Australian Government

MURRAY–DARLING BASIN AUTHORITY

Proposed Basin Plan consultation report

May 2012

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A report prepared under s. 43(11) of the *Water Act 2007* (Cwlth) — broad outline of changes made to the proposed Basin Plan by the Murray–Darling Basin Authority (MDBA) after the start of the 20-week consultation period; and a summary of submissions received by MDBA, including how they were addressed and any alteration made to the proposed Basin Plan as a result of considering them.

Published by the Murray–Darling Basin Authority

MDBA publication no: 59/12
ISBN (print Volume 1): 978-1-922068-74-3
ISBN (print set): 978-1-922068-78-1

ISBN (online Volume 1): 978-1-922068-75-0
ISBN (online set): 978-1-922068-79-8

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FOREWORD

The formal launch of the proposed Basin Plan for public consultation last November was a key step in the journey to better manage our rivers and groundwater.

This report addresses what we have heard and what we propose to change as a result of the consultation process. It also adopts and develops many of the good ideas and opportunities for improved water management we have gathered over the past 12 months.

The work of building the draft plan has been a collaborative effort involving many individuals, local groups, interest groups and governments. We would like to express our thanks to all who have contributed and our appreciation of the time and effort of so many to help us improve our work.

This report demonstrates a clear and genuine willingness by the Murray–Darling Basin Authority (MDBA) to take on board what we have heard in this year-long process and to make changes based on this feedback. While we acknowledge that there is strong opposition to various aspects of the draft plan from a variety of stakeholder, lobby and interest groups, as well as widely varying views among the Basin states, there is a clear recognition that a plan must exist.

In many of our meetings we have heard that people "want to get on with it". We have been regularly urged to "make a start". Equally, people express the view that they are "fed up" with the water debate and want to be left alone to "get on with their lives".

Of course, the many and varied views are important and reflect valid points of view. People can be assured that they have been taken very seriously and we have endeavoured to reflect in this report the myriad of sentiments. In truth though, it is highly unlikely that there will ever be common ground among the parties on all issues.

Sadly, the history of water management in the Murray–Darling Basin has seen the desire for common ground regularly devolve into compromise and lowest common denominator results. As a nation we can, and must, do better.

In 2007, then Prime Minister John Howard reminded us *"that for this plan to work there must be a clear recognition by all—especially the State and Territory governments—that the old way of managing the Murray–Darling Basin has reached its use-by-date".*

The MDBA is the single, Basin-wide institution responsible for planning the Basin's water resources. The national interest is in having a healthy, working river system and strong and resilient industry and communities in the Basin. This cannot be achieved by trying to satisfy separate, often diametrically opposed, interests.

The MDBA has proposed a way forward, giving time for change, a chance for communities to take charge and a willingness to adapt the plan as new knowledge comes into play.

We believe the draft plan provides a commonsense framework for greater certainty and a way towards a more effective balance in the use of water in the Murray–Darling Basin.

Our observations and recommendations for further amendment are now legitimately the focus of the Basin states and, ultimately, the Parliament of the Commonwealth of Australia.

While we understand the need of governments and other representative groups to advocate the interests of their constituents, we need to secure the future of the Basin as a whole; to act in the national interest.

John Howard's 2007 remarks were delivered at the depth of the devastating millennium drought. Communities right across the Basin were confronting the possibility of running out of water. Five years later and the Basin is full and overflowing. Without doubt, Australia is a land of droughts and flooding rains.

But drought will come again. It is not a question of if, but when. We can and we must be better prepared for the next drought. We need a plan that will strengthen the resilience of the environment and the resilience of Basin communities and industries over the long term. This means we must act now to restore the environment and equip Basin communities and industries with the tools for a sustainable and secure future.

Making a start now, when the Basin has been refreshed, makes sense. In fact, we're fortunate to have a reprieve which lets us focus on reform, rather than simply coping.

The Basin Plan is a significant step forward from the way water is currently managed across the Basin. Communities will need time to adjust to the change, and will need the support of all levels of government during the transition.

Taking action and making this plan work will require both courage and leadership: courage to stand up to those who have a vested interest in maintaining the status quo; leadership to address the failures of the past and make a start toward a better way of managing water in the Basin for all of its uses and the nation.

Murray–Darling Basin Authority

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Chair

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Chief Executive

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THE JOURNEY TO A BASIN PLAN – AN OVERVIEW

This report is the culmination of more than 12 months of gathering feedback, seeking out views and exploring ideas to develop a draft plan for the Murray–Darling Basin. This overview provides a summary of the key issues and ideas we have heard, what we have drawn on to develop the draft plan and the changes we have made since then.

Responses to early feedback

Early last year, we received many valuable suggestions and ideas about how the draft plan should look and what it should include. This feedback was instrumental in helping us to develop the draft plan, in terms of how we gathered people's views and input, shaped our policies and framework and designed the plan's implementation.

Engaging with stakeholders

We received many suggestions about how we should consult with stakeholders and consequently, responded to requests to engage early; draw on local knowledge; hold smaller and more targeted meetings in more places; and ensure our engagement activities were designed to give all stakeholders the opportunity to have a say. These were also recommendations made by the Tony Windsor-led Parliamentary Inquiry1. Starting in March 2011, we held meetings in a range of styles and places, from large community meetings in town halls, and round tables and workshops in community centres and offices, to conversations with individuals on verandas, at kitchen tables and on river banks.

Importantly, our "no surprises" approach of exposing our thinking at each step of the way gave us the opportunity to seek out improvements, road test ideas and identify gaps as we worked to develop the draft plan. By November 2011, when we released the draft plan for formal consultation, we had held more than 110 round table and technical meetings with community, industry, Indigenous and environment groups, and met with thousands of people living along different stretches of the Basin's rivers. The value of these meetings was immeasurable. In fact, the ideas and knowledge brought forward by local people reinforced to us that localism must be a critical component of the plan.

Equally important was our consultation with Basin governments. We held more than 200 multilateral and bilateral meetings and working group sessions with state and territory government officials, giving them the opportunity to closely examine, review and provide input into each chapter of the draft plan before its release. We believe the plan was much improved as a result of their input.

[1] Standing Committee on Regional Australia (2011) Of drought and flooding rains: inquiry into the impact of the Guide to the Murray-Darling Basin Plan. House of Representatives, Canberra

Our approach to the science and social and economic analysis

Since early last year, and in response to much feedback, we have considerably improved the robustness of the science and socio-economic analyses used to determine the sustainable water limits in the draft plan. We also responded to strong calls to have our modelling incorporate the physical and operational constraints in the system, as well as testing alternative water recovery scenarios. Our analysis reflected feedback from communities that how water is recovered is as important to communities as the volume of water recovered. This is why we recommended a bias towards investment in infrastructure to recover water for the environment.

Setting a new framework - adaptive management

We created an adaptive management framework in response to requests for a plan that was flexible and could be applied to a system as variable as the Basin. We also built in the 2015 review to give communities and governments the opportunity to bring forward new information and ideas about where and how water could be used more effectively and efficiently. We addressed concerns about the inequities in the starting dates for each Basin states' water resource plan by recommending they be aligned to start in 2019. Basin ministers agreed to this last year.

Reviewing the rules

The Windsor Inquiry and many stakeholders in the Basin highlighted that the different operational rules across the Basin were impeding the efficient delivery of environmental water. We therefore called on the Basin state governments to review those rules, which they committed to last year. That review is underway.

The ideas we heard and feedback we received during the informal consultation period were instrumental in allowing us to formally release a draft plan in November 2011 that addressed many major issues raised by stakeholders and governments in the Basin.

Changes to the draft plan

Over the course of 20 weeks' formal consultation, we continued to meet with stakeholders, holding a total of 24 public meetings, 56 round table and technical meetings, 18 social and economic briefings for representatives from rural financial organisations, five regional briefings on water trading issues, 31 bilateral and working group meetings with Basin states, and a tailored Indigenous consultation process in more than 30 towns in the Basin.

By the end of the 20 weeks, we had received nearly 12,000 submissions from individuals, organisations and governments across Australia, as well as some from overseas. As a result of this further feedback, we have made more than 300 further changes to the draft plan. These range from adding new provisions to the draft plan to redrafting it to improve clarity.

We have provided a summary below of the most common themes raised in submissions during the formal consultation process and how we have responded. A more detailed

explanation of the issues raised in submissions, and our responses and changes to each of these, can be found in the chapter-by-chapter section of this report. Appendix B provides a complete list of all changes made to the draft plan following the formal consultation period.

Common themes from submissions

SUPPORT FOR A BASIN PLAN

Most submissions supported our vision for a healthy, working Basin, supported the need for a Basin Plan, and accepted that the history of disagreement needs to be resolved. Submissions also highlighted that there remain many divergent views across the Basin as to how this should be done. It is also clear from the submissions that there are still some common misconceptions about the purpose of the Basin Plan and the role of the MDBA. In particular, many submissions suggested the plan should address matters that sit outside the remit of the MDBA or the plan, or that remain the responsibility of Basin governments.

The purpose of the Basin Plan is to provide a high level framework that sets Basin-wide standards for the Australian Government, Basin states and the MDBA to manage the Basin's water resources in a coordinated and sustainable way. It is essentially a strategy for managing water in the national interest rather than on jurisdictional or sectoral based views. The plan builds on the past milestone agreements made by the Basin states that remain current today, such as the 1992 Murray-Darling Basin Agreement, the 2004 National Water Initiative and the 2008 Intergovernmental Agreement on Murray-Darling Basin Reform. These agreements clearly set out the obligations of the MDBA, the Australian Government and the Basin states, and define their roles.

Water buybacks, river operating rules, new infrastructure such as water storages, river regulators, salt schemes, water saving infrastructure, structural adjustment and natural resource management activities are matters for the Australian Government and Basin states and are outside the remit of the MDBA and the Basin Plan. But we recognise that the way governments manage many of these issues will be critical to the plan's objectives, in particular to ensure we maintain balance between the environmental, social and economic outcomes. This is why we have not refrained from making comments and recommendations on these matters.

We have closely considered the matters raised in submissions, as well as the Windsor Inquiry, relating to these broader government activities and have included in this report a number of recommendations that highlight and reinforce the importance of action in these areas.

This means that the Basin Plan fits into the broader history of effort and the historic agreements that form the foundation of water management across the Basin. How the governments respond will be critical to the successful ongoing implementation of the plan.

SCIENCE AND SOCIOECONOMIC ANALYSIS

Many submissions challenged the science that underpins the draft plan, including our modelling methodology and our social and economic analysis. Some submissions also questioned whether our work had undergone adequate peer review.

