, vegetation and cultural heritage

Drones were used to map the lake foreshore (image courtesy of Daniel Haines, SA Water).

components of the monitoring program that is required by the Aboriginal heritage impact permit.

We began a review of stage two works at the outlet regulator, after completing the construction of the stage one dam safety improvement works in 2014–15. The outcomes of this review will inform the scope and priority for any additional dam safety improvement works at the outlet regulator.

In 2015–16 remedial works at the second of the two creek crossings along the Frenchmans Creek inlet channel were carried out. At the second creek crossing the area requiring remedial works was much larger and so an alternative, minimal impact option was implemented, reducing the impacts on cultural heritage.

Locks and weirs

There is an established program of planned maintenance activities at each lock and weir. This includes emptying the lock so the chamber can be inspected. This takes place on a cycle of around 15 years. The necessary refurbishment works are then carried out as appropriate. This year the lock at Euston, a WaterNSW-managed structure, was taken out of service and refurbished by SA Water staff. This included painting the gates and valves, and making work health and safety improvements.

Hume to Yarrawonga reach

During 2015–16 the Hume to Yarrawonga reach works program continued. This included revegetation, and fencing to mitigate bank erosion. To manage the rates of anabranch development a log jam was engineered in May 2016 at the offtake of the rapidly expanding Dights Creek anabranch. This project, led by the New South Wales Department of Primary Industries, aimed to manage the rate of flow capture from the main channel and reduce the high rates of erosion along the anabranch.

Vessel wash from activities such as wake boarding and wake surfing are contributing to increases in the rates of erosion along the reach. A proposal to restrict wave and wake producing boats in the reach between Corowa and the junction of the Ovens River is being developed by the MDBA and the New South Wales departments of Primary Industries, and Roads & Maritime Services.

Dredging the Murray Mouth

Tides, waves and currents cause natural movement of sand around the mouth of the River Murray. Over time, and as flows through the mouth have reduced due to river regulation and upstream extraction of water from the river, the sand builds up restricting the flow and reducing the tidal exchange of water between the sea and the Murray's estuary, the Coorong. The Coorong ecosystem relies on cooler, oxygenated water coming in from the sea on high tides. It takes a very large flood to scour significant amounts of sand from the mouth back out to sea.

Along with South Australia, we routinely monitor the build-up of sand at the Murray Mouth. In late 2014 so much sand had settled that it was likely that without intervention the connection between the Coorong and the sea would drop below the level needed to maintain a healthy system. There was also the possibility that the mouth would close altogether.

Dredging began in January 2015 and has continued throughout this year. Two dredges have been operated and over 1.3 million cubic metres of sand has been dredged from within the mouth and pumped to the beach where it is dispersed by the breaking waves. The dredging has helped to maintain the exchange of water between the Coorong and sea above the target level. While mechanical intervention can keep pace with the natural deposition of sand, dredging will need to continue until a large flood passes over the barrages and naturally scours sand from the mouth.

Reducing bank erosion along the Mitta Mitta River

Over 2,300 GL was transferred from Dartmouth Dam to Hume Reservoir between September 2014 and January 2016, at flow rates up to 8,500 ML/day. There were no overbank flows causing considerable erosive pressure on the banks of the Mitta Mitta River. In 2015–16, protection works continued to help reduce the extent of bank erosion.

A condition assessment of the Mitta Mitta River, carried out in July 2015 by the North East Catchment Management Authority and the MDBA identified an increase in the extent of bank erosion, with many new high priority sites being identified. To address this, underspent funds

from other programs were diverted to riverbank protection works along the Mitta Mitta River.

Inspecting the assets

Each year our senior staff inspect all River Murray Operations assets, to assess their operational performance. Assessment criteria include:

- condition of the assets
- operations and maintenance documentation
- workplace health and safety documentation and performance
- achievement of the works program set for the year
- expenditure against budget in meeting the program.

The Senator Collings trophy has been awarded annually since 1943 to the team that has the most effectively maintained site on the River Murray. The award was instituted by Senator J S Collings, the Minister for the Interior from 1941 to 1945 and President of the River Murray Commission at the time. The major dams and barrages have only been eligible for the award since 2003.

The award is keenly contested along the length of the river and the winner in 2015 was Weir and Lock 2 (Taylorville). The award marked the culmination of an improvement program which commenced about 15 years ago and recognises the efforts of all who have been involved over the years. Weir and Lock 2 is managed by SA Water, as the state constructing authority.

Delivering water

Agreed water shares delivered to states

The following key actions are carried out to deliver agreed water shares in the River Murray system to the states, including in extreme conditions:

- regularly assess the water resources of the River Murray system to determine the volume of water available to New South Wales, Victoria and South Australia
- operate structures under the control of the MDBA and determine and review procedures for their efficient and effective operation
- establish, operate and maintain a system of continuous monitoring of the volumes and quality of stored water, and of flows in the River Murray and from its tributaries
- liaise with state and Australian Government authorities on matters related to the River Murray system to provide an up-to-date and comprehensive flow of information.

Rainfall and inflows

Rainfall throughout the Murray–Darling Basin in 2015–16 generally ranged from very much below average to above average, with some small areas of very much above average rainfall, Figure 2.8. Rainfall in Queensland largely ranged from near average to below average, while New South Wales was generally anywhere from above average through to below average.

Following on from a very dry 2014–15, most of Victoria and the lower Murray in South Australia experienced another year of reduced rainfall. Thanks to above average falls in May and June of 2016, catchments on the River Murray upstream of Hume ended up receiving near average rainfall for the year.

The first significant winter rain event occurred in early to mid-July 2015 and was followed by reasonable falls in late July and early August which delivered the peak daily inflow to the Murray system for that winter/spring. Rainfall during the typically wetter months of September and October was well below average in 2015, Figure 2.9. This, in combination with relatively dry catchments and record warm temperatures across much of the basin for 2015–16, Figure 2.10, resulted in monthly inflows to the Murray system remaining well below the long-term monthly averages for most of 2015–16.

The wetter conditions observed in May and June 2016 pushed inflows above average in June 2016, Figure 2.11.

Inflows to the Menindee Lakes over the last three years were the lowest on record and below the previous lowest flows experienced during the millennium drought. Total inflow to Menindee Lakes for 2015–16 was in the lowest 5% of historical records at around 60 GL.

Overall River Murray system inflows during 2015–16 (including inflows to Menindee Lakes, but excluding Snowy Mountains Scheme, inter-valley transfers and environmental water inflows) totalled around 3,625 GL, Figure 2.12.

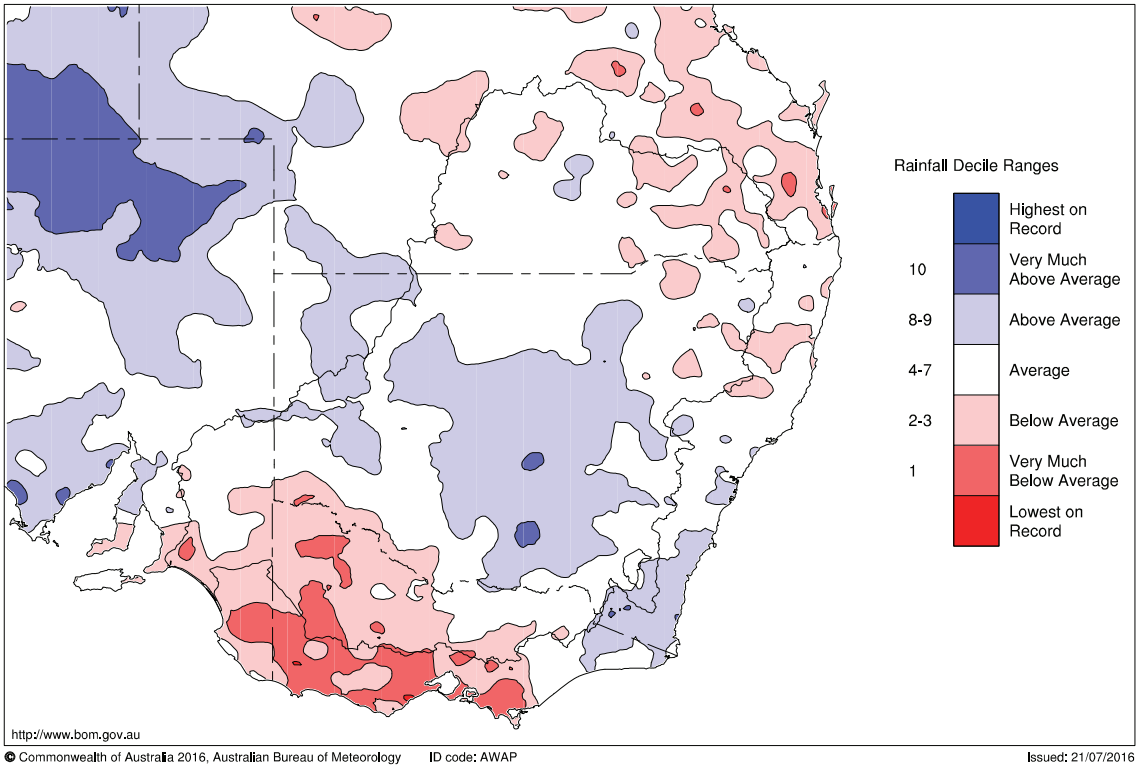


Figure 2.8 Murray–Darling Basin rainfall deciles for 2015–16 (courtesy Bureau of Meteorology)

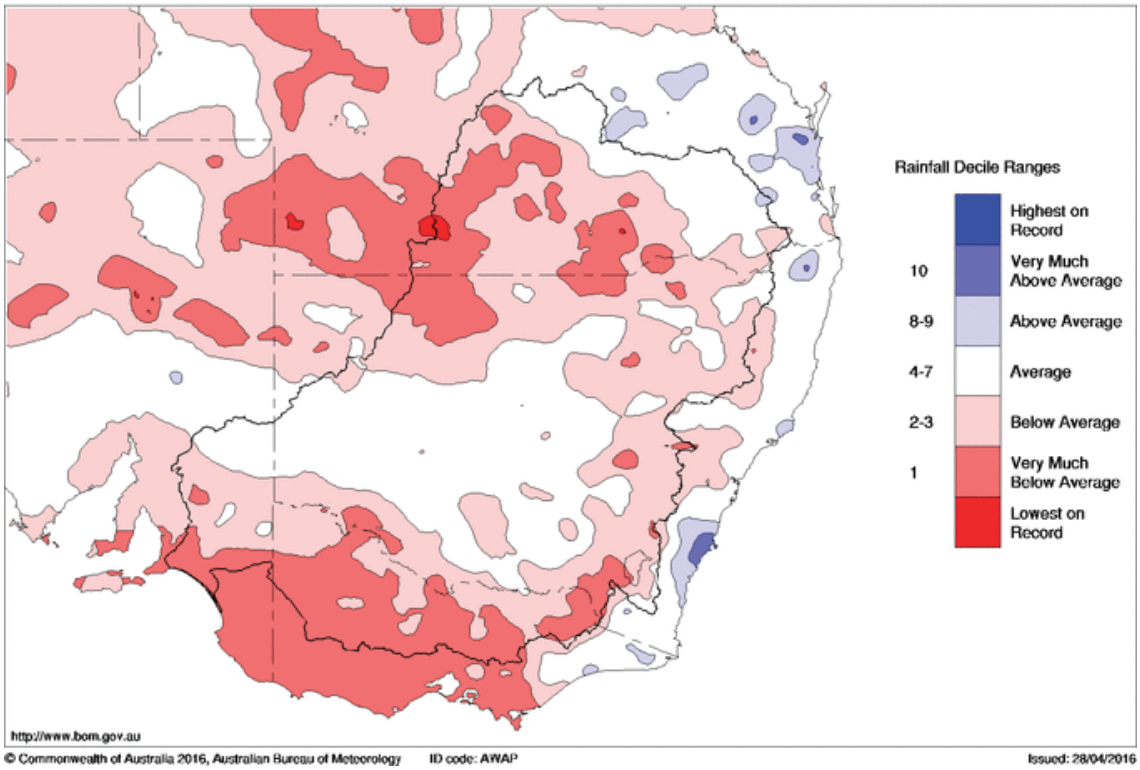


Figure 2.9 Murray–Darling Basin rainfall deciles from 1 August to 31 October 2015 (courtesy Bureau of Meteorology)

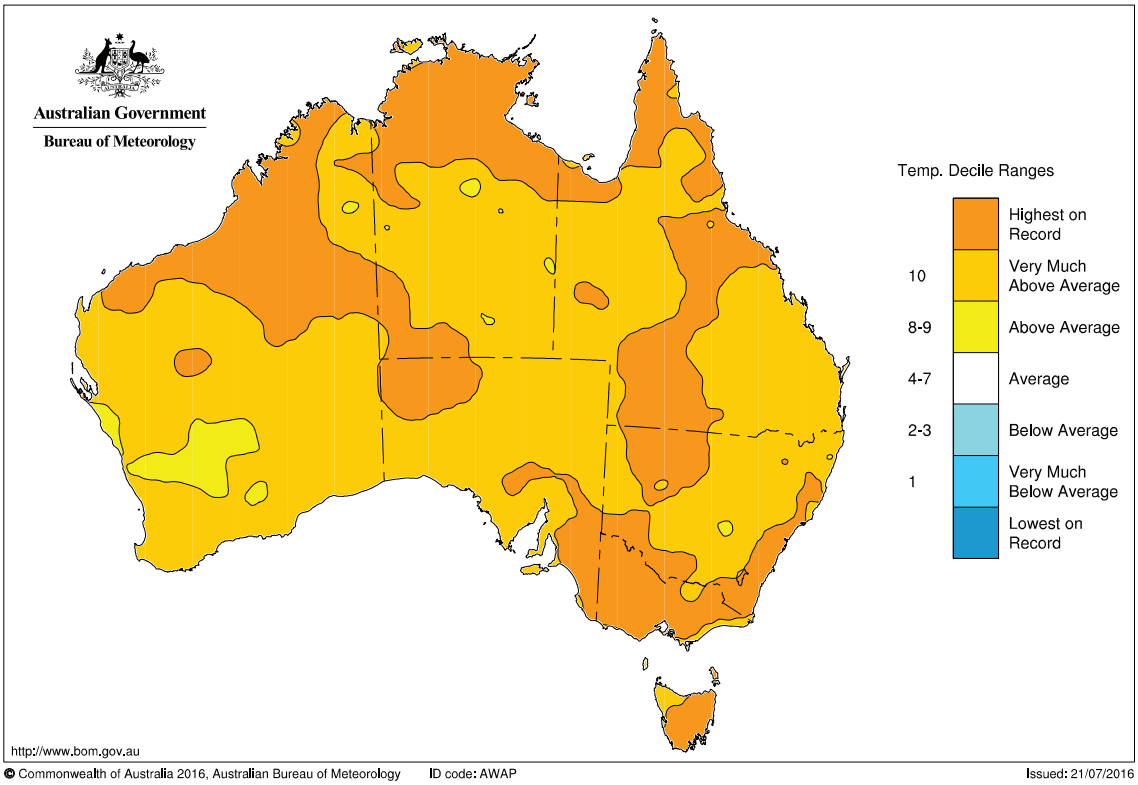


Figure 2.10 Murray–Darling Basin mean temperature deciles from 1 July 2015 to 30 June 2016 (courtesy Bureau of Meteorology)

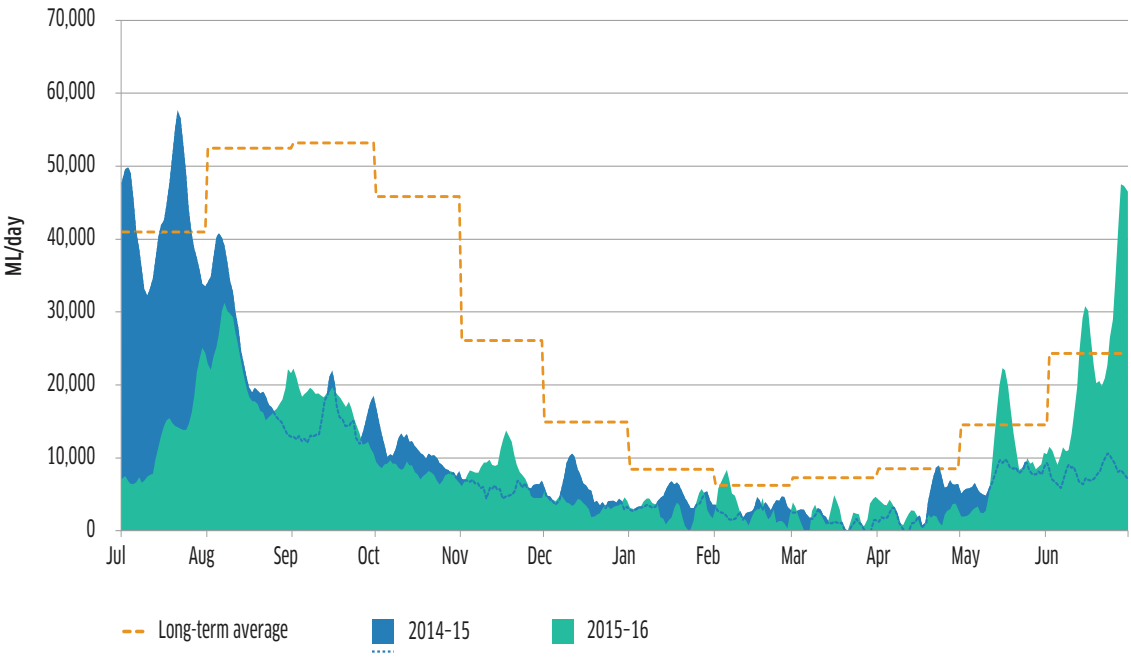


Figure 2.11 Inflows to River Murray (excluding Snowy, Darling, inter-valley trade and environmental inflows)

This volume was well below the long-term median of 9,230 GL, and in the lowest 8% of historical records. Total River Murray system inflows during 2014–15 was around 4,360 GL.

The relatively dry and extremely warm conditions experienced during much of 2015–16 were influenced by an El Niño event which was announced by the Bureau of Meteorology in late May 2015 and persisted until mid-May 2016. While both May and June 2016 saw above average rainfall across much of the basin, significant and sustained follow up rainfall will be required in the coming year to return storages to near capacity.

Active storage

Active storage is the portion of water held in a reservoir, above the level of outlet works, which can be released downstream. From late 2001 to late 2010 active storage was well below the long-term average due to drought conditions, Figure 2.13. High inflows in the second half of 2010 raised MDBA active storage back above the long-term average where it remained for about three years until late 2013. At the beginning of 2015–16 MDBA active storage was already below the long-term average, and with low rainfall, high temperatures, demands and system losses, the active storage was drawn down further to nearly half the long-term average.

Water storage in Hume Reservoir was drawn upon to meet the downstream demands throughout 2015–16, with the volume dropping to 18% capacity in early May 2016. With low inflows to Hume Reservoir this year, around 1,570 GL was transferred from Dartmouth Reservoir, lowering the storage to 43% at the end of April. Due to very low storage levels, no water was available to the River Murray system from Menindee Lakes during 2015–16.

The total MDBA active storage on 30 June 2016 was 3,205 GL. This is around 2,300 GL below the long-term end-of-June average.

State water shares

South Australia again deferred a portion of their entitlement flows in 2015–16 for later use. Under Schedule G of the Murray–Darling Basin Agreement, which came into effect in 2011, South Australia may defer some of its entitlement flow, which is then stored in River Murray storages under specific provisions, in order to build a reserve for critical human water needs and private carryover. South Australia used these provisions to defer 157.7 GL of entitlement in 2015–16.

State water shares in MDBA storages at the beginning and end of 2015–16 are shown in

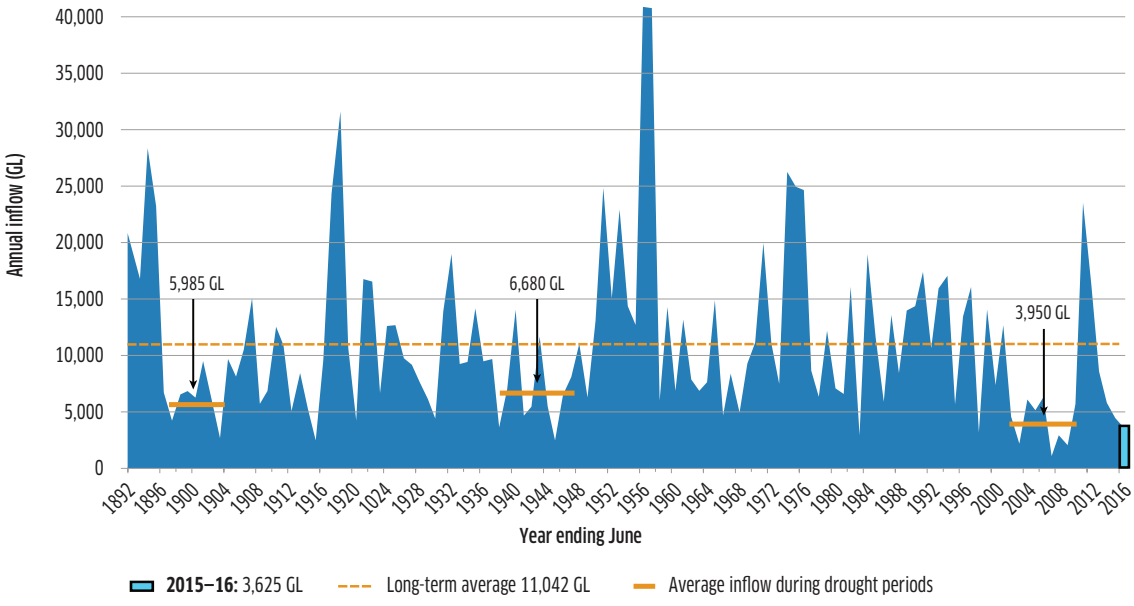


Figure 2.12 River Murray system annual inflows (including inflows to Menindee Lakes, but excluding releases from the Snowy Mountains Scheme, inter-valley transfers and environmental water inflows) since 1892, assuming modelled current conditions

Table 2.2. At the end of 2015–16, the following volumes were also available for use in the River Murray in 2016–17:

- about 175 GL of water in inter-valley trade accounts in the Murrumbidgee and Goulburn valleys
- 500 GL of River Murray Increased Flow environmental water (stored in the Snowy Mountains Scheme)
- 215 GL of water in the River Murray drought account. The drought account is a reserve held in Snowy storages that the states can call on to supply critical human water needs in times of severe shortage.

State water allocations, diversions and carryover

The year began in July 2015 with moderate to low water availability. South Australia started the year with a 100% allocation for the fifth consecutive year.

The New South Wales Murray high security allocation started at 80%, while New South Wales Murray general security access licence holders started at 0% and gradually increased to 23% in February 2016. General security licence holders also had access to, on average, about 30% allocation as carryover from the previous year. New South Wales high security allocation reached 97% in September. On the lower Darling River, high security water holders began with a 20% allocation which increased to 80% by April, while general security water holders had zero allocation for the entire year. New South Wales Office of Water issued regular updates throughout 2015–16 on the status of water availability for lower Darling water users.

In Victoria, Murray high reliability water shares started with an allocation of 35% compared with a starting allocation of 57% for the previous year. In 2015–16 Victorian carryover was made available. Victorian Murray high reliability allocations steadily improved, and reached 100% in February 2016.

With low-moderate water availability, total water diversions (not including environmental water) during 2015–16 for Victoria, New South Wales and South Australia were around 3,460 GL, Figure 2.14. This volume is lower than last year and is close to consumption level in the record dry year of 2006–07. The difference between that year and the past year is that 2006–07 had more water at the start of the year but much smaller inflow and finished the year with record low water in storage.

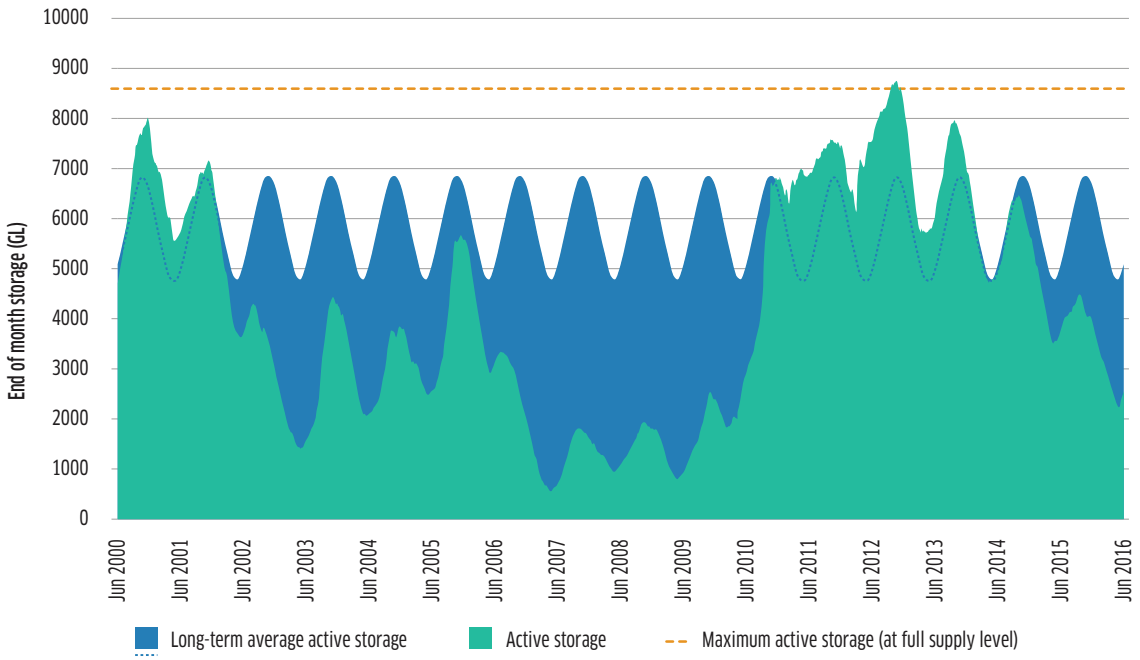


Figure 2.13 MDBA active storage June 2000 to June 2016

Table 2.2 Water shares for New South Wales, Victoria and South Australia – end of June 2015 and June 2016

Storage	Storage at end of June 2015 (GL) [a]				Storage at end of June 2016 (GL) [a]			
	NSW	Vic	SA [b]	Total	NSW	Vic	SA [b]	Total
Dartmouth Reservoir	884	1,887	49	2,820	623	1,037	142	1,802
Hume Reservoir	485	485	0	971	568	585	10	1,162
Lake Victoria	194	248	5	447	165	215	58	438
Menindee Lakes [c]	83	0	0	83	48	0	0	48
Total [d]	**1,646**	**2,621**	**54**	**4,321**	**1,404**	**1,837**	**209**	**3,450**

a Data relates to total storage.

b South Australia has deferred a portion of its entitlement flows. This volume exists in storage under specific provisions and does not contribute to the figure for total storage volume.

c When the storage volume is less than 480 GL, water is not available to MDBA.

d Accounts are based on the best available data, which may contain some unverified operational data that could change in the future. Figures are rounded to the nearest GL and that is why some calculations in this table appear slightly incorrect.

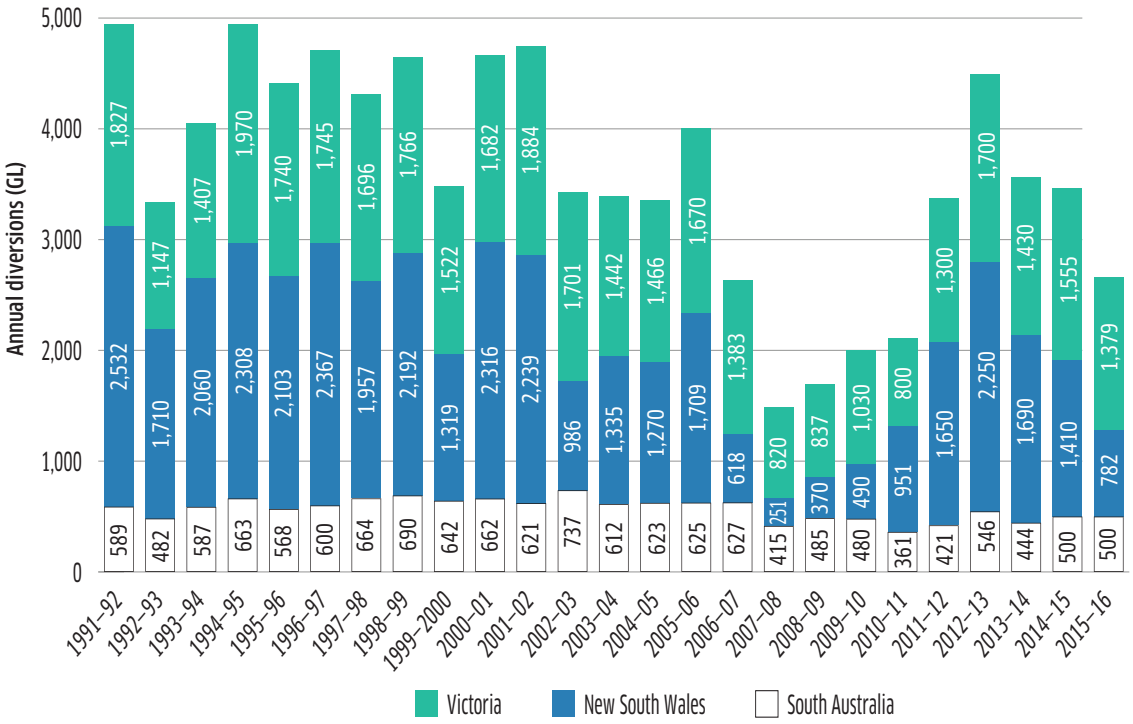


Figure 2.14 State diversions River Murray system (not including environmental water) 1991–92 to 2015–16. (Diversions include the lower Darling and any inter-valley trade received by a state. 2015–16 figures are indicative only and may change as updated data becomes available.)

Storage at end June 2016 was about 2,265 GL higher than June 2007 mainly due to policy changes as a consequence of lessons learnt through the millennium drought including:

- establishing a conveyance reserve to ensure delivery of next year's water
- South Australian storage right
- introducing carryover provisions in Victoria.

Use by Snowy Hydro of flex provisions, that were agreed with New South Wales in 2011, allow early delivery of part of next year's required annual release from the Snowy.

After the irrigation season had ended above average rainfall in May and June boosted storages.

Delivering environmental water

Delivering environmental water is a complex and growing challenge for the MDBA and partner governments. In exercising the operational functions under the Murray–Darling Basin Agreement, our operational staff play an important role in coordinating the delivery and accounting of environmental water across the River Murray system. We also work very closely with partner agencies working in the Goulburn and Murrumbidgee valleys to ensure the best outcomes can be achieved across the southern-connected system. The water management tools, policies and procedures – which evolved largely before the additional focus on environmental water delivery – are being reviewed and renewed to meet current and future requirements.

During 2015–16, we again delivered substantial volumes of environmental water held by the basin state governments, The Living Murray and the Commonwealth Environmental Water Holder, to target a range of environmental outcomes.

Environmental water was released from Hume Dam in the form of 'translucent' releases responding to natural inflow cues to improve in-channel river variability. Further releases of environmental water provided watering of Barmah–Millewa Forest and delivered higher flows through the Edward–Wakool system. Environmental water enabled several planned Goulburn River pulses, higher base flows through Gunbower Creek and watering of Gunbower Forest, Hattah Lakes, Mulcra Island. It also allowed for increased flow through the Lindsay River, pumping into Lake Wallawalla, and for water to be delivered within the Chowilla floodplain. Almost 800 GL of environmental water reached the South Australian border, and a substantial portion of this ultimately reached the internationally-significant Coorong and Lower Lakes.

> Translucent releases occur when a portion of water from specific inflow events is passed through a dam to enable a natural flow pulse into the river system.

We continued to support a trial by the New South Wales Office of Water to vary weir pool levels to achieve a more natural wetting and drying cycle for the riverine environment. The weir pools raised and lowered as part of this trial included locks 7, 8 and 9 and Torrumbarry weir pool. South Australia also managed their own weir pool variation trial which included locks 2 and 5. Further weir pool variations are planned throughout the River Murray system for 2016–17.

In each event we provided a range of technical advice to assist the decision making of environmental water holders and managers throughout the southern basin.

Flow to South Australia

South Australia began the year with its full entitlement of 1,850 GL for the fifth consecutive year. No additional dilution flow was delivered to South Australia in 2015–16 as the required monthly trigger volume at Menindee Lakes was not met at any point throughout the year.

Unlike 2014–15, no periods of unregulated flow were declared by the MDBA in 2015–16. Unregulated flows are declared when it is forecast that flows in the River Murray system cannot be captured in Lake Victoria – because of operating rules, inlet capacity constraints or storage capacity constraints – and the flow passing through to South Australia will be in excess of its entitlement flow (plus any trade or environmental deliveries at that time).

Significant volumes of environmental water began being delivered down the river system and across the South Australian border in July. Additional volumes were delivered from September for both environmental outcomes and testing of regulators at Chowilla, and to provide

environmental outcomes in the Coorong and Lower Lakes. Delivery of environmental water for Chowilla finished in December, however environmental deliveries across the South Australian border for the Coorong and Lower Lakes resumed in January and continued for the remainder of the year.

The total annual flow across the South Australian border, including environmental water and traded water was about 2,490 GL (78% of historical years would have seen higher flows) compared with 2,880 GL last year and the long-term median annual flow of 4,820 GL (based on modelling the current level of development). This compares with about 1,420 GL in 2006–07 which was a similar year in respect of total water use, reflecting improved flow regimes with Basin Plan water recovery.

The Murray component of the Snowy Mountains Scheme

The Snowy Scheme terms of operation are defined in the Snowy Water Licence, which sets a minimum release that must be achieved by the licensee (Snowy Hydro Limited) over the course of the Snowy water year, which runs from 1 May to 30 April.

The required annual release volume may change during the Snowy water year and Snowy Hydro Limited is free to release volumes in excess of the required release. During the 2015–16 Snowy water year, the required annual release increased from 341 GL at the start of the Snowy water year to close at 733 GL. These required annual release volumes included allowance made for the 2 GL released in 2014–15 as an advance on 2015–16 requirements.

The 2015–16 required annual release was adjusted by the changing dry inflow sequence volume through the course of the year (to March 1). The dry inflow sequence volume is a measure of how much the inflows to the Snowy scheme are below the level required to ensure a reliable supply through a repeat of drought conditions, and reduces the release obligation.

The 2015–16 accounted release to the Murray was 931 GL, comprising the 733 GL required annual release, 10 GL of Snowy Montane releases and 198 GL advanced to the 2016–17 required annual release. No credit was made to the drought reserve held in Snowy storages. The total held in the drought reserve remains at 215 GL, the maximum volume allowed in the drought reserve is 225 GL.

The Snowy Water Licence provides Snowy Hydro Limited with the flexibility to make in excess of 200 GL of releases in any year as an advance on the next year's releases. Prior to 2011 Snowy Hydro Limited was only able to make advance releases in drier years or through special arrangements.

Operating the River Murray system – in a very dry year

There were a number of challenges in 2015–16 to operating the River Murray system, because of very low inflows and no access to water in Menindee Lakes. In terms of River Murray system inflows, 2015–16 was the 13th driest year in 125 years of records. Six of the twelve drier years have been in the last two decades i.e. 1997–98, 2002–03 and the four consecutive years from 2006–07 to 2009–10. In contrast, from 1892 to 1996 (more than a century) only five years were drier than 2015–16.

The median inflow from 1997 to 2016 (5,190 GL) is only half that of the median inflow from 1892 to 1996 (10,370 GL) showing the drying trend, observed by the Bureau of Meteorology across south-east Australia since 1996.

Throughout July and August operations were focused on managing modest inflows generated from early season rainfall across the southern basin. However from mid-August inflows declined and remained low during the typically highest inflow months of September and October as conditions turned hot and dry across south-east Australia. The lack of any significant rainfall event combined with record warm temperatures meant inflows remained low throughout the remainder of the year. The warm and dry conditions contributed to high demands and seasonally very high system losses throughout the River Murray system.

With no water available in Menindee Lakes and low tributary inflows, supplying water to meet all demands in the lower Murray across summer and autumn was forecast to be challenging. To protect the delivery of water downstream, trade from above to below the Barmah Choke remained restricted (as per normal standing provisions) in 2015–16.

Despite above average rainfall in the southern Basin in the final two months of the 2015–16 year, yearly inflows to the River Murray system remained well below the long-term average. Large volumes of water were released from Dartmouth and Hume reservoirs in order to supply downstream demands. This resulted in a prolonged period of flow through the Barmah Choke at channel capacity.

With flow through the Barmah Choke at channel capacity we also utilised privately-owned irrigation supply networks to pass water around the Barmah Choke to meet all the downstream demand. In addition to releases from headwater storage, we also called upon high volumes of water from our inter-valley trade accounts in the Goulburn and a record volume from the Murrumbidgee valley. Relatively high demands carried on into late autumn and only declined following a rainfall event close to the end of the irrigation season in May.