All scientific methodologies we have used to determine the sustainable water limits in the draft plan have been peer reviewed and the peer reviews have been published. The most recent review of the science, completed by a CSIRO-led expert panel, determined that our work:

"...represents a sufficient basis to begin an adaptive process of managing the level of take in the future and that the methods of modelling and analysis used by the MDBA were generally robust and defensible."[2]

Similarly, our economic modelling was peer reviewed by KPMG, which found:

"The approaches employed to model the socio-economic impacts are considered to be appropriate ... Overall, the MDBA has brought together an appropriately qualified and experienced set of subject matter experts, and has produced a set of informative studies that serve to provide important insights into particular components of the problem."[3]

We have given close consideration to alternative studies and reports referred to us via submissions. Part of this has included assessing the data and assumptions used in these reports and their modelling. Having carefully reviewed these studies, we are confident we have adopted the best available methodologies to underpin our work.

Importantly, we recognise that science and research must continue to be an essential part of an adaptive process. We have therefore established an Advisory Committee on Social, Economic and Environmental Sciences to give us expert advice on new scientific and socio-economic knowledge and how this might be used in the plan.

This means that ongoing monitoring will play an important role to measure and evaluate the effects of the plan on the environment, as well as on communities and industry, particularly within the context of other influencing factors, such as rainfall, commodity prices and exchange rates.

SURFACE WATER LIMITS

The submissions demonstrated the highly polarised views about the surface water limits proposed in the draft plan. While many argued the limits were too high, there were also many claiming they were too low. Those calling for more water to be recovered for the

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[2] Young WJ, Bond N, Brookes J, Gawne B, Jones GJ (2011) Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray–Darling Basin. CSIRO Water for a Healthy Country Flagship

[3] KPMG (2011) Review of the MDBA's socio-economic impact modelling. A report to the Murray-Darling Basin Authority

environment argued our scientific work was not adequate or did not comply with the Water Act 2007 by failing to achieve desirable flow targets. Submissions claiming the proposed recovery volume was too high argued that we had not given adequate consideration to the social and economic implications.

Determining the surface water limits cannot be based on popular opinion or swayed by political influence. We are required to use the best available knowledge to make a balanced assessment of environmental needs while minimising social and economic impacts. Our objective here is consistent with the Water Act 2007, which requires us to, "...optimise economic, social and environmental outcomes."

Our assessment was based on the concept of a healthy working Basin. To achieve this, we must take into account the current operating rules and other constraints in the system, such as structures that limit flows along river channels.

We consider that a water recovery target of 2,750 GL/y on a long-term average is the right starting point to return enough environmental water to the Basin to achieve most environmental objectives, while also ensuring that social and economic effects are best managed. Some higher flows cannot be achieved due to the constraints in the system. Our proposed 2015 mid-point review will provide an opportunity to take into account any new information, including outcomes of the Basin state governments' rules review and any efficiencies gained through environmental works and measures, as well as new science that complements the current best available science.

This means that our numbers represent a starting point for an adaptive process that will allow further adjustments to be made in the future.

GROUNDWATER LIMITS

Many submissions have raised concerns about the groundwater limits proposed in the draft plan, the data used to determine the limits and concerns about how the draft plan proposed to manage connectivity between surface and groundwater.

We received significant feedback from stakeholders expressing concerns that some of the proposed groundwater limits in the draft plan were too high. Over the past 12 months we have also heard stakeholders express concern about issues such as surface water-groundwater connectivity and also issues associated with coal seam gas extraction in the Basin, an activity which is overseen by the Basin states.

As a result of this feedback, we have carried out further investigations and convened a panel of groundwater experts to review our assessment of the proposed groundwater limits. In particular, we asked them to look at the potential risks to surface water given the lack of available data on some aquifers in the Basin.

As a result, we have now reduced the total groundwater sustainable water limits from 4,340 GL/y to 3,184 GL/y as a long-term average. We are confident that this more conservative approach is based on the best available science and sets a robust foundation for future reviews.

RIVER OPERATIONS

The Windsor Inquiry highlighted that the "...long evolution of Basin water management has resulted in multiple layers of regulations administered by various level of local, state/territory and the Commonwealth governments," and recommended the rules be reviewed to ensure the Basin's water resources are being managed efficiently.

Submissions and feedback we received generally supported the need for governments to explore options that could improve our water efficiency. Some presented specific proposals to improve river management and environmental outcomes, including works at the Lower Lakes, the Barrages and the reconfiguration of the Menindee Lakes system. A number of submissions also stated that improving our river management should be a priority.

Finding ways to be smarter about how we manage the Basin's water resources and making the most of every drop of water must be an ongoing process in this water reform. We have continued to highlight the need to improve and align the historical operating rules and processes that guide water management across jurisdictions and acknowledge that this is just as important as bringing the system back into a volumetric balance. To achieve this objective, a work program is being developed in line with a Ministerial Council decision made in November last year.

The Australian Government and Basin states must also continue to work with communities to identify where and how we can achieve better outcomes through environmental works and measures. We recognise and have continued to argue that there are many opportunities across the Basin to improve river operations for environmental outcomes. Works to deliver fresh flows to the southern Coorong and improved operational management of the Menindee Lakes system are two examples. Any findings from the review of the operating rules and any efficiencies gained through works and measures will be important considerations of the 2015 mid-point review.

ADAPTIVE MANAGEMENT APPROACH AND MID-POINT REVIEW

Submissions have been generally supportive of the adaptive management approach, including the built in review point at 2015. Some submissions have expressed concern that the flexible framework creates uncertainty and others expressed a lack of confidence that Parliament will allow changes to be made to the sustainable water limits as a result of findings in the 2015 review.

We recognise that there is some uncertainty with an adaptive framework, but we believe the risks are greatly outweighed by the opportunities. Importantly, the pathway to 2019 gives states and communities sufficient time to prepare for the plan and adjust. Our socio-economic analysis shows that allowing seven years to adjust to the new water limits keeps the annual rate of economic adjustment below the long-run rate of productivity growth. This means the agricultural output should be higher in 2019 even after moving to the new sustainable limits on water use.

The framework also allows time for the Australian Government to 'bridge the gap', time for the MDBA to determine any potential changes to the proposed sustainable water limits and for Basin states to finalise and consult on their water resource plans before the limits come into effect in 2019.

It provides opportunities and incentives for governments to find ways for their jurisdictions to improve their river operations and become more efficient. This includes completing the review of the current operating rules that limit how efficient we are, working with communities to identify where water can be used more efficiently through environmental flow management and works and measures, and to identify where governments could invest in infrastructure to find water savings. In the northern Basin, it will allow us to implement a work program to examine more closely the environmental outcomes we are seeking to achieve, and the best way to recover water to achieve those outcomes.

The adaptive framework allows any findings to be considered as part of the 2015 review, along with any other new information that might allow us to make changes to the limits we have proposed.

This means we have a framework for the entire Basin, time to assess and adjust, and with a framework for greater certainty, we allow Basin states an opportunity to demonstrate their ability to work together, and with the Australian Government, to improve water use across the Basin.

ENVIRONMENTAL WATERING

Submissions provided valuable feedback and proposed many good ideas about how we can better manage environmental water. Many questioned what would be done with the recovered water, how the Commonwealth Environmental Water Holder will manage its holdings and how it should behave in a market context.

A lot of submissions also commented that the MDBA's Environmental Watering Plan needed to be more detailed and include more specific targets and outcomes. However, there were counter-claims to this arguing for the watering plan to be less prescriptive and have a stronger emphasis on adaptive management.

Some submissions also expressed concern that delivering high flows will lead to flooding of private land and assets.

Based on feedback in submissions, and discussions with Basin states, we have now included a provision in the draft plan for a Basin-wide environmental watering strategy. By taking a Basin perspective, the strategy will complement and guide the long-term watering plans prepared by the Basin states. The strategy can be reviewed and updated as new information becomes available, is more flexible, and can be more detailed than the Basin Plan, which is a legislative instrument.

The Commonwealth Environmental Water Holder will be required to act consistently with the Basin-wide watering strategy, as well as the broader provisions of the Environmental Watering Plan.

In response to feedback in submissions, we have clarified in the draft plan our process for setting annual priorities for environmental water. This includes adding new provisions to ensure river operators are involved in decision making—this will be essential to achieve good environmental watering outcomes.

In response to concerns about flooding risks from environmental watering, we note that our method to determine the sustainable water limits already factors in most of the constraints in the system. This was one of the approaches we took as a result of feedback from stakeholders early last year.

We have also made a recommendation that the Australian Government and Basin states invest in works and measures to boost the outcomes anticipated from environmental watering, notably in the Coorong and the Menindee Lakes system. This means we have a more complete Basin-wide framework for environmental watering plans, and an opportunity to examine ways of improving environmental outcomes.

CLIMATE CHANGE

Many submissions expressed concern about our approach to dealing with climate change, in particular that the draft plan does not give it adequate consideration.

The draft plan recognises climate change as a significant risk to the long-term availability of surface water in the Basin. The plan's proposed water limits will mean that by 2019, we will have recovered more than 3600 GL of water for the environment. The strategic use of this water in future years will restore the health of the system and therefore increase its long-term resilience. This means the rivers, wetlands and floodplains will be better placed to adapt to a changing climate.

Just as importantly, we have an adaptive framework that allows us to adjust as climate trends become more certain. There is significant uncertainty about climate trends over the next five to 10 years. We will be working with our science partners over the next few years to explore climate change implications as part of the proposed 2015 review. Over the long term, the Basin Plan must be reviewed every 10 years and can be reviewed as often as every five years, which allows new climate information and local knowledge to be incorporated over time.

Furthermore, the adaptive framework of the plan allows us to continuously adjust and adapt. For example, there will be an annual process to adjust environmental watering priorities and the progress towards an effective and unrestricted water market, which is a key tool to help industries and communities adapt.

MARKET APPROACH TO WATER REDUCTION

Some Basin states and most irrigators commented on the lack of certainty associated with the 'shared reduction' component of water recovery and that this would lead to inequity.

Our fundamental principle is to minimise the social and economic costs of recovering water for the environment. This is why we have chosen not to specify how much water each of the catchments must contribute to the shared, or downstream, volumes.

This approach allows greater flexibility as to where environmental water can be recovered, so recovery has the least economic cost and will allow market forces to operate. This is consistent with the principles and policy framework of the National Water Initiative, supported by governments since 2004. This approach also allows water recovery to be undertaken in a way that considers the environmental water needs and the system constraints that limit where water can be recovered.

The 2015 review of the proposed sustainable water limits will be an opportunity to review whether the remaining shared reduction component should be apportioned among the Basin states. It is likely there will then be more information about where potential adjustments might be made, updates on water recovery progress, as well as more information about where to best recover water to meet the environmental water needs.

We consider that the benefits of this flexibility outweigh the disadvantages stemming from an uncertainty about where the reductions will occur. Nevertheless, we understand the importance of certainty and recognise that this issue is likely to be a topic for further discussion by Basin ministers.

LOCALISM

Many submissions expressed support and optimism for the role of localism in the implementation of the plan. There were mixed views about how well opportunities for localism have been embedded into the draft plan.

Based on suggestions by a community stakeholder group last year, we agreed to hardwire localism into the draft plan, including into the monitoring and evaluation process and the Environmental Watering Plan. This will provide a significant ongoing role for local communities across the Basin.

The level of knowledge and amount of information local people have provided over the past 12 months further demonstrates why communities must be involved in the future management of the Basin's water resources and to have opportunities to continue to bring forward ideas and suggestions.

To support local engagement, we are setting up two advisory committees—the Northern Basin Advisory Committee and the Adjustment Advisory Committee—to provide advice on proposals brought forward for the 2015 review, which might lead to changes to the sustainable water limits. Both committees will gather input from existing regional groups and networks and will provide advice on issues specific to their regions.

MANAGING THE TRANSITION

Many submissions requested more information about the transition process and emphasised the need for a clear water recovery strategy,

and for governments to identify how they will support communities and industries to make the transition.

We recognise, and have heard from stakeholders, that there are many broader actions that will be critical to ensure our Basin communities and industries are supported through the seven-year transition. We have therefore made a number of recommendations to the Australian and Basin state governments on the types of actions that should be undertaken.

Ongoing monitoring and evaluation will be an important component of the transition process to 2019 to measure the effects of the plan on communities and industry, as well as the environment. We received many ideas and suggestions from people living and working in the Basin about how this should best be done and we are building this feedback into our monitoring and evaluation program. Basin communities will continue to play a critical role in this by providing us with timely advice about how they are adjusting to changes through the transition period. It will be essential for the Australian Government and Basin states to support communities with this involvement.

KEY POINTS

There is broad support around Australia for placing the Murray-Darling Basin on a sustainable footing. Most people want to have the Basin Plan finalised and to achieve certainty about their future. Equally, most people want to create opportunities for improving the way we manage the Basin's rivers, wetlands and floodplains. Most people support adaptive management with strong local involvement.

Nevertheless, there remain opposing views across the Basin on how the system's water resources should be managed. Our responses to the views and concerns of the Basin stakeholders are summarised here.

1. **An adaptive plan.** The MDBA has responded to calls for a more flexible plan. It retains clear and strong standards for the Basin, but has a built in capacity so we can learn, adapt and continuously improve.

2. **A robust starting point.** The sustainable diversion limits (SDLs) for surface water are the most divisive element of the Basin Plan, with most stakeholders demanding greater or lesser quantities of water for the environment. The MDBA has determined that a water recovery target of 2,750 GL/y as a long-term average is still the right place to start. Expert peer review has confirmed this volume is an appropriate starting point to improve environmental resilience and support Basin communities and industries.

3. **Conservative groundwater limits.** Since the release of the draft Basin Plan, the MDBA has undertaken further analysis, reviewed submissions and convened an expert workshop. As a result, the total of groundwater SDL has been revised from 4,340 GL/y to 3,184 GL/y as a long term average. This reduction reflects a more conservative treatment of the risk factors associated with surface water connectivity and other factors.

4. **Best available scientific and socio-economic analyses.** Most of the criticisms of the MDBA's scientific and socio-economic analyses were made to support a case for more or less water. The MDBA has not received any significant scientific or socio-economic data since releasing the draft plan that justifies a revision to surface water limits. We will continue in the years ahead to seek expert advice and community and Indigenous knowledge to improve the analyses at the heart of the Basin Plan.

5. **The 2015 review.** The MDBA has retained a 2015 review of the SDLs in the Basin Plan. The review is a key element for incorporating new information on climate change, environmental resilience, changes to river operations and socio-economic impacts of the Basin Plan. It is also central to the plan's adaptive management framework. The MDBA believes that the 2015 review is the best means of maximising the opportunities of the transition to 2019, but we

understand the importance of certainty and recognise that this issue is likely to be a topic for further discussion by Basin ministers.

6. **The market-based approach to shared reductions.** The plan promotes a flexible, market-based approach to achieving water recovery of the shared reduction in the Murray and Barwon-Darling—an approach that can be adapted as river operations change and environmental watering strategies are put in place. We consider that the benefits of this flexibility outweigh the disadvantages stemming from uncertainty about where reductions will occur. Nevertheless, this issue is also likely to be further discussed by Basin ministers.

7. **Getting the most from environmental watering.** The revised plan now includes the requirement for a Basin-wide environmental watering strategy that will identify longer-term and more detailed outcomes. The strategy will be regularly revised with experience and new information. This means the legal instrument retains its high-level objectives and coordinating function.

8. **Adapting to climate change.** The Basin Plan will implement a critical reform: return all systems in the Basin to environmentally sustainable levels of take under highly variable conditions. The plan is also an adaptive framework that can be adjusted as we gain more knowledge on climate trends across the Basin. There will always be more work to do to determine how climate change may affect water planning, and the MDBA will continue to work with climate experts and communities to maintain a healthy, working Basin into the future.

9. **Localism is reaffirmed and strengthened.** The concept of 'localism'—engaging with regional communities to find local solutions to implementing the Basin Plan—has been hardwired into the draft plan, including into the monitoring and evaluation process and the Environmental Watering Plan. The MDBA will also set up advisory committees to provide formal avenues for connecting with regional groups and networks.

RECOMMENDATIONS

The Basin Plan builds on the 1992 Murray-Darling Basin Agreement, the 2004 National Water Initiative and the 2008 Intergovernmental Agreement on Murray-Darling Basin Reform, signed by the Australian Government and all Basin states. These agreements set out the governments' obligations to manage the water, land and environmental resources of the Basin in a coordinated and sustainable manner. The Basin Plan sets in motion many, but not all, of these commitments. The linkages between the Basin Plan and other intergovernmental agreements are essential to the success of broader water reform strategies. Drawing on the issues raised by many stakeholders, the MDBA makes the following recommendations to governments.

1. **River operations should become more efficient.** The Basin states should complete as a priority a review of river operations to identify opportunities for water savings and improved environmental outcomes by 2015.

2. **Investments in infrastructure deliver environmental returns over the long term.** The Australian Government and Basin states should place an investment priority on infrastructure and environmental works that will lead to long-term efficiency gains and mitigate the social and economic impacts of water recovery.

3. **Australia's water market optimises the economic, social and environmental value of water.** The Australian Government and Basin states should improve the efficiency of the water market and allow it to play its part in recovering the 2,750 GL/y of environmental water. Water trading provides many economic benefits to regions and local communities and, increasingly, to the environment.

4. **The Commonwealth Environmental Water Holder will be an influential player in the water market.** The Commonwealth Environmental Water Holder should publish forward business plans on how it will manage its portfolio of water products, and outline detailed information on future trading intent and community engagement strategies.

5. **Local communities must be engaged.** The Australian Government and Basin states should actively involve local communities in the decision-making processes that affect water and salinity management in their region. In particular, the management of environmental water could be devolved to local communities and groups.

6. **Allocations for cultural flows.** Governments should consider making specific allocations of environmental water available for cultural water purposes. Such allocations could be studied as part of a cultural flows research program.

7. **Investment in environmental works and measures will boost environmental outcomes for the Basin.** There are many opportunities to improve environmental outcomes through works and measures, but the MDBA singles out investment in works to increase the fresher flows into the southern lagoon

of the Coorong, as well as improving the management of the Menindee Lakes System, as urgent priorities.

8. **Communities must be supported through the transition.** The MDBA strongly recommends that the Australian Government and Basin states support communities as the Basin Plan is implemented in a way that acknowledges the social and economic effects of water reforms and expands future economic development opportunities.

9. **Environmental watering must be integrated into broader natural resource management.** The Australian Government, Basin states, catchment management authorities and local governments need to continue working together to ensure that planning and management of environmental water is more closely integrated with broader natural resource management activities. The MDBA strongly encourages governments to continue supporting local and regional bodies in this task so that the benefits of reforming water use are not undermined by environmental degradation stemming from a lack of investment in natural resource management.

INTRODUCTION

Prior to the formal release of the proposed Basin Plan for public comment, the Murray Darling Basin Authority (MDBA) had held more than 160 round-table and technical meetings with community, industry, Aboriginal and environment groups, representatives from Basin states and the Australian government, met with thousands of people living along different stretches of the Basin's rivers, and presented at dozens of conferences and workshops.

The MDBA then released the proposed Basin Plan on 28 November 2011 for a 20-week consultation period. The formal consultation period ended on 16 April 2012. During this time we continued to meet with stakeholders, holding a total of 24 public meetings, 56 round table and technical meetings, 18 social and economic briefings for representatives from rural financial organisations, five regional briefings on water trading issues, 23 bilateral meetings with Basin governments and 8 Basin Government working group meetings and a tailored Aboriginal consultation process in more than 30 towns across the Basin.

At the end of the 20-week consultation period we had received nearly 12,000 submissions from individuals, businesses and organisations from all around the country and some from overseas.

Of these submissions over 9,000 were published on the MDBA website, while over 2,000 identified by the submitter as confidential were not published.

The submissions raised issues directly related to the proposed Basin Plan content as well as commenting on issues related to broader water reform in the Murray–Darling Basin. A small number of submissions raised issues related to other government policies not directly related to water reform.

This report includes a summary of issues raised in submissions, MDBA response to those issues, and any changes made to the proposed Basin Plan.

It covers issues relating to proposed Basin Plan chapters and schedules, issues relating to broader proposed Basin Plan content, and issues relating to broader water reform.

The process used by MDBA to consider and make decisions based on submissions received is detailed in Appendix A.

All changes made to the proposed Basin Plan including those that did not directly arise from consideration of submissions, for example by a policy decision of MDBA, are included in the document *'Proposed Basin Plan consultation report – Appendix B'*.

ISSUES RELATING TO PROPOSED BASIN PLAN CHAPTERS AND SCHEDULES

Many of the submissions received related specifically to provisions contained in the proposed Basin Plan's 12 chapters and 10 schedules. The following sections summarise the issues in these submissions and MDBA's response under each of these chapters and related schedules.