The upper Murray system – highest releases from Dartmouth Reservoir since 2006–07

At the start of 2015–16 storage at Dartmouth Reservoir was 2,820 GL (73% of capacity) with transfers of bulk volumes of water downstream to Hume Reservoir having already begun. Transfers to Hume continued until the end of April 2016. Releases during this time, measured at Colemans gauge, varied from 560 ML/day to 8,560 ML/day, and were released in a variable manner to promote environmental outcomes in the Mitta Mitta River. The storage volume at Dartmouth Reservoir declined throughout most of 2015–16 and reached a minimum storage of 43% at the start of May, before gradually rising as releases from Dartmouth were reduced to minimums (200 ML/day).

Dartmouth was built to sustain River Murray Operations in drought and this year it did just that. The total volume released from Dartmouth Reservoir during 2015–16 was around 1,546 GL. This was the highest total release since 2,330 GL was released in 2006–07. As of 30 June 2016 the storage volume was around 1,800 GL (47% capacity) and the release was at 200 ML/day.

At Hume Reservoir, 2015–16 began with the storage at 975 GL (33% capacity) and releases at 3,300 ML/day to meet downstream environmental demands. With low inflows from upper Murray tributaries, transfers from Dartmouth were relied upon to increase Hume storage and enable Hume to meet downstream requirements. The storage volume at Hume for 2015–16 peaked at 1,520 GL (50.6% capacity) in mid-September before being drawn down to supply downstream demands.

Releases from Hume were highest from mid-September through until late April. The average release during this period was 13,000 ML/day with a maximum of 20,300 ML/day at the beginning of October. Releases remained above

Sign at Dartmouth Dam (photo by Alisha Caldwell)

the minimum release of 600 ML/day up until early May when irrigation demands declined.

Releases to meet environmental, irrigation and other system demands throughout the year resulted in Hume Reservoir being drawn down to a low of 550 GL (18% capacity) on 2 May 2016. Reduced demands from early May onwards, combined with improved natural inflows, increased Hume's storage volume to around 1,160 GL (39% capacity) by the end of June 2016. The total volume released from Hume Dam during 2015–16 was around 3,545 GL, compared with 3,730 GL in 2014–15, and there were no spills.

Mid-Murray – high demands for water

At Yarrawonga Weir, releases were in excess of the downstream channel capacity (about 10,000 ML/day) from late July until early November as part of watering of Barmah–Millewa Forest. The maximum release during the year was 16,400 ML/day in early August.

High downstream demands throughout spring, summer and autumn required a long period of time with releases from Yarrawonga at close to the channel capacity of the Barmah Choke. Once flows had returned to channel capacity in early November, releases from Yarrawonga up until mid-February averaged 9,920 ML/day. During this time irrigation supply networks were also utilised to pass water around the Barmah Choke to meet downstream demands.

From the start of May 2015, the Yarrawonga Weir pool was gradually lowered to 3.5 metres below its regular operating level. This was to enable essential maintenance works on the weir and foreshore, as well as to control the aquatic weed *Egeria densa*. The pool level returned to its full supply level in early August in time for the start of the 2015–16 irrigation season.

Large volumes of inter-valley trade water were called upon in 2015–16 in order to assist meeting the high demands in the lower Murray. This included about 50 GL from the Goulburn River and 190 GL from the Murrumbidgee River.

Inflow from the Goulburn River at McCoys Bridge totalled 440 GL for the year (lowest 19% of records) with a peak flow in mid-October 2015 of 6,600 ML/day, which is well below the minor flood level. The peak flow from the Goulburn contributed to the peak flow at Torrumbarry Weir for 2015–16 of 13,100 ML/day. Flows of this magnitude remain within the River Murray channel and do not flow overbank into Gunbower or Koondrook–Perricoota Forests.

Flows along the Murrumbidgee River were well below average in 2015–16, with inflow to the Murray measured at Balranald totalling about 615 GL. This is well below the long-term average of 1,240 GL and the median inflow of 840 GL. The flow at Balranald peaked during mid-September at 6,300 ML/day and contributed to flows at Euston peaking at 18,500 ML/day on 14 September (minor flood level occurs at about 88,000 ML/day). Works were carried out on the Euston lock chamber from late January to the end of June.

Downstream of the confluence of the Murray and Darling rivers the flow at Wentworth was driven by Murray flows throughout 2015–16. The flow reached a peak in mid-September 2015 of 16,200 ML/day (minor flood level occurs at about 87,000 ML/day).

Menindee Lakes, lower Darling River and the Great Darling Anabranch – very low inflows

As was the case in 2014–15, total inflows to Menindee Lakes for 2015–16 were again very low, totalling around 47 GL (lowest 5% of records) and well below the long-term median annual inflow of about 860 GL. These low inflows were due to consecutive years of poor rainfall, with limited run-off, in the northern basin. Rainfall in June 2016 is expected to deliver some inflow to the Menindee Lakes in July 2016.

The MDBA had no access to water from Menindee Lakes throughout 2015–16. In accordance with the Murray–Darling Basin Agreement, we will not be able to call on water from Menindee Lakes until the storage next rises above 640 GL. With very low volumes of water in storage, New South Wales Office of Water issued regular updates throughout 2015–16 on Menindee Lakes storage volume and the status of water availability for lower Darling water users.

Storage levels at the Menindee Lakes began the year at 83 GL (5% capacity) with releases effectively zero from Weir 32 due to the extremely low storage level. The New South Wales Department of Primary Industries recommenced releases in late July to provide

riparian access for domestic and stock water users on the lower Darling but these were stopped in late December to conserve the remaining water in Menindee Lakes for critical human water needs and permanent plantings.

Modest inflows early in the year had increased the total storage to just over 100 GL in mid-September, but the volume then fell throughout the year, with only a brief pause due to small inflows in March 2016. The primary reason for reductions in storage volume throughout 2015–16 was evaporation, with evaporation rates for several months through spring and autumn close to the maximum on record. Total losses (mainly evaporation) for the Menindee Lakes totalled around 75 GL. There was around 7.5 GL of diversions for town water supply (Broken Hill, Menindee) and permanent plantings.

As of 30 June 2016, Menindee Lakes total storage was steady at 48 GL (3% capacity).

Lake Victoria – significant volumes released

At the start of the year storage at Lake Victoria was 450 GL (66% capacity, 25.00 m AHD). The storage level remained relatively constant throughout July and into August before the level increased to a maximum of 627 GL (93% capacity, 26.59 m AHD) on 29 and 30 September 2015 which is 38 cm below the effective full supply level of 26.97 m AHD.

High environmental water demands in South Australia, together with the delivery of standard entitlement, resulted in significant volumes of water being released from Lake Victoria throughout spring, summer and autumn. The lake reached its lowest level for the year of 213 GL (31%, 22.64 m AHD) on 30 April 2016.

In response to transfers of water from Hume Reservoir and tributary inflows, Lake Victoria began slowly refilling from May onwards. By the end of June 2016 the storage was 432 GL (64% capacity, 24.85 m AHD).

The target storage levels identified in the Lake Victoria operating strategy did not apply in 2015–16 for two reasons. Firstly, due to a conditional rule that removes the requirement to lower the lake when we cease to have access to water in Menindee Lakes. Secondly, the provision for an end of season minimum reserve to be held in Lake Victoria at the end of May 2016 was temporarily waived by Ministerial Council as a means to improve water availability in 2016-17 to guard against the threat of continuing dry conditions. This enabled water to be conserved in the upper storages of Hume and Dartmouth to minimise evaporative losses, and increases the potential of Lake Victoria to harvest tributary inflows.

It is estimated that this approach has conserved in the order of 50 GL to 100 GL in upper storages

Lower Lakes and barrage operation in South Australia – significant volumes of environmental water

Despite no unregulated flow events in 2015–16, the delivery of significant volumes of environmental water allowed releases through the barrages to continue throughout most of the year, apart from during 'reverse head' periods. These occur when downstream water levels in the Coorong exceed upstream water levels in Lake Alexandrina, because of high tides and/or storms. This requires barrage gates to be closed to limit the inflow of sea water.

The absence of unregulated flows entering South Australia meant that there were no opportunities to make very large daily releases of water through the barrages. It is these large daily barrage releases (above 75,000 ML/day) that are required to scour large volumes of sand from the Murray Mouth and enhance connectivity between the Coorong and the Southern Ocean. In the absence of any large flows since autumn 2011, sand has been gradually accumulating in the Mouth and adjacent sections of the Coorong, Figure 2.15.

The Lower Lakes started the year at 0.68 m AHD (5-day average level). The lakes were steadily filled throughout July to above 0.75 m. Barrage releases through July and August were pulsed with a peak release of about 12,000 ML/day on 7 August. Releases from mid-August returned to a steadier rate and averaged about 1,500 ML/day until November when they returned to low releases solely through the fishways. Delivery of additional environmental water in January, February and March allowed barrage releases into the Coorong to increase from mid-February up to a peak of around 3,500 ML/day on 18 March. Releases were then reduced back towards minimums to help manage the levels in the Lower Lakes. Environmental water deliveries enabled South Australia to release water through the barrages to target environmental

outcomes in the Coorong while maintaining lake levels within the target ranges.

Temperatures throughout spring and summer at the Lower Lakes were very much above average, leading to high evaporation rates. The average lake level peaked around 0.87 m AHD in late spring, but then began gradually falling over summer, and by the end of January was around 0.57 m AHD. At the end of June 2016, the average lake level was 0.68 m AHD.

Similar to past years, barrage operations in 2015–16 continued to support fish passage and recruitment for a range of fish species. Fishways remained open at Goolwa and Tauwitchere and flows were provided to encourage fish to enter the fishways when conditions were suitable.

Improving river operations

The river operations improvement team focuses on documenting and improving existing River Murray system operations to address current and future requirements. This is set out in the Murray–Darling Basin Agreement and the objectives and outcomes for River Murray system operations. The objectives and outcomes document is set by the Basin Officials Committee and provides a transparent decision-making framework for operations. It is available on our website <mdba.gov.au>.

The team works closely with river operators and state agencies to identify efficient and effective ways to modernise river operating practices. Our work in 2015–16 included:

- taking steps to integrate environmental water delivery into everyday river operations
- reviewing the Murray–Darling Basin Agreement provisions for water accounting during periods of 'special accounting' (which apply during dry conditions), to ensure they continue to work effectively in extreme dry conditions
- reviewing processes and developing reference material on our obligations under the Basin Plan to 'have regard to' water quality targets and risk management strategies when making river operations decisions
- conducting training as required under the River Murray System Emergency Action Plan
- reviewing the changes required to the Murray–Darling Basin Agreement to implement the sustainable diversion limit proposals
- developing a list of training courses to improve the capability of river operators

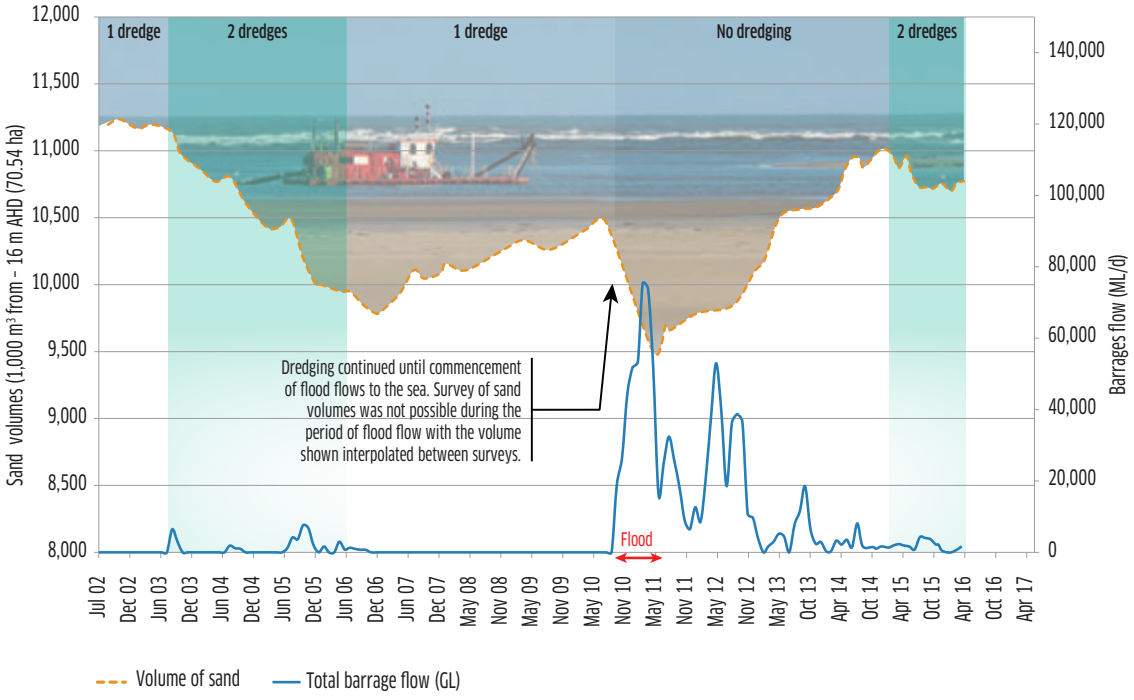


Figure 2.15 Murray Mouth sand volume and flow to sea

and managers across the basin. The list was aligned against the agreed capability framework for river operators

- continuing to use adaptive management to learn and develop improved ways of operating the River Murray system, for example, through the Environmental Guidelines Program we developed guidelines to incorporate greater variability into releases from Dartmouth Reservoir during periods of low flows
- reflecting on the reasons for success and lessons learned from drawdown operations at Lake Mulwala to control the common waterweed, *Egeria*, to inform a new operational strategy
- continued to track the movements of 25 adult Murray cod in the Mitta Mitta River. We will be relating the movement data to the river's flow and water temperature regime, to identify ways to help protect and increase Murray cod numbers in this reach.

An annual review of the objectives and outcomes for the River Murray system was carried out and approved by the Basin Officials Committee in April 2016. While only minor amendments were made in the 2016 review, since last year two specific objectives and outcomes have been added:

a) Specific Objective and Outcome 14.2 Minimising the impacts of one state leaving a period of special accounting – approved in October 2015

b) Specific Objective and Outcome 3.1a and associated amendments to Specific Objective and Outcome 3.1 to become 3.1b, in relation to the maximum regulated flow downstream of Yarrawonga – approved in December 2015.

Critical human water needs

The Murray–Darling Basin Agreement ensures that the southern basin states set aside and deliver water for critical human water needs. It also establishes processes for managing periods when normal water sharing arrangements would not provide enough water for critical human needs.

The Basin Plan sets triggers, or tiers, for changing water sharing arrangements.

Tier 1 is 'normal' water sharing arrangements. Tier 2 arrangements apply during periods of very low water availability, and Tier 3 arrangements are for extreme and unprecedented conditions.

During 2015–16 Tier 1 water sharing arrangements were in place, meaning that critical human water needs were met, as well as the conveyance water needed to ensure sufficient flow in the river system to deliver critical human water needs.

In response to increasingly dry conditions, we carried out a drought preparedness project in 2015–16 to make sure that water resource managers in the River Murray system understood, and could readily implement, the critical human water needs provisions introduced in the Basin Plan. The project included a comprehensive review of the actions taken to respond to the millennium drought, and considered how these actions would fit under the new governance arrangements. A summary of the findings will be published in late 2016, on our website.

Salt interception schemes

Figure 2.16 Total salt load diverted from the River Murray 2010–11 to 2015–16

Table 2.3 Joint/shared salt interception scheme performance reporting 2015–16

Salt interception schemes	Volume pumped (ML)	Salt load diverted (tonnes)	Average salinity (EC units)	Target achieved (% of time)	Power consumption kWh (totals)
Pyramid Creek	1,083	26,762	41,299	100%	176,282
Barr Creek	2,721	14,828	12,658	100%	36,372
Mildura–Merbein	1,785	99,006	80,748	86%	276,623
Mallee Cliffs	1,894	63,044	52,000	100%	494,749
Buronga	2,093	57,104	42,640	100%	431,448
Upper Darling	1,439	34,144	37,062	100%	272,132
Pike River	291	12,707	54,438	NA	73,689
Murtho	968	24,285	39,612	24%	368,319
Bookpurnong	1,002	22,374	36,935	85%	368,306
Loxton	1,164	20,820	23,397	97%	454,170
Woolpunda	4,894	91,828	29,535	100%	2,978,315
Waikerie	3,100	56,726	31,201	87%	1,241,249
Rufus River	69	1,100	39,825	88%	13,543
Total	**22,504**	**524,728**			**7,185,196**

The River Murray salt interception schemes are a significant component of the Basin Salinity Management 2030 Strategy and help us to achieve and maintain agreed salinity levels in the River Murray. Around 524,728 tonnes of salt were diverted from the River Murray in 2015–16, Figure 2.16 and Table 2.3. The salinity management strategy includes a three-year trial of responsive management of salt interception schemes. This includes investigations of salt interception operations in response to forecast river flows and salinity conditions.

For more information about the salinity management strategy see page 43.

STRATEGIC GOAL 5

Improve the knowledge base to support sustainable water resource management

To support sustainable water resource management across the basin, we recognise that knowledge, data and evidence is crucial in assisting with Basin Plan implementation, reviews and River Murray Operations as well as informing policy and decision makers.

Highlights

- Completed social and economic modelling to inform the Northern Basin Review.
- Continued our social and economic work to try and separate out the effects of the Basin Plan from other factors that may be having an influence on communities.
- Continued to work with partner research institutions to strengthen the MDBA's science and research capabilities.
- Refreshed our website to make it easier to find information.
- Began working on a citizen science project with basin residents to better understand inundation patterns across the basin.

Overview

This year we continued our information collection and collaboration arrangements so that we had access to the best available data, information and knowledge to assist in implementing the Basin Plan. We continued to invest in new water resource knowledge, in partnership with governments, scientists and communities, and to deliver integrated water resource modelling across the Murray–Darling Basin.

This year we involved the public in collecting scientific information that could be used in decision making as part of 'citizen'-based science. The type of information collected ranged from rainfall and weather patterns on farming properties, to transcribing Alfred Deakin's diary and his observations of water management in the United States.

We use our website to share the information we collect as well as to publish reports and other communication products. This year we refreshed the website to make it easier to find information, with the most topical and sought after information more clearly available.

We have continued to share our knowledge and experience with international water managers to remain up to date with international best practice. We also continued to work with partners and other institutions to strengthen our science and research capabilities.

Challenges and the year ahead

Science is now telling us more about what a healthy river system needs, and we are starting to have a better understanding of what the effects are on communities and the river when water is recovered. Decisions made for the Murray–Darling Basin in the coming year will not be easy ones but they will be based on the best available science and extensive community consultation.

Providing information on the basin

The MDBA is responsible for providing the Murray–Darling Basin Ministerial Council and the Basin Officials Committee with advice and information that informs joint government decision making about the basin's water resources and related ecosystems.

Modelling the basin

We develop, operate and maintain river models to support river management, water sharing, and salinity management as well as to help develop water resource policies, including the Basin Plan, see pages 19 and 35. Our modelling is central to determining state water accounts and calculating state water shares through the water resources assessment for the River Murray system.

Flood inundation modelling and mapping

Our latest work towards understanding the pattern of floodplain inundation associated with flow has been in the Condamine–Balonne and Barwon–Darling regions. The CSIRO is working with us to develop this new generation of models which will be able to determine inundation extents based on different catchment moisture content or 'antecedent condition'. They are planning to deliver the models in August 2016.

To inform the Northern Basin Review interim inundation extents were estimated, using the Landsat satellite archive of historical flow events developed by Geoscience Australia. This information was able to confirm within different catchments at what flow rate major flow breakouts occurred historically.

The Source Murray model

The Source model of the Murray and lower Darling systems reflects a major investment over the last 15 years by the Australian Government (including the MDBA), and the basin states. A daily model for the River Murray system is configured to represent a 'without development scenario' and the baseline diversion limit. It has also been configured to model salinity in these regions. A multi-jurisdictional working group has helped to develop and review the model. The next step is for the model to be independently reviewed. As part of this process, we will continue to get feedback from the jurisdictions.

Greenness project

The MDBA has completed a pilot research project investigating whether there was a response in vegetation to flow in terms of the overall

Nothing is normal – talking to communities about how rivers flow

Staff from the MDBA and CSIRO met with community members in the Condamine–Balonne and Barwon–Darling regions to see if their inundation modelling matched what landholders knew about how the rivers flowed after rain.

It was reinforced that many factors need to be considered in predicting inundation extent. Many roads were damaged in 2011 and 2012, and these were resurfaced and raised by 30 cm, so floods may now behave differently.

Soil types are also very important as they impact on the speed and extent of any inundation. Landholders recommended splitting the landscape into two parts – the black country and the red country, which have two different infiltration rates. The CSIRO includes soil type in their modelling to match these type of observations.

A reoccurring theme was that every flood is different and can be really different depending on where the water is coming from. Water that comes out of the Condamine is flat and slower than water that comes out of the Maranoa. Floods can also vary depending on the weather. Floods that follow dry times can be absorbed by the floodplain. 'You can stand there for an hour and watch it fall through the cracks.'

Some landholders felt they needed more of the lower level floods rather than the big ones. Others observed that changes in the flood regime changes the vegetation. Lignum is disappearing. Coolabah will have different water requirements depending on where it is and the environment it has adapted to. The type of vegetation also influences how fast the flood moves. If the landscape is covered by tall vegetation then the flood slows down and can change paths.

Modellers can adjust their models to reflect the observations made by community members. This helps the modellers investigate the difference in inundation extent between the modelled prediction and observations made on the ground, helping to improve the accuracy for future modelling of the regions.

'greenness' of the area using satellite imagery (provided by Geoscience Australia). This project was conducted for an area at Gunbower–Koondrook–Perricoota Forest. The project revealed that vegetation greenness changes were detectable, and raised interesting questions about the seasonality and the effects of extended flooding or drought. This project highlights the potential for satellite imagery to be used to detect changes in vegetation health and as a tool to further investigate the relationship between flow and vegetation.

Citizen science

Citizen-based contributions to mainstream scientific investigations are becoming increasingly important. Technology is helping to facilitate this by enabling scientific projects to be more accessible to the public. This year the MDBA started to involve the public in collecting scientific information that could be used in decision making.

We began working with basin residents on a rainfall and river flow project to better understand inundation patterns across the basin, particularly in the northern basin. We funded the installation of automatic weather stations on farming properties and in a national park, and connected these to the Bureau of Meteorology's weather observations website <bom.gov.au>.

Volunteers participating in this project upload photos of weather events, particularly when rivers or creeks are inundated, so we can start documenting when waterways become inundated and how these events are linked to local or distant rainfall. We have also talked to committees in the Goulburn–Broken catchment, and will install weather stations at two wetlands in this catchment. Over the next year, we will work closely with the MDBA's Aboriginal partnerships team to install weather stations in 30 Aboriginal communities around the basin to identify the effects of weather on Aboriginal people's wellbeing.

In developing a citizen science program, we identified that it was critical that we were transparent about the data we collect and that we make information available to the public in a timely manner. We worked with the Atlas of Living Australia <ala.org.au> on an MDBA data portal. All relevant biological and environmental datasets will be published in a way that is accessible for a general audience. This portal will allow people to explore, map and download data of interest with an easy-to-use interface.

Crowd-sourcing is growing in popularity as a way of involving the general public in citizen science projects. This year we trialled our first crowd-sourcing project through Digivol, a collaboration between the Australian Museum and the Atlas of Living Australia.

Thanks to the National Library of Australia and their volunteers, we were able to create a Digivol project to transcribe Alfred Deakin's 1885 travel diary to the United States and Mexico – a very descriptive account. It was during this trip that Deakin formed his ideas about water rights resting with the Commonwealth. This went on to become the foundation of Australia's water legislation and water management.

It took ten volunteers only three days to transcribe 168 pages of copperplate writing. We gave an electronic copy of the diary to the National Library for their archives, to thank them and acknowledge the volunteers involved in documenting a piece of Australia's water history.

Delivering River Murray information

We work with the basin state governments to support the operation and maintenance of hydrometric stations. These stations are predominantly in the Murray and lower Darling and collect water quality and quantity data. Data and information is collated to underpin key operational responsibilities, including:

- storing and delivering water to meet consumptive and environmental needs
- operating salt interception schemes
- enabling navigation and supporting recreation and tourism
- understanding emerging water quality events such as 'blackwater' and blue-green algae
- preparing water resource assessments.

This information is used to direct daily releases from a number of structures along the River Murray, working closely with state agencies and constructing authorities (whose staff physically control the structures) to deliver consistent operations and reliable water supplies for all users in a fair and efficient way.

We share information in a number of ways, including:

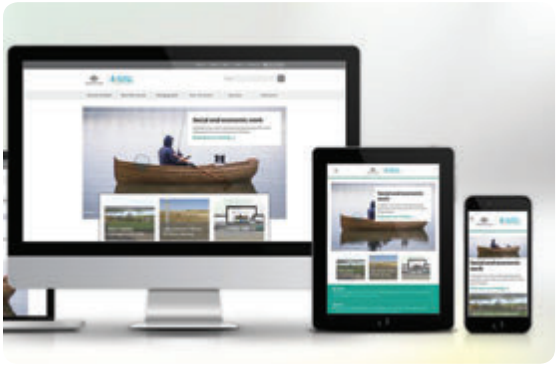
- regular meetings with basin state government authorities
- close liaison with the Bureau of Meteorology, particularly before and during floods
- online publication of information resources, including River Murray live river data, weekly reports and storage, flow and salinity reports
- advising southern basin states on River Murray water availability and accounts
- data on our website
- responding to information requests sent to engagement@mdba.gov.au or datarequests@mdba.gov.au.

Website

Our website is a major source of information for our stakeholders and the public. During the year, we rejuvenated our site to make information more intuitive and discoverable. This major communications project saw thousands of pages rewritten or archived, with the most topical and sought after information clearly available from our new homepage. The feedback from users has been very positive and site traffic (and importantly, user satisfaction) continues to grow.

Library information and geospatial services

The MDBA is an information enterprise. It exists in an environment where there is a common interest in data and a high level of information reporting and sharing between partner agencies and stakeholders. This year the geospatial services team began three projects designed to integrate the use of geospatial data with existing information used for business analysis. All projects have demonstrated how the emerging geospatial technologies will increase our ability to use digital technology to solve business requirements.



Strategic alliances

International engagement

Sharing our knowledge and experience with international water managers helps us to remain up to date with international best practice. We continued to build and maintain our international relationships in 2015–16 and briefed visiting government delegations from India, the United States, Nepal, France, Chile, Korea and countries in the Mekong River Basin. In 2015, we became partners in the Australian Government's Department of Foreign Affairs and Trade's Australian Water Partnership, which coordinates the Australian Government's international engagement on water resource management issues.

We participated in the following key international forums to showcase our work and learn from international best practice:

- Getches–Wilkinson Centre for Natural Resources, Energy and the Environment's summer conference 7–11 June 2016, held in Boulder, Colorado, United States
- Indigenous Water Justice Symposium 6 June 2016, hosted by the University of Colorado in Boulder, United States
- the International Riversymposium in Brisbane from 20–23 September 2015
- World Water Week in Stockholm from 23–28 August 2015
- the International Course on River Basin Management from 13–14 July 2015, jointly organised by the University of Melbourne and China's Tsinghua University.

Sponsorship

We continue to develop and maintain strong relationships with communities in the Murray–Darling Basin through sponsoring leadership programs, as well as conferences and workshops related to our work. Sponsorship over the past year included:

- community based events, such as the Taste of Coleambally Food and Farm Festival, Lake Burrendong Family Fishing Classic and New South Wales Aboriginal Rugby League (Koorie Knockout)

- key industry meetings, such as the Irrigation Australia and Cotton Australia conferences
- leadership and capacity building initiatives, such as Regional Victoria Community Leaders, Ricegrowers' Association of Australia Emerging Leaders of the Rice Industry Leadership Development Program, and the Peter Cullen Trust
- environmental initiatives, such as the WetlandCare Australia Photography Competition
- key science events, such as the National Climate Adaptation Conference, 11th International Symposium on Ecohydraulics and the Australian Stream Management Conference.

The education team continued to use sponsorships to increase awareness and uptake of the range of MDBA education resources available to educators. Sponsored events for the year were the Primary Industries Food and Fibre Conference, the geography teacher's associations of Queensland, Victoria and New South Wales, the conference of the Australian Science Teachers Association as well as the National Youth Science Forum.

Research partnerships

We continue to work with partners and other institutions to strengthen our science and research capabilities to inform the Basin Plan. These partnerships aim to deliver benefits to the MDBA and our partners while aligning with priority research areas.

National Centre for Groundwater Research and Training

We have a strong strategic research alliance with the National Centre for Groundwater Research and Training which focuses on: groundwater and surface water interactions; groundwater replenishment processes; and the impact that social and economic factors may have on groundwater management in the future. The research alliance is expected to enhance the risk assessment method used to determine a groundwater sustainable diversion limit in the Basin Plan. This method may be used in future reviews of the Basin Plan. Research under the alliance is focusing on the Campaspe River in Victoria and the Murrumbidgee River in New South Wales.

Murray–Darling Freshwater Research Centre

The MDBA oversees a research partnership with the Murray–Darling Freshwater Research Centre on behalf of the basin governments. The research centre provides specialist skills and knowledge in riverine ecology in the southern basin, and the River Murray in particular.

CSIRO

We have a long history of collaboration with the CSIRO. Projects underway in 2015–16 relate to consistent platforms for hydrological modelling, improving our understanding of floods and floodplain inundation and improving our ability to monitor and evaluate basin health.

Scenario planning

This year, we began a scenario planning process to explore the challenges and opportunities the Murray–Darling Basin and the MDBA might face in the future. Scenario planning is a systematic approach that is increasingly being carried out by private and public organisations worldwide to develop scenarios about a range of possible futures to deal with future uncertainty.

The process involved conducting a scan of social, economic and ecological factors that might influence how we manage water in the basin, and a two-day workshop with experts from diverse fields, including members of our Advisory Committee on Social, Economic and Environmental Science and senior MDBA staff. The results will be used for future strategic planning as well as to inform our investment in research and knowledge.

National Cultural Flows Research Project

We are the major contributor to this multi-year project to provide rigorous and defendable knowledge on Indigenous water interests for the benefit of Indigenous people. The project will draw on a range of research methodologies and generations of cultural knowledge to:

- provide Australia with a greater understanding of Indigenous values relating to water and other natural resources
- provide Aboriginal people with information to ensure that Aboriginal water requirements and preferences are reflected in water planning and management policy

» inform the development of new governance approaches to water management that incorporate aspects of Aboriginal governance and capacity building.

The planning and research committee comprises representatives from the Northern Basin Aboriginal Nations, the Murray Lower Darling Rivers Indigenous Nations, the Northern Australia Land and Sea Management Alliance, basin state water agencies and the Commonwealth Environmental Water Office.

Visiting Fellows

Hosting academics enables us to better connect with the research community and improve how research informs policy and management in the basin. We hosted scientists from the University of Canberra, University of Adelaide and the Australian National University. Their research topics included environmental watering, water markets and blue-green algae. Collaborations with the scientific community assist in ensuring scientific enquiries are relevant for policy and assist the MDBA to access current knowledge and build partnerships with the research community.

F

STAFF SNAPSHOT

A graduate's experience – *meet Sophie*

The MDBA graduate program has provided me and my fellow graduates with many great opportunities to learn and grow both professionally and personally.

I came to work at the MDBA because I want to contribute to the sustainable management of water resources to ensure people, industry, and the environment benefit from management decisions.

After spending a year with the MDBA as a graduate, I have gained a great appreciation for the breadth of work that the agency undertakes. Having participated in three rotations across three different divisions, I am consistently amazed at the extent of the agency's work and its constant commitment to ensuring the health of the basin's industries, communities and environment.

Throughout the year I was lucky enough to meet and learn from a wide range of staff and stakeholders working both within the MDBA and outside of it. Being exposed to their extensive knowledge of the basin, and their passion for their work, has helped me and the other graduates reflect on how we can best contribute to the management of the basin throughout our careers.

Australian Government

MURRAY–DARLING BASIN AUTHORITY

Annual performance statements

Introductory statements

I, as the accountable authority of the Murray–Darling Basin Authority, present the 2015–16 annual performance statements, as required under paragraph 39(1)(a) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act).

In my opinion, these annual performance statements are based on properly maintained records, accurately reflect the performance of the entity, and comply with subsection 39(2) of the PGPA Act.

Mr Phillip Glyde
Chief Executive
10 October 2016

Entity purpose

The MDBA is responsible for achieving the equitable and sustainable use of the water resources of the Murray–Darling Basin by governments and the community, through the development and implementation of a Basin Plan, operation of the River Murray system, shared natural resource management programs, research, information and advice. The delivery of the MDBA's purpose is achieved through Program 1.1 – Equitable and sustainable use of the Murray–Darling Basin, and has the following five strategic goals:

1. Lead the implementation of the Basin Plan to achieve a healthy working basin.
2. Strengthen engagement with the community.
3. Evaluate and report the social, economic and environmental outcomes of basin water reforms.
4. Operate the River Murray system efficiently for partner governments.
5. Improve the knowledge base to support sustainable water resource management.

Results

Tables 2.4 to 2.8 outline the achievement or progress of the key performance indicators in relation to the MDBA's outcome.

Table 2.4 Goal 1 Lead the implementation of the Basin Plan to achieve a healthy working basin (p. 16 to 25)

Key performance indicator	Source	Results
The sustainable diversion limit (SDL) adjustment mechanism operates to allow the surface water SDL to be adjusted to reflect the operation of robust supply and efficiency measures	Corporate Plan 2015–16, p. 13	**ONGOING** After successfully trialling the SDL adjustment assessment framework, we worked with the basin state governments to integrate the proposed supply measures. We also evaluated different packages of supply measures proposed by the basin states and provided regular advice on the potential adjustment volume p. 20–1. Throughout 2015–16, we continued to provide secretariat support to enable basin states to successfully develop and submit a package of supply and efficiency measures, and to support ongoing resolution of complex issues surrounding the development of the assessment framework and the supply and efficiency measures p. 93, 161–5. The SDLs ensure a balance between the water needs of communities, industries and the environment, which is key to achieving a healthy working basin.
Effective arrangements are in place for working with basin governments in Basin Plan implementation, with a rolling implementation work program updated annually	Corporate Plan 2015–16, p. 13	**ONGOING** We successfully established an Australian Government/state government senior officials committee and four subcommittees to oversee the implementation of the Basin Plan. The committees oversee and review the operation of the intergovernmental Basin Plan Implementation Agreement p. 28, 163. Four meetings of the senior officials committee were held in 2015–16. They provided state-based technical and policy advice to the MDBA that contributed to our understanding and approach to areas of water resource planning, environmental watering, trade, monitoring and evaluation. An MDBA and Department of Agriculture and Water Resources (Australian Government) socio-economic working group oversees separate and complementary roles and responsibilities in relation to socio-economic evaluation and reporting of Basin Plan implementation.
The Northern Basin Review provides information to determine whether there is a robust case to amend relevant settings of the Basin Plan	Corporate Plan 2015–16, p. 13	**ONGOING** Work aimed at developing new scientific knowledge, and economic understanding and profiling has been completed as part of the Northern Basin Review. This work enabled indicators to be developed to assess the effects of different water recovery scenarios – a triple bottom line assessment p. 17–20. We assessed: scenarios that focused on different recovery volumes; the approach to how water was recovered (including by location and entitlement type); and how environmental water may be delivered. The scenarios demonstrated that flows through the Condamine–Balonne and the Barwon–Darling are dependent on the volume and pattern of recovered water, as well as the water management strategy used. This information will be used to present a case to amend the settings of the Basin Plan, once the review is complete. The completion date for the Northern Basin Review has been revised, with agreement from the Authority, to November 2016 (from September 2016).

Table 2.4 Goal 1 Lead the implementation of the Basin Plan to achieve a healthy working basin (continued)

Key performance indicator	Source	Results
The constraints management strategy informs development and implementation of measures that allow environmental water to be used more effectively, while addressing impacts on third parties	Corporate Plan 2015–16, p. 13	**ACHIEVED** We assisted the basin state governments to develop proposals to relax the physical constraints that were identified in the constraints management strategy p. 24. In April 2016, basin ministers agreed to progress constraints for the Murray, Murrumbidgee and Goulburn rivers, as part of a package of supply, constraints and efficiency measures under the SDL adjustment mechanism. We have begun assessing implementation plans submitted by the basin states for prerequisite policy measures.
Progressive accreditation of state water resource plans that meet the Basin Plan requirements	Corporate Plan 2015–16, p. 13	**ONGOING** We continue to provide assistance to all basin state governments as they develop water resource plans for accreditation against the requirements of the Basin Plan. The first water resource plan, of the 36 required, was submitted by Queensland to the MDBA for assessment in early 2016. We are assessing this plan against the requirements in the Basin Plan, and expect to submit the plan, along with its recommendation regarding accreditation, to the Minister for Agriculture and Water Resources in mid-2016 p. 21–2.
Basin annual and long-term environmental watering priorities provide a basin level outcome	Corporate Plan 2015–16, p. 13	**ACHIEVED** We completed and published the basin environmental watering outlook and the 2016–17 basin annual environmental watering priorities in 2015–16. These outputs give effect to the Basin Plan and the basin-wide environmental watering strategy and will guide environmental watering priorities for 2016–17 p. 23. In 2015–16 environmental watering in the basin was guided by priorities published by the MDBA in an increasingly coordinated effort to achieve the long-term outcomes set out in the strategy. We convened the Southern Connected Basin Environmental Watering Committee to facilitate coordinating the delivery of all environmental water and the use of The Living Murray water portfolio. This helped to maximise environmental outcomes across the southern connected basin, consistent with annual and long-term priorities. It will take some time for the full benefits of the environmental watering to be realised, because of biological lags and because water recovery and the Basin Plan won't be fully implemented until 2019. Since the Basin Plan came into effect, in 2012, only small volumes of environmental water have been available, so environmental watering has been on a relatively small scale. Monitoring has shown that environmental water has helped some areas to recover from drought and there has been progress towards meeting long-term basin level outcomes p. 36–39.
The Basin Plan is amended in response to the sustainable diversion limit adjustments and basin reviews	Corporate Plan 2015–16, p. 13	**ONGOING** The proposed Basin Plan amendments, relating to the basin reviews, will be in response to the results of the Northern Basin Review due in November 2016. It is expected that the Basin Plan amendment process will begin after the Northern Basin Review is completed. The proposed amendments will also include the outcomes of the 2014 groundwater reviews and the changes to the Basin Plan as a result of the *Water Act 2007* amendments in 2016. The basin governments have sought deferral of the operations of the sustainable diversion limit adjustment mechanism to late 2017.
Compliance approach is risk based and minimises red tape	Corporate Plan 2015–16, p. 13	**ONGOING** The MDBA is subject to the Australian Government's Regulator Performance Framework. We are finalising the 2015–16 self-assessment and preparing for the 2016–17 reporting period. Implementing the framework will assist us to minimise our regulatory burden. The MDBA Compliance Risk Management Framework has been completed and endorsed. The framework will assist us to carry out compliance activities in a risk-based manner p. 24–5.

Link to outcome (analysis)

We made progress toward achieving the planned activities for this reporting period. A water resource plan accreditation framework and work processing system have been implemented, allowing us to facilitate a smooth and consistent approach to assisting basin state governments with their water resource plan accreditation. We continue to ensure dynamic and responsive coordination of Basin Plan implementation across the basin. We have shown this through the work done in establishing subcommittees to progress the work.

The sustainable diversion limit adjustment has progressed through establishing and trialling a framework, and making sure there is a coordinated approach to working with basin jurisdictions on how these levels might impact the basin and basin communities.

Delays by the basin states in providing key requirements have affected our performance for 2015–16. These include:

- submission of water resource plans for assessment and accreditation. New South Wales, in particular, have delayed presenting their plans, some of which are now 18 months behind the planned timeline. We understand that New South Wales is currently reorganising its efforts to begin a number of plans
- the completion of assessment by basin jurisdictions of business cases for sustainable diversion limit adjustment measures. Assessment processes have not been completed within the specified timeframes. A Basin Plan amendment is being progressed by the Australian Government to allow for a second notification step to occur in June 2017. This will extend the sustainable diversion limit adjustment timeframes, with a determination likely to be made late in 2017 (pending the Basin Plan amendment).

A recommendation on the need to amend the Basin Plan as part of the Northern Basin Review is likely to be made in November 2016. We have successfully completed a number of tasks associated with the review, generating many supporting reports.

The work completed for this goal has meant that we are well placed for fulfilling obligations related to the equitable and sustainable use of the Murray–Darling Basin. The agency has aligned its work output to meet the requirements set out in the Basin Plan to ensure a healthy working basin.

Table 2.5 Goal 2 Strengthen engagement with the community (p. 26 to 33)

Key performance indicator	Source	Results
Local knowledge and solutions inform the implementation of the Basin Plan	Corporate Plan 2015–16, p. 15	**ONGOING** Local knowledge and solutions are continuously being sought in a variety of ways, including the Northern Basin Advisory Committee, Lower Balonne Working Group, one-on-one data collection, targeted workshops, as well as providing a direct 1800 number and an engagement email inbox. The information collected from local communities about changes in rivers is used to inform models and descriptions of social, economic and environmental change in the basin. In making a recommendation about the best balance for communities and the environment, we have also considered community concerns and suggestions for how to optimise water use in the basin.
A broad range of stakeholders are engaged and informed through the use of effective engagement and communication forums and channels	Corporate Plan 2015–16 p. 15, and portfolio budget statements	**ACHIEVED** In 2015–16 the Chief Executive toured the basin to meet with stakeholders, including local government officials, industries, peak bodies and the general public. The aim was to facilitate and obtain feedback on the implementation of the Basin Plan and to broaden stakeholder understanding of the equitable and sustainable use of the basin p. 32–3. We provided updates and offered the opportunity for stakeholders to discuss critical elements of our work with our subject matter experts. We used a variety of ways to communicate to receive feedback from the basin community. These included community programs and events, website information and meetings with peak bodies and other stakeholders p. 26–9.
Basin-wide education programs are delivered, in partnership with the basin communities and organisations	Corporate Plan 2015–16 p. 15, and portfolio budget statements	**ACHIEVED** The education program delivered education and awareness programs related to sustainable water resource management in the basin p. 29–30. These programs targeted communities throughout the basin and wider Australia. Development and distribution of these programs have been facilitated through strong partnerships with local education centres, professional teacher associations, teachers and national institutions. Feedback has indicated that these programs are being accessed by schools and students and have increased the awareness and knowledge of the basin.

Link to outcome (analysis)

We committed to extensive community engagement in 2015–16. Knowledge and information held by basin communities and industries is important for making sure the Basin Plan, and its implementation, is robust and balanced.

Community and industry engagement activity was achieved using formal advisory/governance committees, as well as informal community meetings and online/email/phone calls received. Our education programs also help to increase awareness throughout the basin, resulting in an increase in the number of partnerships, high uptake of our digital resources, and a high level of participation in our education events.

In 2015–16 we:

- organised 24 peak body meetings
- held 210 stakeholder meetings
- sponsored 26 community programs and events, including 3 leadership programs, 12 conferences and 6 community events
- hosted 21 meetings with international governments and delegations
- informed 4,000 stakeholders from over 2,500 organisations
- fielded 415 inquires through our engagement inbox.

Table 2.6 Goal 3 Evaluate and report the social, economic environmental outcomes of basin water reforms (p. 34 to 45)

Key performance indicator	Source	Results
Reporting on environmental watering outcomes and subsequent planning and priority setting	Corporate Plan 2015–16, p. 17	**ACHIEVED** We published the Basin Plan annual report for 2014–15, which includes a basin-wide analysis of the alignment of actual watering events with the annual environmental watering priorities. The report also included environmental outcomes reported by water holders for the priorities and other watering events p. 35. Findings of the 2014–15 Basin Plan annual report included: • delivery of over 2,000 GL of environmental water to most of the basin annual environmental watering priorities. Some of this volume consisted of re-used flows to provide multiple benefits downstream • new water management structures, designed to maximise the use of environmental water, were used for the first time • monitoring showed local environmental benefits for wetlands, waterbirds and fish. There were also improved flows in the River Murray system. The Basin Plan annual report assists in adapting the annual watering priorities and guides the distribution and sharing of natural resources.
Water quality and salinity targets in the Basin Plan are met	Corporate Plan 2015–16, p. 17	**ACHIEVED** Salinity targets at Lock 6, Morgan and Murray Bridge were met. Although the salinity targets at Burtundy and Milang were exceeded, the water quality and salinity outcomes in the basin were consistent with the Basin Plan requirements p. 43–5, 62–3. The salinity levels of the Murray–Darling Basin are required to be kept in check to allow for equitable and sustainable use of the basin by the communities which rely on the rivers.
Compliance with SDLs from 2019, and transitional reporting on water use up to 2019	Corporate Plan 2015–16, p. 17	**IN PROGRESS** The requirement to comply with the sustainable diversion limit will not begin until after the SDLs are introduced in 2019. We have begun working with the basin state governments on issues related to water use reporting, including settling the planning assumptions as directed by Ministerial Council p. 39–41.

Table 2.6 Goal 3 Evaluate and report the social, economic environmental outcomes of basin water reforms (continued)

Key performance indicator	Source	Results
Compliance with water trading rules	Corporate Plan 2015–16, p. 17	**ACHIEVED** We have been working with the basin state governments, Australian Government agencies and irrigation infrastructure operators to implement the Basin Plan water trading rules, and raise awareness of their obligations p. 41–2. We identified potential compliance issues due to inconsistencies between Basin Plan trade rules and current state arrangements for water trading. As a priority we have been working with the basin state governments to overcome these inconsistencies. This year we also focused on raising stakeholder awareness and knowledge of the water trading rules and guidelines through public forums such as local field or market days.
Evaluation and audit activities indicate that Basin Plan implementation is: a. improving the health of water-dependent ecosystems and ecosystem functions in the basin b. facilitating water reaching its most productive use c. contributing to productive and resilient water-dependent industries	Corporate Plan 2015–16, p. 17	**ONGOING** We are monitoring environmental indicators against the targets (expected outcomes) in the Basin-wide Environmental Watering Strategy. The focus is on collecting data related to flow, connectivity, vegetation, fish and waterbirds. Monitoring activities are carried out in collaboration with the states and Commonwealth Environmental Water Office to make sure the watering is efficient and avoids duplication p. 36–9. We also investigated the social and economic aspects of the Basin Plan implementation. Both intended and unintended social and economic effects have been identified through an extensive consultation process. As a result indicators have been developed to measure these impacts p. 35–6. Interim social, economic and environmental findings are reflected in the Basin Plan annual report and will be reported in more detail in the 2017 evaluation.

Link to outcome (analysis)

Monitoring, evaluating and reporting the effects of basin water reforms is mostly achieved through the Basin Plan annual report. The report covers the social, economic and environmental outcomes of water reforms on an annual basis, with an assessment of the first five years due in 2017.

Areas that are evaluated during this process include water quality and salinity targets, transitional sustainable diversion limit reporting (prior to 2019) and compliance with trade rules. Water quality and salinity targets are measured against annual targets. The SDL adjustment will not be in place until 2019, so transitional arrangements are being progressed against the work set by the Sustainable Diversion Limit Advisory Committee.

Note: key performance indicators (b. facilitating water reaching its most productive use) and (c. contributing to productive and resilient water-dependent industries) have been identified as ineffective measures of our performance, as this work is beyond our control and relies on external factors, such as the basin states, industry practices, and available technology. Our role does not extend to commenting on the most productive use of water on a national scale. These key performance indicators will be removed from the 2016–17 corporate plan.

Table 2.7 Goal 4 Operate the River Murray system efficiently for partner governments (p. 46 to 63)

Key performance indicator	Source	Results
No adverse rulings from jurisdictional dam safety regulators	Corporate Plan 2015–16, p. 19	**ACHIEVED** There have been no adverse rulings from jurisdictional dam safety regulators received during this reporting period. Regulators in Victoria and New South Wales were briefed on changes to the assessed hydrological risk of Hume and Dartmouth dams. Both regulators noted the assessment and indicated support for the ongoing program to monitor, review and, where needed, reduce dam safety risk at major storages p. 47. Regulators were also updated on the management of River Murray Operation assets through the routine annual dam safety reporting of constructing authorities (Water NSW and Goulburn Murray Water). Regulators have not raised any concerns with the management of these assets. The structural integrity of River Murray assets is necessary for the MDBA to operate the river system.
Annual inspection assesses assets to have achieved a good or high standard of maintenance	Corporate Plan 2015–16, p. 19	**ACHIEVED** The annual inspection of River Murray assets was completed. All assets were assessed to have achieved a good or high standard with significant improvements observed at sites that had previously required attention p. 50. With limited major construction across the program locally based resources have been focused on routine maintenance activities. Given the environment in which River Murray Operations assets operate, significant attention has been applied to corrosion protection of metal components. All assets are in a state of good repair and available to efficiently operate the River Murray river system.
Endorsement of the performance relating to River Murray system operations by the Independent River Operations Review Group and the Basin Officials Committee	Corporate Plan 2015–16, p. 19	**ACHIEVED** The Independent River Operations Review Group reported favourably on the performance of river operations. The group's report on 2014–15 operations was noted by the Basin Officials Committee in December 2015. This is an annual evaluation process that reports in September each year.
Deliver on joint programs as set out in agreements under the Murray–Darling Basin Agreement	Corporate Plan 2015–16, p. 19	**ACHIEVED** The routine operation and maintenance of the River Murray system enabled the delivery of state water shares in accordance with the Agreement. All assets have been maintained fit-for-purpose to achieve this outcome p. 47. Continuous improvement initiatives included completing a scoping study to define improvements to the joint program asset management processes. The proposed scope of enhancements was endorsed by governments. The Lake Victoria Aboriginal heritage impact permit was approved for a further five years enabling the ongoing operation of Lake Victoria. Lessons learned from the millennium drought were documented and potential response actions reviewed against the revised governance arrangements set out by the Agreement.
Basin states adopt the next 15-year salinity management strategy	Corporate Plan 2015–16, p. 19	**ACHIEVED** The basin states adopted the next 15-year salinity management strategy in November 2015. This strategy outlines how salinity will be managed over the next 15 years finishing in 2030. Managing salinity is a key consideration in operating the river system efficiently p. 43–5.

Table 2.7 Goal 4 Operate the River Murray system efficiently for partner governments (continued)

Key performance indicator	Source	Results
South Australia Riverland Floodplain Integrated Infrastructure Program meets milestones	Corporate Plan 2015–16, p. 19	**ONGOING** Investment proposals for each of the four projects (Pike and Katarapko floodplain inundation, salinity management, and environmental pathways) were progressed throughout 2016–17. This process involves defining the environmental objectives and associated infrastructure functional requirements followed by preparing engineering concept designs to deliver on identified outcomes p. 47. All investment proposals were well progressed. Procurement and construction of two early works packages at Margaret Dowling Inlet (Pike) and Bank J Regulator (Katarapko) were commissioned to enable construction through the spring and summer of 2016–17. These no-regrets works enabled the program to remain on track for delivery by 2020 with 2016–17 expenditure targets met.
Positive annual performance report for all salt interception schemes	Corporate Plan 2015–16, p. 19	**ACHIEVED** State constructing authorities have provided annual performance reports. All reports indicate schemes were operated to meet agreed targets p. 62. A new operational approach that sees the level of salt interception adjusted to reflect the short to medium term in-river salinity risk was implemented throughout 2015–16. This approach will achieve cost savings through reduced pumping when salinity risk is low. This differs from the previous approach were schemes where operated to a pre-determined regime effectively pumping at full capacity for most of the time.

Link to outcome (analysis)

The MDBA operates the River Murray, to deliver state water shares, and oversees the management of River Murray assets in accordance with a program agreed with the joint venture governments. Both the river operations and asset management programs were delivered as agreed in 2015–16.

An Independent River Operations Review Group undertakes a thorough annual review of the MDBA's river operation functions to determine compliance with operating rules and outcomes agreed by the respective joint venture governments. The Independent River Operations Review Group process includes examination of river operations records and consultation with officials from the MDBA and relevant Australian Government and state agencies. During 2015–16 the Independent River Operations Review Group reported favourably on our 2014–15 performance. The 2015–16 report is due by 30 September 2016.

The efficient operation of the River Murray system relies on the structural integrity of assets such as dams, locks and weirs. The assets are operated and maintained by agencies nominated by the respective states to fulfil the role of state constructing authorities. The MDBA oversights the activities of the state constructing authorities in a collaborative manner providing assurance to both Australian and state governments that the program is delivered efficiently and effectively The assets are inspected annually by senior MDBA managers for maintenance and safety. The 2015–16 assessment resulted in all assets as having a good or high standard during the 2015–16 reporting period. In addition, MDBA officers are regularly engaged with state constructing authorities in program delivery activities that include inspection and assessment of asset performance.

The major water storages are covered by dam safety legislation in the state in which the dam is located. The state constructing authorities are required to report to the dam safety regulators on an annual basis on matters related to the safety of those dams. The MDBA also participates in briefing regulators on critical issues. In 2015–16 we advised dam safety regulators of recent work to assess the risk associated with extreme rainfalls in the Dartmouth and Hume catchments. The regulators acknowledged the value of this groundbreaking work. Dam safety regulators have not raised any concerns with the condition or management arrangements for the MDBA assets.

Managing salinity in the River Murray is a critical part of maintaining a healthy River Murray and making sure water is fit for purpose both environmentally and for consumptive uses. A key part of managing river salinity is operating salt interception schemes that prevent saline groundwater from entering the river. The next 15-year salinity management strategy (Basin Salinity Management 2030) was finalised and accepted by the basin states. The strategy includes a new operating regime for salt interception that will target the level of groundwater pumping to match the assessed salinity risk. A trial of this new regime began in 2015–16.

Table 2.8 Goal 5 Improve the knowledge base to support sustainable water resource management (p. 64 to 69)

Key performance indicator	Source	Results
Adoption of integrated water resource modelling across the basin	Corporate Plan 2015–16, p. 21	**ONGOING** The Source Murray model is ready to submit to an independent review. In partnership with the CSIRO and basin state governments, good progress has been made on documenting better practice for developing models in the basin. These models describe the surface water resources of the Basin Plan to inform decisions on water resource management p. 65.
Evaluation of Basin Plan effectiveness is well supported by evidence	Corporate Plan 2015–16, p. 21	**ONGOING** Work carried out over the past 12 months has strengthened the evidence base which can underpin an evaluation of Basin Plan effectiveness. Key examples include completion of all commissioned environmental science investigations as part of the Northern Basin Review and continuing work to develop systematic planning and monitoring tools and procedures p. 17–20, 35.
Increased stakeholder access to data and information	Corporate Plan 2015–16, p. 21	**ONGOING** Rolled out a new MDBA website, which was well received by basin stakeholders and educational groups. We also finalised an environmental data portal built in conjunction with the Atlas of Living Australia. Ten geospatially enabled data sets have been released on the portal and will meet the demand from research, educational and environmental consultants for environmental data p. 66–9. In conjunction with Geoscience Australia completed the largest LIDAR (Light Detection and Ranging) data capture project in the southern hemisphere and continued sharing the data between natural resource management programs. We initiated a project, in collaboration with the CSIRO, to develop a new generation of floodplain inundation models to help understand the floodplain inundation patterns associated with different flows p. 65.
Data requirements, information requests and analysis services, are delivered on time, in accordance with standard practices and linked to agreed project plans	Corporate Plan 2015–16, p. 21	**ACHIEVED** Provided modelling services, including data requirements, information requests and analysis, to support Basin Plan programs, including SDL adjustment proposals, Northern Basin Review, and assessment of water resource plan models p. 19, 65. We have been working with the basin states to assess the potential for environmental works and altered river operations to deliver equivalent environmental outcomes using less water. This includes integrating the proposal into the modelling framework and providing technical support to the states as required. We explored the influence of different water recovery scenarios on the hydrology of northern basin catchments. The findings were presented to basin governments and community members. Modelling work should be fully documented and released in late 2016. To inform the Northern Basin Review we estimated inundation extents, using the Landsat satellite archive of historical flow events originally developed by Geoscience Australia. We also continued to develop tools and processes to assess the impact of increased environmental water on the hydrology and inundation patterns throughout the basin.
Data requirements, information requests and analysis services, are delivered on time, in accordance with standard practices and linked to agreed project plans	Corporate Plan 2015–16, p. 21	**ACHIEVED** We successfully negotiated overarching research collaboration frameworks with key knowledge brokers such as the CSIRO, Bureau of Meteorology and universities to link coordination processes and high level steering committees with relevant institutions to ensure all research is strategic p. 68–9.

Link to outcome (analysis)

Strong scientific grounding and partnerships with research organisations allow us to support sustainable water resource management. Sharing information and research strengthens decision making for sustainable use of the basin, and shared natural resource management programs for all stakeholders. We continued to build on relationships with research organisations such as the CSIRO, Bureau of Meteorology, Murray–Darling Freshwater Research Centre, National Centre for Groundwater Research and Training and universities throughout Australia.

These partnerships have provided scientific support for our work, research and reporting towards the Basin Plan amendment. Examples of this include: inundation modelling approach, assessment approaches for environmental water needs, how climate change is considered in the Basin Plan, the importance of seasonal and inter-annual climate sequencing and variability on key water users, and management objectives of the southern basin.

Our modelling has supported the Northern Basin Review and SDL adjustment proposals as well as providing modelling services to external stakeholders. Our Source modelling is being independently reviewed, and will provide an integrated modelling platform available to all basin states.

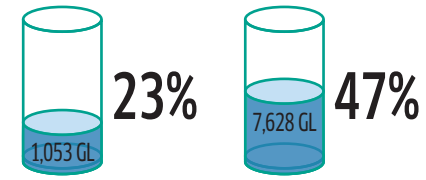
Our approach to partnership and research supports informed, scientifically based, decision making in regard to implementation of the Basin Plan and shared natural resource management programs.

OUR YEAR AT A GLANCE (VIA TWEETS)

In 2015–16 we sent out more than 460 tweets to over 2,500 followers. Here are just some of them.

JULY 2015

Water storages in July



AUGUST 2015

Thanks to Regional Development Australia Riverina for the chance to talk about our social and economic work at their Tumut meeting yesterday.

SEPTEMBER 2015

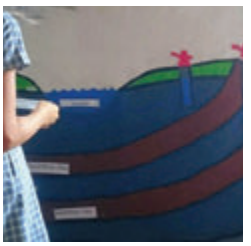
We are at the River Symposium, in Brisbane, come and have a chat.

OCTOBER 2015

In Barmera, SA, with the Central Irrigation Trust and ABARES, hearing from local horticultural growers (citrus, stone fruit, wine grapes, almonds and avocado) about their industry.

NOVEMBER 2015

We travelled the basin from tip to tail in November to meet with communities, landholders and water managers.



Thx to Tamworth public school for gr8 day including Monopoly.

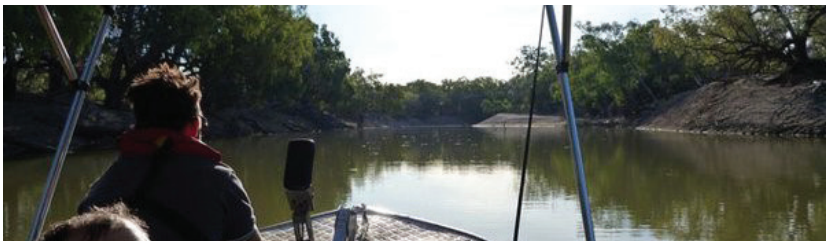
DECEMBER 2015

Congrats to our grads for their recognition from the APSC. We're proud of you.

Worked with the Murray–Darling Freshwater Research Centre to collect samples of water bugs and test water quality at several sites along the upper Murray in Vic.

JANUARY 2016

As part of our Northern Basin Review we funded the mapping of 1,100 km of the Darling River for fish, by NSW DPI and others.



FEBRUARY 2016

Setting up a pilot weather station at Angledool, north-western NSW. Farmers can upload photos of local flows and any weather event on their property.

MARCH 2016

Spent World Water Day at Questacon, in Canberra, talking to students.

APRIL 2016

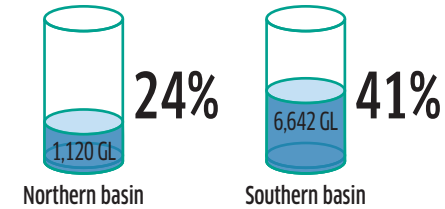
Continued to work with Aboriginal communities to build pictures of life on Country in north-west NSW and southern Qld. We visited Brewarrina, Walgett, Goodooga, Lightning Ridge, Collarenebri, St George, Dirranbandi, Thallon and Mungindi.

MAY 2016

Met with Traditional Owners at Boobera Lagoon, near Goondiwindi, Qld. Also in Shepp & Deni this month to talk with rice growers, Murray Irrigation, local paper, BCC & local councils. Also in #Warren & #Nyngan & #Narromine

June 2016

Water storages in June



OUR HISTORY

99 years and counting...

2004 the National Water Initiative is signed by all governments and aims to achieve a more cohesive national approach to the way Australia manages, measures, plans for, prices and trades water

2003 The Living Murray program is announced, which aims to use 500 GL of water, and associated engineering projects, to improve the health of six icon sites along the River Murray

1917 the River Murray Commission is established

1914 1921 1931 1944 1952 1956 1968 1974 1993

1981 the Murray Mouth closes for the first time in recorded history

1997 the longest drought in Australia's recorded history begins (1997–2010)

1987 the Murray–Darling Basin Agreement is signed establishing the Murray–Darling Basin Commission, replacing the River Murray Commission. The resource-sharing arrangements between the states are expanded to cover the whole Murray–Darling Basin

2007 (early) the Australian Government announces a $10 billion plan to put water use within the basin onto a sustainable footing. This includes new legislation and a substantial investment in water-efficient infrastructure

2007 (late) the Water Act implements key reforms for water management in Australia. It sets out the requirements for a Basin Plan that will set sustainable limits on the amount of surface and groundwater that can be taken from the basin

2012 the Basin Plan becomes law providing for the first time a coordinated sustainable approach to water use across the basin's four states and the ACT

2006

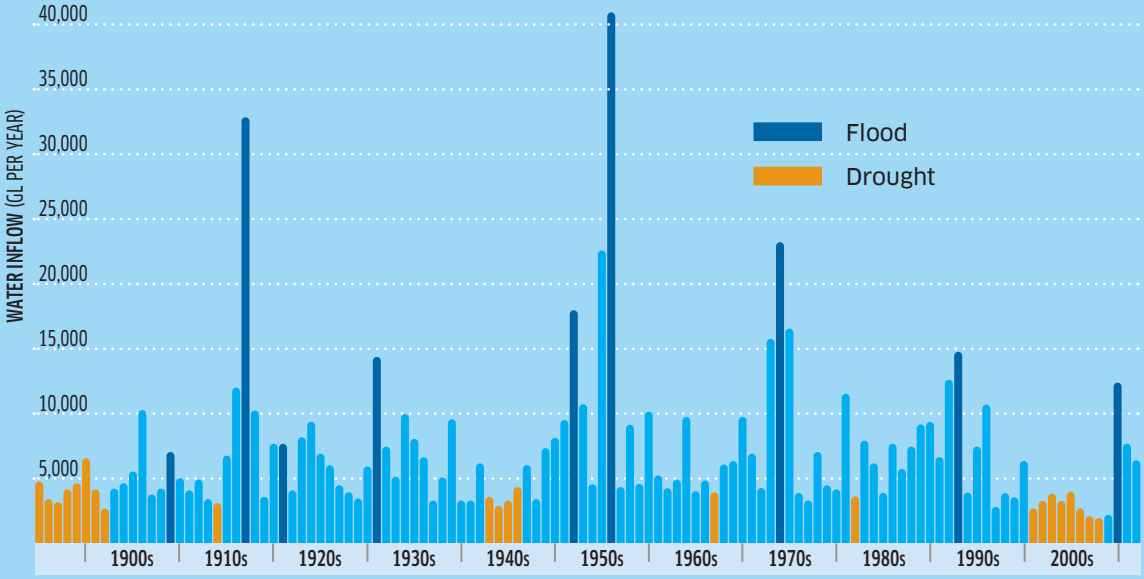
2006 the drought gets worse. Lowest inflows into the River Murray since records began

2010

2008 the Murray–Darling Basin Authority takes over the functions of the Murray–Darling Basin Commission, as well as planning responsibility for the basin's water resources, including groundwater

2015 celebrated 100 years since the beginning of construction of Lock 1 in South Australia. This marked the start of joint construction work on the River Murray by South Australia, New South Wales, Victoria and the Commonwealth

SIGNIFICANT FLOODS AND DROUGHTS



MDBA staff, Authority members and committee members at Bourke, New South Wales (photo by Alisha Caldwell).

03

MANAGEMENT AND ACCOUNTABILITY

MANAGEMENT AND ACCOUNTABILITY

Highlights

- Launched our Reconciliation Action Plan and established our Indigenous Employment Strategy 2015–20.
- Voted 13th in the Australian Graduate Employers' top graduate employers for 2016 and in the top two of Australian Public Service agencies.
- The secretariat provided support to over 44 committee meetings, four of which were Ministerial Council meetings.
- The number of staff who self-identify as Aboriginal increased to 1.24% (up from 0.3% in June last year).
- Progressed our wellbeing strategies and implemented the Workplace Diversity and Inclusion Program 2016–20.

Overview

For the first time since the implementation of the *Public Governance, Performance and Accountability Act 2013*, the MDBA has produced annual performance statements to provide more detailed information on our performance. They allow us to report on the results actually achieved by the MDBA against the targets, goals and key performance indicators that were established at the beginning of the financial year.

The effective management of risk continues to be a key area in the effective management of the MDBA. Our strengths in risk management, according to the Comcover 2016 risk management benchmarking survey, are in establishing a risk management policy, defining responsibility for managing risk and embedding systematic risk management into business processes. Our risk management plan was updated for 2015–16. The business management continuity policy and business continuity plan were also updated.

We continued to support equity and diversity within the workplace through a range of key strategy and action documents implemented in 2015–16. We launched our Reconciliation Action Plan (Strengthening connections), and formed an implementation committee comprised of staff volunteers. We also launched the Indigenous Employment Strategy 2015–20

We also developed our Strategic Workforce Plan 2016–26 to identify key workforce requirements for the medium to long term, and prioritise implementation of the strategies. The workforce plan will guide efforts to recruit, develop and retain MDBA staff in order to successfully deliver our objectives and outcomes.

Challenges and the year ahead

This year's focus on strategic workforce planning is directly relevant to addressing our future workforce challenges along with the implications of a reduction in future funding.

After ten productive years in our current offices, most MDBA staff will be moving to new offices in early 2017. Staff consultation has been carried out at various stages of the relocation process so that the new offices will meet our current and future needs.

Negotiations with staff on the enterprise agreement will continue in 2016–17 to finalise and achieve a replacement.

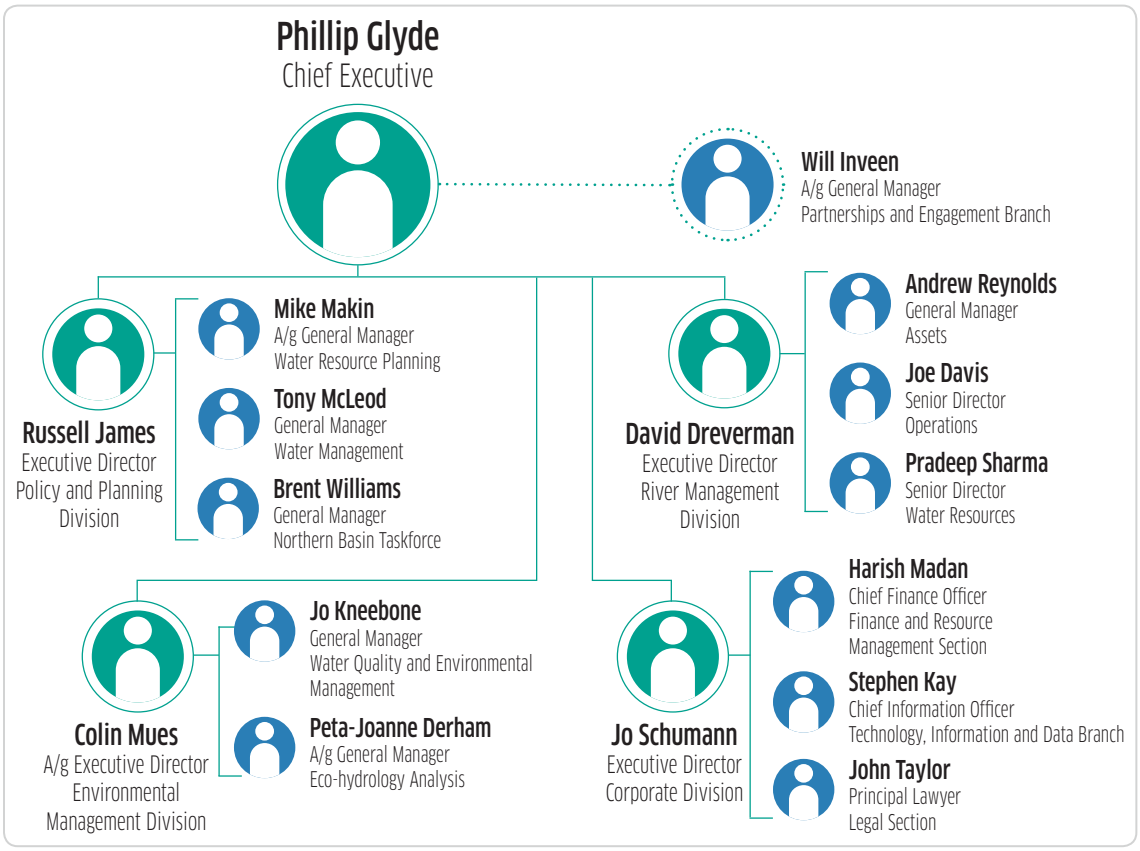


Figure 3.1 The MDBA organisational structure as at 30 June 2016

Our structure

Figure 3.1 shows our organisational structure, made up of four divisions. The River Management Division manages the operation and maintenance of River Murray assets, and the sharing of waters of the River Murray between New South Wales, Victoria and South Australia.

The Policy and Planning Division oversees implementation of the Basin Plan. The Environmental Management Division manages the delivery of environmental management programs and components of the Basin Plan.

The Corporate Division provides legal, finance, human resources, governance, performance reporting, information technology, office administration, security, communications services to the agency as well as secretariat support to high-level committees.

Our governance

We report to the Minister for Agriculture and Water Resources. Our governance comprises:

- the Minister for Agriculture and Water Resources, the Hon. Barnaby Joyce MP
- the six member Murray–Darling Basin Authority
- the Ministerial Council
- the Basin Officials Committee
- the Basin Community Committee.

The MDBA consists of the six member Authority, including the Chief Executive, and MDBA staff. The Murray–Darling Basin is managed through a partnership of the Australian Government and the governments of New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory (the basin states).

The governance arrangements are set out in the *Water Act 2007* which establishes an Australian Government–state cooperative arrangement for the management of basin water resources operating under Commonwealth law. The relationship between these governance bodies is described in Figure 3.2.

THE AUTHORITY

The Murray–Darling Basin Authority (the Authority) consists of the Chief Executive, a part-time Chair and four part-time members. Authority members are appointed by the Governor General and each must have substantial expertise in one or more fields relevant to the activities of the agency – for example, water resource management, hydrology, freshwater ecology, resource economics, irrigated agriculture, public sector management and financial management.

At 30 June 2016 Authority members were:

Neil Andrew (Chair) AO

The Hon. Neil Andrew was welcomed as the new Chair of the Authority in January 2015, replacing the Hon. Craig Knowles. Neil's achievements include election to the Australian House of Representatives in 1983 and appointments as Government Whip (1997) and Speaker of the House of Representatives (1998). He served the Australian Parliament until 2004.

Since retiring from Parliament, Neil has continued a lifelong association with the irrigation industry – particularly horticulture and viticulture. He chaired a review of the South Australian citrus industry and was also chairman of the Crawford Fund in Australia, which provides agricultural research and training to farmers in developing countries. He was appointed an Officer of the Order of Australia in 2008.

Phillip Glyde

Phillip Glyde joined the Authority as Chief Executive on 4 January 2016. Previously, Phillip was a deputy secretary at the Department of Agriculture, where he held positions with responsibility for agriculture, fisheries and forestry policy, corporate and governance functions, as well as international trade and market access, export certification services and the research division – the Australian Bureau of Agricultural and Resource Economics.

A member of the Australian Public Service since 1980, Phillip has worked on natural resource management, industry and environmental policies in a number of Australian Government departments including Prime Minister and Cabinet; Environment; and Resources and Energy.

Phillip has also spent some time working overseas including with the Environment Directorate of the Organisation of Economic Cooperation and Development in Paris, and the Cabinet Office and the Department of Environment, Food and Rural Affairs in the United Kingdom.

Dianne Davidson AM

Dianne Davidson is an agricultural scientist and horticulturist, and has a strong management background in natural resources, particularly water and irrigated agriculture. She is a fourth generation farmer in the Lower Lakes region of the basin and manages her own mixed agricultural business there, as well as carrying out consulting work throughout Australia and internationally.

In the 2015 Queen's Birthday Honours, Dianne was made a Member of the Order of Australia for services to the wine-making industry, to horticultural management science, and to higher education administration.

Susan Madden

Susan Madden was appointed to the Authority in March 2016. She is an agricultural economist with professional services firm GHD and has over 15 years' experience working in agricultural and natural resource management in the public and private sector. Her leadership capabilities and contribution to agricultural and natural resource management over this time have been recognised through a number of industry awards and achievements.

Susan lives in Dubbo, in central west New South Wales, and serves on the Board of the Central West Local Land Services. Previously she was the Executive Officer of regional farming group Macquarie River Food and Fibre. In this role she participated in major government planning reform processes including the review of New South Wales water sharing plans and development of the Basin Plan, as well as water pricing determinations carried out by the Independent Pricing and Regulatory Tribunal and the Australian Competition and Consumer Commission.

Barry Hart AM

Professor Barry Hart is an Emeritus Professor at Monash University and has established an international reputation in the fields of ecological risk assessment, environmental flow decision making, water quality, environmental chemistry and catchment management.