CHAPTER 1: INTRODUCTION

Chapter 1 of the proposed Basin Plan sets out how the plan should be cited, its scope and its commencement dates. It also provides an overview of the structure of the plan; consisting of 12 chapters and 10 schedules. Definitions of terms used in the proposed Basin Plan are provided, many of which have special meanings as used in the proposed Basin Plan. Chapter 1 also outlines that the Basin Plan has no effect to the extent to which it is inconsistent with the Snowy Hydro licence; and the extent to which the proposed Basin Plan may impose an obligation on a Basin state that would contravene a constitutional doctrine restricting the obligations that the Australian Government may impose on a State.

1. ISSUE

Submissions suggested that further clarification of definitions in chapter 1 of the proposed Basin Plan was needed. Issues surrounding clarity of definitions particularly focused on definitions of commercial forestry/plantations and water trading where different states use different terms.

> ***'Definitions, particularly of terms in Chapter 1, could be clearer, more comprehensive and better reflect recent changes to the draft Basin Plan'***

RESPONSE

Terms are defined in chapter 1 only when they differ from the common language definition in the Macquarie Dictionary and are not already defined within the *Water Act 2007* (Cwlth) (the Act). The definitions in chapter 1 apply to the defined term each time it is used in the proposed Basin Plan. Other definitions which have specific meaning within a chapter are defined within the relevant chapter.

MDBA is satisfied that the definition for 'commercial plantation' is appropriate. The 'net take by a commercial plantation' best represents the net impact on water resources of a catchment and aligns with the baseline estimates of water interception by commercial plantation.

MDBA has consulted state governments to ensure that the most appropriate term is used when there is more than one term for particular water trade rules.

2. ISSUE

Submissions raised the importance of removing inconsistencies in the use of terms in different parts of the proposed Basin Plan. Some pointed out that uniformity was needed when the Basin state agencies prepared water resource plans.

RESPONSE

MDBA agrees that it is important that the terms used in the Basin Plan are consistent throughout the document. Where definitions have specific meaning within a chapter, they are clearly defined within the confines of that chapter. Definitions contained in chapter 1 have been reviewed for consistency with definitions used in other parts of the Plan.

There has been a change to terminology in chapter 10 (Critical Human Water Needs). The use of the term 'water quality characteristic' in this chapter was different to the way it was defined in chapter 1 and used in chapter 8 (Water Quality and Salinity Management Plan). To prevent any confusion, chapter 10 now defines 'water quality characteristic' by reference to health-related guideline values.

CHAPTER 2: BASIN WATER RESOURCES AND THE CONTEXT FOR THEIR USE

Chapter 2 and schedule 1 of the proposed Basin Plan provide a description of Basin water resources and the context in which those resources are used. It has been prepared in accordance with the requirements of section 22(a) of the Act and is based upon the best information available to MDBA at this point in time. It comprises information on the size, extent, connectivity, variability and condition of the Basin water resources; the uses to which the Basin water resources are put (including by Aboriginal people); the users of the Basin water resources; and the social and economic circumstances of the Basin.

The Murray–Darling Basin is large, diverse and dynamic in terms of its climate, natural resources and the social and economic circumstances of its industries and communities. Spatial and temporal changes in the availability, condition and use of water resources are ongoing, resulting in a highly variable set of circumstances across different parts of the Basin at any given time. This description considers the Basin water resources and the context in which those resources are used, primarily from a Basin-wide perspective.

3. ISSUE

Submissions raised a range of issues regarding schedule 1 including:

- **Questioning assertions of fact, missing data or errors within the description of the Basin.**
- **Expressing concern that the data sources used in the assessment of Basin water resources were too reliant on small data samples, were biased data from third parties or were biased due to the recent drought. For example, it was identified that data used in the Sustainable Rivers Audit came from a period of drought.**

  'We also express concern about the "So Called" science and incorrect claims about the health and salinity of the Murray River, and would like to see more scientific research over a longer period when not in drought times'

- **Others expressed the view that the data used treated the Murray–Darling system as a whole and did not adequately include consideration of regional or local information.**
- **Submissions disputed the extent to which water resources and the environment, particularly in the Murrumbidgee and Mildura regions, have been degraded. These submissions generally cited the cyclical nature of the Murray–Darling river**

system, claiming that the area is regarded as semi-arid and that in some cases irrigation actually improves biodiversity.

- **Submissions disputed the socioeconomic figures in the proposed Basin Plan. Most cited local employment numbers and examples of communities' reliance on single irrigation-centred industries.**

RESPONSE

The documents and reports used in the preparation of the description of Basin water resources included those from the Australian Bureau of Statistics (ABS) and scientific papers and reports from institutions such as CSIRO, as well as reports prepared by MDBA[4] such as the Sustainable Rivers Audit report. Some of these data were derived from the period of the drought, which is considered appropriate as they document one of the climate extremes which the Basin Plan needs to take into account, but much also refers to longer term trends. For example, some hydrologic data used in the description of Basin water resources spans 114 years, from 1895–2009.

While most of these information sources indicate that the water resources and environment of the Basin have been degraded, it is acknowledged that in some areas of the Basin river regulation has provided some localised environmental benefits such as drought refuge and habitat provision.

Data used to describe the social and economic circumstances of Basin communities draws on a range of works, but primarily from ABS reports and information, as this provides the most authoritative and consistent view across the whole Basin.

The Basin is a large and diverse geographic entity. MDBA agrees it is very difficult to include the appropriate level of detail in a description of the entire Basin, including its water resources and communities, that reflects the full range of individual local circumstances. Schedule 1 of the Basin Plan is intended to provide an overview of the whole Basin, and as a consequence the more detailed regional and community level information is not included. However, the MDBA acknowledges that this information is extremely important, and has been used to inform the setting of the Sustainable Diversion Limits (SDLs) and will be critical to the effective implementation of the Basin Plan. More information on local scale issues is available from other sources.

Schedule 1 has been rewritten to describe the Basin's water resources and the socioeconomic circumstances of Basin communities more simply and holistically whilst providing specific examples where appropriate.

[4] Available at: http://www.mdba.gov.au/bpkid

CHAPTER 3: WATER RESOURCE PLAN AREAS AND WATER ACCOUNTING PERIODS

Chapter 3 of the proposed Basin Plan identifies water resource plan areas and the water accounting periods for each area.

4. ISSUE

The need for new water resource plan areas, differing from state planning boundaries, to be established under the proposed Basin Plan was questioned.

Submitters raised concerns that the aggregation of state water planning areas into larger planning areas would disadvantage some valleys. It was suggested that separate water resource plan areas should be created for some sub-catchments.

RESPONSE

MDBA is required by the Act to establish water resource plan (WRP) areas under the Basin Plan. Where possible, these WRP areas are aligned with existing state water planning areas. In some cases, however, existing boundaries have been varied: for example, to include water resources not currently covered by state water planning areas; or as a result of consultation with Basin states.

In deciding upon the number of WRP areas across the Basin, MDBA balanced the need for a consistent approach across the Basin at an appropriate level of detail with the approach taken by each state to developing water resource plans. For example, in New South Wales, nine surface water WRP areas have been chosen to encompass the areas covered by some 28 existing and proposed surface-water-related water sharing plans. This number of WRP areas is considered adequate for establishing Sustainable Diversion Limits (SDLs) at an appropriate level of detail across the Basin.

The intent of the Basin Plan is to establish a plan for the Basin as a whole and to set a framework within which states will continue to develop the detailed arrangements through their ongoing water planning and management roles.

Some small changes have been made to this chapter to better align with states planning processes. In relation to groundwater in NSW, a change has been made to groundwater water resource plan boundaries in the north-west of the state. As a result what were two NSW water resource plan areas will be replaced with a single area. In South Australia, the surface water of the main stem of the River Murray is now identified as a separate water resource plan area.

5. ISSUE

Submitters raised concerns that the adopted accounting period would limit the ability to use environmental entitlements flexibly across multiple accounting periods.

RESPONSE

MDBA agrees that the ability to be flexible when using any entitlements, including environmental entitlements, is desirable so as to achieve the most benefit. The definition of the accounting period does not place any restrictions on existing arrangements such as carry-over, which allow a degree of flexibility as to when allocations are used.

CHAPTER 4: THE IDENTIFICATION AND MANAGEMENT OF RISKS TO BASIN WATER RESOURCES

Chapter 4 of the proposed Basin Plan identifies the risks to the condition or continued availability of Basin water resources, and sets out strategies to be used to manage or address those risks. The chapter also allows MDBA to publish guidelines setting out specific actions that may be taken in relation to the implementation of the strategies. Water resource plans must be prepared having regard to the risks set out in this chapter, and any guidelines made by MDBA about risk assessment and identification.

6. ISSUE

Submissions expressed concern that the proposed Basin Plan's strategies to manage risks were too broad or inadequate.

RESPONSE

The risk assessment framework in chapter 4 details the risks to the Basin's water resources and provides management strategies to mitigate these risks. The strategies to manage risks are considered to be fit for purpose, providing a framework within the legislative instrument on which risks can be flexibly managed and allowing for the adaptive management of risks over time. Water resource plans for individual water resource areas, prepared by Basin states, must have regard to these risks, and any subsequent guidelines prepared by MDBA.

7. ISSUE

Submissions mentioned that more stakeholder consultation about the risk assessment frameworks would be required in the future.

RESPONSE

MDBA consulted widely in the development of an appropriate risk management and mitigation strategy for inclusion in the proposed Basin Plan. This included consultation with expertise from Basin states regarding the approach, risks and strategies to be included within chapter 4. The risk assessment framework is compliant with the Australian Standard (AS/NZS ISO 31000:2009).

Should further detail be required in the future regarding specific risks, MDBA will develop guidelines in consultation with Basin states and communities. Opportunities will also arise for further stakeholder consultation during the development of individual water resource plans undertaken by Basin states.

8. ISSUE

Submissions expressed concerns about who would pay for implementing risk management strategies.

RESPONSE

Chapter 4 is not intended to impose obligations or costs on particular parties, but rather to identify potential areas of future activity by MDBA or Basin states with regard to the identified risks and associated management strategies. Actions to this end by MDBA will be subject to the normal funding decisions of the Australian Government. In relation to Basin states, this chapter provides guidance as to the risk assessment approaches they may wish to undertake; any decision to fund such actions is a matter for each state.

9. ISSUE

It was submitted that risk assessment provisions in the proposed Basin Plan did not go far enough, did not adequately describe or assess risks, or did not express risk management strategies in sufficient detail. Some suggested the proposed Basin Plan did not consider the financial and social risks associated with the implementation of the Plan, and some suggested that the risk strategies were too concerned with risks to the environment rather than risks to consumptive water users.