Barry chairs a number of government scientific and strategic advisory committees, and is director of an environmental consulting company. In the 2012 Queen's Birthday Honours, Barry was made a Member of the Order of Australia for services to conservation and the environment.

George Warne

George is a recognised leader in the rural sector, with a strong understanding of rural communities. He has extensive experience in water reform and has worked in the water industry for more than 25 years, including being Chief Executive Officer of Murray Irrigation Limited and State Water New South Wales.

Between 2011 and 2013 he was appointed interim Chief Executive Officer of the Northern Victorian Irrigation Renewal Program and facilitated its transition to form part of Goulburn–Murray Water.

Farewells

During the year, the Authority farewelled Ms Diana Gibbs, whose term as an Authority member expired on 2 February 2016.

The Authority also farewelled Dr Rhondda Dickson, the Chief Executive of the MDBA, on 30 September 2015.

EXECUTIVE TEAM

Executive leadership of the Murray–Darling Basin Authority comprises:

Phillip Glyde
Chief Executive

Phillip Glyde joined the Murray–Darling Basin Authority as Chief Executive on 4 January 2016. Previously, Phillip was a deputy secretary at the Department of Agriculture, where he held positions with responsibility for agriculture, fisheries and forestry policy, corporate and governance functions, as well as international trade and market access, export certification services and the research division – the Australian Bureau of Agricultural and Resource Economics.

A member of the Australian Public Service since 1980, Phillip has worked on natural resource management, industry and environmental policies in a number of Australian Government departments including Prime Minister and Cabinet; Environment; and Resources and Energy.

Phillip has also spent some time working overseas including with the Environment Directorate of the Organisation of Economic Cooperation and Development in Paris, and the Cabinet Office and the Department of Environment, Food and Rural Affairs in the United Kingdom.

David Dreverman
Executive Director
River Management

David Dreverman joined the Murray–Darling Basin Commission in 2000 as Manager Assets and was appointed General Manager River Murray Water in 2003. David transferred to the MDBA in late 2008, when it subsumed the functions of the Murray–Darling Basin Commission.

From 1974 until he joined the Commission David worked in the consulting engineering industry with SMEC; the Hydro-Electric Commission of Tasmania; and Australian Power & Water. He was involved with large dam, hydropower and irrigation projects, both in Australia and overseas. He has led the management of the River Murray system through the millennium drought and the reforms that followed. He has also led a major asset renewals program covering all River Murray Operations assets, including the construction of new environmental works and salt interception schemes.

Russell James
Executive Director
Policy and Planning

Russell James joined the MDBA in 2011, having worked with other Australian Government agencies on water reform, including developing the National Water Initiative and the *Water Act 2007*.

Russell has worked extensively with state government agencies and community stakeholders to finalise the Basin Plan and develop strategies for its implementation. In addition to coordinating Basin Plan implementation across the MDBA, his division also leads on water resource planning, social and economic analysis and advice, and policy development.

Colin Mues

Executive Director
Environmental Management

Colin Mues is in his third year with the MDBA, and is the acting Executive Director, Environmental Management. His division is responsible for environmental water planning and management, as well as providing scientific and model-based advice to support the implementation of the Basin Plan.

Prior to joining the MDBA he was responsible for managing the Murray–Darling Basin water buyback program at the Department of the Environment (Australian Government). The program provided more than half the water which has been recovered for the environment in the Basin Plan.

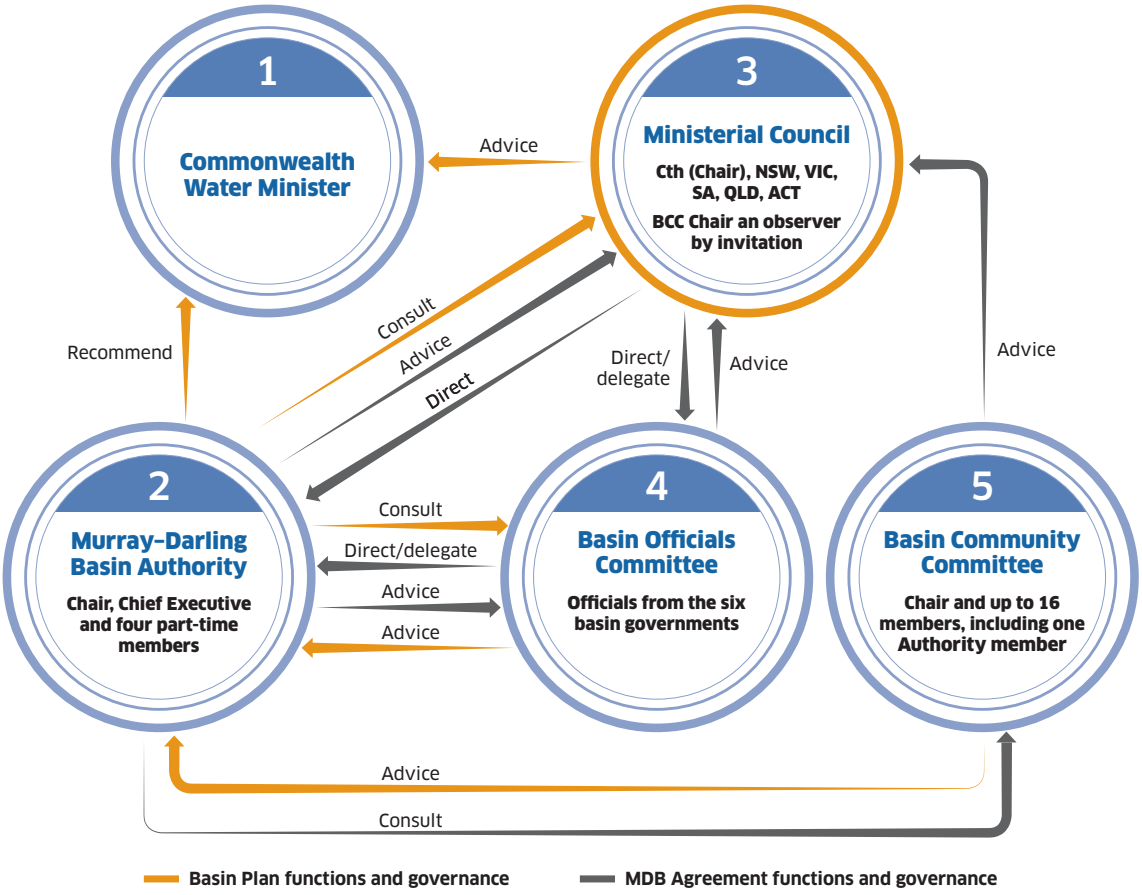
Colin also has considerable experience in natural resource management issues gained from his time at the Australian Bureau of Agricultural and Resource Economics.

Jo Schumann

Executive Director
Corporate Services

Jo Schumann joined the MDBA in 2015 to lead the Corporate Division. Before this Jo was responsible for the Australian Competition and Consumer Commission's corporate services division. She is a very experienced corporate manager, working in similar roles previously in the Department of Veterans Affairs and the Australian Capital Territory Government.

Throughout her career, Jo has been closely involved in managing organisational change. She has led the integration of strategic business approaches and been responsible for substantial improvements in business processes in these agencies.



CORE FUNCTIONS

1. The decision maker on the Basin Plan and chairs Ministerial Council
2. Responsible for developing, implementing, evaluating and reviewing the Basin Plan

   Manages the River Murray system on behalf of joint governments
3. Policy and decision-making roles on state water shares and funding of joint programs as per the MDB Agreement
4. Makes decisions consistent with the delegations from the Ministerial Council and advises on the Basin Plan
5. Provides advice to the Authority and Ministerial Council on Basin community issues

Figure 3.2 Governance of the Murray–Darling Basin Authority

Senior management committees

During the year the senior management committees continued to provide advice and assurance to the Chief Executive and to manage cross-agency aspects of our business.

Executive Committee

The MDBA's Executive Committee, chaired by the Chief Executive, is the key forum in which cross-agency issues on policy and corporate governance are discussed. The committee meets on a weekly basis and comprises the executive directors of our four divisions (policy and planning; environmental management; river management; and corporate), the General Manager, Partnerships and Engagement; and the Director Media.

The committee also includes three external committee members David Butler (Information Management and Technology Committee), Tanya Hammond (People and Culture Committee) and Lisa Corbyn (Compliance Governance Committee).

During 2015–16 the Executive Committee considered strategic and critical management issues such as:

- implementing the Basin Plan, including finalising the Northern Basin Review
- developing submissions and response to the Select Committee on the Murray–Darling Basin Plan
- developing and trialling a citizen science project to record weather events and river flows
- compliance and water resource planning policy positions
- negotiation of a new enterprise agreement
- restructuring of corporate services
- end-of lease discussions
- River Management Operations 'cost spikes' review.

Three sub-committees report to the Executive:

- the Information Management and Technology Committee provides strategic direction and governance for the MDBA's information and technology management
- the People and Culture Committee focuses on all aspects of the MDBA's organisational culture, learning and development initiatives, performance management and recruitment strategies. It also oversees internal communications
- the Budget and Reporting Committee oversees the financial management and corporate reporting aspects of the MDBA.

Information Management and Technology Committee

The Information Management and Technology Committee advises on, and provides strategic direction for our information management and information technology initiatives. It also evaluates and endorses major projects which have information management or information technology components or impacts.

During 2015–16 the group oversaw the development of the MDBA's Project Management Framework and began several large enterprise-wide application development projects.

During the year the Chief Executive became the Chair of the committee. This demonstrated the MDBA's commitment to enhancing service delivery through the appropriate investment in digital technologies. The committee's membership also includes an external advisor who has considerable expertise in developing digital and information solutions in similar organisations.

People and Culture Committee

The first meeting of the People, Communications and Culture Committee (a sub-committee of the Executive Committee) was held in 2015–16. In early 2016 its name was changed to the People and Culture Committee. The purpose of the committee is to ensure a high performing organisation through the development of well-targeted policies and programs addressing people, communications and organisational culture.

The committee will achieve its purpose through the high level management, monitoring and review of relevant policies and programs, consistent with the direction of the Executive Committee, including:

- the MDBA workforce strategy
- ensuring effective workforce management practices through appropriate people policies including workplace diversity, and work health and safety
- recruitment and redeployment
- protective security policy, protocols, delegations and compliance in line with the Protective Security Policy Framework
- the Performance Management Framework
- managing staff awards
- the MDBA graduate and other intake programs
- learning and development framework and programs
- oversighting communication activities.

Health and Safety Committee

The Health and Safety Committee operates in accordance with the *Work Health and Safety Act 2011* and meets quarterly to oversee work health and safety matters across the MDBA. In 2015–16 the committee met in September,

December, March and June. The committee has the following members:

- the Chair who is a member of the MDBA Senior Executive Service and is appointed by the Chief Executive. The Chair for 2015–16 continued to be the General Manager, Constraints Management
- the health and safety representative for each of the three identified work groups, or their deputy in the event they are unavailable (deputies are encouraged to attend all health and safety committee meetings as observers)
- the Chief Emergency Warden, as a representative of workers engaged in the MDBA's emergency management team
- one employee representative from the Employee Consultative Committee
- the Director People and Culture
- a work health and safety practitioner from the people and culture team as nominated by the director.

Work health and safety issues considered by the committee in 2015–16 included:

- sponsoring employee wellbeing activities and promoting staff awareness in conjunction with fostering healthy activity and eating habits, flu vaccination program and health assessments
- improving our work health and safety framework through new and revised policies and guidelines, including our first rehabilitation policy
- oversighting actions to enhance the rehabilitation management system and actively reviewing compensation and non-compensation rehabilitation matters to address systemic issues or hazards
- oversighting the workplace inspection regime and actively addressing potential hazards
- improving the workplace incident and injury reporting arrangements through initiating automated workflows and notifications
- initiating a program of testing and tagging all appropriate electrical appliances and further consultation on rural, regional and remote travel arrangements
- endorsing the transition to a new employee assistance provider and proactive monitoring of trends and issues in reporting
- facilitating involvement of first aid officers, emergency wardens and harassment contact officers in proactive work health and safety preventative arrangements
- reviewing the 'pilot' refurbishment in corporate areas
- oversighting appropriate work health and safety action on specific workplace issues and incidents such as issuing instructions on health and safety matters to staff
- engaging with other 'Persons conducting a business or undertaking' as required by the Work Health and Safety Act.

Employee Consultative Committee

The Employee Consultative Committee was established following the certification of the MDBA Enterprise Agreement 2011–14. The consultative committee comprises an elected employee representative from each of the MDBA's four divisions, elected employee organisation representatives from Professionals Australia and the Community and Public Sector Union, two management representatives and the Chief Executive fulfilling the role of Chair. It facilitates communication, consultation and cooperation with employees on matters affecting the workplace and the operation of the enterprise agreement. The consultative committee provides a forum for:

- staff consultation and input into the decision-making process in relation to changes to existing policies, guidelines or procedures or developing new policies, guidelines or procedures referred to in the enterprise agreement
- consultation and agreement prior to the Chief Executive commencing a formal variation process under the *Fair Work Act 2009* in relation to changes in any current conditions or entitlements included in the enterprise agreement
- providing advice to the Chief Executive on matters arising from the operation of the enterprise agreement.

Although the enterprise agreement is past its nominal expiry date of 30 June 2014, it remains active until the MDBA is able to certify a replacement agreement through the Fair Work Commission. The bargaining process disrupted the meeting schedule during 2015–16 with meetings occurring in December 2015 and April

2016 in addition to progressing a number of policies out of session.

With implementation of the enterprise agreement essentially complete, the review of the policies linked to the enterprise agreement was focused on legislative changes and where improved efficiency in processes could be implemented through policy.

New arrangements for coordinating feedback from consultation on policies were successfully introduced which has significantly improved the MDBA's ability to demonstrate how feedback was considered and, where appropriate, incorporated into revisions of the documents. The Employee Consultative Committee continued to work cooperatively with the Health and Safety Committee to develop and implement key work health safety policies by facilitating consultation and feedback.

Audit Committee

The Audit Committee was established by the Chief Executive under the PGPA Act to provide independent advice and assurance to the Chief Executive. The committee's functions include reviewing the appropriateness of the MDBA's:

- financial reporting
- performance reporting
- system of risk oversight and management
- system of internal control.

The Audit Committee charter and audit protocol were updated during the year. The committee's functions were expanded during the year to include reviewing and providing independent advice and assurance to the Chief Executive. This was in relation to the annual special purpose financial statements of the joint venture River Murray Operations and The Living Murray Initiative assets.

The committee met six times during 2015–16: 22 September 2015, 22 October 2015, 3 November 2015, 3 December 2015, 23 March 2016 and 25 May 2016. The meeting held in October 2015 was a short meeting held specifically to consider and recommend the MDBA 2014–15 financial statements to the Chief Executive for signature. The meeting held in November 2015 was a short meeting to consider presentations on ICT developments in the MDBA.

The Committee's membership remained constant during the year following the appointment of the Deputy Chair Colin Mues and the additional independent member, Jenny Goddard, on 16 July 2015, see Table 3.1.

The committee considered financial management and reporting at each of its meetings except the special meeting in November 2015. Continued attention was paid to the PGPA Act requirements as well as management of financial risks. The committee also considered the new PGPA performance reporting requirements and the MDBA's readiness to meet these requirements.

The committee considered the MDBA's systems of internal control (including policies and procedures, delegations and authorisations and legislation) and activities to monitor compliance with the internal legal control framework.

The committee continued to review internal audit reports and the implementation of audit recommendations and was pleased to note a continued reduction in the number of outstanding audit recommendations over the year. Three internal audit reports were reviewed. The committee also reviewed and recommended to the Chief Executive some changes in the internal audit plan for 2015–16 and the draft internal audit plan for 2016–17.

Table 3.1 Audit Committee membership and number of meetings attended

Member and position appointed under the PGPA Act	Number of meetings attended
Jenny Morison, Chair and independent member	6
Colin Mues, Deputy Chair	6
Jenny Goddard, independent member	6
Advisory members not appointed under the PGPA Act	Number of meetings attended
Russell James, advisory member to 22 September 2015 and in 2016	2
Tony McLeod, advisory member 23 September to 31 December 2015	2
Andrew Reynolds, advisory member	5

Risk management

The effective management of risk continues to be a key area in the effective management of the MDBA. Our risk management framework and policy was developed in 2014–15 to comply with the PGPA Act and better practice. The MDBA's risk management plan was updated for 2015–16 and the business management continuity policy and business continuity plan were also updated.

The Audit Committee and the Executive Committee monitor the risk management framework and implementation of enterprise risk treatments. At a sub-program level risk management is monitored as part of quarterly corporate planning and reporting processes. The MDBA Health and Safety Committee monitors health and safety risks, and the Security Group monitors security risks.

The fraud control plan continues to be monitored by the Executive Committee and the Audit Committee. Our fraud risk assessment and fraud control plan were updated for 2016–18. A mandatory risk management induction and online training on ethics, fraud and conflict of interest (including managing sensitive water market information) was provided for all new employees and contractors during the year.

Comcover – where we can improve

Comcover provides insurance cover to the MDBA. Identifying and assessing our insurable risks is done annually through Comcover's insurance renewal process. The MDBA is separately insured by Comcare for worker's compensation for employees.

The Comcover 2016 risk management benchmarking survey found that the MDBA again achieved risk maturity at the advanced level, which was above the average and in the top 30% of Australian Government entities. The survey determined that our strengths in risk management were in relation to establishing a risk management policy, defining responsibility for managing risk and embedding systematic risk management into business processes.

The elements where the survey found that we could improve the most were: understanding and managing shared risk, communicating and consulting about risk, and maintaining risk management capability.

Fraud control and investigations

Our management of fraud and implementing the fraud control plan is monitored by the Audit Committee. All employees are required to report instances of fraud or suspected fraud. All employees with financial delegations are also required to report any actual or potential fraud related occurrences through the quarterly and annual PGPA compliance reporting process.

Fraud investigations

No instances of fraud were identified in 2015–16.

Business continuity and ICT disaster recovery plans

Our arrangements for recovering from a business disruption are set out in the River Murray system emergency action plan and the MDBA business continuity and ICT disaster recovery plans. All these plans were updated during the year. We also carried out desktop testing of the emergency action plan and the business continuity plan. Our business impact assessment and ICT disaster recovery arrangements were reviewed during the year.

Internal audit

In 2015–16 the consultancy firm KPMG provided internal audit services. The internal audit plans are developed in light of our risk management plan and following consultation with senior managers. This year there was a greater concentration on performance audits than in the previous year. KPMG also assisted with the update of our fraud risk assessment and fraud control plan.

The internal audit reports finalised in 2015–16 were:

- program management – Basin Plan Implementation Committee
- sustainable diversion limits adjustment mechanism method
- PGPA performance management and reporting preparedness.

No serious matters were raised in the reports. Implementing internal audit report recommendations is monitored by the Audit Committee.

Compliance reporting

The PGPA Act requires the MDBA to report significant non-compliance with the finance law. Finance law includes the PGPA Act, the PGPA Rule, instruments made under the PGPA Act (including Accountable Authority Instructions) and Appropriation Acts.

The compliance report process is an important means of identifying and disclosing instances of non-compliance with the PGPA framework, as a basis for continuous improvement. We refined our internal Resource Management Framework during the year. These changes to the MDBA governance framework have allowed for the further improvement and streamlining of operations against a background of strengthened and improved internal controls and risk management.

The MDBA now operates on best practice, which incorporates the spirit of government policy, guidance material issued by the Department of Finance, and mandatory aspects of finance law. Compliance requirements have been tailored to our business and balanced to attain a strong level of assurance whilst minimising processing requirements. We utilise a 'Financial Management Compliance System' to gather data and increase awareness of the Resource Management Framework by requiring all Authorised Officials to complete a questionnaire. This information is then reviewed to ensure breaches are reported correctly.

There were no 'significant' reportable breaches of the PGPA Act, Rules or Australian Government policies for 2015–16.

Secretariat services

The secretariat team provide support to the Authority and a range of committees established to support the MDBA in delivering our business. The team also supports the Murray–Darling Basin Ministerial Council and the Basin Officials Committee established under the Murray–Darling Basin Agreement, under which the joint programs operate.

During 2015–16 the secretariat provided support to over 44 committee meetings, four of which were Ministerial Council meetings. The secretariat initiated over 28 papers for out-of-session consideration by committees, including 12 for the Ministerial Council and 14 for the Basin Officials Committee. We also provided support to sub-committees, including working groups and technical panels across the MDBA.

Appendix C provides more information.

External scrutiny

Auditor-General reports

The MDBA's financial statements are audited by the Auditor-General. No additional audits carried out by the Auditor-General specifically involved the MDBA in 2015–16.

Commonwealth Ombudsman

The Commonwealth Ombudsman made no formal reports relating to the MDBA during 2015–16.

Parliamentary committees

On 24 June 2015, the Senate resolved to establish the Select Committee on the Murray–Darling Basin Plan. The committee was to inquire on the positive and negative impacts of the Basin Plan on regional communities. The committee's report was tabled on 17 March 2016 and contained 31 recommendations. The Australian Government had not tabled a response to the report at the time of preparing the annual report.

Judicial decisions and tribunals

No judicial decisions or decisions of administrative tribunals relating to the MDBA were made during 2015–16.

Legal services

The MDBA's legal services are provided principally through an in-house legal team. We also access external legal services through the legal services multi-use list established by the Attorney-General's Department.

During 2015–16, demand for legal services included:

- advising all MDBA divisions in relation to implementing the Basin Plan 2012

- coordinating joint advice to the basin states on the sustainable diversion limit mechanism
- contributing to the development of legislation
- providing advice to MDBA staff about program delivery and legislative obligations
- assisting with the development of agency policies, procedures and documentation and providing related training to staff.

Privacy

The MDBA treats the personal information we handle in the course of our business in accordance with the *Privacy Act 1988*, including the Australian privacy principles which set out how the MDBA must collect, store, use or disclose, and allow access to and correction of, personal information. Our privacy notice is available on our website <mdba.gov.au>.

The MDBA registered with the Office of the Australian Information Commissioner as a partner in Privacy Awareness Week 2016, which ran from 15 to 21 May 2015, and which is the primary privacy education event in the Asian Pacific region. The theme for 2016 was privacy in your hands with an emphasis on the need for the MDBA to maintain a good understanding of the rights and responsibilities for handling personal information. Training and other activities were provided to allow staff to refresh their knowledge and application of our privacy obligations.

Privacy education is a continuing process in the MDBA and the Privacy Contact Officer provides training as well as timely and best practice support and advice throughout the year on privacy issues.

Freedom of information

The *Freedom of Information Act 1982* (FOI Act) gives individuals the right to access copies of documents held by Australian Government ministers and agencies, with some exceptions.

During 2015–16, we received and finalised one freedom of information request and finalised one request that was on hand at the beginning of the year. All requests were processed in accordance with the statutory timeframes. Reporting obligations under the FOI Act were also met. The MDBA's freedom of information policy and procedures were updated in line with the Australian Information Commissioner's freedom of information guidelines.

Under the FOI Act, we must publish a range of information on our website as part of the Information Publication Scheme, see <mdba.gov.au>. This information includes our structure, what we do and how we do it, appointments, annual reports and consultation arrangements, and contact details for our freedom of information officer. Details of how to obtain information released following freedom of information requests and information routinely provided to parliament are also published online. Our Information Publication Scheme agency plan outlines our approach to the scheme and what we include in our entry and publish online.

Documents we hold

The MDBA holds the following types of documents:

- working files, including correspondence, analysis and advice
- internal administrative records, such as personnel files, staffing and financial records and office procedures
- submissions and comments from the public and stakeholders
- papers relating to new and amending legislation, drafting instructions and draft legislation
- briefing papers and submissions prepared for the Australian Government minister responsible for water
- documents relating to meetings and committees (such as agenda, minutes and reports)
- copies of questions asked in parliament, together with related replies
- tender documents
- government (including agency) policy statements, communiqués, guidelines and media releases
- contracts
- educational materials
- reports on research, water audits and MDBA activities.

How to lodge a freedom of information request

Your request must:

- be in writing
- state that the request is an application for the purposes of the Freedom of Information Act
- provide information about the document(s) to assist us to process your request
- provide an address for reply.

Please note charges may apply.

For more information, contact the MDBA's freedom of information officer:

FOI Officer
Murray–Darling Basin Authority
GPO Box 1801
CANBERRA ACT 2601

email: foi@mdba.gov.au
Phone: 61+2 6279 0100
Fax: 61+2 6248 8053

Directions under section 175 of the Water Act

No directions were given by the Commonwealth Minister under section 175 of the Water Act.

Ministerial and parliamentary business

The MDBA provides our portfolio minister with timely, evidence-based advice or information on key issues through written briefs and meetings. The preparation of responses to ministerial correspondence with information on our policies and programs supports an important function of government. Attending the hearings of the Senate's estimates committees and responding to questions on notice is also an important part of providing information about the policies and programs administered by the MDBA.

Table 3.2 sets out the volume of written advice provided by the MDBA during 2015–16 compared to previous years.

Our people

Highlights

- Launched our Reconciliation Action Plan – Strengthening connections.
- Established the Indigenous Employment Strategy 2015–20 to support our Strengthening Connections Reconciliation Action Plan. The MDBA significantly increased our Aboriginal representation towards the 3% target by 2018.
- Introduced our Disability Action Plan 2015–20 to foster inclusion and increased participation of people with a disability in the MDBA workforce.
- Launched our Strategic Workforce Plan 2016–26 to guide our workforce arrangements to support business capability and objectives.
- Progressed wellbeing strategies and implemented the Workplace Diversity and Inclusion Program 2016–20.

Learning and development

The MDBA is committed to the continuous development of all employees, and offers diverse training opportunities throughout the year.

Courses held in-house this year included: performance management training, working with diversity, bootcamp for the brain: building resilience for high performing teams, administrative law, travel database training, APS job applications and interview skills, working in teams, Skype for business training, coaching and developing others, Australian Public Service Commission ethics and fraud training, privacy in your hands, conducting performance conversations and foundation writing skills.

During 2015–16 the MDBA continued to invest in external specialist training programs for employees. There was also strong attendance at Australian Public Service Commission facilitated

Table 3.2 Volume of written ministerial and parliamentary advice 2011–12 to 2015–16

Type of advice	2011–12	2012–13	2013–14	2014–15	2015–16
Ministerial briefs	32	11	42	63	63
Ministerial correspondence	0	0	0	13	13
Senate Estimates questions on notice	199	68	260	109	109
Parliamentary questions on notice	0	0	0	0	3

courses such as: community engagement, SharePoint, and continued demand for external IT computer training.

We continue to support employees who choose to study at a tertiary level. During 2015–16, 12 employees were approved to receive study assistance. The most popular areas of study were business, financial management and environmental management.

Leadership

During 2015–16, one cohort of executive level 1 employees participated in the MDBA leadership development program. This three month program combined structured learning in a series of facilitated workshops with experiential learning in the form of on-the-job projects relevant to our operational needs.

The key objectives of the program were to:

- build a strong leadership cohort across the organisation with the flexibility to support a matrix workforce structure
- recognise and develop talented executive level staff for succession to senior executive service within the MDBA.

Mentoring program

In February 2016, the MDBA established a formal 12-month mentoring program for employees. The cohort consisted of 23 specifically matched mentor/mentee pairs from the MDBA workforce.

The mentoring program aims to:

- develop and retain talented staff
- provide opportunities to build networks
- provide ongoing support and encouragement to staff to learn from people that can share their experiences.

A second cohort is scheduled to commence in August 2016 and will include some participants from other areas within the Agriculture and Water Resources portfolio in addition to MDBA mentees and mentors.

Personal efficiency program

Several groups from across senior and middle management levels went through the personal efficiency program which has at its core a set of principles designed to streamline work methods and reduce the time taken to complete tasks. Through implementing these structured behaviours and associated tools, the program works to increase the productivity of participants by enabling them to identify the time and capacity needed to undertake work with high value outcomes. Participants in 2015–16 acknowledged changes in their behaviour and linked the learning to improved outcomes.

Coaching program

Coaching and support is offered to staff at a variety of levels as a way to improve leadership, capability, team management and individual performance, as well as to enhance effectiveness. One-on-one coaching sessions formed part of targeted support and development arrangements. By utilising professional organisations with a range of specialities, suitable coaches provide the outcomes that staff are looking for in a supportive and cohesive manner aligned to MDBA objectives.

Internal seminars

Our internal seminar series continued to focus on supporting the professional development of staff. This year, speakers presented on a wide range of topics including our work in the northern basin, the on-farm efficiency program, and modelling. Helen Stagg spoke about her book *Harnessing the River Murray*, which examines the lives of people who constructed the locks and weirs of the River Murray. During NAIDOC Week local Ngunnawal man Tyronne Bell spoke about his culture and sites around Canberra, and former AFL player, Michael O'Loughlin spoke as part of our National Reconciliation Week activities.

Michael O'Loughlin speaking during National Reconciliation Week (photo by Brayden Dykes).

Performance management

The MDBA is committed to creating and maintaining a culture of high performance, achieving results and developing the capabilities of its workforce. The Performance Management Development Scheme requires all employees to establish an annual performance management plan to set and align performance objectives to operational and strategic goals. Although the plan is reviewed regularly, formal assessments against key objectives are conducted at least twice a year.

The performance management scheme is supported by an electronic performance management system ePerform, which is configured to suit our performance review cycle and support the manager and employee to:

- establish realistic and meaningful individual performance objectives and expectations of performance
- align objectives with the MDBA's corporate plan and strategic documents, where these are applicable to the individual employee's role or the work of the team
- foster two-way communication and performance feedback that is constructive, fair and honest.

The scheme provides an opportunity to make sure effective performance feedback is provided to all staff, to:

- provide clarity on the operational and strategic objectives of the roles and responsibilities across the MDBA
- identify and implement strategies to manage areas of performance that is not aligned with the agreed performance management plan
- identify the value of feedback in building capability
- develop a plan to support individual career growth.

Our workforce

A people and culture focus

The MDBA established a stand-alone people and culture section in the Corporate Division from 1 July 2015. The aim of the section is to support the effective management of staff to deliver on organisational objectives by establishing workforce management plans as well as continuing negotiations towards a new enterprise agreement. The human resources function was reviewed to ensure practices, processes and outcomes were being delivered to help achieve the MDBA's business outcomes. This review also incorporated positioning the MDBA in relation to whole-of-government considerations around sharing services across agencies.

The review proposed that the structures and capabilities of the MDBA's people and culture team be transitioned to:

- increase the focus on strategic people and culture services, including reporting
- implement the Strategic Workforce Plan 2016–26
- change the 'functional' process to 'generalist' outcomes
- take a leadership role in broader cultural change
- improve human resources information systems allowing increased automation, digitisation of paperwork, as well as supporting the 'reducing red tape' policy changes
- move transactional services to a shared services or outsourced arrangement
- provide ownership and accountability for maintaining effective and contemporary policies and practices driven by, and held by, the people and culture director.

To address the recommendations of the review, the MDBA has embedded a strategic human resources business partner model to assist us to manage workforce requirements and implement initiatives and strategic human resources solutions. A key driver of this initiative is closer interaction, and providing understanding and support for employees and managers across the organisation, particularly in relation to business focused people and culture initiatives.

Contextualising the operational environment in this manner provides support for complex staffing considerations such as navigating employment arrangements and having the difficult conversations with staff, particularly during times of conflict. This model also assists in strengthening the capabilities of our managers in leading effective performance conversations and improving the wellbeing and inclusion of staff.

Workforce planning

The MDBA has identified efficiencies in the workforce through the enterprise agreement bargaining process, including the review of organisational structures and work synergies for better organisational design. Organisational design approaches have been used to review roles, processes and structures to build on synergies across the organisation and improve span of control, including reporting lines.

We adopted the Australian Public Service generic work level standards and implemented the Australian Public Service Commission's role evaluation tool whereby all vacancies undergo an assessment prior to advertising. The Australian Public Service Job Family Model and span of control information is now starting to be collected to ensure that the MDBA can utilise this data for further segmentation, analysis and assessment of the workforce to inform improved and efficient organisational design decisions.

We developed our Strategic Workforce Plan 2016–26 to identify key workforce requirements for the medium to long term (10 years), and prioritise implementation of the strategies. In particular it seeks to proactively manage risks associated with workforce capacity, capability and flexibility. The workforce plan will guide efforts to recruit, develop and retain MDBA staff in order to successfully deliver our objectives and outcomes. The workforce plan identifies and commits the MDBA to implementing the key initiatives and projects in 2016–17 in relation to the following strategies:

- retain suitable staff across roles which are critical for the delivery of key milestones
- establish effective human resources practices so that specialised capabilities can be 'borrowed' across the organisation and from external sources
- develop critical capabilities for all staff, including technically specialised staff, on fundamental organisational and emerging capabilities
- lead organisational and cultural change to ensure high levels of productivity, engagement, wellbeing and collaboration across our functions
- develop an employment brand and effective people and culture practices to attract diverse and talented employees.

These initiatives are directly relevant to addressing our future workforce challenges and focuses resourcing to high value activities such as strategic workforce planning and talent management.

Australia Day achievement awards

The MDBA recognises high performance by individual employees and teams throughout the year. We recognise that building a culture that values its employees and recognises and rewards outstanding performance is a critical element in attracting and retaining the best people. The Australia Day awards are amongst our highest individual and team accolades. Hosted by the Chief Executive annually they are a formal way to celebrate outstanding achievements and acknowledge employee performance.

The 2016 awards were presented at an all-staff meeting to celebrate Australia Day. A total of 16 nominations were received for various individuals and teams. Individual recipients were Susan Buckle, Belinda Wilson, Harish Madan, Janet Pritchard and Paul Doyle. Team awards recognised the water quality and salinity management team and the Source modelling team.

Determining senior executive service employee remuneration

The MDBA had eight substantive and three acting senior executive service employees at 30 June 2016 in 12 approved senior executive positions. This does not include the Chief Executive who is employed as a statutory office holder.

Rates of pay for senior executive service employees are set by the Chief Executive after consultation with individual employees and in accordance with the MDBA senior executive service remuneration policy. All substantive senior executive service employees' terms and conditions of employment, including remuneration, are covered by determinations made under Section 24(1) of the *Public Service Act 1999*.

Salary increases are aligned with general staff increases available through the enterprise agreement. No senior executive service remuneration increases were applied in 2015–16 as the MDBA had not negotiated a replacement enterprise agreement by 30 June 2016.

Performance pay

Senior executive service and non-senior executive service employees are not eligible for performance pay. However, a non-senior executive service employee at the top, or penultimate increment point, in their salary range may be eligible for one-off bonus as a result of achieving an 'outstanding' performance rating at the end of the performance cycle.

Individual non-senior executive service terms and conditions

In certain circumstances, and where appropriate, terms and employment conditions may be agreed to make an individual flexibility arrangement between the Chief Executive and a non-senior executive service employee.

Enterprise agreement

The expiry date for the Enterprise Agreement 2011–14 was 30 June 2014. The agreement has no facility for general salary increases after 1 July 2013, although incremental advancement linked to suitable levels of performance is available to all staff up to the maximum of the salary range for their classification.

Following the release of the Australian Government Public Sector Workplace Bargaining Policy on 28 March 2014, the MDBA formally commenced consultation and bargaining with employee representatives in May 2014 to develop a replacement enterprise agreement.

The bargaining team held six meetings in the early part of 2015–16 following on from the 14 meetings during 2014–15 and two meetings in 2013–14. Significant progress was achieved by the bargaining representatives in identifying productivity offsets and potential content for the replacement enterprise agreement that would meet the requirements of the bargaining policy.

In November 2015, after taking into account announced changes to the bargaining policy, a formal offer based on content approved under the 2014 bargaining policy was put to staff for consideration. It was not endorsed, by a narrow margin, through the secret ballot process. A staff survey, with a high level of participation at over 53%, was conducted to further inform the bargaining process which recommenced in February with eight bargaining team meetings conducted up to June 2016. Negotiations will continue in 2016–17 to finalise and achieve a replacement enterprise agreement.

Staffing profile

Tables 3.3 and 3.4 and figures 3.3 to 3.5 summarise our staffing statistics for 2015–16.

Recruitment

The interim recruitment arrangements were lifted from 1 July 2015. We have introduced a new streamlined system to make the application process easier and improve opportunities for candidates. We have also committed to use Aboriginal and Torres Strait Islander-specific media for vacancies within identified and special measures positions to increase the number of candidates for these roles.

During 2015–16, we advertised 65 positions externally, attracting 1,017 applications, and 39 temporary vacancies, which were advertised internally. We continued to advertise the MDBA

Table 3.3 The MDBA's staff by employment agreement as at 30 June 2016

Category	2011–12	2012–13	2013–14	2014–15	2015–16
Enterprise agreement	306	287	276	275	306
Non-senior executive service individual flexibility agreements	13	14	14	15	11
SES individuals s. 24(1) determinations	14	12	11	12	8
Chief Executive	1	1	1	1	1
Total	334	314	302	303	326

Note: The Chair and the other four part-time members of the Authority are not included.

Individual flexibility arrangements supplement terms and conditions in the enterprise agreement so these staff are also counted in the enterprise agreement numbers.

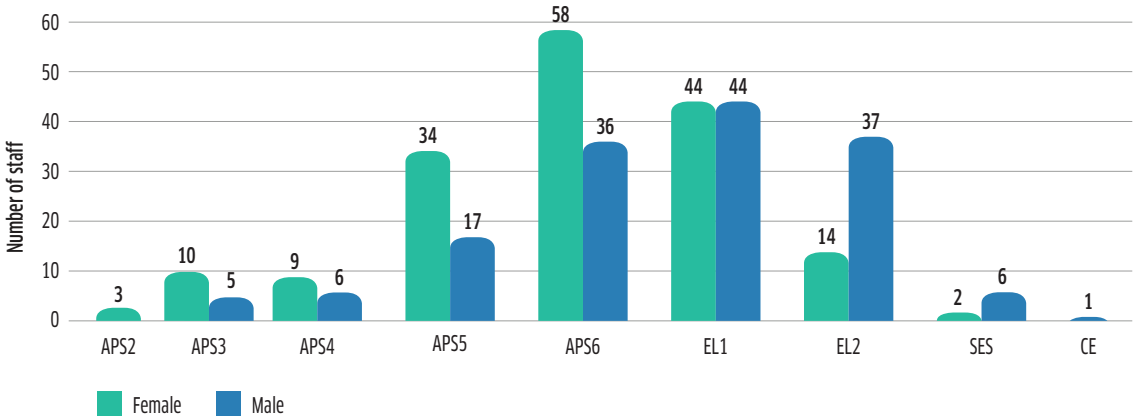


Figure 3.3 The MDBA's classification profile by gender as at 30 June 2016

Table 3.4 The MDBA's staff by employment agreement as at 30 June 2016

	2011–12	2012–13	2013–14	2014–15	2015–16
Ongoing staff	299	289	283	275	301
Non-ongoing staff	35	25	19	28	25
Total	**334**	**314**	**302**	**303**	**326**

non-ongoing register and over 425 candidates registered. The register was implemented to provide an alternative for managers to access quality non-ongoing candidates.

The people and culture team continues to improve the MDBA's induction modules, recruitment guidelines and new starter application packs to provide employees with comprehensive information on conditions of employment and Australian Public Service Commission frameworks.

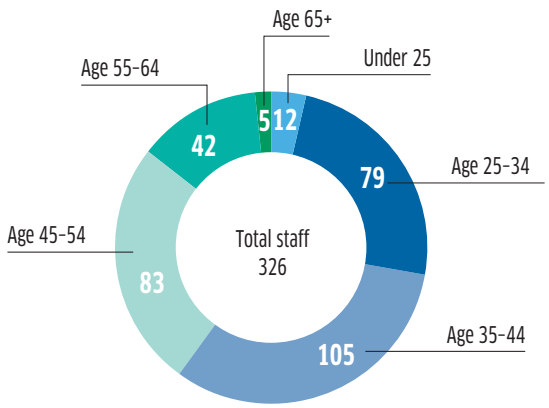


Figure 3.4 Age profile of MDBA staff, as at 30 June 2016

Graduate program

The MDBA was voted 13th in the Australian Association of Graduate Employers' Top 75 graduate employers for 2016. This positioned the MDBA in the top two Australian Public Service agencies, as voted by graduates and third highest public sector agency. This listing is based on feedback from graduates about the program and the support provided by the employer.

This is a clear indication that we value and support our graduates. We have improved our ranking in each of the last three years since first making the Top 75 list.

Eleven graduates began our 11-month graduate program in January 2016 (including one employee engaged from the Australian Public Service Commission Indigenous Pathways program). The program provides graduates with exposure to the MDBA's broad range of work.

The 2016 graduates continue to participate in the Australian Public Service Commission Graduate Development Program. Graduates are supported in their professional development with additional training, including in-house seminars and a field trip which they arrange themselves. The training is designed to equip graduates with the skills and knowledge they will need to make a meaningful contribution to the MDBA and the Australian Public Service.

A graduate selfie from left to right (back row) Sophie, Julia, Vanessa, Antonia, Daniel, Tegan (middle row) Anthony, Kea, Ashleigh and (front row) Duncan and Nathan. They come with a range of qualifications, including environmental science, engineering and law, and are from around Australia, including Adelaide, Brisbane and Melbourne.

The field trip is an opportunity for graduates to further develop their understanding of the MDBA's responsibilities and activities. For the 2015 trip, the graduates arranged visits to industry, agriculture, state government, local government and non-government organisations. The group presented their findings in the internal seminar series.

Diversity

We continue to support equity and diversity within the workplace through a range of key strategy and action documents implemented during 2015–16 namely: the Workplace Diversity and Inclusion Program 2016–20, the Indigenous Employment Strategy 2015–20, and the Disability Action Plan 2015–20.

We are committed to embracing the principles of equity and diversity in our daily business by providing an inclusive work environment that is fair, harmonious and safe and offers opportunities for all employees to achieve their full potential.

Aboriginal Nations where we grew up

MDBA staff come from around the basin, around Australia and around the world. Aboriginal staff at the MDBA come from the Wiradjuri, Biripi, Wakka Wakka and Wulli Wulli Nations.

MDBA staff grew up in Australia on Ngunnawal, Yaitmathang, Wiradjuri, Gadigal, Kaurna, Dharug, Wulgurukaba and Yuin Country, just to name a few. Staff who grew up overseas lived on Algonquian, Sámi, Tolowa, Maori and Semang Country.

Aboriginal and Torres Strait Islander staff

The MDBA has an active Aboriginal and Torres Strait Islander staff network who deliver major cultural events and assist in promoting reconciliation in the MDBA. Each year we celebrate several cultural events and recognised days of significance for Aboriginal and Torres Strait Islander people, including Reconciliation Week and NAIDOC Week.

In July 2016 we launched our Strengthening Connections Reconciliation Action Plan. The working group and staff across the organisation continue to implement it. The Indigenous Employment Strategy 2015–20 was launched at the same time.

The MDBA is actively involved in Indigenous whole-of-government entry level programs focused on Indigenous graduates, trainees and cadets. During 2015–16 we participated in the Indigenous Australian Government Development Program to attract Indigenous employees. The program offers a 15 month development opportunity for Indigenous trainees at the APS 3 level while they complete a Diploma of Government before being advanced to the APS 4 classification.

The MDBA employed one trainee through the development program this year and is actively involved in the 2016–17 process. The Pathways trainee program, through the Australian Public Service Commission, provides APS 1–2 level Indigenous trainees with a structured introduction to the necessary skills and knowledge for a career in the Australian Public Service. We engaged one trainee through this

program in 2015–16 and they will complete a certificate-level qualification during their first year.

The MDBA also engaged an Indigenous graduate through the APSC Indigenous Pathways graduate program who started as part of our 2016 graduate cohort in January 2016. They will participate in a 12 month program with work rotations throughout the year to learn about our business. This will be combined with a structured learning program that contributes towards a masters accreditation if they go on to further study.

We continue to work in partnership with Aboriginal Nations throughout the Murray–Darling Basin, with our vision being to play an active and meaningful role in reconciliation through all that we do.

Since 2006 Reconciliation Australia has assisted Australian public and private sector organisations to develop meaningful and practical plans to help develop relationships, show respect and increase opportunities for Aboriginal and Torres Strait Islander people.

Staff with a disability

The MDBA's Disability Strategy and Action Plan 2015–20 identifies strategies and support measures that assist people with a disability to access our programs, policies and information.

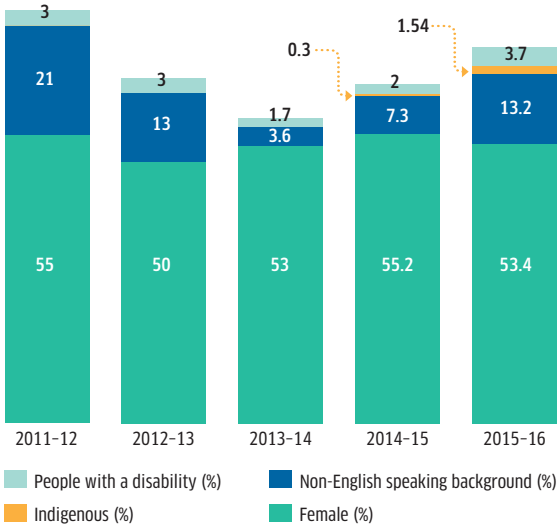


Figure 3.5 MDBA staff by equal employment opportunity group 2011–12 to 2015–16

We are committed to increasing opportunities for people with a disability to participate more broadly in employment opportunities. We also comply with the Australian Government accessibility requirements for online access and publishing. We offer assistive technology during recruitment processes, and also provide furniture and equipment to assist employees with their duties.

The MDBA is a bronze member of the Australian Network on Disability and with the assistance of the disability champion, is seeking ways in which to support staff with a disability, and providing support for awareness raising events such as International Day of People with a Disability.

LGBTI staff

Initiatives identified and tabled in the Workplace Diversity and Inclusion Program 2016–20, include LGBTI awareness training for staff and managers, and the application of the requirements set out in the Australian Government's guidelines on the recognition of sex and gender.

Work health and safety

Executive commitment, work health and safety structure and oversight

The MDBA comprises two 'persons conducting a business or undertaking' under the *Work Health and Safety Act 2011*, the six member Authority and the MDBA. Both the Authority and the MDBA have responsibilities under the Work Health and Safety Act for the safety of their workers and workplaces.

All of our senior executive service employees are officers under the Work Health and Safety Act and have been provided with information and training to assist them in carrying out their responsibilities.

Executive commitment to the maintenance of safe and healthy MDBA workplaces is set out in the MDBA health and safety management arrangements. The commitment of all parties to workplace safety is also set out in the MDBA Enterprise Agreement 2011–14. The MDBA's work health and safety management arrangements are overseen by the MDBA Health and Safety Committee.

After extensive consultation with staff, the MDBA implemented its rehabilitation policy in April 2016. This provides an overarching framework for our rehabilitation management system and supports staff to minimise the impact of work related and non-work related injuries on themselves and their teams.

Effective communication and consultation

Communication and consultation relating to work health and safety continued with MDBA staff during 2015–16 through:

- quarterly meetings of the Health and Safety Committee
- daily notices on the MDBA intranet, email, posters and signage
- mandatory work health and safety induction and training
- consultation with health and safety representatives
- procedures to consult with 'persons conducting a business or undertaking' that share responsibilities for MDBA workers and worksites.

Initiatives ensuring workers' health and safety

Initiatives to ensure workers' health and safety have continued throughout 2015–16, these included:

- regular workplace inspections, risk assessments and monitoring by the Health and Safety Committee
- flu vaccinations
- annual health and wellbeing allowance
- delivering information and programs during the annual health and wellbeing week
- maintaining and providing health and safety information and policies
- conducting workstation assessments by qualified occupational therapists and providing ergonomically suitable equipment recommended as part of these assessments
- providing early intervention services to prevent or mitigate development of chronic injury or illness
- maintaining and developing a range of policies to encourage the health and safety of MDBA workers and workplaces and delivery of training associated with these policies.

Wellbeing program

The 2015 Australian Public Service State of the Service Employee Census informed the MDBA that wellbeing of its employees should be a focus. The Executive committed to action by establishing an ongoing wellbeing program to complement existing wellbeing initiatives, such as the annual Health Week and the Employee Assistance Program.

The program has delivered a variety of initiatives including:

- a resource portal on the MDBA Intranet, on establishing and maintaining a healthy mind and body
- training with a focus on mental health, resilience and managing through periods of change and creating a mentally healthy culture
- access to weekly lunchtime yoga sessions.
- celebrating men's health week, providing training, discussions and activities designed to generate a conversation about improving and sustaining men's health
- structured wellbeing activities throughout the year, designed to deliver a variety of initiatives and raise awareness.

Health and safety outcomes achieved as a result of initiatives

All issues identified through hazard and incident reports and regular workplace inspections were investigated and action taken. The Health and Safety Committee monitors incidents as well as the use of harassment contact officers and the Employee Assistant Program.

Table 3.5 compares work health and safety statistics from 2011–12 to 2015–16.

Comcare investigations conducted or notices issued

Comcare did not conduct any investigations or issue any notices to the MDBA under the Work Health and Safety Act during 2015–16.

The MDBA participated in an audit of the rehabilitation management system and received a conformance rating of 88%. We developed an action plan to address all areas of non-conformance to meet the certificate of compliance guidelines for rehabilitation authorities.

Table 3.5 Work health and safety statistics

	2011–12	2012–13	2013–14	2014–15	2015–16
Internal reports on workplace hazards and incidents	59	50	70	44	16
Lost time caused by incident and injury not reported to Comcare (staff days)	2	8	26.3	4.5	1.5
Lost time caused by incident and injury reported to Comcare (staff days)	17	0	0	10	0
Incidents reported to Comcare	5	0	0	1	0

Comcare premiums

The agency premium rate for each employer provides an indication of the employer's effectiveness in preventing injury or illness and in helping its employees return to work quickly and safely after a work-related injury or illness. The overall scheme premium rate decreased from 1.93% in 2014–15 to 1.85% in 2015–16, Figure 3.6.

Our efforts over the last few years on implementing early intervention strategies are achieving results. The initial premium provided by Comcare for 2015–16 was 2.50% however was revised to 2.25%, an improvement in comparison to 3.05% in 2014–15. In addition, the comparative difference between the MDBA premium and the overall scheme premium has decreased from 1.12% in 2014–15 to 0.4% in 2015–16.

During 2015–16 there were no claims submitted to Comcare, Table 3.6. This is a positive reflection on initiatives to provide support to staff through early intervention practices.

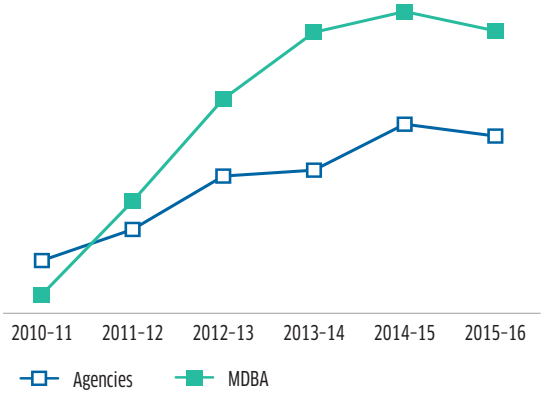


Figure 3.6 MDBA compensation premium rate compared to premium rates for all other agencies combined

Accident and dangerous occurrence statistics

There were no reported accident and dangerous occurrences in 2015–16. Figure 3.7 shows the number of accidents and dangerous incidents notified from 2011–12 to 2015–16.

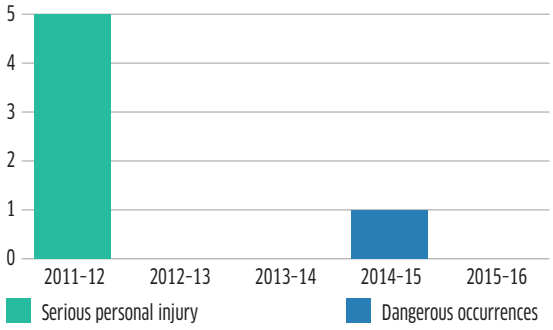


Figure 3.7 Number of accidents and dangerous occurrences

Table 3.6 A comparison between Comcare claims and premiums

	2011–12	2012–13	2013–14	2014–15	2015–16
Number of new claims	5	4	4	1	0
Total cost of new claims ($)	124,407	105,682	61,754	11,625	0
Average cost of new claims ($)	24,882	26,421	10,292	11,625	0
Comcare premium ($)	408,828	628,621	1,094,118	1,080,859	1,062,746
Premium percent of payroll	1.60	2.29	2.74	2.88	2.25
Premium rates for all agencies combined	1.41	1.77	1.81	2.12	1.85

Our planning and finances

Highlights

- With the introduction of the PGPA Act we prepared annual performance statements to report on results.
- Prepared the MDBA corporate plan for 2015–16 setting out our purpose and strategic goals.
- Implemented an enhanced financial management information system.

Business planning

The MDBA carries out complex cross-jurisdictional activities requiring high levels of collaboration and program planning. The efficient and effective delivery of these activities is supported by our integrated planning and reporting framework and annual business planning process.

Our corporate plan outlines our planned activity for the next financial year and the three out years, as required by the *Public Governance, Performance and Accountability Act 2013*. We also generate business plans at the sub-program level, which link up to the corporate plan and the portfolio budget statements. Individual performance discussions complete the strategic planning process by linking individual activity and performance with broader program and organisational plans, Figure 3.8.

Responsibility for setting the MDBA's strategic direction, outlined formally through our corporate plan, rests with the MDBA Executive and consultation with key stakeholders. The MDBA Executive also recognise and incorporate obligations required of the MDBA under the Water Act, including Schedule 1 (the MDBA Agreement) and decisions of the Ministerial Council.

Corporate plan

The *Water Act 2007* and the PGPA Act require us to prepare an annual corporate plan, for Australian Government programs, and provide it to the minister. The corporate plan sets out the purpose andstrategic goals, while describing the operating environment, of the MDBA while meeting our obligations under the Water Act, the Basin Plan 2012 and the Murray–Darling Basin Agreement 2008.

In accordance with the requirements of MDBA's enabling legislation, the Water Act, we also prepare a corporate plan for the joint programs that includes:

- the planned activities of the MDBA for the current financial year, and three out years, as they relate to Goal 4: River Murray asset

Figure 3.8 The relationship of key planning processes with the MDBA

management. This includes new capital works and operational and maintenance programs to be carried out under the Murray–Darling Basin Agreement

- the budget for those activities.

Performance reporting

Performance reporting is an essential aspect of the Australian Government's Public Management Reform Agenda Performance Framework, supported by the PGPA Act. Organisational performance reporting is also an important management activity within the MDBA. It provides essential feedback to stakeholders ensuring that organisational accountability and effort are directed towards the right objectives making sure that the outcomes, outlined in the corporate plan, are delivered.

To make sure that there is accountability in delivering the MDBA's Australian Government and jointly funded programs, we operate a comprehensive performance reporting process. Quarterly performance reports are provided to the Executive team, the Authority, the Basin Officials Committee and Ministerial Council and annual performance statements track the progress of activities related to our strategic goals and performance measures.

Our reporting provides a way for programs to review their activities by enabling stakeholders to provide feedback. This feedback supports day-to-day management, facilitating continuous improvement in our program management standards.

All performance reports outline information on financial and non-financial performance, and include performance against budgets, deliverables, key performance indicators, risks and pressures, and proposed remedial actions.

For the first time since the implementation of the PGPA Act, the MDBA has produced annual performance statements, see p. 70 to 79. The annual performance statements allow the MDBA to report on the results actually achieved against the targets, goals and key performance indicators that were established at the beginning of the reporting year in the portfolio budget statements and the corporate plan.

In 2014–15 we implemented a new performance reporting system, confirming our commitment to improve the efficiency and effectiveness of our performance reporting.

Financial management

During the year the major focus on improved efficiency and effectiveness of financial management has continued with the implementation of an enhanced Financial Management Information System and related procedures to provide improved transparency and control over key financial processes throughout the MDBA.

The enhanced Financial Management Information System supports the MDBA in adhering to new performance reporting requirements under the PGPA Act and provides clear separation and improved control over our reporting obligations.

The MDBA's funding for 2017–18 onwards is declining. The MDBA continues to work with the Department of Agriculture and Water Resources and the Department of Finance to secure stable funding for 2017–18 and the forward estimates.

At the same time it was agreed that the Minister for Agriculture and Water Resources and the Minister for the Environment and Energy would bring forward a joint submission on the extension of funding for Australian Government water functions from 2017–18, including a Functional and Efficiency Review of the Murray–Darling Basin Authority and other Australian Government water-related agencies.

Key areas of focus included the resourcing of corporate functions and core services and the opportunities to share or outsource financial management services in a phased manner.

The recommendations of the Functional Efficiency Review support the decision of the MDBA to realise the benefits that shared service arrangements can offer. The likelihood of achieving transition within the stated timeline appears optimistic given the current level of progress.

Financial performance

Revenues

The MDBA receives revenue from three sources:

- Australian Government (for Basin Plan related functions)

- contributions from Australian, state and territory governments (for Murray–Darling Basin Agreement-related functions)
- other, such as rent for land and cottages; royalty from hydropower generation; and interest.

During 2015–16, the MDBA received $71.7 million (compared to $55.6 million in 2014–15) in revenues from Government. This increase in revenues is primarily due to an increase in revenue for the South Australian Riverland Floodplains Integrated Infrastructure Program. Total revenue received for this program in 2015–16 was $25 million (compared to $7 million in 2014–15).

Contributions from jurisdictions was $77.7 million (compared to $64.1 million). The increase in contributions was due to the restoration of previously deferred activities.

Other revenues of $14.7 million (compared to $6.9 million in 2014–15) included $5.1 million in hydropower generation (compared with $1.4 million in 2014–15).

Expenditures

The MDBA's total expenditure for 2015–16 was $164.4 million (compared to $137.9 million in 2014–15) the change is primarily due to the South Australian Riverland Floodplains Integrated Infrastructure Program. Table 3.7 outlines the main features of our financial performance.

Financial position

The MDBA's net equity position decreased in 2015–16 by $2.2 million to $60.8 million. This decrease is the result of additional expenditure on the Environmental Works and Measures Program which is nearing completion.

Assets and asset management

The MDBA's financial and non-financial assets at the end of 2015–16 were $83.9 million and $4.7 million. Our financial assets consist primarily of cash and cash equivalents. Our non-financial assets consist of ICT infrastructure and office fit-out and equipment.

Liabilities

Liabilities administered directly by the MDBA at the end of 2015–16 amounted to $27.9 million. Our liabilities mainly consist of amounts owing to suppliers and provisions for employee entitlements.

Total equity

The MDBA ended the year with a total equity of $60.8 million, Table 3.8, consisting mainly of cash resources, minor fixed assets offset by trade creditors and employee liabilities.

Managed assets: joint ventures

Two joint ventures were established through separate agreements: the Asset Agreement for River Murray Operations Assets 2009; and the Further Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray–Darling Basin – Control and Management of The Living Murray Assets 2009.

Under the agreements the MDBA has responsibility for managing the following classes of assets:

- River Murray Operations assets
- water entitlements acquired to achieve the objective of The Living Murray Initiative.

The assets are controlled and held by the two unincorporated joint ventures.

Table 3.7 MDBA financial performance from 2011–12 to 2015–16

	MDBA	2011–12 Actuals $'000	2012–13 Actuals $'000	2013–14 Actuals $'000	2014–15 Actuals $'000	2015–16 Actuals $'000
Outcome 1 and total departmental	Revenue	172,170	155,802	137,434	127,058	164,136
	Expenses	199,512	204,729	169,274	138,244	164,416
	Surplus (deficit)	(27,342)	(49,126)	(31,876)	(11,186)	(280)

Table 3.8 MDBA equity at from 2011–12 to 2015–16

Measurement	2011–12	2012–13	2013–14	2014–15	2015–16
Assets	207,879	154,456	108,038	96,695	88,648
Liabilities	52,607	48,310	33,768	33,611	27,853
Total equity	155,272	106,146	74,270	63,084	60,795

At 30 June 2016, the River Murray Operations assets joint venture held net assets of $2.6 billion including the Hume and Dartmouth dams and the locks and weirs on the River Murray. During 2015–16 the River Murray Operations assets increased by $33 million due to the addition of constructed assets and the increase for the agreed internal management valuation methodology.

The Living Murray joint venture held net assets of $606.8 million comprising gross investment in water recovery measures of $695.9 million and accumulated impairment losses of $89.1 million. The significant change in The Living Murray asset values during 2015–16 was the impairment reversal on water entitlements of $67 million.

Procurement

The MDBA conducted procurement activities in 2015–16 in accordance with the Commonwealth Procurement Rules.

Consultancy services

The MDBA engages consultants when it requires specialist expertise or when independent research, review or assessment is required. Consultants are typically engaged to investigate a defined issue; carry out defined reviews or evaluations; or provide independent expert advice, information or creative solutions to assist in the MDBA's decision making.

The decision to engage a consultant is made in accordance with the *Public Governance, Performance and Accountability Act 2013* and related regulations, including the Commonwealth Procurement Rules and relevant internal policies.

All new consultancy contracts entered into in 2015–16 valued at $10,000 (inclusive of GST), or more, are published on the AusTender website, <tenders.gov.au>.

Procurement initiatives to support small business

The MDBA supports small business participation in the Australian Government procurement market. Small and medium enterprises and small enterprise statistics are available on the Department of Finance's website <finance.gov.au/procurement/statistics-on-commonwealth-purchasing-contracts/>.

Our procurement processes support small and medium enterprises by:

- following the small business engagement principles (outlined in the Australian Government's industry innovation and competitiveness agenda), such as communicating in clear, simple language and presenting information in an accessible format
- using electronic systems or other processes to facilitate on-time payment performance, including the use of payment cards.

All contracts with a value of $10,000 or more were reported on AusTender during 2015–16.

Grants

Information on grants awarded by the MDBA during 2015–16 is available on our website at <mdba.gov.au/about-mdba/tenders-grants>.

Accommodation

The MDBA has two offices in Canberra, located at 40 and 51 Allara Street, Canberra City. We also maintain small offices at 213 Greenhill Road, Eastwood, Adelaide, South Australia and at 123 Margaret Street, Toowoomba, Queensland. The combined premises are managed to meet the MDBA's existing and foreseeable accommodation needs.

Our information resources

Information and communications technology

During 2015–16 the Information and Communication Branch changed its structure to improve the alignment of ICT services to MDBA business capability. The structure has been adapted from the customer centric IT service management processes of the Information Technology Infrastructure Library. The new structure has two teams, one dedicated IT operations and the other service strategy and design.

The IT operations team provides services to support the organisation's geospatial data analysis capability, records management, library services, client services and infrastructure support.

The geospatial information services team provides:

- management of MDBA geospatial services including licensing and support
- spatial analysis, mapping and remote sensing services.

The records management team provides:

- management, training and governance of records keeping systems and methodologies in the MDBA
- training and configuration.

The library provides:

- maintenance of library catalogue and subscriptions
- emphasis on research assistance for science and research staff.

Client services provides:

- first and second level support for MDBA ICT systems
- training services.

The web services team provides:

- maintenance of the MDBA external internet and internal intranet websites
- the MDBA with the tools and support to conduct business and communicate information to stakeholders.

The infrastructure team provides:

- configuration and maintenance of ICT server and network infrastructure including voice services
- maintenance of licensing and support for MDBA systems.

Key accomplishments included:

- restructuring the library services to provide specialist research skills and access for the MDBA to relevant, up to date electronic journals and subscriptions
- implementing projects encompassing disaster recovery, geospatial data management and utilisation pilots
- renewing the Whole of Government Microsoft Volume Sourcing Agreement for software
- procuring multi-configuration laptops to enable mobility and activity-based working activities
- restructuring mobile billing arrangements to leverage grouped data plans and achieve significant annual saving.

The service strategy and design team is responsible for identifying, developing and delivering ICT projects in accordance with MDBA business requirements.

Key accomplishments included:

- releasing the MDBA ICT Strategy
- establishing a project management framework under the guidance of the Information Management and Technology Committee
- developing a customer relationship database to support the engagement of the MDBA's stakeholders
- developing reporting tools that improve data analysis of environmental water trends
- developing analytical tools that allow geospatial data to be used to predict river volume and environmental outcomes
- working with Geoscience Australia to develop innovative methods to use observational data such as Landsat satellite imagery to support the analysis of river flows.

The Lower Lakes, South Australia, one of the priority sites for environmental water in 2015–16 (photo by Andrew Beer).

04

FINANCIAL PERFORMANCE

CHIEF FINANCE OFFICER'S REPORT

During 2015–16 the MDBA reported an operating deficit of $0.3 million, which compared to an approved operating deficit of $17.7 million. Significant fluctuations in spending against the budget are due to the impact of the complex nature of joint programs, which reflect a high level of inherent risk associated with capital construction and environmental projects.

Some reasons for delays included:

- work at the major dam sites is only possible at certain times of the year
- work on other infrastructure projects is also impacted by the levels in the rivers
- accessibility of the terrain around construction sites (such as wetlands) may be restricted at certain times of the year
- cultural heritage issues (such as protecting cultural sites) may require complex and lengthy approvals which can lead to further delays.

In 2015–16 this resulted in actual expenditure being less than budget, in particular due to lower activity relating to the Environmental Works and Measures Program (page 51).

Programs were delivered costing $164.4 million (compared to $137.9 million in 2014–15). Contributions from jurisdictions were $77.7 million (compared to $64.0 million in 2014–15) and revenue from Government was $71.7 million (compared to $55.6 million in 2014–15). The MDBA continued to manage over $4.9 billion (gross value) in assets comprising dams, weirs, locks and water entitlements used for achieving The Living Murray Initiative objectives.

Other revenue received of $14.7 million (compared to $6.9 million in 2014–15) comprised interest, rent for land and cottages, royalty from hydropower generation and grant funding.

The *Public Governance, Performance and Accountability Act 2013* has brought about significant changes to the way in which the MDBA approached its overall resource management. Consistent with 2014–15, the MDBA's operating account sits outside of the consolidated revenue fund and the transactions and financial position of the South Australian Riverland Floodplains Integrated Infrastructure Program, previously treated as an administered item prior to 1 July 2014, are reported in the main body of the MDBA's financial statements and notes.

The transactions during 2015–16 for the South Australian Riverland Floodplains Integrated Infrastructure Program did not result in any residual assets or liabilities.

The MDBA's closing equity (net assets) is $60.8 million (compared to $63.1 million in 2014–15).

On 21 September 2015, machinery of government changes transferred responsibility for water policy and resources from the Department of the Environment to the Department of Agriculture and Water Resources. In 2015–16, the MDBA received its departmental and administered appropriations directly under the Appropriations Act. In 2016–17 funding will be appropriated to the Department of Agriculture and Water Resources and is specified within the Annual Appropriation Bill as a payment to the MDBA.

Financial results

Figure 4.1 shows there has been an increase in contributions received from the jurisdictions and there has been a steady level of revenue received from Government, which represents core funding for Basin Plan related functions.

Own source revenue increased in 2015–16 primarily due to the impact of water volumes released from Dartmouth being much greater than the previous year. As a result revenue from electricity generation and the associated Renewable Energy Certificates was greater. In addition an audit of Renewable Energy Certificate payments over past years identified additional revenue owing from the power station owner. This was received in 2015–16.

Figure 4.2 shows revenue received, expenditure incurred and the available funds. Available funds represent the funds held by the Murray–Darling Basin Commission that were transferred to the MDBA during 2008. A significant component of these funds has been applied for key River Murray construction projects, including the Environmental Works and Measures Program, and the MDBA share in the

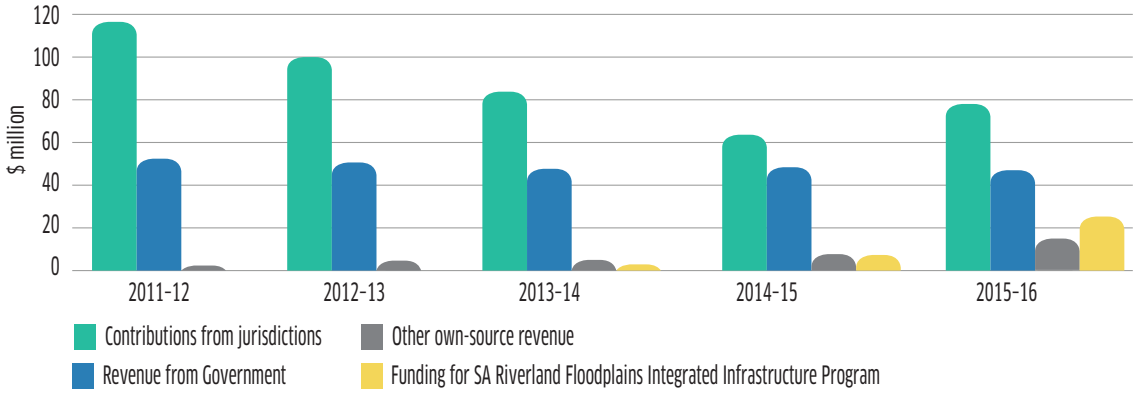


Figure 4.1 MDBA revenue (2011–12 to 2015–16)

Notes:

- The 2011–12 and 2012–13 contributions include a one-off contribution of $10 million each year for the Hume Dam Improvement project.
- The 2011–12 and 2012–13 revenue from Government figures include a $3.3 million one-off contribution each year for the above Hume Dam Improvement project.

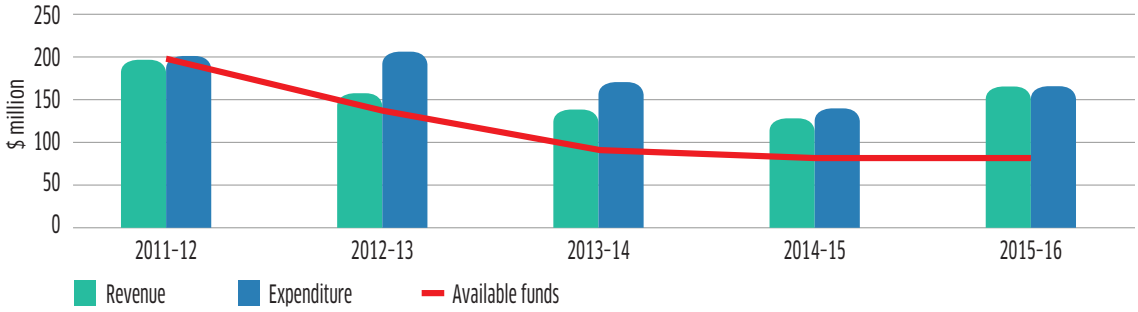


Figure 4.2 MDBA expenditure and special account (2011–12 to 2015–16)

Notes:

- The expenditure on Environmental Works and Measures Program, which was funded from a special appropriation in 2009 represents the declining balance in available funds.
- The MDBA became a corporate Commonwealth entity with the commencement of the *Public Governance, Performance and Accountability Act 2013*; one implication was that the MDBA special account under the Financial Management Act was abolished and the funds were drawn from the special account on 30 June 2014. The figures above include previous balances of the special account and amounts now held in 'cash at bank' for comparative purposes.

acquisition of water entitlements for The Living Murray Initiative, all of which has resulted in the declining cash reserves.

General and special purpose reporting

The MDBA's general-purpose financial report sets out our objectives and refers to our economic dependency on the Australian Government in order to administer the entity and its functions.

A key function of the MDBA is as an asset manager for key infrastructure assets throughout the basin. Infrastructure assets comprise $2.6 billion (written down value) in River Murray Operations assets (such as Hume and Dartmouth dams, and the locks and weirs on the River Murray). More assets are being added as major water management structures are completed under the Environmental Works and Measures Program.

The MDBA also manages $606.8 million in water entitlements through The Living Murray program. These assets were either purchased from the market or acquired as a result of environmental water infrastructure projects. These assets are subject to valuation on an annual basis and are valued (on a consistent basis) in accordance with Australian accounting standards.

The River Murray Operations and The Living Murray assets do not form part of the MDBA's general-purpose financial statements. They are reported separately in special-purpose financial statements on behalf of the state controlling governments that control these assets. These special-purpose financial statements do not form part of this annual report, but are independently audited on an annual basis.

In turn, the asset values reported in the special-purpose financial statements provide the formal basis for the Australian Government, and other state-controlling governments, to reflect their controlling shares in these assets in their respective financial statements.

Internal controls

The Auditor-General has advised that the MDBA has appropriate financial controls in place and that these operated effectively and reliably during the past year. Similarly, no major issues have been identified by the MDBA's internal auditors.

It is relevant to note that we have:

- a sound internal control framework, including effective identification and management of business risks in the MDBA, with supporting procedures in place
- reliable financial and management reporting systems
- complied with applicable laws, regulation and government policies (including reporting on the results of using mandatory compliance reporting).

The implementation of the key elements of the Enhanced Commonwealth Performance Framework represents the next major phase of reforms and we have begun work on implementing the necessary changes.

FINANCIAL STATEMENTS

Murray-Darling Basin Authority

STATEMENT BY THE ACCOUNTABLE AUTHORITY AND ACTING CHIEF FINANCE OFFICER

In our opinion, the attached financial statements for the year ended 30 June 2016 comply with subsection 42(2) of the *Public Governance, Performance and Accountability Act* 2013 (PGPA Act), and are based on properly maintained financial records as per subsection 41(2) of the PGPA Act.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Murray-Darling Basin Authority will be able to pay its debts as and when they fall due.

Signed.....

Phillip Glyde
Chief Executive
27 September 2016

Signed.....

Harish Madan
Acting Chief Finance Officer
27 September 2016

Australian National
Audit Office

INDEPENDENT AUDITOR'S REPORT

To the Minister for Agriculture and Water Resources

I have audited the accompanying annual financial statements of the Murray-Darling Basin Authority for the year ended 30 June 2016, which comprise:

- Statement by the Accountable Authority and Acting Chief Finance Officer;
- Statement of Comprehensive Income;
- Statement of Financial Position;
- Statement of Changes in Equity;
- Cash Flow Statement; and
- Notes to and forming part of the financial statements.

Opinion

In my opinion, the financial statements of the Murray-Darling Basin Authority:

(a) comply with Australian Accounting Standards and the *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015*; and

(b) present fairly the financial position of the Murray-Darling Basin Authority as at 30 June 2016 and its financial performance and cash flows for the year then ended.