> ***'Financial and social risks need to be considered as they will impact on the continued availability of basin water resources.'***

RESPONSE

In drafting the proposed Basin Plan, MDBA carefully considered the range of potential consequences that could result from implementing the Plan. Chapter 4 of the proposed Basin Plan was drafted not only to identify these risks, but also to provide strategies under which these risks would be managed. Chapter 4 is considered to be fit for purpose, providing flexibility and the opportunity for adaptive management while ensuring sufficient detail is captured within the legislative instrument.

MDBA might in future develop guidelines in relation to specific risks, in consultation with Basin States and communities. Water Resource Plans, prepared by Basin states, must have regard to chapter 4 and any subsequent guidelines. Water resource plans must identify the risks to water resources in that water resource area and provide appropriate strategies to address them.

Risks associated with potential financial and social consequences of the proposed Basin Plan are included within section 4.02(2).

10. ISSUE

Submissions queried how risk management strategies would be implemented and how the performance of the strategies would be assessed. Submissions referred to the guidelines for implementing risk strategies mentioned in chapter 4.

RESPONSE

Chapter 4 of the proposed Basin Plan identifies risks to the Basin's water resources and suggests strategies to manage those risks. Basin states should have regard to these risks and management strategies when preparing water resource plans, however the chapter is not intended to impose obligations on other parties. MDBA will be responsible for the performance and assessment of these risk management strategies. Consideration of this work will influence any future amendment to the Basin Plan. MDBA might in the future publish guidelines to help states in managing risks to water resources. Such guidelines would be intended as supporting materials only, and states would not be assessed against them. They would be prepared in consultation with the states.

CHAPTER 5: MANAGEMENT OBJECTIVES AND OUTCOMES TO BE ACHIEVED BY THE BASIN PLAN

Chapter 5 lists the management objectives and outcomes of the proposed Basin Plan. The chapter covers the proposed Basin Plan as a whole, the environment, water quality and salinity, long-term Sustainable Diversion Limits (SDLs) and water trading.

In the proposed Basin Plan, these objectives and outcomes are tied to the more detailed objectives in the Environmental Watering Plan (chapter 7) and the Water Quality and Salinity Management Plan (chapter 8). Chapter 5 provides the outcomes to be monitored and reported on to measure Basin Plan effectiveness as set out in the Monitoring and Evaluation Program (chapter 12).

11. ISSUE

Submissions expressed concern about the proposed optimisation economic, social and environmental outcomes.

While generally agreeing about the need to balance uses of water for environmental, social and economic needs, people tended to disagree about the scale of rebalancing required. Some felt that balancing these outcomes would not be equitable — that is, one or other of these outcomes would be met at the expense of the others, or impacts might fall disproportionately in particular areas.

> ***'I do not believe that the Draft Basin Plan provided balance between social, economic and environmental factors. That was the foundation on which this entire process was based and you simply have not delivered.'***

Some submissions mentioned that, in the proposed Basin Plan, socioeconomic outcomes must be consider before environmental ones, otherwise Basin communities would have to bear the cost of adjusting to the economic changes that would flow from optimising environmental outcomes.

Other submissions claimed that the objectives did not reflect the prioritisation of the objects of the Act. These submissions outlined concerns that environmental outcomes and protection of areas under international agreements must be prioritised before social and economic considerations.

Other submissions expressed concern that achieving a better balance for the environment would continue to be compromised by prioritising the consumptive use of Basin water.

> ***'The objectives of the Act are very clear and the social and economic outcomes can only be optimised, as required, when the long-term environmental outcomes are also optimal.'***

RESPONSE

The Basin Plan should optimise social, economic and environmental outcomes, and MDBA considers that this has been achieved in a way that is consistent with the Act.

Optimising social, economic and environmental outcomes will not be achieved solely by implementing SDLs over the transitional period to 2019. It will also involve other programs and initiatives of governments and communities to improve management of water resources. This includes policy initiatives by MDBA and other Australian Government or Basin state government agencies, including upgrading infrastructure to reduce water loss/improve efficiencies, ongoing strategic water buybacks, effective water markets, and complementary natural resource management programs.

MDBA agrees, however, that the objectives and outcomes could be better expressed and in revising the proposed Basin Plan has addressed several of the issues raised in submissions.

The objectives and outcomes for the Basin as a whole in section 5.02 have been amended regarding optimising social, economic and environmental outcomes

The outcome of a healthy working Basin, which supports the objective of optimisation, has been revised to include the outcomes of:

- **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-dependant 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.**

12. ISSUE

Submitters felt MDBA needed to demonstrate more clearly the relationship between chapter 5 (Management objectives and outcomes to be achieved by the Basin Plan) and the objectives and outcomes set out in subsequent chapters of the proposed Plan.

RESPONSE

Management objectives and outcomes described at a high level in chapter 5 are directly linked to the more-detailed objectives set out in chapters 7 (Environmental Watering Plan), 8 (Water Quality and Salinity Management Plan) and 12 (Program for monitoring and evaluating the effectiveness of the Basin Plan). To increase clarity on this matter, notes are included in relevant sections of chapter 5 directing readers to specified

subsidiary objectives in chapters 7 and 8. Other chapters contribute more broadly to the management objectives and outcomes in chapter 5.

The management objectives and outcomes in chapter 5 also relate to the long-term benchmarks for success as presented by the Monitoring and Evaluation Program in chapter 12 and the reporting requirements outlined in schedule 10. The Monitoring and Evaluation Program will help to assess the extent to which the Basin Plan is achieving its objectives and outcomes.

To address concerns around clarity of linkages from chapter 5 objectives and outcomes to other chapters of the Basin Plan, MDBA has clarified and simplified language across the chapter for increased readability. To further strengthen linkages, Chapter 12 and schedule 10 have been updated to refer back to chapters 5, 7 and 8.

13. ISSUE

Submitters mentioned the lack of management objectives and outcomes regarding the protection of Aboriginal uses and values in the Basin, including in relation to implementation and transitional arrangements.

RESPONSE

The management objectives and outcomes in chapter 5 encompass a series of broad objectives and outcomes which incorporate elements such as strong communities, including strong Aboriginal communities. However, MDBA recognises the need to support more clearly the cultural use of water and the management objectives and outcomes have been modified to provide for the outcome of a healthy working Basin which encompasses Aboriginal water use through reliable supplies for cultural uses.

In addition, MDBA has continued to strengthen and ensure that each element of the proposed Basin Plan supports the objectives and outcomes set out in chapter 5, including in part 14 of chapter 9 which outlines the way objectives and outcomes for Aboriginal values and use of water resources will be identified in water resource plans. The identification of these objectives and outcomes related to Aboriginal values within the water resource planning process enables a consultative process to be undertaken so that objectives and outcomes can be captured at a local scale.

Further, the principles outlined in chapter 12, the program for monitoring and evaluating the effectiveness of the Basin Plan, have been amended to make clear that MDBA values and will seek cultural knowledge to evaluate the effectiveness of the Basin Plan.

MDBA has amended the objectives and outcomes for the Basin Plan as a whole where the outcome of a healthy working Basin encompasses the needs of communities with

sufficient and reliable water supplies that are fit for a range of intended purposes, including domestic, recreational and cultural use (see section 5.02 [2]a).

In addition, cultural knowledge has been incorporated into principle 7 in chapter 12 to help determine the effectiveness of the Basin Plan

14. ISSUE

Submissions discussed whether management objectives and outcomes were measurable and could be met. Submitters mentioned the lack of clarity about what a healthy Murray–Darling Basin is and how it can be assessed. Others identified the need for an environmental impact assessment prior to the Plan being implemented to provide an understanding of the current state of the Basin and how management objectives would be progressed from this state to achieving the management outcomes outlined in chapter 5.

RESPONSE

Chapter 5 of the proposed Basin Plan provides broad management objectives and their outcomes for the whole of the Basin.

Subsequent chapters outline how these management objectives will be achieved and provide targets towards which progress can be measured. For example, chapter 7 and schedule 7 set out a framework for the EWP. Once an EWP has been made, progress made towards targets outlined in schedule 7 provides a way in which the overall environmental objectives for water-dependent ecosystems can be assessed and reported. This informs the progress made towards the broader management objectives and outcomes in relation to environmental outcomes in chapter 5.

Chapter 9 outlines the requirements of water resource plans. These water resource plans represent a key element for the implementation of the Basin Plan and thus the mechanisms by which the management objectives and outcomes will be achieved. Elements within chapter 9 require targets to be used and are linked to management objectives and outcomes in chapter 5. For example, in part 7 of chapter 9 water quality management plans for water resource areas will need to identify water quality targets for water-dependent ecosystems, including Ramsar wetlands. The water quality management plan then needs to specify appropriate measures for that water resource area. The planning and implementation of measures against specified targets to assess water-dependent ecosystems, including Ramsar wetlands, provides a way to achieve the water quality objectives for water-dependent ecosystems and thus the achievement of the water quality management objective and outcome in 5.04.

The management outcomes described in chapter 5 will be assessed using the framework and principles for monitoring and evaluation set out in chapter 12. Chapter 12 provides

a schedule of reporting which enables consistent ways to review and evaluate of the effectiveness of the Basin Plan and its elements.

15. ISSUE

Submissions questioned whether other natural resource management issues including soil loss and degradation, the presence of pest fish in the Basin's rivers, bank erosion and loss of native vegetation would be addressed in the Plan.

RESPONSE

The Basin Plan is constrained by the Act from reaching into wider natural resource management issues which remain a state responsibility. However MDBA agrees it is essential to ensure that the Basin Plan should be implemented in an integrated manner. There are two key mechanisms within the proposed Basin Plan for this to occur – firstly through the development of water resource plans, and secondly through the development of valley-based EWPs.

A range of government policies and programs are available that could support the implementation of the Basin Plan that sit outside the scope of the Basin Plan.

MDBA agrees that it is essential to continue to improve the broader management of natural resources of the Murray-Darling Basin to restore the condition of water dependent ecosystems. We have revised the objectives for the proposed Basin Plan as a whole (section 5.02) to this end.

In response to these concerns MDBA has included in the whole-of-Basin objectives, an objective to establish a sustainable and long term adaptive management framework for the Basin water resources, that takes into account the broader integrated management of natural resources in the Murray–Darling Basin (see 5 5.02 (1)(b)).

16. ISSUE

Submissions suggested that proposed Basin Plan objectives and outcomes referred to matters outside the scope of the Plan itself. They felt that the Plan should concern itself only with Basin water resources.