Accountable Authority's Responsibility for the Financial Statements

The Chief Executive of the Murray-Darling Basin Authority is responsible under the *Public Governance, Performance and Accountability Act 2013* for the preparation and fair presentation of annual financial statements that comply with Australian Accounting Standards and the rules made under that Act and is also responsible for such internal control as the Chief Executive determines is necessary to enable the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on the financial statements based on my audit. I have conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. These auditing standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

GPO Box 707 CANBERRA ACT 2601
19 National Circuit BARTON ACT
Phone (02) 6203 7300 Fax (02) 6203 7777

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the Accountable Authority of the entity, as well as evaluating the overall presentation of the financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Independence

In conducting my audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the requirements of the Australian accounting profession.

Australian National Audit Office

John Jones

Executive Director

Delegate of the Auditor-General

Canberra

27 September 2016

Statement of Comprehensive Income

for the period ended 30 June 2016

	Notes	2016 $'000	2015 $'000	Original Budget $'000
NET COST OF SERVICES				
Expenses				
Employee benefits	1.1A	**36,920**	37,674	39,801
Suppliers	1.1B	**87,504**	83,487	106,558
Grants	1.1C	**37,483**	15,292	25,000
Depreciation and amortisation	2.2A	**2,034**	1,408	2,316
Write-down and impairment of assets	1.1D	**460**	27	-
Finance costs	1.1E	**4**	38	-
Losses from asset sales		**-**	19	-
Total expenses		**164,405**	137,945	173,675
Own-Source Income				
Own-source revenue				
Contributions from jurisdictions	1.2A	**77,708**	64,098	80,708
Grants	1.2B	**1,742**	1,165	-
Interest		**1,698**	2,167	-
Other revenue	1.2C	**11,279**	3,569	3,507
Total own-source revenue		**92,427**	70,999	84,215
Gains/(Losses)				
Other Gains/(Losses)	1.2D	**(27)**	490	-
Total Gains/(Losses)		**(27)**	490	-
Total own-source income		**92,400**	71,489	84,215
Net cost of services		**(72,005)**	(66,456)	(89,460)
Revenue from Government	1.2E	**71,736**	55,569	71,736
Share of deficit of joint ventures accounted for using the equity method		**-**	(310)	-
Surplus/(Deficit) attributable to the Australian Government		**(269)**	(11,197)	(17,724)
OTHER COMPREHENSIVE INCOME				
Changes in asset revaluation surplus		**(11)**	11	-
Total comprehensive income attributable to the Australian Government		**(280)**	(11,186)	(17,724)

The original budget comprises of both the Administered budget and Departmental budget as disclosed in the Portfolio Budget Statements (PBS) 2015-16.

The above statement should be read in conjunction with the accompanying notes.

Budget Variances Commentary

Budget variance explanations are outlined in Note 7.

Statement of Financial Position
as at 30 June 2016

	Notes	2016 $'000	2015 $'000	Original Budget $'000
ASSETS				
Financial assets				
Cash and cash equivalents	2.1A	**80,963**	81,271	51,336
Trade and other receivables	2.1B	**2,975**	4,066	5,707
Total financial assets		**83,938**	85,337	57,043
Non-financial assets				
Leasehold improvements	2.2A	**414**	1,002	-
Property, plant and equipment	2.2A	**1,205**	1,041	1,313
Intangibles	2.2A	**1,601**	9,261	7,258
Other non-financial assets	2.2B	**1,490**	54	281
Total non-financial assets		**4,710**	11,358	8,852
Total assets		**88,648**	96,695	65,895
LIABILITIES				
Payables				
Suppliers	2.3A	**15,935**	15,846	14,669
Other payables	2.3B	**1,702**	6,554	11,769
Total payables		**17,637**	22,400	26,438
Provisions				
Employee provisions	4.1A	**9,968**	10,994	10,781
Other provisions	2.4A	**248**	217	669
Total provisions		**10,216**	11,211	11,450
Total liabilities		**27,853**	33,611	37,888
Net assets		**60,795**	63,084	28,007
EQUITY				
Contributed equity [1]		**(11,199)**	(11,199)	(11,199)
Reserves		-	11	-
Retained surplus		**71,994**	74,272	39,206
Total equity		**60,795**	63,084	28,007

The above statement should be read in conjunction with the accompanying notes.

1. Please refer to the Statement of Changes in Equity for more information.

Budget Variances Commentary

Budget variance explanations are outlined in Note 7. The original budget balances have been adjusted so as to be consistent with the financial statement classification.

Statement of Changes in Equity
for the period ended 30 June 2016

	2016 $'000	2015 $'000	Original Budget $'000
CONTRIBUTED EQUITY/CAPITAL[1]			
Opening balance			
Balance carried forward from previous period	**(11,199)**	(11,199)	(11,199)
Closing balance as at 30 June	**(11,199)**	(11,199)	(11,199)
RETAINED EARNINGS			
Opening balance			
Balance carried forward from previous period	**74,272**	85,469	56,930
Adjustment for errors	**(2,009)**	-	-
Adjusted opening balance	**72,263**	85,469	56,930
Comprehensive income			
Surplus/(Deficit) for the period	**(269)**	(11,197)	(17,724)
Other comprehensive income	-	-	-
Total comprehensive income	(269)	(11,197)	(17,724)
Closing balance as at 30 June	**71,994**	74,272	39,206
ASSET REVALUATION RESERVE			
Balance carried forward from previous period	**11**	-	-
Adjusted opening balance	**11**	-	-
Comprehensive income			
Other comprehensive income	**(11)**	11	-
Total comprehensive income	**(11)**	11	-
Closing balance as at 30 June	**-**	11	-
TOTAL EQUITY			
Opening balance			
Balance carried forward from previous period	**63,084**	74,270	45,731
Adjustment for errors	**(2,009)**	-	-
Adjusted opening balance	**61,075**	74,270	45,731
Comprehensive income			
Surplus/(Deficit) for the period	(269)	(11,197)	(17,724)
Other comprehensive income	(11)	11	-
Total comprehensive income	**(280)**	(11,186)	(17,724)
Closing balance as at 30 June	**60,795**	63,084	28,007

The above statement should be read in conjunction with the accompanying notes.

1. The negative contributed equity is a historical legacy relating back to the transition of the Murray-Darling Basin Commission (MDBC) to the Murray-Darling Basin Authority on 15 December 2008. As part of the transition arrangement, all cash held by the MDBC totalling $441.488m was paid back to the Official Public Account (OPA) before being appropriated to the Authority. Once appropriated to the Authority these funds were recorded as revenue in the Authority's accounts.

Liabilities of $19.180m and assets of $7.981m were transferred to the Authority during the 2008-09 financial year. The excess of liabilities over assets of $11.199m continues to be shown in the Financial Statements of the Authority as negative contributed equity.

Budget Variances Commentary

Budget variance explanations are outlined in Note 7.

Cash Flow Statement
for the period ended 30 June 2016

	Notes	2016 $'000	2015 $'000	Original Budget $'000
OPERATING ACTIVITIES				
Cash received				
Receipts from Government		**71,736**	55,569	71,736
Contributions from jurisdictions		**77,708**	64,098	77,708
Grants		**1,530**	1,710	-
Interest		**1,674**	2,167	-
Net GST received		**8,756**	7,477	13,534
Other		**8,867**	4,434	3,507
Total cash received		**170,271**	135,455	166,485
Cash used				
Employees		**39,017**	36,010	39,801
Suppliers		**92,267**	93,043	117,592
Grants		**37,483**	14,365	27,500
Total cash used		**168,767**	143,418	184,893
Net cash received/(used by) operating activities	3.2A	**1,504**	(7,963)	(18,408)
INVESTING ACTIVITIES				
Cash used				
Purchase of property, plant and equipment		**1,153**	544	425
Purchase of intangible assets		**659**	1,649	1,585
Total cash used		**1,812**	2,193	2,010
Net cash used by investing activities		**(1,812)**	(2,193)	(2,010)
Net decrease in cash held		**(308)**	(10,156)	(20,418)
Cash and cash equivalents at the beginning of the reporting period		**81,271**	91,427	71,754
Cash and cash equivalents at the end of the reporting period	2.1A	**80,963**	81,271	51,336

The above statement should be read in conjunction with the accompanying notes.

Budget Variances Commentary

Budget variance explanations are outlined in Note 7.

Overview

Objectives of the Murray-Darling Basin Authority

The Murray-Darling Basin Authority (the Authority) is an Australian Government controlled corporate Commonwealth entity established by the *Water Act 2007*. It is a not-for-profit entity. The principal objective of the Authority is to manage the Murray-Darling Basin's water resources in the national interest so that there may be an equitable and sustainable use of the Basin's resources.

The Authority is structured to meet the following outcome:

Outcome 1*: Equitable and sustainable use of the Murray-Darling Basin by governments and the community including through the development and implementation of a Basin Plan, operation of the River Murray system, shared natural resource management programs, research, information and advice*.

The continued existence of the Authority in its present form and with its present programs is dependent on:

- Funding from Basin jurisdictions towards meeting the cost of Murray-Darling Basin Agreement functions; and
- Government policy and on continuing funding by Federal Government for the Authority's administration and programs relating to the Basin Plan and Murray-Darling Basin Agreement functions.

The Authority's activities contributing toward these outcomes are classified as departmental. Departmental activities involve the use of assets, liabilities, income and expenses controlled or incurred by the Authority in its own right.

From 1 July 2013, the Authority became responsible for administered activities in respect of the South Australian Riverland Floodplains Integrated Infrastructure Project (SARFIIP). SARFIIP aims to enhance the effectiveness of improved environmental flows to South Australia in particular at the Pike and Katarapko - Eckert's Creek (Katfish Reach) Floodplains and is expected to extend over 7 years, with an estimated cost of $155 million. While these activities are not controlled by the Authority it exercises effective project oversight and funding on behalf of the Commonwealth. SARFIIP funding is recorded as revenue from government and expenses are recorded as a grant expense in the Authority's Statement of Comprehensive Income. Prior to 2014-15, the project was reported as an Administered item.

Basis of Preparation of the Financial Statements

The financial statements are general-purpose financial statements and are required by section 42 of the *Public Governance, Performance and Accountability Act 2013* (the PGPA Act).

The financial statements have been prepared in accordance with:

a) *Public Governance, Performance and Accountability (Financial Reporting) Rule 2016* (FRR) for reporting periods ending on or after 1 July 2015; and
b) Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention except for the certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial statements are presented in Australian dollars and values are rounded to the nearest thousand dollars unless otherwise specified.

Unless alternative treatment is specifically required by an accounting standard, income and expenses are recognised in the Statement of Comprehensive Income, when and only when the flow, consumption or loss of economic benefits has occurred and can be reliably measured.

Overview - continued

New Accounting Standards

Revised standards that were issued prior to the sign-off date and are applicable to the current reporting period did not have a material effect, and are not expected to have a future material effect, on the Authority's financial statements.

Adoption of New Australian Accounting Standard Requirements
AASB 2015-7 Amendments to Australian Accounting Standards - Fair Value Disclosures of Not-for-Profit Public Sector Entities.

The Authority has elected to early adopt AASB 2015-7. The standard exempts not-for-profit public sector entities from disclosing quantitative information about significant unobservable inputs used in the fair value of Property Plant and Equipment. The disclosure exemptions only apply to assets within the scope of AASB 116 Property, Plant and Equipment that are primarily held for their current service potential, rather than to generate future net cash inflows.

Future Australian Accounting Standard Requirements

The following new, revised or amending standards or interpretations were issued by the Australian Accounting Standards Board prior to the sign-off date and may have a material impact on the financial statements, in future reporting periods:

Standard	Effective for annual reporting Standard periods beginning on or after 2015	Expected to be initially applied in the financial year ending	Nature of the impending change or changes in accounting policy
AASB 9 Financial Instruments	1 January 2018	30 June 2019	The final version of AASB 9 brings together the classification and measurement, impairment and hedge accounting phases of the IASB's project to replace AASB 139 Financial Instruments: Recognition and Measurement. The Standard carries over the existing derecognition requirements from AASB 139 but all other areas of AASB 139 have been revised.
AASB 15 Revenue from Contracts with Customers	1 January 2017	30 June 2018	AASB 15 outlines a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers; and replaces AASB 111 Construction Contracts, AASB 118 Revenue, Interpretation 13 Customer Loyalty Programmes, Interpretation 15 Agreements for the Construction of Real Estate, Interpretation 18 Transfers of Assets from Customers, and Interpretation 131 Revenue-Barter Transactions Involving Advertising Services. The core principle is that an entity recognises revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services.
AASB 16 Leases	1 January 2019	30 June 2020	AASB 16 introduces a single lessee accounting model and requires a lessee to recognise assets and liabilities for all leases with a term of more than 12 months, unless the underlying asset is of low value. AASB 16 contains disclosure requirements for lessees. It also requires enhanced disclosures to be provided by lessors that will improve information disclosed about a lessor's risk exposure, particularly to residual value risk.
AASB 2015-6 Amendments to Australian Accounting Standards – Extending Related Party Disclosures to Not-for-Profit Public Sector Entities (arising from AASB 10, AASB 124 & AASB 1049)	1 July 2016	30 June 2017	Extends the scope of AASB 124 to not-for-profit public sector entities. Implementation guidance is included to assist application of the Standard by not-for-profit public sector entities.

All other new, revised or amended standards or interpretations that were issues prior to the sign off date and are applicable to future reporting periods are not expected to have a future material impact on the Authority's financial statements.

Taxation

The Authority is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

Revenues, expenses and assets are recognised net of GST except:

- where the amount of GST incurred is not recoverable from the Australian Taxation Office; and
- for receivables and payables which are recognised are recognised inclusive of GST.

Remuneration of Auditors

The financial statements are audited by the Australian National Audit Office (ANAO). The cost of the audit services provided to the Authority was $81,000 (2015: $80,000). No other services were provided by the ANAO during the reporting period.

Comparative Figures

Comparative figures are adjusted so that they conform with changes in the presentation of the financial statements where required.

Events After the Reporting Period

Subsequent to year end, the Authority entered into an agreement to agree on a 10 year lease for office premises. No final lease has been signed. Other than this, no matters or circumstances have arisen since the end of the financial year which significantly affected or may affect the operations of the Authority, the results of these operations or state of affairs of the Authority in subsequent years.

Financial Performance

This section analyses the financial performance of the Authority for the year ended 30 June

Note 1.1: Expenses

	2016 $'000	2015 $'000
Note 1.1A: Employee Benefits		
Wages and salaries	**26,219**	26,019
Superannuation		
Defined contribution plans	**2,810**	2,591
Defined benefit plans	**2,475**	2,724
Leave and other entitlements	**4,271**	5,372
Separation and redundancies	**1,145**	968
Total employee benefits	**36,920**	37,674

Accounting policy
Accounting policies for employee related expenses are outlined in Note 4.1.

Note 1.1B: Suppliers		
Goods and services supplied or rendered		
Expenditure by State Constructing Authorities	**54,820**	59,718
Water licence fee	**3,888**	3,396
Consultants and contractors	**14,357**	11,093
Communication & IT services	**5,510**	1,603
Other employment expenses	**1,758**	1,275
Committee expenses	**1,143**	1,017
Travel	**1,148**	1,150
Other provision of goods & services	**2,071**	1,437
Goods and services supplied or rendered	**84,695**	80,689
Goods and services are made up of:		
Provision of goods	**1,418**	1,407
Rendering of services	**83,277**	79,282
Total goods and services supplied or rendered	**84,695**	80,689
Other suppliers		
Operating lease rentals		
Minimum lease payments - external parties	**1,800**	1,789
Workers compensation expenses - government entity	**1,009**	1,009
Total other suppliers	**2,809**	2,798
Total suppliers	**87,504**	83,487

Leasing Commitments
The MDBA in its capacity as a lessee holds the following leases:
Canberra, ACT
Commencing on 1 January 2007 a 10 year and 3 months lease was initiated in respect of premises at 51 Allara Street. Lease payments are subject to fixed annual increases of 3.5% on review date (January each year).
Commencing on 1 May 2011 a 5 year and 11 months lease was initiated in respect of premises at 40 Allara Street. Lease payments are subject to fixed annual increases of 4% on review date (May each year).

Operating leases held by the MDBA are effectively non-cancellable.

Note: Commitments are GST inclusive where relevant.

Note 1.1: Expenses - continued

	2016 $'000	2015 $'000
Commitments for minimum lease payments in relation to non-cancellable operating leases are payable as follows:		
Within 1 year	**1,866**	2,429
Between 1 to 5 years	**-**	2,559
Total operating lease commitments	**1,866**	4,988

Accounting policy

Operating lease payments are expensed on a straight-line basis which is representative of the pattern of benefits derived from the leased assets.

Note 1.1C: Grants

Grants		
State and Territory Governments[1]	**33,843**	12,410
Local Governments	**11**	34
Private sector:		
Commercial entities	**1,811**	1,964
Non-profit institutions	**1,525**	767
Other	**293**	117
Total grants	**37,483**	15,292

1. Includes the South Australian Riverland Floodplains Integrated Infrastructure Project of $25m (2015:$7m).

Note 1.1D: Write-Down and Impairment of Assets

Impairment on financial instruments	**2**	-
Impairment of computer software	**54**	-
Revaluation decrement of leasehold improvements	**354**	27
Revaluation decrement of other property plant and equipment	**50**	-
Total write-down and impairment of assets	**460**	**27**

Note 1.1E: Finance Costs

Unwinding of discount on make good provision	**4**	38
Total finance costs	**4**	38

Note 1.2: Own-Source Income

Own-Source Revenue	2016 $'000	2015 $'000
Note 1.2A: Contributions from Jurisdictions		
Australian Government	**9,989**	11,300
New South Wales	**24,699**	18,900
Victoria	**23,568**	18,000
South Australia	**19,054**	15,500
Queensland	**100**	100
Australian Capital Territory	**298**	298
Total contributions from jurisdictions	**77,708**	64,098

Accounting policy

The Authority receives contributions from jurisdictions based on an agreed contributions model (the model). The model, which has been carried forward from the Authority's predecessor agency, the Murray-Darling Basin Commission, is based on a number of different requirements including specific provisions under the Murray-Darling Basin Agreement.

Note 1.2B: Grants Received		
South Australian River Murray Constraints	**-**	411
South Australia Barrage Fishways	**1,118**	754
Victorian River Murray Constraints	**624**	-
Total grants received	**1,742**	1,165

Note 1.2C: Other Revenue		
Hydropower generation	**5,073**	1,365
Contributions by States - Salinity program	**805**	736
Victoria's contribution to Lindsay Island project	**3,394**	-
Land and cottage rents	**352**	363
Other	**1,574**	1,025
Resources received free of charge - ANAO audit	**81**	80
Total other revenue	**11,279**	3,569

Accounting policy

Revenue from rendering of services is recognised by reference to the stage of completion of contracts at the reporting date. The revenue is recognised when:

- the amount of revenue, stage of completion and transaction costs incurred can be reliably measured; and
- the probable economic benefits associated with the transaction will flow to the Authority.

The stage of completion of contracts at the reporting date is determined by reference to the proportion that costs incurred to date bear to the estimated total costs of the transaction.

Resources Received Free of Charge

Resources received free of charge are recognised as gains when, and only when, fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense. Resources received free of charged are recorded as either revenue or gains depending on their nature.

Note 1.2: Own-Source Income - continued

Gains/(Losses)	2016 $'000	2015 $'000
Note 1.2D: Other Gains/(Losses)		
Gain/(loss) on movement in provisions	**(27)**	490
Total other gains/(losses)	**(27)**	490

Revenue from Government

Note 1.2E: Revenue from Government		
Appropriation - Departmental - Basin Plan Activities	**46,736**	48,569
South Australian Riverland Floodprints Integrated Infrastructure Project	**25,000**	7,000
Total revenue from Government	**71,736**	55,569

Revenue from Government includes $25m that was shown as Administered in the 2015-16 Appropriation Acts (2015: $7m). This amount relates to the South Australian Riverland Floodplains Integrated Infrastructure Project (see Overview).

Financial Position

This section analyses the Authority's assets used to conduct its operations and the operating liabilities incurred as a result. Employee related information is disclosed in the People and Relationships section.

Note 2.1: Financial Assets

	2016 $'000	2015 $'000
Note 2.1A: Cash and Cash Equivalents		
Cash on hand	**80,963**	81,271
Total cash and cash equivalents	**80,963**	81,271

Accounting policy

Cash is recognised at its nominal amount. Cash and cash equivalents include cash on hand and any deposits in bank accounts with an original maturity of 3 months or less that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value.

Note 2.1B: Trade and Other Receivables		
Trade Receivables	**74**	530
GST receivable from the Australian Taxation Office	**1,962**	2,095
Other Receivables	**971**	1,471
Total trade and other receivables (gross)	**3,007**	4,096
Less impairment allowance		
Goods and services	**32**	30
Total impairment allowance	**32**	30
Total trade and other receivables (net)	**2,975**	4,066
Trade and other receivables (net) expected to be recovered		
No more than 12 months	**2,975**	4,066
Total trade and other receivables (net)	**2,975**	4,066
Trade and other receivables (gross) aged as follows		
Not overdue	**2,928**	3,565
Overdue by		
0 to 30 days	**10**	-
31 to 60 days	**-**	479
61 to 90 days	**37**	27
More than 90 days	**32**	25
Total trade and other receivables (gross)	**3,007**	4,096
Impairment allowance aged as follows		
31 to 60 days	**-**	7
More than 90 days	**32**	23
Total impairment allowance	**32**	30

Credit terms for goods and services were within 30 days (2015: 30 days).
The Authority has not provided any loans (2015: no loans).

Accounting policy

Trade and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts due less any impairment allowance account. Collectability of debts is reviewed at end of the reporting period. Allowances are made when collectability of the debt is no longer probable.

Note 2.1: Financial Assets - continued

Reconciliation of the Impairment Allowance

Movements in relation to 2016

	Goods and services	Total
	$'000	$'000
As at 1 July 2015	**30**	**30**
Increase recognised in net cost of services	**2**	**2**
Total as at 30 June 2016	**32**	**32**

Movements in relation to 2015

	Goods and services	Total
	$'000	$'000
As at 1 July 2014	9	9
Increase recognised in net cost of services	21	21
Total as at 30 June 2015	30	30

Accounting policy

Financial assets are assessed for impairment at the end of each reporting period.

If there is an indication that receivables may be impaired, the Authority makes an estimation of the receivable's recoverable amount. When the carrying amount of the receivable exceeds the recoverable amount, it is considered impaired and is written down to its recoverable amount.

Note 2.2: Non-Financial Assets

Note 2.2A: Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment and Intangibles

Reconciliation of the opening and closing balances for 2016

			Intangible assets		
	Leasehold improvements $'000	Property, plant & equipment $'000	Computer software[1] $'000	Data sets $'000	Total $'000
As at 1 July 2015					
Gross book value	**1,002**	**1,041**	**6,355**	**8,007**	**16,405**
Accumulated depreciation, amortisation and impairment	**-**	**-**	**(5,101)**	**-**	**(5,101)**
Total as at 1 July 2015	**1,002**	**1,041**	**1,254**	**8,007**	**11,304**
Additions					
Purchased	**560**	**593**	**204**	**272**	**1,629**
Internally developed	**-**	**-**	**182**	**-**	**182**
Adjustments to opening balances[2]	**-**	**-**	**71**	**(7,462)**	**(7,391)**
Revaluation and Impairments recognised in net cost of services	**(354)**	**(50)**	**(54)**	**-**	**(458)**
Reversal of revaluation reserves recognised in other comprehensive income	**-**	**(11)**	**-**	**-**	**(11)**
Depreciation and amortisation	**(795)**	**(367)**	**(871)**	**(2)**	**(2,034)**
Disposals	**-**	**(1)**	**-**	**-**	**(1)**
Total as at 30 June 2016	**413**	**1,205**	**786**	**815**	**3,220**
Total as at 30 June 2016 represented by					
Gross book value	**413**	**1,205**	**6,758**	**817**	**9,193**
Accumulated depreciation, amortisation and impairment	**-**	**-**	**(5,972)**	**(2)**	**(5,974)**
Total as at 30 June 2016	**413**	**1,205**	**786**	**815**	**3,220**
Total intangible assets			**1,601**		

[1] The carrying amount of computer software includes $525,000 of purchased software and $75,000 of internally generated software.

[2] The adjustment for errors is comprised of 3 amounts, being:

- intangibles WIP recognised in previous periods of $361,000 which should have been expensed. This has been offset by a correction to the amortisation of intangible assets in the previous periods of $432,000 where the assets were incorrectly written-off to zero while the assets were still in use; and

- in the current financial year a deeper assessment was undertaken with regards to data sets recognised as intangible assets under the Australian Accounting Standards. Amounts previously recognised as an asset have been expensed at the point the data sets were approved and provided to Geoscience Australia for upload into the public domain. The adjustment is comprised of a reclassification to prepayments of $5,381,000 and an opening balance adjustment to retained earnings of $2,081,000. Whilst the data sets have not been recognised as intangible assets, the MDBA is of the view these data sets will generate further economic benefit to the MDBA in future years through their continued use in delivering the Murray Darling Basin Plan.

All non-financial assets have been assessed for impairment indicators. Where indicators have been identified due to physical damage, obsolescence or performance short falls, an impairment calculation has been performed.

Leasehold improvements and some property, plant and equipment assets are expected to be sold or disposed of within the next 12 months due to the termination of the office lease agreement and expected relocation of the business activities to new premises. The useful lives of all assets affected were adjusted accordingly. No intangible assets are expected to be sold or disposed of within the next 12 months.

A revaluation of leasehold improvements, property, plant and equipment was undertaken as at 30 June 2016. This resulted in a decrement recognised in net cost of services.

There are no contractual commitments for the acquisition of property, plant and equipment.

Reconciliation of the opening and closing balances for 2015

	Leasehold improvements $'000	Property, plant & equipment $'000	Computer software $'000	Total $'000
As at 1 July 2014				
Gross book value	3,452	2,047	13,184	18,683
Accumulated depreciation, amortisation and impairment	(1,867)	(1,295)	(4,956)	(8,118)
Total as at 1 July 2014	1,585	752	8,228	10,565
Additions				
By Purchase	42	548	232	822
Internally developed	-	-	1,450	1,450
Revaluation increment recognised in other comprehensive income	-	11	-	11
Write-downs and impairment recognised in net cost of service	(27)	-	-	(27)
Depreciation and amortisation	(598)	(221)	(589)	(1,408)
Disposals	-	(49)	(60)	(109)
Total as at 30 June 2015	1,002	1,041	9,261	11,304
Total as at 30 June 2015 represented by				
Gross book value	1,002	1,041	14,362	16,405
Accumulated depreciation, amortisation and impairment	-	-	(5,101)	(5,101)
Total as at 30 June 2015	**1,002**	**1,041**	**9,261**	**11,304**

Note 2.2: Non-Financial Assets - continued

Accounting policy

Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and income at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor's accounts immediately prior to the restructuring.

Asset Recognition Threshold

Purchases of property, plant and equipment are recognised initially at cost in the statement of financial position, except for purchases costing less than $2,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located. This is particularly relevant to 'make good' provisions in property leases taken up by the Authority where there exists an obligation to restore the property to its original condition. These costs are included in the value of the Authority's leasehold improvements with a corresponding provision for the 'make good' recognised.

Revaluation

Following initial recognition at cost, property, plant and equipment is carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depends upon the volatility of movements in market values for the relevant assets.

All leasehold improvements and property, plant and equipment assets were reviewed and assessed for fair value as at 30 June 2016 by Australian Valuation Solutions.

Revaluation adjustments are made on a class basis. Any revaluation increment is credited to equity under the heading of asset revaluation reserve except to the extent that it reverses a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit.

Revaluation decrements for a class of assets are recognised directly in the surplus/deficit except to the extent that they reverse a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to the revalued amount.

Depreciation

Depreciable property, plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the Authority using, in all cases, the straight-line method of depreciation.

Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

Depreciation and/or amortisation rates applying to each class of asset are based on the following useful lives:

Asset Class	**2015-16**
Computers and IT equipment	**3-4 years**
Office equipment	**2-5 years**
Leasehold improvements	**Lease term**
Data sets	**3-20 years**
Software applications	**3-4 years**
Software licences	**Length of licence but within range of 1-4 years**

The useful lives did not change from the prior year to the current year, except for data sets which were 3-10 years in the prior year.

Impairment

All assets were assessed for impairment at 30 June 2016. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs of disposal and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if the Authority were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

Derecognition

An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

Intangibles

The Authority's intangibles comprise internally developed software; acquired data-sets for internal use and software licences. These assets are carried at cost less accumulated amortisation and accumulated impairment losses.

Software is amortised on a straight-line basis over its anticipated useful life. All software assets were assessed for indications of impairment as at 30 June 2016.

Note 2.2: Non-Financial Assets - continued

	2016	2015
	$'000	$'000
Note 2.2B: Other Non-Financial Assets		
Prepayments	**1,490**	54
Total other non-financial assets	**1,490**	54
Other non-financial assets expected to be recovered		
All prepayments are expected to be recovered within 12 months	**1,490**	54
Total other non-financial assets	**1,490**	54

No indicators of impairment were found for other non-financial assets.

Note 2.3: Payables

	2016 $'000	2015 $'000
Note 2.3A: Suppliers		
Trade creditors and accruals	**15,809**	15,616
Operating lease rentals	**126**	230
Total suppliers	**15,935**	15,846
Suppliers expected to be settled		
No more than 12 months	**15,935**	15,846
Total suppliers	**15,935**	15,846

Settlement terms are 30 days.

Note 2.3B: Other Payables		
Wages and salaries	**189**	1,099
Superannuation	**20**	181
Lease incentive	**131**	306
Prepayments received/unearned income	**1,362**	4,968
Total other payables	**1,702**	6,554
Other payables expected to be settled		
No more than 12 months	**1,702**	6,423
More than 12 months	**-**	131
Total other payables	**1,702**	6,554

Accounting policy

The Authority's financial liabilities consist of trade creditors and accruals. These liabilities are recognised at their nominal amounts, being the amounts at which the Authority expects the liabilities will be settled. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

Unearned income represents assets received from another party in advance of the Authority fulfilling its contracted obligations. The Authority releases unearned income to revenue when the services required to be performed have been performed.

Note 2.4: Other Provisions

	2016 $'000	2015 $'000
Note 2.4: Other Provisions		
Provision for make good	**248**	217
Total other provisions	**248**	217
Other provisions expected to be settled		
Less than 12 months	**248**	-
More than 12 months	**-**	217
Total other provisions	**248**	217

	Provision for restoration $'000	Total $'000
As at 1 July 2015	**217**	**217**
Additional provisions made	**27**	**27**
Unwinding of discount or change in discount rate	**4**	**4**
Total as at 30 June 2016	**248**	**248**

	Provision for restoration $'000	Total $'000
Carrying amount 1 July 2014	669	669
Unwinding of discount or change in discount rate	38	38
Amounts reversed	(490)	(490)
Closing balance 2015	217	217

The Authority currently has 2 (2015: 2) agreements for the leasing of premises which have provisions requiring the Authority to restore the premises at the conclusion of the lease. The Authority has made a provision to reflect the present value of this obligation.

Funding

This section identifies the Authority's funding.

Note 3.1: Appropriations

Note 3.1A: Annual Appropriations ('Recoverable GST exclusive')

Annual Appropriations for 2016

	Appropriation Act[1]		*PGPA Act*				
	Annual Appropriation[2] $'000	AFM $'000	Section 74 $'000	Section 75 $'000	Total appropriation $'000	Appropriation applied in 2016 (current and prior years) $'000	Variance $'000
Departmental							
Ordinary annual services	**46,736**	**-**	**-**	**-**	**46,736**	**46,736**	**-**
Total departmental	**46,736**	**-**	**-**	**-**	**46,736**	**46,736**	**-**
Administered[3]							
Ordinary annual services							
Administered items	**25,000**	**-**	**-**	**-**	**25,000**	**25,000**	**-**
Total administered	**25,000**	**-**	**-**	**-**	**25,000**	**25,000**	**-**

1. As at 30 June 2016, the Appropriations Receivable balance was Nil. (2015: Nil).
2. In 2015-16, there were no appropriations that have been withheld (Section 51 of the PGPA Act) or quarantined for administrative purposes.
3. Due to the transition of the MDBA from an Agency under the FMA Act 1997 to a corporate Commonwealth entity, for the purposes of the PGPA Act, the administered item 'South Australian Riverland Floodplains Integrated Infrastructure Project' (SARFIIP) is recorded in the Authority's Statement of Comprehensive Income.

Note 3.1: Appropriations - continued

Annual Appropriations for 2015

	Appropriation Act[1]		*PGPA Act*				
	Annual Appropriation[2] $'000	AFM $'000	Section 74 $'000	Section 75 $'000	Total appropriation $'000	Appropriation applied in 2016 (current and prior years) $'000	Variance[3] $'000
Departmental							
Ordinary annual services	**48,608**	**-**	**-**	**-**	**48,608**	**48,569**	**39**
Total departmental	**48,608**	**-**	**-**	**-**	**48,608**	**48,569**	**39**
Administered[4]							
Ordinary annual services							
Administered items	**7,000**	**-**	**-**	**-**	**7,000**	**7,000**	**-**
Total administered	**7,000**	**-**	**-**	**-**	**7,000**	**7,000**	**-**

1. As at 30 June 2015, the Appropriations Receivable balance was Nil.
2. In 2014-15, there were no appropriations that were withheld (Section 51 of the PGPA Act) or quarantined for administrative purposes.
3. In 2014-15, there was a formal reduction in revenue under the Financial Reporting Rule Part 6 Div 3, but at law the appropriations had not been amended before the end of the reporting period. The reduction was a targeted saving measure for Communications and Public Affairs Functions of $0.039m, which accounts for the variance.

4. Due to the transition of the MDBA from an Agency under the FMA Act 1997 to a corporate Commonwealth entity, for the purposes of the PGPA Act, the administered item 'South Australian Riverland Floodplains Integrated Infrastructure Project' (SARFIIP) is recorded in the Authority's Statement of Comprehensive Income.

Note 3.2: Cash Flow Reconciliation

	2016 $'000	2015 $'000
Reconciliation of cash and cash equivalents as per statement of financial position to cash flow statement		
Cash and cash equivalents as per		
Cash flow statement	**80,963**	81,271
Statement of financial position	**80,963**	81,271
Discrepancy	-	-
Reconciliation of net cost of services to net cash from/(used by) operating activities		
Net (cost of)/contribution by services	**(72,005)**	(66,456)
Revenue from Government	**71,736**	55,569
Share of deficit in joint venture	**-**	(310)
Adjustments for non-cash items		
Depreciation/amortisation	**2,034**	1,408
Net write-down of non-financial assets	**460**	27
Loss on disposal of assets	**-**	19
Items previously capitalised that have been expensed in the current year	**3,892**	-
Other non-cash items	**-**	11
Movements in assets and liabilities		
Assets		
(Increase)/Decrease in net receivables	**1,091**	1,388
(Increase)/Decrease in share in joint ventures	**-**	310
(Increase)/Decrease in prepayments	**54**	228
Liabilities		
Increase/(Decrease) in employee provisions	**(1,026)**	1,533
Increase/(Decrease) in supplier payables	**89**	1,476
Increase/(Decrease) in other payable	**(4,852)**	(2,714)
Increase/(Decrease) in other provisions	**31**	(452)
Net cash from/(used by) operating activities	**1,504**	(7,963)

People and Relationships

This section describes a range of employment and post employment benefits provided to our people and our relationships with other key people.

Note 4.1: Employee Provisions

	2016 $'000	2015 $'000
Note 4.1: Employee Provisions		
Leave	**9,729**	10,424
Separations and redundancies	**239**	570
Total employee provisions	**9,968**	10,994
Employee provisions expected to be settled		
No more than 12 months	**3,640**	3,932
More than 12 months	**6,328**	7,062
Total employee provisions	**9,968**	10,994

Accounting policy

Liabilities for 'short-term employee benefits' (as defined in AASB 119 *Employee Benefits*) and termination benefits due within twelve months of the end of reporting period are measured at their nominal amounts.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

Other long-term employee benefits are measured as the net total of the present value of the defined benefit obligation at the end of the reporting period.

Leave

The liability for employee benefits includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the Authority is estimated to be less than the annual entitlement for sick leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied at the time the leave is taken, including the Authority's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by reference to the shorthand method as per the FRR and Commonwealth Entity Financial Statements Guide. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

Separation and Redundancy

Provision is made for separation and redundancy benefit payments. The Authority recognises a provision for termination when it has developed a detailed formal plan for the terminations and has informed those employees affected that it will carry out the terminations.

Superannuation

The Authority's staff are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS), the PSS accumulation plan (PSSap) or other employee nominated superannuation funds.

The CSS and PSS are defined benefit schemes for the Australian Government. The remaining funds are defined contribution schemes.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported in the Department of Finance's administered schedules and notes.

The Authority makes employer contributions to the employees' superannuation scheme at rates determined by an actuary to be sufficient to meet the current cost to the Government. The Authority accounts for the contributions as if they were contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June represents outstanding contributions for the final fortnight of the reporting period.

The Authority also contributes to a number of complying funds to discharge the Authority's liability in regard to individual employees and the *Superannuation Guarantee (Administration) Act 1992* as well as to facilitate the salary sacrifice options of employees.

Note 4.2: Senior Management Personnel Remuneration

	2016 $	2015 $
Short-term employee benefits		
Salary and other employee benefits	**2,667,905**	2,663,366
Total short-term employee benefits	**2,667,905**	2,663,366
Post-employment benefits		
Superannuation	**499,113**	545,489
Total post-employment benefits	**499,113**	545,489
Other long-term employee benefits		
Annual leave	**272,979**	221,218
Long-service leave	**88,068**	72,298
Total other long-term employee benefits	**361,047**	293,516
Termination benefits		
Voluntary redundancy payments	**110,000**	-
Total termination benefits	**110,000**	-
Total senior executive remuneration expenses	**3,638,065**	3,502,371

The total number of senior management personnel included in the above table is 15 (2015: 14).

In the prior year, remuneration was calculated by including leave balances on both accrual and cash basis. The comparative number has been adjusted to remove the cash component from the calculation, resulting in a decrease of $268,437.

Managing uncertainties

This section analyses how the Authority manages financial risks within its operating environment.

Note 5.1: Contingent Assets and Liabilities

There are no contingent assets or liabilities in current year or prior year.

Quantifiable Contingencies

Claims:

There were no estimated contingent liabilities as at 30 June 2016.

Unquantifiable Contingencies

In addition to the above matters, there are a number of unquantifiable contingencies where it is not possible to estimate the amounts of any eventual payments.

These pertain to the former Murray-Darling Basin Commission (the Commission); under Section 239F of the *Water Act 2007*, the liabilities of the Commission became liabilities of the Authority.

This included any liability, duty or obligation, whether contingent or prospective; but does not include a liability, duty or obligation imposed by:

- an Act; or
- regulations or other subordinate legislation made under an Act; or
- the *Murray-Darling Basin Act 1992* of New South Wales; or
- the *Murray-Darling Basin Act 1993* of Victoria; or
- the *Murray-Darling Basin Act 1996* of Queensland; or
- the *Murray-Darling Basin Act 1993* of South Australia; or
- the former Murray-Darling Basin Agreement.

Native Title Claims

The MDBA is a party to a Native Title Determination Application. It is not possible to estimate any liabilities arising out of this matter.

Accounting policy

Contingent liabilities and contingent assets are not recognised in the statement of financial position but are reported in the notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

Note 5.2: Financial Instruments

	2016 $'000	2015 $'000
Note 5.2A: Categories of Financial Instruments		
Financial Assets		
Loans and receivables		
Cash and cash equivalents	**80,963**	81,271
Trade and other receivables	**1,013**	1,971
Total loans and receivables	**81,976**	83,242
Total financial assets	**81,976**	83,242
Financial Liabilities		
Financial liabilities measured at amortised cost		
Trade creditors and accruals	**15,809**	15,616
Total financial liabilities measured at amortised cost	**15,809**	15,616
Total financial liabilities	**15,809**	15,616

Accounting policy

Financial Assets

The Authority classifies its financial assets in the following categories:

- held-to-maturity investments; and
- loans and receivables.

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Financial assets are recognised and derecognised upon trade date.

Loans and Receivables

Trade and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. The Authority did not have any loans during 2015-16. Receivables are measured at cost less impairment.

Impairment of Financial Assets

Financial assets are assessed for impairment at the end of each reporting period.

If there is an indication that receivables may be impaired, the Authority makes an estimation of the receivable's recoverable amount. When the carrying amount of the receivable exceeds the recoverable amount, it is considered impaired and it is written down to its recoverable amount.

Financial Liabilities

The Authority's financial liabilities consist of trade creditors and accruals, amounts owing to research providers and other payables. These liabilities are recognised at their nominal amounts, being the amounts which the Authority expects the liabilities will be settled. Liabilities are recognised to the extent the goods and services have been received (and irrespective of having been invoiced).

Note 5.2B: Fair Value of Financial Instruments

The carring amount at all financial instruments approximates their fair value.

Note 5.2C: Credit Risk

The Authority was exposed to minimal credit risk as loans and receivables were trade and other receivables. The maximum exposure to credit risk was the risk that arises from potential default of a debtor. This amount was equal to the total amount of trade receivables (2016: $1,045,000 and 2015: $2,001,000). The entity had assessed the risk of the default on payment and had allocated $32,000 in 2016 (2015: $30,000) to an impairment allowance account. The entity managed its credit risk by undertaking background and credit checks prior to allowing a debtor relationship. In addition, the entity had policies and procedures that guided employees debt recovery techniques that were to be applied. The Authority held no collateral to mitigate against credit risk.

Note 5.2: Financial Instruments - continued

Note 5.2C: Credit Risk - continued

Credit quality of financial assets not past due or individually determined as impaired

	Not past due nor impaired 2016 $'000	Not past due nor impaired 2015 $'000	**Past due or impaired 2016 $'000**	Past due or impaired 2015 $'000
Cash and cash equivalents	**80,963**	81,271	**-**	-
Trade and other receivables	**966**	1,440	**79**	531
Total	**81,929**	82,711	**79**	531

Ageing of financial assets that were past due but not impaired in 2016

	0 to 30 days $'000	**31 to 60 days $'000**	**61 to 90 days $'000**	**90+ days $'000**	**Total $'000**
Trade and other receivables	**10**	**-**	**37**	**-**	**47**
Total	**10**	**-**	**37**	**-**	**47**

Ageing of financial assets that were past due but not impaired in 2015

	0 to 30 days $'000	31 to 60 days $'000	61 to 90 days $'000	90+ days $'000	Total $'000
Trade and other receivables	-	479	27	25	531
Total	-	479	27	25	531

Note 5.2D: Liquidity Risk

The Authority received funding from the Australian Government and jurisdictions. The Authority manages its budgeted funds to ensure it has adequate funds to meet payments as they fall due. In addition, the Authority has policies in place to ensure timely payments are made when due and has no past experience of default.

The Authority had no derivative financial liabilities in either 2016 or 2015. The total balance of trade creditors and accruals in 2016 and 2015 has a maturity profile of within 1 year.

Note 5.2E: Market Risk

The Authority is not exposed to currency risks as no financial asset or liability is denominated in foreign currency.
The Authority is exposed to interest rate risk primarily through the holding of cash and cash equivalents. A 25 basis points increase/decrease in the interest rate will increase/decrease the Net Cost of Services by $202,000 (2015: $203,000).

Note 5.3: Fair Value Measurements

The following tables provide an analysis of assets and liabilities that are measured at fair value.
The different levels of the fair value hierarchy are defined below.

Level 1: Quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at measurement date.

Level 2: Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
Level 3: Unobservable inputs for the asset or liability.

Accounting policy
Following initial recognition at cost, property, plant and equipment is carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depends upon the volatility of movements in market values for the relevant assets.

The Authority's assets are held for operational purposes and not held for the purposes of deriving a profit. The current use of all non-financial assets is considered their highest and best use.

The Authority's policy is to recognise transfers into and transfers out of fair value hierarchy levels as at the end of the reporting period. There have been no transfers between level 1 and level 2 of the hierarchy during the year.

Level 3 fair value measurements - valuation processes
Independant valuers undertake the valuations and the Authority's management review the key inputs, assumptions and outputs to ensure compliance with AASB 13.

Significant Level 3 inputs utilised by the Authority are derived and evaluated as follows:

Leasehold Improvement & Property, Plant and Equipment - Physical Depreciation and Obsolescence
All level 3 assets have been measured utilising the cost (Depreciated Replacement Cost or DRC) approach. Under the DRC approach the estimated cost to replace the asset is calculated and then adjusted to take into account physical depreciation and obsolescence. Physical depreciation and obsolescence has been determined based on professional judgement regarding physical, economic and external obsolescence factors relevant to the asset under consideration.

Level 2 fair value measurements - valuation processes
Assets valued using Level 2 inputs have been done using the Market Approach. Under the Market Approach the value of similar assets or transactions is identified and adjusted to reflect professional judgement regarding physical, economic and external obsolescence factors relevant to the asset under consideration.

Note 5.3: Fair Value Measurements - continued

Note 5.3A: Fair Value Measurements

	Fair value measurements at the end of the reporting period			For Levels 2 and 3 fair value measurements	
	2016 $'000	2015 $'000	Category (Level 1, 2 or 3)[2]	Valuation technique(s)[1]	Inputs used
ASSETS					
Assets measured at fair value					
Leasehold improvements	**414**	960	Level 3	Depreciated Replacement Cost (DRC)	Replacement Cost New
Other property, plant and equipment	**460**	129	Level 2	Market Approach	Adjusted market transactions
Other property, plant and equipment	**745**	578	Level 3	Depreciated Replacement Cost (DRC)	Replacement Cost New
Total assets measured at fair value	**1,619**	1,667			
Assets measured at other than fair value, but approximate fair value[3]					
Leasehold improvements - work in progress	**-**	42			
Other property, plant and equipment - Work in progress	**-**	334			
Cash and cash equivalents	**80,963**	81,271			
Trade and other receivables	**2,975**	4,066			
Total assets measured at other than fair value, but approximate fair value	**83,938**	85,713			
Assets measured at cost					
Intangibles	**1,601**	9,261			
Other non-financial assets	**1,490**	54			
Total assets measured at cost	**3,091**	9,315			
Total assets stated in the Statement of Financial Position	**88,648**	96,695			
LIABILITIES					
Liabilities measured at fair value					
Provision for restoration	**248**	217	Level 3	Estimate of future obligation related to the underlying asset	Replacement Cost New, Discount rate and Inflation rate
Total liabilities measured at fair value	**248**	217			
Liabilities measured at other than fair value, but approximate fair value[3]					
Suppliers	**15,935**	15,846			
Other payables	**1,702**	6,554			
Total liabilities measured at other than fair value, but approximate fair value	**17,637**	22,400			
Liabilities measured at cost					
Employee provisions	**9,968**	10,994			
Total liabilities measured at cost	**9,968**	10,994			
Total liabilities stated in the Statement of Financial Position	**27,853**	33,611			

The Authority did not measure any non-financial assets at fair value on a non-recurring basis as at 30 June 2016 (2015:Nil).

1. There were no changes in valuation technique from the previous reporting period (2015:Nil).

2. The future economic benefits of the Authority's property, plant and equipment assets are not primarily dependent on their ability to generate cash flows. The Authority has not disclosed quantitative information about the significant unobservable inputs for the level 3 measurements in those classes.

3. These items carrying amount equate to their fair values.

Note 5.3: Fair Value Measurements - continued

Note 5.3B: Reconciliation for Recurring Level 3 Fair Value Measurements

Recurring Level 3 fair value measurements - reconciliation for assets

	Non-financial assets					
	Leashold Improvements		Property plant and equipment		Total	
	2016	2015	**2016**	2015	**2016**	2015
	$'000	$'000	**$'000**	$'000	**$'000**	$'000
As at 1 July	**960**	1,585	**578**	-	**1,538**	1,585
Total gains/(losses) recognised in net cost of services[1]	**(1,149)**	(625)	**(378)**	-	**(1,527)**	(625)
Total gains/(losses) recognised in other comprehensive income[2]	**-**	-	**(11)**	-	**(11)**	-
Purchases	**560**	-	**557**	-	**1,117**	-
Disposals	**-**	-	**(1)**	-	**(1)**	-
Transfers into Level 3[3]	**42**	-	**-**	578	**42**	578
Total as at 30 June	**413**	960	**745**	578	**1,158**	1,538

1. These gains/(losses) are presented in the Statement of Comprehensive Income under depreciation and amortisation and write-down and impairment of assets.
2. These gains/(losses) are presented in the Statement of Comprehensive Income under changes in asset revaluation surplus.
3. There have been transfers of property, plant and equipment assets into level 3 during the prior year due to a change in accounting policy from the Cost to Revaluation model for the class. During the current year the transfers in represent prior year work in progress balances that were recorded at cost.

Recurring Level 3 fair value measurements - reconciliation for liabilities

	Financial liabilities			
	Provision for restoration		Total	
	2016	2015	**2016**	2015
	$'000	$'000	**$'000**	$'000
As at 1 July	**217**	669	**217**	669
Amounts increased/(reversed)[1]	**27**	(490)	**27**	(490)
Unwinding of discount or change in discount rate[2]	**4**	38	**4**	38
Total as at 30 June	**248**	217	**248**	217

1. These gains/(losses) are presented in the Statement of Comprehensive Income under Other Gains/(Losses).
2. Unwinding of discount or change in discount rate are presented in the Statement of Comprehensive Income under Finance Costs.

Other information

Note 6.1: Reporting of Outcomes

Note 6.1A: Net Cost of Outcome Delivery

The Statement of Comprehensive Income and Statement of Financial Position represent the amount for Outcome 1 of the Authority which is the Authority's only Outcome.

Budget Variances

Note 7.1: Explanations of Major Budget Variances

Variances are considered to be 'major' if they are core to the Authority's activities and based on the following criteria:
• the variance between budget and actual is greater than +/- 10% of the original budget for a line item; and
• the variance between budget and actual is greater than $1,000,000; or
• an item is below this threshold but is considered important for the reader's understanding or is relevant to an assessment of the discharge of accountability and to an analysis of the Authority's performance.

The budget is not audited.

Budget Variance Explanation	Affected statements and line items
The Authority has experienced significant fluctuations in its spending against budget due to the impact of the complex nature of joint programs, which reflect a high level of inherent risk associated with capital construction and environmental projects. For example, work at the major dam sites is only possible at certain points of the year; many other works are also impacted by the levels in the rivers; accessibility of the terrain around construction sites (e.g. wetlands) may be restricted at points in the year and cultural heritage issues (e.g. preservation of cultural sites which may require complex and lengthy approvals), may lead to further delays. In the current year this resulted in actual expenditure being less than budget in particular due to lower activity relating to the Environmental Works & Measures Program. Similarly, there was a decrease in the related cashflows (including GST). In addition, part of the underspent variance was due to a reallocation between supplier expenses and grant expenses recognised during the 2015-16 financial year. The budget for grant expenditure was solely for South Australian Riverland Floodplains Integrated Infrastructure Project. During the year other grant arrangements were entered into.	Statement of Comprehensive Income: - Suppliers - Grants Statement of Financial Position: - Cash and cash equivalents - Suppliers - Other payables Cash Flow Statements: - Net GST received - Suppliers - Grants
Hydropower generation revenue from Dartmouth is dependent on the volume of water released to meet entitlement demands. With a dry sequence in 2015-16 volumes released from Dartmouth were much greater than the previous year and as a result revenue from electricity generation and the associated Renewable Energy Certificates (REC) was greater. In addition an audit of REC payments over past years identified additional revenue owing from the power station owner which was received in the current year. Similarly, in prior years the Authority reflected revenue received in advance for the Lindsay Island project. During 2015-16 the project was completed and the Authority recognised the revenue.	Statement of Comprehensive Income: - Other revenue Cash Flow Statement: - Cash received –other
Two grant agreements were entered into after the original budget estimate was determined. The grants relates to the South Australia Barrage Fishways and Victoria River Murray Constraints.	Statement of Comprehensive Income: - Grants Cash Flow Statement: - Cash received - grants
Budget did not anticipate interest income being derived.	Statement of Comprehensive Income: - Interest Cash Flow Statement: - Cash received - Interest
The budget assumed trade and other receivables would be consistent with prior year trends. The reduction of trade and other receivables are primarily due to a decrease in trade debtors balance in the current year and a lower GST receivable balance due to an under spent in supplier expenses.	Statement of Financial Position: - Trade and other receivables
The budget assumed no significant acquisitions of intangibles. However, during the 2015-16 financial year a deeper assessment was undertaken with regards to the recognition of data sets. As a result of the assessment, data sets were expensed to the extent they had been received and approved. Where data sets have not been received and approved, they were recognised as prepayments.	Statement of Financial Position: - Intangibles - Other Non-Financial Assets
Suppliers and other payables, when analysed together, represent a net reduction from the original budget of $8.8m. This reduction is due to the following factors: (i) Reduction in level of activity as discussed above, which drives a reduction in creditors and accruals; and (ii) Revenue received in advance recorded in previous years released in the current year as discussed above.	Statement of Financial Position: - Suppliers - Other payables

The eastern great egret, an endangered species in Victoria, benefited from environmental watering, with successful breeding recorded at sites along the River Murray (photo by Brayden Dykes).

05

APPENDICES AND REFERENCES

APPENDIX A

Goals and key performance indicators for the joint programs
(MDBA Corporate Plan 2015–16)

Table A.1 Goal 1 Integrated water management

Key performance indicators	Program	Results
Number of recommendations from the Schedule D review which are completed, with legislative drafting prepared	Water markets – *to improve water security for all uses of basin water resources*	**ONGOING** Six of the twelve recommendations from the Schedule D review were made into regulation in December 2015.

Table A.2 Goal 2 River and ecosystem health

Key performance indicators	Program	Results
Trades are implemented consistent with agreed The Living Murray protocols.	The Living Murray planning and delivery – *to optimise ecological outcomes of environmental water in the basin*	**ACHIEVED** Trades implemented consistent with the agreed The Living Murray protocols.
Watering actions completed consistent with agreed priorities	The Living Murray planning and delivery – *to optimise ecological outcomes of environmental water in the basin*	**ACHIEVED** As agreed by the Southern Connected Basin Environmental Watering Committee, The Living Murray water delivered about 179 GL to five target sites in coordination with other environmental water holders.
Modelling support to inform operations at The Living Murray target sites, and accounting for environmental water use is provided in a timely and scientifically robust manner	The Living Murray modelling – *to optimise ecological outcomes of environmental water in the basin*	**ACHIEVED** Requested tasks have been completed in a timely manner and to a high technical standard. As a result, they have been well received by internal clients and jurisdictional operating groups.
Water quality data from 28 sites acquired and stored, and findings conveyed to states and river operators	River Murray Health – *to improve the understanding of river health including ecosystem health, function and response to watering and management interventions*	**ONGOING** Data were collected and stored successfully over the whole year, with the exception of a small number of summer phytoplankton samples from Hume Reservoir. Cleaning of historic data has continued to deliver to states and scientific reviewers.
Reduce risks of incursion of alien fish species into the basin, and showcase river restoration techniques	River Murray Health – *to improve the understanding of river health including ecosystem health, function and response to watering and management interventions*	**ONGOING** Six projects related to alien fish and river restoration were carried out in collaboration with the states. Success stories from these initiatives are being shared using our social media.
Monitoring actions undertaken in accord with intervention and condition monitoring plans	The Living Murray monitoring – *to improve the understanding of river health including ecosystem health, function and response to watering and management interventions*	**ACHIEVED** 2015–16 monitoring activities carried out in accordance with icon site condition and intervention monitoring plans. Monitoring results are now being analysed, with reporting due next financial year. A number of target sites are updating condition monitoring plans to reflect condition monitoring refinement recommendations.

Table A.2 Goal 2 River and ecosystem health (continued)

Key performance indicators	Program	Results
Key performance indicators to be developed once program activity and desired outcomes have been agreed	Environmental monitoring and evaluation – *to improve the understanding of river health including ecosystem health, function and response to watering and management interventions*	**NOT MET IN 2015–16** Key performance indicators are being developed as part of the 2016–17 corporate planning process.
Salinity registers independently verified by auditors	Water quality and salinity management – *to reduce adverse impacts on river and ecosystem health*	**ACHIEVED** Salinity registers were independently verified and endorsed by the auditors in November 2015.
Basin Salinity Management Strategy annual implementation report and audit reports approved and published	Water quality and salinity management – *to reduce adverse impacts on river and ecosystem health*	**ONGOING** The Basin Salinity Management Strategy annual implementation report and the salinity audit report completed. Both reports are waiting to be noted by Ministerial Council prior to being published on the website.
Basin Salinity Management 2030 and revised Schedule B accepted by the Basin Officials Committee and Ministerial Council	Water quality and salinity management – *to reduce adverse impacts on river and ecosystem health*	**ONGOING** The Basin Officials Committee endorsed the new basin-wide salinity strategy in October 2015 and the Basin Salinity Management 2030 was approved by Ministerial Council in November 2015. Draft proposed amendments to Schedule B were prepared by partner governments in March/April 2016. Drafting instructions for amendments to Schedule B were provided to the Department of Agriculture and Water Resources in May for consideration. Drafting of amendments by Parliamentary Counsel is planned for July, and following further jurisdictional consultation, it is expected that final amendments will be provided to the Basin Officials Committee in October 2016 and Ministerial Council in November 2016 for approval.

Table A.3 Goal 3 Knowledge into action

Key performance indicators	Program	Results
Model results accepted	Water resources core modelling – *to continuously build an evidence base to support the implementation of the Basin Plan and delivery of joint programs through data acquisition, research and dissemination of knowledge*	**ACHIEVED** No model results have been rejected. Also, no formal or informal complaints have been received from clients on modelling carried out.
Model runs support implementation of the Murray–Darling Basin Agreement	Water resources core modelling – *to continuously build an evidence base to support the implementation of the Basin Plan and delivery of joint programs through data acquisition, research and dissemination of knowledge*	**ONGOING** No results were due in this quarter.

Table A.3 Goal 3 Knowledge into action (continued)

Key performance indicators	Program	Results
Satisfaction level of the Murray–Darling Basin Ministerial Council, Basin Officials Committee, and other relevant Advisory Committees with the secretariat support provided	Secretariat – *timely publication and communication of information relating to the Murray–Darling Basin in a form that is accessible to communities, governments and industry to meet their information needs*	**ONGOING** No formal complaints were lodged about the variety of services provided by the secretariat.
Agenda papers delivered according to agreed protocols	Secretariat – *timely publication and communication of information relating to the Murray–Darling Basin in a form that is accessible to communities, governments and industry to meet their information needs*	**PARTIALLY ACHIEVED** The instance of late papers has generally reduced. All papers provided to the secretariat within the agreed timeframes were circulated on time. Papers that were not provided by authors within the agreed timeframes were circulated late.
Draft minutes and actions arising provided to jurisdictions within two weeks of a meeting	Secretariat – *timely publication and communication of information relating to the Murray–Darling Basin in a form that is accessible to communities, governments and industry to meet their information needs*	**PARTIALLY ACHIEVED** The secretariat endeavours to meet the time frames, stipulated in the operational and internal and external clearance procedures for each committee, for the circulation of draft minutes and actions arising. Internal and external clearance requirements have affected the ability of the secretariat to consistently meet this time frame.
The Living Murray Indigenous partnership project is implemented consistent with agreed work plans	The Living Murray Indigenous Partnerships – *timely publication and communication of information relating to the Murray–Darling Basin in a form that is accessible to communities, governments and industry to meet their information needs*	**ONGOING** The Living Murray Indigenous partnership project is implemented consistent with agreed work plans.

Table A.4 Goal 4 River Murray asset management

Key performance indicators	Program	Results
No adverse rulings from jurisdictional dam safety regulators	Water assets Victoria – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** There have been no adverse rulings in this financial year. Presentations on the extreme rainfall study for Hume and Dartmouth catchments have been made to the Victorian regulator on 1 October 2015 and to the New South Wales regulator on 10 February 2016.
Annual inspection assesses all Victorian assets to have achieved a good or high standard of maintenance as defined by the asset controlling governments	Water assets Victoria – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ONGOING** The standard of maintenance on all Victorian assets have been rated as 'high' during the annual Collings trophy inspections.
No unscheduled major outages of assets	Water assets Victoria – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** No unscheduled major outages.

Table A.4 Goal 4 River Murray asset management (continued)

Key performance indicators	Program	Results
Annual inspection assesses all riparian health assets to have achieved a good or high standard of maintenance as defined by the asset controlling governments	Water assets New South Wales – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ONGOING** This key performance indicator will be assessed based on inspection of a sample of works. The upper Murray inspections have been completed and revealed that some assets need additional maintenance in 2015–16. Hume–Yarrawonga data not yet available.
No adverse rulings from jurisdictional dam safety regulators	Water assets New South Wales – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** There have been no adverse rulings in this financial year. Presentations on the extreme rainfall study for Hume and Dartmouth catchments have been made to the Victorian regulator on 1 October 2015 and to the New South Wales regulator on 10 February 2016.
Annual inspection assesses all Water NSW assets to have achieved a good or high standard of maintenance as defined by the asset controlling governments	Water assets New South Wales – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** The standard of maintenance on all New South Wales assets have been rated as 'high' during the annual Collings trophy inspections.
No unscheduled major outages of assets	Water assets New South Wales – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** No unscheduled major outages.
No adverse rulings from jurisdictional dam safety regulators	Water assets South Australia – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** There have been no adverse rulings in this financial year.
Annual inspection assesses all South Australian assets to have achieved a good or high standard of maintenance as defined by the asset controlling governments	Water assets South Australia – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** Standard of maintenance on all SA assets has been assessed as 'high' during annual Collings trophy inspections.
No unscheduled outages of assets	Water assets South Australia – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** No unscheduled major outages affecting service.
Asset management documentation established and maintained to the satisfaction of asset controlling governments	Asset management strategies – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ONGOING** The current scoping study for asset management improvements will provide a comprehensive assessment of each state construction authority's documentation and practice. This will be used to assess the adequacy of current processes with respect to asset controlling government's expectations. Improvement recommendations (if needed) will be developed as part of this study. The River Murray Operations Committee's consideration of the resulting report will provide evidence of governments' degree of satisfaction.

Table A.4 Goal 4 River Murray asset management (continued)

Key performance indicators	Program	Results
Work health and safety reports meet, or are better than government and industry safety standards	Asset management strategies – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ONGOING** Reported to the Asset Management Advisory Panel. There were no significant Workplace Health and Safety incidents in quarter three.
The Dam Improvement Program is being implemented to the satisfaction of the asset controlling governments	Asset management strategies – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** The Hume and Lake Victoria projects are being progressed by relevant state construction authorities. Review of the risk profile to reflect recent investigations is underway to reassess the scope and priority for further works.
Positive annual performance report for all salt interception schemes	Salt interception schemes – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** State construction authorities have provided annual performance reports. Schemes continue to be operated and maintained, which includes the reduction in operations to achieve the $1.3 million program budget saving. Salinity at Morgan continues to be low.
Each scheme meets its individual operational target	Salt interception schemes –*to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ACHIEVED** Operation outcomes against targets will be documented in annual reports for schemes. With responsive management of schemes commencing, previously established targets will have less relevance as they are based on consistent 'full' operation of all schemes. Revised targets reflecting responsive management practices will be established.
Commissioning and handover activities are progressing consistent with the schedule and budget and in accordance with MDBA and state approvals	Environmental Works and Measures Program progress construction of works – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ONGOING** There has been limited opportunity for commissioning in the winter and spring of 2015. This activity will be progressively carried out as water availability and environmental requirements permit. The Mullaroo Regulator was commissioned for a weir pool raising and lowering.
Final inspection after commissioning assesses environmental works assets to be complete, fit for purpose, and able to deliver the ecological benefits intended	Environmental Works and Measures Program management progress construction of works – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ONGOING** Commissioning will take a number of years to observe the full range of conditions the works have been designed to operate under.
Environmental works and specific projects are managed efficiently to achieve their objectives and are maintained to contemporary standards	Operate and maintain environmental works – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ONGOING** Processes for routine inspection and maintenance of environmental assets are being developed and trialled at Lindsay–Mulcra–Walpolla. With these assets progressively being added to the state contructing authorities' programs, maintenance requirements will be refined as operations are conducted. These assets are being managed within existing construction authority resources at water supply assets and locks and weirs. The sustainability of this, especially if watering events are conducted at multiple sites at the same time, will continue to be evaluated.

Table A.4 Goal 4 River Murray asset management (continued)

Key performance indicators	Program	Results
Incremental operation and maintenance costs of new barrage fishways are minimal	Water assets SA (barrage fishways) – *to build, maintain and improve River Murray system assets to achieve contemporary best practice standards*	**ONGOING** Four fishways have been constructed and are operating. Due to delays in the preparation of designs, construction of the remaining two fishways will now be delayed to the first and second quarters of 2016–17. Preliminary data of fish ascension and attractant monitoring of operational fishways indicate they are effective. This will be further investigated from spring/ summer monitoring and commissioning. This monitoring is relatively minor and is being met by resources at the barrage that are already funded within the joint program. The static nature of vertical slot fishways means maintenance requirements are small.
Positive report on River Murray system operations by the Independent River Operations Review Group, endorsed by the Basin Officials Committee	River Operations – *to manage the water sharing of the River Murray system between states to meet multiple social, economic and environmental objectives and support the community*	**ONGOING** The Independent River Operations Review Group reported favourably on the performance of River Operations and its report on 2014–15 operations was noted by BOC in December 2015. IRORG will review 2015–16 operations by 30 September 2016. The key performance indicator is achieved by carrying out operations in accordance with the Murray–Darling Basin Agreement and objectives and outcomes set by Basin Officials Committee.
Water data system downtime no greater than 5 days over a 12 month period	Operations Services (River Murray Office) – *to manage the water sharing of the River Murray system between states to meet multiple social, economic and environmental objectives and support the community*	**ONGOING** The system experienced minor outages during the key performance indicator period. This key performance indicator ensures water data system is operational and available for operational use. This key performance indicator contributes to goal 4.
Age of hydrographic data is no more than 90 days at high priority sites	Operations Services (River Murray Office) – *to manage the water sharing of the River Murray system between states to meet multiple social, economic and environmental objectives and support the community*	**ACHIEVED** Target met. No high priority sites were identified as having hydrographic data older than 90 days.
River Operations workflow system is being used for day to day river operations activities	Operations Services (River Murray Office) – *to manage the water sharing of the River Murray system between states to meet multiple social, economic and environmental objectives and support the community*	**ACHIEVED** The operations workflow is fully operational and it is being used daily by river operators. Reduced operational data entry and quality assurance by 2–3 hours daily since the introduction of the River Operations workflow system.
Hydrometric services provided meet the service standard	Operations Services (hydrometric network) – *to manage the water sharing of the River Murray system between states to meet multiple social, economic and environmental objectives and support the community*	**ACHIEVED** No exceptions to agreed standard were identified or reported.

Table A.4 Goal 4 River Murray asset management (continued)

Key performance indicators	Program	Results
New or amended specific objectives and outcomes recommended to the Basin Officials Committee	Operations Improvement – *to manage the water sharing of the River Murray system between states to meet multiple social, economic and environmental objectives and support the community.*	**ONGOING** Reviewed and amended in accordance with Clause 19 of the *Objectives and outcomes for river operations in the River Murray System* (required by clause 31 of the MDB Agreement). In 2015–16, the Basin Officials Committee has agreed to: • new specific objective and outcome 14.2 to mitigate the special accounting step function issue (at meeting 35) • amendments to specific objective and outcome 4.1 to clarify the treatment of the Barmah–Millewa Forest Environmental Water Allocation under special accounting (at Meeting 35) • new specific objective and outcome 3.1a for the maximum flow downstream of Yarrawonga Weir when forest inundation is desirable (at meeting 37, including key messages) and associated amendments to specific objective and outcome 3.1.
Environmental guidelines progressively agreed and are being followed	Operations improvement – *to manage the water sharing of the River Murray system between states to meet multiple social, economic and environmental objectives and support the community*	**ONGOING** The environmental guidelines is an ongoing program that assists the MDBA meet its obligations under clause 50 of the Murray–Darling Basin Agreement and clause 4(5) of the *Objectives and outcomes for river operations in the River Murray system.* Environmental guidelines for variability in minimum planned regulated releases from the Dartmouth Pondage Weir (Banimboola) were approved by the Executive Director, River Management on 26 May 2016. Approval of environmental guidelines for periodic winter drawdown of Lake Mulwala for management of the water weed *Egeria densa* is anticipated for the first quarter of 2016–17.
Emergency Action Plan up to date	Operations improvement – *to manage the water sharing of the River Murray system between states to meet multiple social, economic and environmental objectives and support the community.*	**ACHIEVED** Sub-clause 9(3) of the *Objectives and outcomes for river operations in the River Murray system* requires the MDBA to have and maintain an emergency action plan. Minor updates to the emergency action plan were made in June, however the review scheduled to commence in 2016 has not been undertaken due to a focus on other priorities. The MDBA internal auditor undertook a test of the emergency action plan in June 2016, the findings of this will inform the next review.

APPENDIX B

The Regulator Performance Framework

TThe Australian Government has committed to reducing the cost of unnecessary or inefficient regulation imposed on individuals, business and community organisations by at least $1 billion a year. As a means of contributing to this, the Regulator Performance Framework is intended to assist in highlighting where improvement of regulatory frameworks could reduce compliance costs.

The framework requires Australian Government regulators to self-assess their regulatory performance once every 12 months. Regulatory performance is based on six key performance indicators and each regulator has developed its own metrics based on these indicators. All self-assessments must be externally verified.

This document contains an externally-verified self-assessment of the Murray–Darling Basin Authority's performance against its agreed framework metrics for the 2015–16 reporting period.

The MDBA's regulatory activity subject to the Regulator Performance Framework

There are some contextual factors that influence how much of the MDBA's work is subject to the framework. It is important to understand these factors as they influence the MDBA s self-assessment.

Firstly, the entities regulated by the MDBA are primarily governments or their agencies. Only a very small portion of the work involves direct regulation of non-government entities. Given that the focus of the framework is on impacts of regulation on individuals, business and community organisations (i.e. non-government entities), only a very small portion of the MDBA's work is subject to the framework. The relevant work is the administration of the Basin Plan water trading rules as those rules apply to individual traders and irrigation infrastructure operators. This is a relatively minor component of the MDBA's overall work and imposes a minor regulatory burden – the annual compliance cost has been estimated at less than $15,000 for the entire regulated community.

Secondly, the relevant regulatory work is already well into the implementation phase following comprehensive stakeholder consultation prior to the enactment of the water trading rules in July 2014. Among others, that consultation targeted irrigation infrastructure operators and irrigation bodies. It also included bilateral meetings with regulated entities at each major stage of the decision-making process.

The consultation included a strong focus on how to minimise compliance burden on individuals, business and community organisations. As well as helping to promote transparency and accountability, this ultimately resulted in a trade rules system that already imposes minimal burden on those concerned. Given that the framework involves annual reporting periods (e.g. this self-assessment is concerned with activities undertaken in 2015–16), there is limited opportunity for the MDBA to report on the significant work already done as it pre-dates the framework's current reporting period.

The MDBA's 2015–16 self-assessment

In relation to the administration of the Basin Plan water trading rules as those rules apply to individual traders and irrigation infrastructure operators, the MDBA has in place a regulatory framework that is consistent with the intent of the framework in that it:

- provides for minimal impediment to the operation of individual traders and irrigation infrastructure operators
- includes effective communication channels
- provides that regulatory actions are proportionate to risk
- includes coordinated compliance monitoring approaches
- is based on transparency
- is subject to continual improvement.

The MDBA has developed strategic priorities in relation to the water trading rules to ensure that compliance efforts are proportionate to risk and do not unnecessarily impede the operation of regulated entities. These priorities are periodically revised. The priorities are underpinned by a Compliance Risk Management Framework that provides the foundation for the MDBA's risk-based approach to compliance.

The MDBA's compliance approach includes targeted communication and providing information. For example, the MDBA's water markets and trade section:

- advises the Trade Rules Working Group of our approach and strategic priorities in administering the water trading rules
- communicates with irrigation infrastructure operators regarding their roles and responsibilities
- encourages trade approval authorities to remind individuals of their requirements under the water trading rules in relation to price reporting.

To complement this targeted communication, the MDBA ensures a transparent approach by providing information on our website. This information includes a compliance strategy that outlines the MDBA's compliance approach, and publications outlining individual roles and responsibilities under the Basin Plan water trading rules. As a requirement of the Basin Plan, the MDBA also collects and publishes information on irrigation infrastructure operators' trading rules and water rights.

The MDBA also has effective mechanisms in place to receive information. As well as ongoing communication, our website allows stakeholders to register queries, complaints and allegations.

In addition to the framework, the MDBA recognises the need for continual improvement and is undertaking work that will contribute to the intent of the framework and reduce the regulatory burden on individual traders and irrigation infrastructure operators. This includes:

- ensuring staff are appropriately trained to undertake compliance activities and effective stakeholder engagement
- ensuring that evaluation is undertaken of communication effectiveness
- using feedback from stakeholders to inform continual improvement.

The MDBA will address these areas for improvement over the 2016–17 period.

APPENDIX C

Governance bodies meetings and outcomes

The Authority

The six member Authority met 11 times during 2015–16 focusing mainly on water resource planning, sustainable diversion limit adjustment and the Northern Basin Review.

Other key areas of work included: continuing implementation of the Basin Plan water trading rules and coordination of interstate trade under Schedule D of the Murray–Darling Basin Agreement; regular engagement with jurisdictional representatives and technical experts; an examination of the issues associated with the protection of held environmental water in the northern basin; and amending the Basin Plan when required, due to independent scientific advice or jurisdictional concerns.

Significant outcomes included:

- providing advice on the constraints management strategy and the pre-requisite policy measures
- approving the annual environmental watering priorities
- endorsing the Aboriginal Partnerships Action Plan
- endorsing the Basin Plan annual report 2014–15
- expanding the MDBA's citizen science initiatives
- providing advice on the MDBA's social and economic work in the northern basin
- developing its triple bottom line decision making tool
- providing advice on the Northern Basin Review.