RESPONSE

The management objectives and outcomes in chapter 5 of the proposed Basin Plan have been reviewed against the purpose of the Basin Plan (section 20), basis (section 21) and objects (section 3) included in the Act. The objectives and outcomes in chapter 7 provide a greater level of detail addressing requirements of section 28 (Environmental Watering Plan) of the Act.

While the Basin Plan's scope is limited to water management, MDBA is and will continue to liaise with other federal and state agencies to participate in a whole-of-government approach to the natural resource management in the Murray–Darling Basin.

17. ISSUE

Submitters suggested including a new management objective and outcome in relation to implementation and transitional arrangements. A number of these submitters suggested that there be objectives and outcomes related to management of risks. Some asked for management outcomes linked to the 2015 SDL review be incorporated.

RESPONSE

The risks to Basin water resources and strategies to manage these risks are outlined in chapter 4, which identifies the risks to the condition or continued availability of Basin water resources, and sets out the strategies to be used to manage or address those risks. Risk management is also supported through the chapter 9 requirements for water resource plans to be prepared having regard to risks to the condition and availability of water resources.

The purpose of the 2015 sustainable diversion limit (SDL) review is to review the limits on diversions and to incorporate further knowledge, both environmental and socioeconomic, into the setting of these limits. The management objectives and outcomes set out in chapter 5 consider the long-term objectives and outcomes that will be achieved by the Basin Plan.

MDBA considers that no additional objectives are required for the proposed Basin Plan. However, based on feedback received from submissions we have amended how a number of objectives and outcomes were written. These changes are detailed elsewhere in this chapter.

18. ISSUE

Concern was expressed with the lack of a management objective and outcome in relation to providing environmental water for the lower River Murray, saying this would greatly impact on the environmental assets in this area and the communities who live around them, particularly if another drought occurs.

RESPONSE

Chapter 7 has objectives and targets for the Coorong and Lower Lakes which, when met, will provide significant benefit to the lower River Murray. Similarly, the overall ecosystem function objectives in chapter 7 will, when met, provide significant benefit to the lower Murray. The resilience objectives in chapter 7 are also pertinent to the risks facing much of the Basin, including the lower Murray, as they are set out to ensure

water-dependent ecosystems are resilient to risks and threats such as drought. The MDBA will prepare a Basin-wide environmental watering strategy within two years of the Basin Plan coming into effect. States will need to prepare long-term watering plan within 12 months of the strategy being made. These plans will be used to assist the Australian Government and states to provide water to areas such as the lower River Murray.

19. ISSUE

It was submitted that the management objectives and outcomes in the proposed Based Plan insufficiently addressed social and economic outcomes. Some submitters suggested including a new management objective and outcome in relation to social and economic matters.

> ***'The overarching Basin Plan Objective mentions "strong communities and a productive economy". This does not manifest in the subsequent management objectives and outcomes. A productive economy is inferred under the long-term SDL objective, but it is not so clear. A separate objective around the community strength, resilience, adaptability and the resultant economic flow-on could add to the plan.'***

RESPONSE

A large body of work has been considered with regard to development of social and economic objectives and outcomes, and how they are considered in determining the SDL. These include management outcomes that contribute to optimising social and economic outcomes, water security for all uses of the Basin's water resources, providing greater certainty of access to Basin water resources, and improved adaptation to reduced quantities of available water. The objectives and outcomes in the proposed Basin Plan are compliant with the Act. This approach reflects MDBA's intention for the Basin Plan to provide for a healthy working Basin.

MDBA agrees that these objectives and outcomes should be further strengthened and has made a number of amendments related to social and economic issues. These changes provide greater clarity on MDBA's intention for the Basin Plan to provide for a healthy working Basin which includes improvements in social and economic outcomes for communities and industries.

Changes to the objectives in section 5.02 include establishing for the Basin water resources a sustainable and long-term adaptive management framework that takes into account the broader management of natural resources in the Murray–Darling Basin to optimise social, economic and environmental outcomes arising from use of Basin water resources in the national interest.

CHAPTER 6: WATER THAT CAN BE TAKEN

This chapter sets out the limits on how much water can be taken from the Murray-Darling Basin and describes how compliance with these limits will be achieved. It also establishes a review of the SDLs in 2015 and identifies the Australian Government's share of risks in relation to the reductions in diversion limits, and changes in reliability of water allocations.

The Basin Plan sets new long-term average Sustainable Diversion Limits (SDLs) that reflect an environmentally sustainable level of water use or 'take' (ESLT). The SDLs are limits on the volumes of water that can be taken for consumptive use (including domestic, urban, industrial and agricultural use) and are set at both a resource unit and a Basin-wide scale.

Surface water SDLs are defined as Baseline Diversion Limits less a local reduction amount and a shared reduction amount (where applicable). The total shared reduction amounts for either the southern Basin or northern Basin can be recovered from anywhere within a group of connected SDL resource units.

MDBA will review the SDLs in 2015, which will allow for the incorporation of the outcomes of works and measures, changes in river management and advances in scientific knowledge.

The SDLs will commence in 2019, by which point they will be incorporated in water resource plans (see chapter 9). SDL compliance will be determined for each SDL resource unit in each water accounting period following commencement on 1 July 2019.

SURFACE WATER SUSTAINABLE DIVERSION LIMITS

20. ISSUE

Submissions argued that the science showed that either more or less water was needed for the environment – that SDLs should be lower or higher than that proposed by MDBA. Some submissions expressed the view that the Basin Plan should target water recovery of at least 4,000 GL/y as suggested in the Guide to the proposed Basin Plan (the Guide).

> ***'Scientific analysis concludes that returning 2,750 gigalitres (GL) of environmental water per year to the Basin's rivers is insufficient to ensure a healthy working river system.'***
>
> ***'...the suggested reduction in diversions are too high and if applied as outlined in the Guide (proposed Basin Plan) would decimate the SA irrigation industry and the regions it supports.'***

RESPONSE

Whilst MDBA received many submissions questioning the science, environmental objectives, or proposing an alternative water recovery amount, after reviewing these submissions the MDBA considers it has struck the appropriate balance with regard to optimising the environmental, social and economic outcomes, and that the current science base is robust. Consequently MDBA has chosen to retain the proposed ESLT and associated water recovery amount of 2,750 GL/y. The proposed adaptive management strategy, including the proposed 2015 review, provides suitable mechanisms to review the ESLT and associated SDLs if new knowledge supports adjustments, either up or down.

There are many fundamental changes between the approach in the Guide and the new approach in the proposed Basin Plan.

These changes include delaying the introduction of SDLs until 2019, using an adaptive management approach (including the ability to change SDL numbers over time), localism, and working within the system's physical and operational constraints.

Many important changes also occurred between the method used in the Guide and that used in the proposed Basin Plan to determine SDLs. In October 2010 the Guide proposed a reduction in diversions of between 3,000 and 4,000 GL/y. This was on the basis of a relatively simple end-of-system flow analysis to identify environmental water requirements, and consideration of socioeconomic impacts – which led MDBA to select the low end of the identified environmental water requirements range. The end-of-system flow analysis was a relatively simple approach used as a range-finding technique to estimate the ESLT and SDLs. However, the approach did not enable consideration of the specific environmental water needs of individual sites, nor did it model the specific environmental outcomes that could be achieved.

The ESLT and SDLs in the proposed Basin Plan were informed by detailed hydrologic modelling of the environmental water requirements of indicator sites. The indicator site method to determine an ESLT is much more robust, as it takes into account the specific ecological targets and flow requirements for indicator sites, and opportunities and constraints for environmental water delivery. The models also allow thorough assessment of different water availability conditions, water sharing arrangements and environmental flows over the past 114 years of climate records and variability. The indicator site method and its components have been the subject of a number of peer-review steps in the period 2009-2011, including the CSIRO-led science review which commenced in June 2011.

MDBA used the indicator site method to test the ability of three Basin-wide ESLT options (representing reductions of 2,400, 2,800 and 3,200 GL/y) to achieve the specified ecological targets and flow indicators at the indicator sites. This options assessment

focussed predominantly on the southern basin. The assessment showed that 2,400 GL/y was insufficient to achieve a number of key environmental objectives for the River Murray downstream of the Murrumbidgee junction (including the Coorong, Lower Lakes and Murray Mouth), while the incremental benefits associated with the 3,200 GL/y option were not considered sufficient to justify the additional recovery of water. (See also the response to issue No. 121)

Subsequent to this, MDBA also undertook some specific options assessment in the Condamine-Balonne region, looking at the ability of alternative SDL options and water recovery strategies to achieve environmental objectives.

Whilst the proposed Basin-wide water recovery volume of 2,750 GL/y is similar to the 3,000 GL/y option in the Guide, the individual SDLs for each region vary on the basis of the new modelling described above and the decisions made by MDBA in the consideration of this work. MDBA determined a proposed ESLT representing a reduction in diversions of 2,750 GL/y that considered the results of comprehensive modelling of three Basin-wide ESLT options in addition to specific modelling in the Condamine-Balonne region which accounts for the 50 GL/y deviation from the Basin-side 2,800 GL/y scenario.

A number of submissions argued that other sources of science indicated that the water recovery volume should be around 4,000 GL/y. MDBA has undertaken a thorough review of all previous assessments related to the issue of determining an ESLT. Many of these assessments, such as those undertaken as part of developing The Living Murray, were undertaken many years ago, before the 'millennium drought', or used simplified methods. These assessments also typically estimated recovery volumes compared to the Cap, and don't take into account the water recovery programs and other adjustment mechanisms that have already been completed, which add up to about 823 GL/y. Consequently MDBA maintains its modelling and assessments are the best available.

The CSIRO-led science review also gives MDBA confidence that this work is robust. The review concluded that MDBA's methods are sufficiently robust, and that the current knowledge base and application of that knowledge by the MDBA in developing the Basin Plan, is sufficient to provide a suitable starting point for an adaptive management process.

21. ISSUE

Submissions expressed the view that the Basin Plan needs to recognise environmental reforms and progress already made.

RESPONSE

MDBA agrees that existing environmental reforms should be taken into account and built upon. The proposed Basin Plan does exactly that. For decades, Basin governments

and communities have worked hard to restore the health of rivers, limit water use and improve water recovery. This includes the introduction of the Cap on surface-water extractions in the Basin in 1995, which resulted in significant volumes of water being set aside for the environment. Basin governments have provided water for the environment through a range of programs such as The Living Murray, Water for Rivers, state water plans, Australian and state government water purchases and investment in water-saving infrastructure.

This water is included in the 2009 baseline adopted for the proposed Basin Plan: around 823 GL/y on a long-term average basis that was returned to the Basin's environment before 2009 (of the 959 GL/y recovered in the Basin, the balance of which has been provided to the Snowy River). As such, the recovery of a further 2,750 GL/y represents a portion of the total volume of water that will be available to the environment.

The proposed Basin Plan was developed by taking this historical effort into account, and it aims to build upon and complement existing reforms and through accreditation or adoption of water resource plans the Basin Plan will ensure continued protection of planned environmental water.

Further, the Basin Plan also recognises the progress in environmental water recovery since 2009 and identifies that as at 31 March 2012, 1,344 GL/y (of the proposed 2,750 GL/y) of water has already been recovered (or contracted to be recovered) for the environment through the Australian Government's Water for the Future program, the New South Wales RiverBank program and the Northern Victoria Irrigation Renewal Project.

This level of recovery of environmental water already achieved leaves 1,406 GL/y to be found across the Basin in the remaining seven years to 2019.

22. ISSUE

Submissions raised concerns related to how SDLs had been specified. These concerns included specifying the SDLs as a formula, and the view that there was too much focus on volumetric reductions rather than outcomes. Some submissions expressed the view that diversions for stock and domestic use and town water supply should be exempt from reductions. There was a concern that an SDL which is broken up into subcomponents did not allow innovative solutions to achieve the desired outcomes.

RESPONSE

SDLs have been specified as a formula: the SDL is equal to the Baseline Diversion Limit (BDL) minus the local reduction amount and, if applicable, minus any contribution to the shared reduction amount.

The specification of the SDL in this way has several advantages. Firstly, the BDL uses a descriptive approach. This means improved estimates of forms of take (e.g. interceptions or model improvements) can be incorporated into the SDL without the need to amend the Basin Plan. Secondly, the BDL clearly describes the different forms of take and provides estimates. This approach provides transparent information on the component parts of each SDL. Further, the adopted approach provides greater flexibility than specifying separate SDL components for each form of use. Changes across the various forms of take within an SDL unit are possible as long as the overall integrity of the SDL is met. Accordingly, innovative solutions are provided for by not prescribing any particular solution. While this approach offers no explicit protection from recovery of stock and domestic use and town water supply take, recovery of water from these types of use is not expected to be significant. Related to this issue, it remains the responsibility of the Basin states to determine water shares between the different consumptive uses within the overall SDL set through the Basin Plan.

23. ISSUE

Submissions expressed concern about the possible effects if the long-term diversion limit equivalent factors used to convert water access entitlements into a common unit changed. Would this mean that the gap between the Baseline Diversion Limit (BDL) and SDLs could reopen after it was closed? One submitter proposed inclusion in the Plan of defined long-term reliability factors that could be used by all market participants, must be accepted by the Australian Government, and which could be changed only via the process set out in the Act for a change to the Plan itself.

RESPONSE

MDBA agrees that a consistent, universally agreed set of long-term diversion limit equivalent factors is necessary in the Basin. Progress in 'bridging the gap' will be measured using a consistent set of factors applied to the entitlements recovered for the environment. MDBA is aware of views that such factors should be included in the Basin Plan. This has not been done as it is not the role of the Basin Plan to specify the 'equivalence' of the various forms of entitlement in the Basin. This is a state government responsibility. The Basin Plan has, and does perform, the role of setting SDLs.

24. ISSUE

Submissions raised concerns about what was seen as unfair treatment of plantation forestry and asked about the inclusion of estimates of water intercepted by other land uses.

RESPONSE

Plantations can be generally classified based on their purpose including: large scale plantations for timber production (commercial plantations); carbon sequestering; land

conservation; or other environmental purposes. For the purpose of the proposed Basin Plan it was identified that there was limited reliable regional or national data available to estimate interception except for commercial plantations[5]. As such the interception estimates for forestry are based on the assumptions of commercial plantations, mainly for timber production and the plantations established on pasture or crop land. The interception volumes used reflect the net effect of the change in land use to plantations rather than the gross amount intercepted by plantations.

Inclusion of other land uses (i.e. dryland cropping) as an interception activity can occur through the requirements for states to carry out a risk assessment in preparing water resource plans. Such an assessment would include consideration of the risks associated with any land-use changes. These assessments are best done through water resource plans, where relevant, as provided for in the proposed Basin Plan (refer chapter 9).

In response to these submissions, the process for assessment of the risks posed through changes in the amount of interceptions has been revised (part 5 of chapter 9) to clarify that this applies only to interception activities not already included in the SDL.

25. ISSUE

Submissions suggested that adoption of a NSW floodplain harvesting policy would be necessary to ensure works and interceptions were licensed. It was further submitted that:

> ***'...unless the policy is implemented, it is unclear how all of the forms of take can be adequately accounted for.'***

There were also concerns about the regulation of floodplain harvesting and that the overland flow licences should be abolished.

RESPONSE

Floodplain harvesting is incorporated in the Baseline Diversion Limit (BDL), and thus the sustainable diversion limit (SDL), under the Basin Plan as per the detailed descriptions in schedule 3. Further, any growth in this form of take needs to be controlled by water resource plans developed by states and accredited by MDBA for each SDL area. This further requirement is to ensure that such use does not grow beyond the limits set by SDLs. Alternatively, any growth needs to be accommodated by a change to the limit for another form of take so that there is no overall change in the total long-term annual average quantity of water that can be taken. Prior to the Basin Plan SDLs taking effect in

[5] Sinclair Knight Merz, CSIRO, Bureau of Rural Science (2010) *Surface and /or groundwater interception activities: initial estimates* Published by National Water Commission – Waterlines Report Series No. 30.

2019, all forms of take including floodplain harvesting are controlled under existing state laws.

Floodplain harvesting is included in river system models where there are significant diversions (i.e. in most of the larger models in the northern Basin). The models are generally able to report unregulated off-allocation water harvesting and overland flow harvesting. This is to ensure that all forms of take are included in the development of BDLs/SDLs as required by the Act.

26. ISSUE

Concern has been raised that the ACT's SDL is inadequate to meet the future growth of the ACT and that the approach to setting its SDL does not consider the social and economic impact that will be imposed on the region. The view was expressed that the ACT's SDL should be adjusted to cover population growth over time in a manner similar to the method under the existing ACT Cap arrangements.

Submitters also questioned why the ACT has not been included in the southern basin shared reduction zone.

RESPONSE

All urban water supplies from the Basin's water resources are covered by SDLs in the proposed Basin Plan. As urban centres grow, including in the ACT, they will need to consider a range of options to augment their supplies while recognising that SDLs constrain any future growth in the overall level of water use from the Basin's water resources. Purchase of entitlements on the water market will be an option available for additional urban water supplies, including for the ACT. The water market will continue to play an important role of accommodating changes in demand for water under SDLs.

Special treatment to cater for population growth for the ACT would be inconsistent with the approach taken to set SDLs in all other water resource plans areas across the Basin. SDLs are required to be set at a level that reflects an ESLT. While it is recognised that the ACT Cap arrangements do allow for growth in diversions, this approach is not consistent with setting SDLs. Allowing for growth over time would undermine the MDBA assessments of environmental water requirements and the associated environmental outcomes.

Water use in the ACT is mainly for urban purposes, so it has been excluded from contributing to the shared downstream component as it is unlikely that it will be sold to the Australian government under its water purchase program. The ACT has an ongoing commitment to urban water-use efficiency through the 'Think water, act water' strategy which was reiterated in its submission on the proposed Basin Plan.

SHARED REDUCTIONS

27. ISSUE

The 'shared reduction' component of the SDLs attracted strong commentary relating to lack of certainty and equity. Submissions sought an apportionment of this component.

> ***'The uncertainty bough about by the 971GL/year shared reduction target makes it impossible to accurately estimate the impacts.'***

Submissions also expressed concern about the volume of shared reductions that regions might have to contribute; others questioned why a certain connected valley was included or excluded among those required to contribute to shared reductions. Other submissions agreed with the proposed market model for recovering shared reductions.

> ***'[Submitter's name] is an advocate of a cost-effective, market-based approach to meeting environmental water requirements (where these are scientifically based), and as such,* is not uncomfortable with the concept of a shared reduction.'**

RESPONSE

The 'shared reduction' approach was taken to provide greater flexibility in where environmental water can be recovered, to enable recovery at the least economic cost and to allow market forces to operate. This approach also allows governments undertaking water recovery to consider both how environmental water needs are best met and system constraints that could limit where water can be recovered to meet these needs.

MDBA's view is that the benefits of this flexibility outweigh the disadvantages of certainty about where the reductions will occur. Further, transparency of the Australian Government's water recovery, through the publishing of a water recovery strategy, will assist in addressing uncertainty.

Each upstream catchment must meet its own environmental watering needs, but the system's major trunk rivers, the Barwon-Darling and the Murray, rely on significant inflows from their tributaries to complement some local inflows directly into the trunk rivers. Some of the additional reductions required to meet the environmental needs in these two catchments will need to be sourced from upstream catchments.

MDBA has not specified how much water each catchment must contribute to the shared reduction amounts, other than to acknowledge that some catchments are physically

restricted from reliably contributing to downstream flows because they are only tenuously connected to the system's major waterways.

The 2015 SDL review will be an opportunity to review whether the shared reduction can be distributed. At that time there will be more information available on the location of works and measures that may affect the SDLs and progress on recovering water particularly through infrastructure investments, as well as where best to recover water to meet the range of environmental water needs.

GROUNDWATER SUSTAINABLE DIVERSION LIMITS

28. ISSUE

Submissions were critical of the changes to groundwater SDLs in the proposed Basin Plan compared to baseline diversions and diversions proposed in the *Guide to the proposed Basin Plan* (the Guide).

Some submissions focused on the magnitude of change in total SDLs between the Guide and the proposed Basin Plan. The feedback focused on two main areas: concern that the change in the groundwater SDLS would have an impact on the surface-water resources of the Basin; and that the groundwater SDLs were set too high and that they represented an unsustainable level of take.

> ***'Much greater scientific understanding of the relevant groundwater resources and the degree of connectivity between surface and groundwater systems in the Basin is required...it is at best premature to be suggesting such huge increases in groundwater extraction when so little is known about the long-term consequences of doing so.'***

The submissions in general looked at the aggregated volume of the SDLs across the Basin and were concerned that the increased groundwater SDLs compared to the Guide would largely negate the gains from reducing surface-water take across the Basin. Implicit in some of the submissions was the assumption that the groundwater resources of the Basin could be aggregated to a single volume and for every 1 ML of groundwater extracted there was a corresponding 1 ML reduction in surface water flow due to the connectivity between surface and groundwater.