Murray–Darling Basin Ministerial Council

The Murray–Darling Basin Ministerial Council is comprised of the Australian Government Minister for Agriculture and Water Resources, the Hon. Barnaby Joyce MP, and the basin state ministers with responsibility for the Murray–Darling Basin. The Hon. Barnaby Joyce, MP replaced the Hon. Bob Baldwin MP as Chair in September 2015. At 30 June 2015 basin state ministers were:

- The Hon. Niall Blair MP (New South Wales)
- Mr Simon Corbell MLA (Australian Capital Territory).
- The Hon. Ian Hunter MLC (South Australia)
- The Hon. Anthony Lynham MP (Queensland)
- The Hon. Lisa Neville MP (Victoria).

Meetings and outcomes

The Murray–Darling Basin Ministerial Council met four times in 2015–16: August and November 2015 in Sydney, March 2016 in Melbourne and April 2016 in Brisbane. The communiqués from these meetings are available on our website, <mdba.gov.au>. The Ministerial Council achieved a number of significant outcomes during 2015–16, both in and out of session, these included:

- agreeing to a package of supply, efficiency and constraints measures that will result in changes to the sustainable diversion limits of the Basin Plan
- agreeing on the principles that would guide the implementation of the sustainable diversion limit adjustment package and provide the basis for updating the current Intergovernmental Agreement on Implementing Water Reform in the Murray–Darling Basin
- agreeing to revise Schedule B to the Murray–Darling Basin Agreement to give effect to the new Basin Salinity Management 2030 Strategy
- requesting that officials advise on opportunities and a process to enable a wider range of environmental projects, such as measures to control carp, to provide triple bottom line benefits under the Basin Plan past 30 June 2016
- discussing the continued collaboration to minimise as far as possible the impacts of widespread blue-green algae in the southern basin
- approving and noting the significance of the new 15-year plan to manage salt in the river system – the Basin Salinity Management 2030 Strategy
- noting that due to basin governments' water reform measures of the past 10 years, including the Basin Plan, the river system is now more resilient to drought conditions than was the case at the start of the millennium drought but that irrigators, other water users

and communities still come under pressure in low allocations years

- reaffirming their governments' commitment to work together towards the next set of Basin Plan milestones in 2016, consistent with their shared objective of implementing the Basin Plan
- agreeing that the audit of the books of joint venture accounts maintained by the MDBA be undertaken by a highly reputable private sector firm
- noting the passage, in September 2015, of legislation that places a 1,500 GL limit on surface water purchases by the Australian Government, noting that the legislation also allows greater flexibility in the way additional water could be recovered for the environment, through a combination of on-farm and off-farm efficiency measures
- noting progress by officials on the Northern Basin Review, which involves additional scientific and socio-economic assessment of different diversion limits and consideration of a possible amendment to the Basin Plan in the north
- noting their appreciation of the work of the Northern Basin Advisory Committee in the Northern Basin Review
- receiving an update on how state water planning processes will accommodate consideration of Aboriginal peoples' interests in water management, consistent with the requirements of the Basin Plan
- noting water trade restrictions can be required to manage physical constraints in the southern basin, but it is important that these measures are reported transparently to provide appropriate and timely information for water users across the basin
- releasing an independent sustainable diversion limit adjustment stocktake report showing a supply contribution of about 500 GL is plausible under the sustainable diversion limit adjustment mechanism and that a further contribution is feasible
- noting progress towards settling key planning assumptions that the states will use to develop their water resource plans under the Basin Plan
- welcoming the strong collaboration among Australian Government and state agencies to coordinate environmental water delivery, which has built on the work of previous years
- applauding outgoing MDBA Chief Executive Dr Rhondda Dickson's outstanding contribution to water reform and Basin Plan implementation and welcoming the appointment of Mr Phillip Glyde as the new Chief Executive.

Basin Officials Committee

The Murray–Darling Basin Officials Committee was established by the Murray–Darling Basin Agreement, Schedule 1 to the Water Act. The committee facilitates cooperation and coordination between the Australian Government, the MDBA and the basin states in funding works and managing the basin water resources.

Membership of the committee comprises officials from the six basin governments, and is chaired by the Australian Government committee member. The Authority Chair and the MDBA Chief Executive are non-voting members of the Committee.

The committee is responsible for providing advice to the Murray–Darling Basin Ministerial Council and for implementing policy and decisions of the council on matters such as state water shares and coordination of environmental watering.

The committee has high-level decision-making responsibilities for river operations, including setting objectives and outcomes to be achieved by the MDBA in River Murray Operations and providing advice to the Ministerial Council on the joint programs component of the corporate plan. As at 30 June 2016, committee membership comprised:

- Chair, David Parker (Australian Government)
- Leanne Barbeler (Queensland)
- Dorte Ekelund (Australian Capital Territory)
- Tim Goodes (South Australia)
- Gavin Hanlon (New South Wales)
- Kate Houghton (Victoria).

Leanne Barbeler replaced Lyall Hinrichsen as the Queensland representative on the Basin Officials Committee late in 2015–16.

Meetings and outcomes

The Basin Officials Committee held seven meetings during 2015–16 and achieved the following significant outcomes:

- endorsed the 2016–17 draft corporate plan, subject to jurisdictional budget confirmation.
- endorsed the Basin Salinity Management 2030 implementation plan
- prepared a finalisation plan (as agreed to by the Ministerial Council) to assist in achieving the best possible supply contribution from the operation of the sustainable diversion limit adjustment mechanism
- endorsed revised phase 2 (assessment) and phase 3 (confirmation) guidelines and considered ongoing interim advice from the MDBA on the potential sustainable diversion limit adjustment from a package of supply measures
- approved a seventh watering trial on the River Murray system in the 2016–17 water year
- commissioned an independent inventory and detailed analysis of changes to the Framework for River Operation in the River Murray System that are necessary to give effect to supply, constraint and prerequisite policy measures that are being proposed by basin jurisdictions.
- agreed to revised objectives and outcomes for river operations
- provided advice on the constraints management strategy annual report.

Basin Plan Implementation Committee

In August 2013 the finalised Implementation Agreement established the new Basin Plan Implementation Committee as a high-level forum to monitor, review and make decisions relevant to implementing the agreement. The MDBA chairs the committee which has members from the basin state agencies responsible for water resource management and environmental watering, the Commonwealth Environmental Water Holder and the Australian Government Department of Agriculture and Water Resources.

Four Basin Plan Implementation Committee working groups were also established – water resource planning, environmental watering, trade rules, and monitoring and evaluation. These four technical working groups also have basin government representatives and have been set up to progress the tasks outlined in the implementation agreement. The MDBA also chairs each working group and provides secretarial support.

Meetings and outcomes

The committee met four times in 2015–16. The terms of reference, work programs and working groups were developed and agreed to. Arrangements to share information on community engagement were also established and are working well. The committee provided a progress report on Basin Plan implementation to the Ministerial Council in November 2015. It highlighted the collaborative work on water resource planning; the agreement on an approach for reporting water take during transition from the 2012 Basin Plan to the 2019 sustainable diversion limits; and progress on developing planning assumptions.

The four working groups have met more frequently to progress the many tasks under the implementation agreement in a collaborative manner. These tasks included:

- developing a risk register, or issues log, addressing risks to meeting the June 2019 timeframe in consultation with the Water Resource Planning Working Group
- progressing of a framework for the development and implementation of the Register of Take for surface water and groundwater compliance
- assisting with planning and participating in the annual water planners forum – 'Water Planning Together', 25–26 March 2015
- sharing and discussing progress, challenges and information on long-term environmental watering plans
- undertaking stocktake and gap analysis of existing monitoring and reporting across the Murray–Darling Basin
- preparing reporting guidelines and templates for annual reporting against Schedule 12 of the Basin Plan
- coordinating successful implementation of Schedule 12 reporting for 2013–14 and 2014–15.

River Murray Operations Committee

The River Murray Operations Committee was established to provide support and advice to the Basin Officials Committee on responsibilities with regards to River Murray Operations. It met five times in Canberra in 2015–16.

The committee provides formal oversight of River Murray Operations which are managed by the MDBA on behalf of the relevant contracting governments in accordance with the provisions of the agreement including:

- providing advice to the relevant contracting governments, through the Basin Officials Committee, on:
  - policy matters with regard to asset use, construction and planned maintenance
  - policy matters relating to the delivery and accounting for the water available to the relevant contacting governments under the agreement's water sharing arrangements
  - cost sharing arrangements to meet the costs of constructing, managing, controlling, operating, using, maintaining, repairing and renewing River Murray Operations assets
  - advising the relevant contracting governments of any associated issues and risks, and potential actions to address those issues and risks
  - proposals for the future development of River Murray Operations
- providing advice to the MDBA on:
  - preparation of corporate plans in relation to River Murray Operations
  - preparation of the asset management plan and any amendments to the asset management plan
  - coordination of waterway management functions of New South Wales, Victoria and South Australia in relation to the River Murray system.

Basin Community Committee

The role of the Basin Community Committee includes providing advice to the MDBA about the performance of its functions, including:

- engaging the community in the implementation of the Basin Plan
- community matters relating to the basin water resources
- matters referred to the committee by the Authority.

The Basin Community Committee advises the Murray–Darling Basin Ministerial Council on the Murray–Darling Basin and its functions under the Murray–Darling Basin Agreement, which may include matters such as delivery of natural resource management programs.

In carrying out these functions, the committee liaises with the broader basin community, by convening meetings with regional basin stakeholders during the implementation process for the Basin Plan. They also carry out liaison activities to help provide advice to the Authority and the Murray–Darling Basin Ministerial Council. At 30 June 2016, the 11 member committee comprised:

- Chair, Rory Treweeke, Lightning Ridge (New South Wales)
- Di Bowles, Cohuna (Victoria)
- Paul Harvey, Adelaide (South Australia)
- Karen Hutchinson, Griffith (New South Wales)
- Howard Jones, Dareton (New South Wales)
- Christopher Joseph, Dalby (Queensland)
- Anthony Martin, Merbein (Victoria)
- Russell Pell, Wyuna (Victoria)
- Joanne Pfeiffer, Murray Bridge (South Australia)
- Grant Rigney, Meningie (South Australia)
- Jason Wilson, Dubbo (New South Wales).

Meetings and outcomes

The Basin Community Committee held four meetings during 2015–16 and achieved the following significant outcomes:

- provided strategic advice to the MDBA on its engagement with communities, including on the tools being used to support engagement
- provided advice to assist the MDBA communicate the modelling scenarios for the Northern Basin Review
- emphasised to the Ministerial Council the importance of individual communication, particularly in relation to the proposed constraints strategy and whenever major changes in on-ground impacts anticipated.

Northern Basin Advisory Committee

During 2015–16 the Northern Basin Advisory Committee continued providing valuable independent advice on how an adaptive Basin Plan can be implemented in the northern basin. The main focus of the committee has been their

northern basin work program, which is guided by six key objectives:

- to achieve positive social and economic outcomes
- to achieve sensible water recovery and effective use
- to identify the best environmental science
- to ensure communities have confidence in the implementation of the Basin Plan
- to establish reliable monitoring and evaluation methods
- to recognise cultural flows.

Members of the committee are:

- Mal Peters (Chair), Ashford (New South Wales)
- John Clements, Wee Waa (New South Wales)
- Ed Fessey, Brewarrina (New South Wales)
- Katrina Humphries, Moree (New South Wales)
- Bruce McCollum, Goondiwindi (Queensland)
- Sarah Moles, North Branch (Queensland)
- Michelle Ramsay, Bonshaw (Queensland)
- Donna Stewart, St George (Queensland)
- Ian Todd, St George (Queensland)
- Jason Wilson, Dubbo (New South Wales)
- Geoff Wise, Dubbo (New South Wales).

The committee met four times during the year in Canberra: 28–29 July 2015; 25–26 November 2015, 29 February–1 March 2016; 3–4 May 2016.

The working groups that provide advice to the Northern Basin Advisory Committee are: social and economic; environmental science; monitoring and evaluation; water recovery and use; and confident communities. The working groups held 17 meetings in 2015–16.

Advisory Committee on Social, Economic and Environmental Sciences

The MDBA established the Advisory Committee on Social, Economic and Environmental Sciences to provide high-level, strategic advice on a range of scientific matters relevant to implementing the Basin Plan. Members of the committee bring skills and eminence in the fields of economics, hydrology, ecology and resilience, water governance and law, sociology and sustainable systems. As at 30 June 2016, committee members comprised:

- Professor Stuart Bunn
- Professor Kate Auty
- Dr David James
- Associate Professor Mike Stewardson
- Professor Poh-Ling Tan.

Professor Stuart Bunn replaced Dr Brian Walker as the Chair on 30 May 2016.

The diversity of the members' skills provides a valuable opportunity to integrate across the scientific disciplines and to help ensure that our work is based on the best possible scientific advice. Strategic advice from the committee is used in developing a coherent approach to identifying knowledge gaps, aligning collective efforts, and identifying new ways to connect and communicate the complex technical issues that underpin a healthy working basin.

The members participated in an MDBA scenario planning workshop late May 2016. Scenario planning is a systematic approach towards strategic foresight. The MDBA embarked on the process to answer the question: 'Are we prepared for a future that might look quite different?' The purpose of exploring this question is not to try and predict the future, but to anticipate some of the challenges and opportunities the Murray–Darling Basin and MDBA might face in the future.

The committee met four times in 2015–16, in Canberra.

APPENDIX D

Communication products

We produce a range of communication products each year, in printed and electronic formats.

Publications

Aboriginal Partnerships Action Plan – Building partnerships with traditional owners (07/15)

Aboriginal Waterways Assessment program (20/15)

Assessment of the salt export objective and salinity targets for flow management 2013–14 (08/15)

Assessment of salt export objective and salinity targets flow management 2014–15 (32/15)

Basin annual environmental watering priorities 2016–17 (online)

Basin environmental watering outlook for 2016–17 (29/15)

Basin Plan annual report 2014–15 (23/15)

Basin Plan timeline for 2016 (online)

Basin Salinity Management 2030 (21/15)

Basin Salinity Management Strategy 2013–14 annual implementation report (03/15)

Constraints management strategy annual progress report to ministers 2015 (34/15)

Irrigated agriculture profile: dairy (online)

Irrigated agriculture profile: wine grapes (online)

Lower Darling reach report (online)

Murray–Darling Basin Authority annual report (2014–15)

Murrumbidgee reach report (online)

Revision of the River Murray Water Quality Monitoring Program (18/15)

River Murray system annual operating plan 2015–16 (13/15)

River Murray system annual operating plan 2015–16 end October 2015 update (22/15)

South Australian River Murray reach report (online)

Statements of Assurance 2014–15 (online)

Strategic priorities – Basin Plan water trading rules (online)

Strengthening Connections – Reconciliation Action Plan 2015–18 (04/15)

The Living Murray 2014–15 environmental watering report (25/15)

The Living Murray environmental watering outlook 2015–16 (17/15)

The Living Murray icon sites monitoring 2013–14 (24/15)

The MDBA's submission to the select committee on the Murray–Darling Basin Plan (online)

The SDL adjustment assessment framework for supply measures (06/15)

Brochures and fact sheets

Lake Victoria – a special place (online)

Northern Basin Review factsheets

Sustainable diversion limit fact sheet – How the sustainable diversion limit in the basin can change (33/15)

eNewsletters

Basin Connect (Chief Executive enewsletter)

The northern basin newsletter (September 2015)

Other

Alfred Deakin's diary from his travels in America (online)

APPENDIX E

Agency resource statement and resources for outcome 1

The annual report must include an agency resource statement table providing information about the various funding sources that the agency may draw upon during the year.

The agency resource statement has been designed to allow agencies to reconcile the final usage of all resources in cash terms, by declaring the actual available appropriation for 2015–16 (including carried forward cash balances and further adjustments such as section 75 transfers under the *Public Governance, Performance and Accountability Act 2013* and advances to the Finance Minister), and comparing this to the actual payments made.

Additionally, for departmental appropriations and special accounts, information about any remaining balance that will be carried over to the next financial year must also be reported.

Outcome 1: Equitable and sustainable use of the Murray–Darling Basin by governments and the community including through development and implementation of a Basin Plan, operation of the River Murray system, shared natural resource management programs, research, information and advice.

Table E.1 Resource statement 2015–16 (excluding GST)

	Actual available appropriation for 2015–16 $'000 (A)	Payments made 2015–16 $'000 (B)	Balance remaining 2015–16 $'000 (A)-(B)
Ordinary annual services[1]			
Departmental appropriation			
Transfer of Special Account balance[2]	81,271	308	80,963
Departmental appropriation[3]	46,736	46,736	-
Own-source income[4]	92,427	92,427	-
Total	**220,434**	**139,471**	**80,963**
Administered expenses			
Outcome 1[5]	25,000	25,000	-
Total	**25,000**	**25,000**	-
Total ordinary annual services	**245,434**	**164,471**	**80,963**
Total available annual appropriations	**245,434**	**164,471**	**80,963**
Total net resourcing for MDBA	**245,434**	**164,471**	**80,963**

1 Appropriation Bill (No.1) 2015–16

2 On 1 July 2014, the Authority ceased to be an Agency under the FMA Act and became a corporate Commonwealth entity for the purposes of the *Public Governance, Performance and Accountability Act 2013* as amended (PGPA Act).

One of the outcomes associated with this change was that the MDBA elected to fully draw-down the existing cash balance of $91.427 m and transfer these monies to 'Cash At Bank'. This was to facilitate the subsequent transfer of these funds on 1 July 2014 to a new operating account that functions outside of the Official Public Account. The cash at bank balance remaining at 30 June 2016 is $80.963 m.

3 The MDBA did not receive a Departmental Capital Budget in 2015–16.

4 Own-source income comprises of mainly the jurisdictions contributions to the MDB Agreement functions.

5 The MDBA did not receive the Administered Capital Budget in 2015–16.

Table E.2 Budgeted expenses for outcome 1

	Budget 2015–16 $'000 (A)	Actual 2015–16 $'000 (B)	Variation 2015–16 $'000 (A)-(B)
Program 1.1 Equitable and sustainable use of the Murray–Darling Basin			
Revenue from Government			
Ordinary annual services (Appropriation Bill No. 1)	71,736	71,736	-
Payment from related entities	9,989	9,989	-
Revenue from other independent sources [a]	91,950	82,680	9,270
Total for Program 1.1	**173,675**	**164,405**	**9,270**
Outcome 1 totals by resource type			
Revenue from Government			
Ordinary annual services (Appropriation Bill No. 1)	71,736	71,736	-
Payment from related entities	9,989	9,989	-
Revenue from other independent sources [a]	91,950	82,680	9,270
Total expenses for Outcome 1	**173,675**	**164,405**	**12,966**

a Revenue from other independent sources include contributions from jurisdictions for MDB Agreement functions, other miscellaneous revenue and funds drawn from Murray–Darling Basin special account. Murray–Darling Basin special account is not a Special Account for the purpose of the *Public Governance, Performance and Accountability Act 2013*.

	2011–12	2012–13	2013–14	2014–15	2015–16
Average staff level (number)	295	305	295	289	286

APPENDIX F

Advertising and market research

This table of expenditure for 2015–16 is presented in accordance with the reporting requirements in s.311A of the *Commonwealth Electoral Act 1918*. Expenditure was in the media advertising category only.

Table F.1 MDBA media advertising for 2015–16

Agency	Purpose	Expenditure $ (excluding GST)
NRM jobs	Recruitment advertising	150.00
Mitchell and Partners Australia Pty Ltd	Recruitment advertising	425.90
Environment	Recruitment advertising	13,544.70
Hays personnel	Recruitment advertising	5,226.78
Australian publisher	Recruitment advertising	3,806.00
Walsh media	Providing information about the Basin Plan	2,140.00
Mitchell and Partners Australia Pty Ltd	Press advertising for community meetings	1,428.00
Hall & Partners/Open Minds	Market research on the Basin Plan annual report	43,220.00
Total		**69,941.38**

APPENDIX G

Ecologically sustainable development and environmental performance

Ecologically sustainable development is at the core of our activities and business. The *Water Act 2007* requires the MDBA to take into account the principles of ecologically sustainable development.

The principles of ecologically sustainable development include:

- decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- the principle of intergenerational equity – that the present generation should ensure that the health, biodiversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- the conservation of biodiversity and ecological integrity should be a fundamental consideration in decision making improved valuation, pricing and incentive mechanisms should be promoted.

We take into account these principles as part of our core business activities, which include:

- developing and implementing the Basin Plan, which will help to ensure that the environmental health of the Murray–Darling Basin is maintained for future generations. Decision-making processes have included extensive consultation to ensure that economic, environmental, social and equitable aspects are considered
- developing an environmental watering management plan and annual watering priorities which will help to maximise environmental outcomes and contribute to the conservation of biodiversity and ecological integrity within the basin
- using The Living Murray's environmental water portfolio to meet the environmental objectives of the target sites, which includes Australia's largest river red gum forest, and internationally significant wetlands
- constructing and operating fishways, including the Sea to Hume Fishway Program, to allow for greater movement of native fish
- funding strategies to reduce pest fish species in the basin
- commissioning salt interception schemes to divert salt from the River Murray.

Internal operations

We also follow the principles of ecologically sustainable development in our internal operations and we have implemented a number of initiatives, including:

Recycling by:

- operating a paper, cardboard, battery, co-mingled and organic waste recycling program
- using 100% recycled or partially recycled stock for all print publications
- recycling printer cartridges
- changing over toilet paper suppliers to a company that uses 100% renewable resources and donates 50% of their profits to help build toilets for those in need

Reducing by:

- minimising our paper and toner use by default setting printers to double-sided, black and white printing
- publishing only in electronic format unless a need for print copies is identified
- carefully planning print runs, which has significantly reduced our excess stock
- using water saving flushes in all bathrooms, and low flow taps where possible, to reduce water consumption

Reducing our power consumption by:

- implementing server virtualisation for our IT network to reduce power usage
- enabling computers to turn off automatically overnight to save power
- using power-efficient centralised multi-function devices instead of distributed desktop printing
- operating lighting through movement sensors in all work spaces, so that lights are switched off when areas are not in use
- purchasing energy-saving whitegoods and ICT equipment

- direct heating water where possible
- installing secondary glazing on windows where heat transference is significant.

Travel

- in 2015–16 we travelled 168,334 km by car (an average of 589 km per employee), and 2,411,045 km by plane (an average of 8,430 km per employee)
- interstate travel was reduced by utilising teleconferences, Skype and videoconferencing, where possible, although in 2015–16 there continued to be extensive travel throughout the basin due to the importance of meeting face-to-face with community members
- the MDBA actively supports staff who cycle to work by providing secure bike storage, lockers and showers. Around 40% of staff regularly cycle to work
- we continue to look for further opportunities in our internal operations and in our premises to further minimise our impact on the environment.

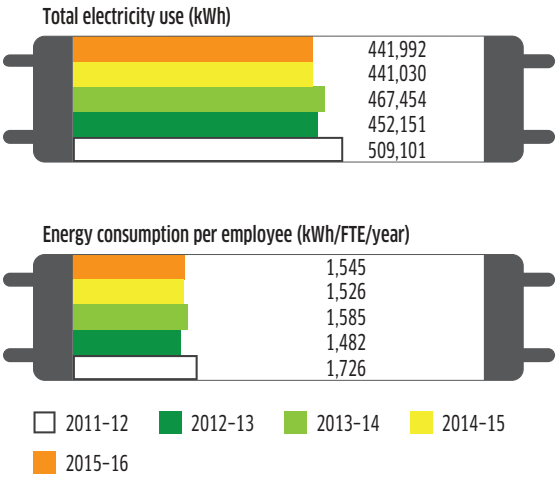


Figure G.1 MDBA energy use 2011 to 2016

Sustainability

Continued to work towards the sustainable use of water resources in the Murray–Darling Basin by implementing the Basin Plan.

Continued to reduce our energy consumption by power saving measures and buying energy efficient equipment.

Around 40% of staff regularly cycle to work.

Continued to reduce the number of printed publications.

Changed to a supplier of toilet paper who donates part of their profits to providing toilets in developing countries.

ABBREVIATIONS AND ACRONYMS

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
AHD	Australian height datum
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EC	electrical conductivity unit
GL	gigalitre (a billion litres)
LGBTI	the Australian Government uses the initials LGBTI to refer collectively to people who are lesbian, gay, bisexual, trans and/or intersex
MDBA/the Authority	Murray–Darling Basin Authority: the agency/the six member Authority
ML	megalitre (a million litres)
ML/d	megalitres per day
MLDRIN	Murray Lower Darling Rivers Indigenous Nations
Ministerial Council	Murray–Darling Basin Ministerial Council
NBAN	Northern Basin Aboriginal Nations
RMIF	River Murray Increased Flows
SDL	sustainable diversion limit
TLM	The Living Murray

SCIENTIFIC NAMES OF PLANTS AND ANIMALS

Australasian bittern	*Botaurus poiciloptilus*
Australian smelt	*Retropinna semoni*
Australian white ibis	*Threskiornis moluccus*
black box	*Eucalyptus largiflorens*
black swan	*Cygnus atratus*
blue-green algae	*Chrysosporium ovalisporum*
carp	*Cyprinus carpio*
carp gudgeon	*Hypseleotris klunzingeri*
common galaxias	*Galaxias maculatus*
congolli	*Pseudaphritis urvillii*
coolabah	*Eucalyptus coolabah*
eastern great egret	*Ardea modesta*
freshwater catfish	*Tandanus tandanus*
golden perch (or yellowbelly)	*Macquaria ambigua*
little pied cormorant	*Microcarbo melanoleucos*
marsh club rush	*Bolboschoenus fluviatilis*
Moira grass	*Pseudoraphis spinescens*
Murray cod	*Maccullochella peelii*
Murray hardyhead	*Craterocephalus fluviatilis*
pouched lamprey	*Geotria australis*
river red gum	*Eucalyptus camaldulensis*
river swamp-wallaby grass	*Amphibromus fluitans*
royal spoonbill	*Platalea regia*
southern bell frog (or growling grass frog)	*Litoria raniformis*
straw-necked ibis	*Threskiornis spinicollis*
tilapia	*Oreochromis spp.*
trout cod	*Maccullochella macquariensis*
waterweed	*Egeria sp.*
wavy marshwort	*Nymphaea crenata*
Yarra pygmy perch	*Nannoperca obscura*

GLOSSARY

Allocation

The water to which the holder of an access licence is entitled from time to time under licence, as recorded in the water allocation account for the licence.

Antecendent condition

Describes how wet or dry a catchment is before rain, as this can have a very significant effect on the flow responses of rivers during wet weather.

Australian height datum

In 1971 the mean sea level for 1966–68 was assigned the value of zero on the Australian height datum at 30 tide gauges around the coast of the Australian continent. The resulting datum surface, with minor modifications in two metropolitan areas, was termed the Australian height datum and was adopted by the National Mapping Council of Australia as the datum to which all vertical control for mapping is to be referred. Elevations quoted using this datum are normally followed with the acronym 'AHD'.

Australian National Committee on Large Dams

The Australian National Committee on Large Dams Incorporated is an incorporated voluntary association of organisations and individual professionals with an interest in dams in Australia.

Barmah Choke

A narrow section of the River Murray that constrains the volume of water that can pass during major floods. During floods, large volumes of water are temporarily banked up behind the Barmah Choke, flooding the Barmah–Millewa Forest wetland system.

Barrages

Five low and wide weirs built at the Murray Mouth in South Australia to reduce the amount of sea water flowing in and out of the mouth due to tidal movement, and to help control water levels in the Lower Lakes and River Murray below Lock 1 (Blanchetown, South Australia).

Baseline

Conditions regarded as a reference point for the purpose of comparison.

Basin states

For the purposes of the Basin Plan, the basin states are defined in the Water Act as New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory.

Basin water resources

Under the *Water Act 2007*, basin water resources are within or beneath the Murray–Darling Basin, but do not include water resources within or beneath the basin that are prescribed by the regulations, or groundwater that forms part of the Great Artesian Basin.

Cap (the Cap on diversions)

A limit, implemented in 1997, on the volume of surface water that can be diverted from rivers for consumptive use. Under the Basin Plan, the Cap is replaced by long-term average sustainable diversion limits.

Carryover

A way to manage water resources and allocations that allows irrigators to take a portion of unused water from one season into the new irrigation season.

Connectivity

Connections between natural habitats, such as a river channel and adjacent wetland areas. Connectivity is a measure or indicator of whether a water body (river, wetland, floodplain) has water connections or flow connections to another body.

Constraints

A constraint is anything that affects the delivery of environmental water. It can include physical aspects such as low lying bridges, or river channel capacity, but can also include operational aspects such as river rules or operating practices that impact on when and how much water can be delivered.

We can improve how effectively we manage and deliver environmental water by looking at how we can change some of these physical and operational constraints.

Consumptive use

Use of water for irrigation, industry, urban, stock and domestic use, or for other private consumptive purpose.

Conveyance water

Conveyance water is the water needed to physically run the river system. Extra water must then be supplied on top of the conveyance water in order to meet deliveries along the river system. The conveyance reserve is water set aside for the next year to minimise the risk of not having enough conveyance water.

Setting aside water for conveyance and critical human needs aims to safeguard fundamental water requirements during a drought more severe than the millennium drought.

Counterfactual modelling

This is the process of producing a model run that represents what river flows would have occurred in each valley before the Basin Plan. These results can then be compared to what is happening as a result of the Basin Plan at the same locations.

Critical human water needs

Under the Water Act, the minimum amount of water required to meet core requirements of communities dependent on basin water resources. The definition also includes non-human requirements that, if not met, would cause prohibitively high social, economic or national security costs.

Cultural flows (or cultural water flows)

Water entitlements legally and beneficially owned by the Aboriginal Nations of the Murray–Darling Basin. They are of sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of Aboriginal people.

EC

Water and soil salinity levels are measured by passing an electric current between the two electrodes of a salinity meter. Electrical current (EC) is influenced by the concentration and composition of dissolved salts.

Salts increase the ability of a solution to conduct an electric current, so a high EC indicates a high salinity level. Freshwater above 800 EC becomes marginal for drinking, above 1,600 EC it is brackish, and above 4,800 EC it is saline.

Efficiency measure

Provide more water for the environment by making water delivery systems for irrigation more efficient. This can include replacing or upgrading on-farm irrigation, or lining channels to reduce water losses within an irrigation network.

Entitlement (or water entitlement)

The volume of water authorised to be taken and used by an irrigator or water authority; includes bulk entitlements, environmental entitlements, water rights, sales water and surface-water and groundwater licences.

Environmental flow

Any river flow pattern provided with the intention of maintaining or improving river health.

Environmental water

Water used to achieve environmental outcomes, including benefits to ecosystem functions, biodiversity, water quality and water resource health.

Environmental water requirements

The amount of water needed to meet an ecological or environmental objective.

Fishway

A structure that provides fish with passage past an obstruction in a stream.

Flow

The movement of water – the rate of water discharged from a source, given in volume with respect to time.

Flow event

A single event of flow in a river, sometimes required to achieve one or more environmental targets. A series of flow events comprises a flow history.

Flow regime

The characteristic pattern of a river's flow quantity, timing and variability.

Groundwater

Water occurring naturally below ground level (in an aquifer or otherwise).

Held environmental water

Held environmental water is water that is available under a water access right, a water delivery right, or an irrigation right for the purpose of achieving environmental outcomes.

Inflow

Source of the water that flows into a specific body of water; for a lake, inflow could be a stream or river, and inflow for a stream or river could be rain.

Joint governments

Includes the Australian Government, and governments of New South Wales, Victoria, South Australia, and Australian Capital Territory

Keeping place

A community museum housing Aboriginal artefacts, art and information.

Macroinvertebrate

An animal without a backbone that is large enough to be seen without magnification.

Modelling

Application of a mathematical process or simulation framework (e.g. a mathematical or econometric model) to describe various phenomena and analyse the effects of changes in some characteristics on others.

Murray Lower Darling Rivers Indigenous Nations (MLDRIN)

MLDRIN was formed in 1998 as a confederation of Indigenous Nations from the southern part of the Basin. It comprises representatives of the Barapa Barapa, Barkindji (Paakantyi), Dhudhuroa, Dja Dja Wurrung, Latji Latji, Maraura, Mutti Mutti, Nari Nari, Ngarrindjeri, Ngintait, Nyeri Nyeri, Tatti Tatti, Taungurung, Wadi Wadi, Wamba Wamba, Waywurru, Wegi Wegi, Wergaia, Wiradjuri, Wolgalu, Wotjabaluk, Yaitmathang, Yita Yita, Yorta Yorta.

Northern Basin Aboriginal Nations (NBAN)

NBAN was formed in April 2010 and comprises Aboriginal Nation representatives from the northern part of the Basin and representatives from the New South Wales Aboriginal Land Council, the Queensland Murray–Darling Committee, the Condamine Alliance and South West Queensland Natural Resource Management.

NBAN comprises Traditional Owner nominated representatives from the following Nations:

Barkindji (Paakantyi), Barunggam, Bidjara, Bigambul, Budjiti, Euahlayi, Gamilaroi, Githabul, Gunggari, Gwamu (Kooma), Jarowair, Kambuwal, Kunja, Kwiambul, Maljangapa, Mandandanji, Mardigan, Murrawarri, Ngemba, Ngiyampaa, Wailwan and Wakka Wakka.

Ramsar Convention

The Convention on Wetlands of International Importance is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Regulated

A water system in which water is stored or flow levels are controlled through the use of structures such as dams and weirs.

Salt interception scheme

Large-scale groundwater pumping and drainage projects that intercept saline groundwater inflowing to rivers, and dispose of the saline waters by evaporation and aquifer storage at more distant locations.

Span of contol

The area of activity and number of functions, people or things for which an individual or organisation is responsible for.

Surface water

Includes water in a watercourse, lake or wetland, and any water flowing over or lying on the land after having precipitated naturally or after having risen to the surface naturally from underground (see s. 4 of the Water Act).

Sustainable diversion limit

The maximum long-term annual average quantities of water that can be taken, on a sustainable basis, from the basin water resources as a whole, and the water resources, or particular parts of the water resources, of each water resource plan area.

Sustainable diversion limit adjustment mechanism

Allows the sustainable diversion limit to be adjusted under certain circumstances.

Take

Take is the removal of water from, or the reduction in flow of water into, a water resource.

Translucent flows

Translucent releases occur when a portion of water from specific inflow events is passed through a dam to enable a natural flow pulse into the river system.

Water accounting

A systematic process of identifying, recognising, quantifying, reporting and assuring information about water, the rights or other claims to water, and the obligations against water. Water accounting applies Australian Water Accounting Standards

Water allocation

The specific volume allocated to water entitlement holders in a given season, often quoted as a percentage of the volume of each entitlement. For example, a 20% allocation in a particular season allows a water user with a 100 ML entitlement to take 20 ML of water.

Water resource

Of groundwater, water that occurs naturally beneath the ground level (whether in an aquifer or otherwise), or water that has been pumped, diverted or released to an aquifer for the purpose of being stored there. Murray–Darling Basin groundwater resources exclude groundwater in the Great Artesian Basin.

Of surface water, includes water in a watercourse, lake or wetland, and any water flowing over or lying on land after having precipitated naturally, or after having risen to the surface naturally from beneath the ground level.

Water resource plans

Statutory management plans developed for particular surface-water and groundwater systems, currently known by different names throughout the Murray–Darling Basin (e.g. 'water sharing plans' in New South Wales and 'water allocation plans' in South Australia).

Water trading rules

A set of overarching consistent rules enabling market participants to buy, sell and transfer tradeable water rights.

Water year (or hydrologic year)

A continuous 12-month period starting from July, or any other month as prescribed under the water regulation or a resource operations plan, but usually selected to begin and end during a relatively dry season. Used as a basis for processing streamflow and other hydrologic data.

Wetland complex

Consists of two or more individual wetlands with overlapping riparian (land connected to the wetland) management areas and a combined wetland area of five hectares or more.

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SOUTH AUSTRALIA
VICTORIA
ACT
NORTHERN BASIN
SOUTHERN BASIN
Charleville
Roma
Cunnamulla
St George
Toowoomba
Goondiwindi
Dirranbandi
Moree
Narrabri
Tamworth
Bourke
Dubbo
Broken Hill
Ivanhoe
Forbes
Orange
Cowra
Griffith
Wagga Wagga
Leeton
Albury
Deniliquin
Swan Hill
Echuca
Bendigo
Shepparton
Seymour
Horsham
Mildura
Wentworth
Renmark
Pinnaroo
Murray Bridge
BRISBANE
SYDNEY
CANBERRA
ADELAIDE
MELBOURNE
Currawinya Lakes
Narran Lake
Gwydir Wetlands
Paroo River Wetlands
Macquarie Marshes
Banrock Station Wetland Complex
Riverland
Hattah-Kulkyne Lakes
Lake Albacutya
Coorong and Lakes Alexandrina and Albert
NSW Central Murray State Forests
Fivebough-Tuckerbil
Barmah Forest
Ginini Flats wetland complex
Gunbower Forest
Kerang Wetlands

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Cover image: Eleven year old Jet at home in the Macquarie Marshes, one of the Murray–Darling Basin's most significant wetlands (photo by Leanne Hall, Macquarie Marshes landholder).

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