Some submissions stated that they do not believe that there was enough information and science to set the unassigned groundwater SDLs at the levels in the proposed Basin Plan. They believed MDBA should take a more conservative approach and reduce the unassigned groundwater SDLs. These submissions said that further increases in the groundwater SDLs should occur only when additional information

and science were available to determine the groundwater SDLs more accurately.

'[Submitter's name] questions whether there is sufficient evidence to indicate that the proposed SDLs represent an ESLT for groundwater.'

There were also some that considered the groundwater SDLs to be too conservative and that they should be higher. Some of these submissions suggested that uncertainty factors that had been applied were not appropriate and should be removed to allow a higher level of groundwater take.

RESPONSE

Submissions raised significant concerns about the groundwater SDLs in the proposed Basin Plan. In response to these issues MDBA undertook further analysis and consulted with groundwater experts and has decided to change some elements relating to groundwater SDLs in the proposed Basin Plan. In summary the result is a reduction in the overall groundwater SDL from 4340 GL/y to 3,184 GL/y. The response below sets out the changes made and the basis for these changes.

Recap on the groundwater provisions in the proposed Basin Plan

In the period between the release of the Guide to the Basin Plan and the release of the proposed Basin Plan, changes to the assessments of the groundwater Baseline Diversion Limits (BDLs) and SDLs resulted in a change in the total of groundwater BDL was 1,787 GL/y to 2,352 GL/y, and for SDLs from 2,095 GL/y to 4,340 GL/y.

Two reports published by MDBA provide details of the groundwater settings in the proposed Basin Plan and the methods applied in this work:

- *Groundwater Baseline and Sustainable Diversion Limits: methods report*[6]; and
- *Groundwater Sustainable Diversion Limit Resource Unit Summary Report Cards*[7]

Revisions to groundwater provisions arising from consultation and further work

In response to concerns raised during the consultation period and through submissions received on the proposed Basin Plan regarding the groundwater SDLs, MDBA carried out further investigations on particular matters associated with groundwater provisions. This work included issues raised in individual submissions and also the convening of a

[6] Available at: http://www.mdba.gov.au/draft-basin-plan/supporting-documents/groundwater-report.
[7] Available at: http://www.mdba.gov.au/draft-basin-plan/supporting-documents/groundwater-report.

review workshop of groundwater professionals to review the MDBA groundwater methodology and discuss the applicability of the methods used to determine the proposed groundwater SDLs.

In response to the further work on the groundwater provisions, MDBA revised a number of the groundwater SDLs. As a result the total of groundwater SDLs in the proposed Basin Plan is now 3,184 GL/y.

Changes to groundwater SDLs

Revision of unassigned water availability

The largest change in the proposed SDLs in the proposed Basin Plan is in the areas with unassigned water. The total change is a reduction of around 1,000 GL/y distributed across 35 groundwater SDL areas.

Unassigned groundwater is the groundwater that can be made available for consumptive use above the BDL. In the proposed Basin Plan released for consultation, for groundwater systems where a technical assessment identified the potential for unassigned water, depending on the system, half or all of the increase up to the limit indicated by the technical assessment was allowed (i.e. an unassigned water factor of 0.5 or 1.0 was applied).

After further investigation and consideration by a group of experts, a number of options were explored focusing on modification of the unassigned groundwater factors, and the implications arising. The characteristics of each of the three broad aquifer systems were considered and key arguments for revision identified:

- Western (data quality, risk of localised impacts, precautionary considerations);
- Lachlan Fold Belt (risk of surface water impacts; localised impacts, precautionary approach); and
- Highlands (risk of surface water impacts; localised impacts, precautionary approach).

In response to this further work, including the key arguments set out above, a consistent and more precautionary approach to unassigned groundwater was adopted by MDBA for the proposed Basin Plan. In summary, an unassigned groundwater factor of 0.25 is now applied throughout areas with unassigned groundwater.

Revision of groundwater SDL in the Gunnedah-Oxley Basin

A change has also been made to the SDL for the deep groundwater resources of the Gunnedah-Oxley Basin. The SDL has been reduced from 300 GL/ to 102 GL/y. The initial

proposal was based upon the forthcoming NSW plan limit, adjusted to accommodate the way MDBA specified limits on groundwater extraction nearer the land surface. The revised proposal is based upon the method adopted in other such systems in the Basin, coupled with the revised unassigned water assessment approach set out above. This approach will allow future incorporation of the additional information on this aquifer that will become available through the Namoi Water Study and projects funded under the Independent Expert Scientific Committee on Coal Seam Gas and Coal Mining.

Other changes incorporated

Changes to the SDL areas and associated SDLs have occurred in Victoria. Victoria now has two SDL areas for the part of the state within the Basin. A change has also occurred in the Victorian Goulburn-Murray: Sedimentary Plain area (GS8) where the SDL has increased by 42 GL/y after a review of the numerical groundwater model, where a peer review had identified the earlier interpretations of results as unduly conservative. On review, MDBA decided to adjust its approach in this case.

In NSW, MBDA has merged two Water Resource Plan areas into one (New South Wales Great Artesian Basin Shallow) with three SDL areas rather than the two in the proposed Basin Plan. NSW has also provided updated information regarding entitlement and stock and domestic use used to determine the groundwater BDLs. There have been small increases and decreases in a number of NSW SDL areas.

Other changes not incorporated

Some submissions expressed a view that there was a technical argument for making further reductions in the NSW areas which are currently undergoing a reduction program. MDBA previously agreed to allow the reduction program to be completed before any further revisions were considered. Given that any change would be in the context of compounding uncertainty in the systems as current reduction programs have not been completed, and noting that storage volume in these systems exceeds 200 years of use, MDBA considered these views but decided to maintain the SDLs in the seven SDL areas in New South Wales currently undergoing a reduction program.

Further documentation

Some submissions on the proposed Basin Plan groundwater provisions expressed a desire for more detailed technical information to inform the provisions of the Basin Plan itself. MDBA is committed to providing the supporting documentation associated with its proposal. This includes the recent changes to groundwater SDLs in the proposed Basin Plan.

Accordingly, addendums to the proposed *Groundwater Baseline and Sustainable Diversion Limits: methods report*[8] and the *Groundwater Sustainable Diversion Limit Resource Unit Summary Report Cards*[9] will be released in June 2012 to further document the changes that have been made.

MDBA considers that the groundwater SDLs set out a sustainable framework for the management of groundwater in the Basin.

29. ISSUE

Submitters were concerned about the data supporting groundwater SDLs. Also, submissions expressed concern about how the proposed Basin Plan managed connectivity between surface and groundwater.

MDBA received a wide range of submissions that raised questions about the data and methods used to support the groundwater SDLs. There were concerns raised in some submissions that groundwater systems have been heavily over-allocated in the past and that actions to reduce groundwater use once it is established is difficult and costly to achieve.

Some submissions also questioned whether MDBA had sufficiently analysed existing data available on groundwater dependent ecosystems and that the focus of the proposed Basin Plan had considered too narrowly groundwater contributions to surface water flows.

RESPONSE

Groundwater data availability is variable across the Basin. There are areas with metering and high levels of groundwater monitoring and associated information, and other areas without metering and low levels of groundwater monitoring and other information.

Where data and numerical groundwater models were available, numerical modelling was carried out in 13 SDL resource units which account for about 80% of groundwater use in the Basin. Where numerical models were not available, MDBA used a recharge risk assessment method (RRAM), originally developed for CSIRO. In determining the groundwater SDLs, the numerical groundwater models and RRAM considered the risks of groundwater extraction on:

- the ability of aquifers to continue to be productive over time;

[8] Available at: http://www.mdba.gov.au/draft-basin-plan/supporting-documents/groundwater-report.
[9] Available at: http://www.mdba.gov.au/draft-basin-plan/supporting-documents/groundwater-report.

- groundwater-dependent ecosystems;
- surface water resources that are fed from groundwater; and
- water quality (salinity) of groundwater.

Information on the methods used to develop the SDLs is available in two key reports setting out the methods and the technical information and data used during the development of the individual groundwater SDLs for the proposed Basin Plan:

- *The proposed Groundwater Baseline and Sustainable Diversion Limits: methods report*[10]
- *Groundwater Sustainable Diversion Limit Resource Unit Summary Report Cards*[11]

There have been a number of revisions to the SDLs in schedule 4 of the proposed Basin Plan: Matters relating to groundwater SDL resource units. These changes are described in the response to issue No. 28

30. ISSUE

Submitters were critical of the exclusion of the water resources of the Great Artesian Basin from the proposed Basin Plan.

RESPONSE

Section 4 of the Act defines Basin water resources as excluding groundwater that forms part of the Great Artesian Basin. Consistent with this, the Great Artesian Basin has been excluded from the provisions of the proposed Basin Plan.

2015 REVIEW AND PROCESS FOR ADJUSTING SUSTAINABLE DIVERSION LIMITS

31. ISSUE

Some submissions expressed strong support for the review of SDLs in 2015. However, other submissions mentioned concerns about the process for the review. Of particular concern was the process for implementing any changes to SDLs resulting from the review through an amendment to the Basin Plan. An amendment to the Basin Plan can be disallowed by Parliament. If the Parliament at that time does not agree to allow any amendments to the Basin Plan arising from

[10] Available at: http://www.mdba.gov.au/draft-basin-plan/supporting-documents/groundwater-report.
[11] Available at: http://www.mdba.gov.au/draft-basin-plan/supporting-documents/groundwater-report.

the review this may result in projects being fully implemented, but SDLs not being adjusted accordingly.

> ***'The proposed Basin Plan does not compel the Government or the Parliament to accept any proposals to adjust the SDL contained in the Statutory Instrument.'***

Some of these submissions suggested embedding the adjustments to SDLs within the Basin Plan more strongly to prevent this situation. One suggestion was to reduce the 2,750 GL/y reduction amount by the volume the MDBA expects can be recovered through the review and amend the Plan only if this volume is not achieved.

Some also expressed the view that the review of SDLs in 2015 prolonged the uncertainty around what the final SDLs might be in 2019. These submissions expressed concern that this uncertainty would impact on investor confidence.

Some submissions expressed doubt that additional information on which to base a review would be available by 2015.

RESPONSE

MDBA notes the support for the 2015 SDL, considering that good environmental outcomes for the Basin require consideration of environmental works and measures, river operations that optimise social, economic and environmental outcomes, and the most effective and efficient use of all environmental water. Consequently MDBA remains convinced that an opportunity to review SDLs prior to them becoming enforceable in 2019 will provide for the best possible opportunity to achieve such optimisation.

MDBA actively explored options to include in the proposed Basin Plan provisions to allow the benefits of environmental works and measures projects to be recognised without requiring a formal amendment of the Basin Plan. However, while it was found that the provisions of the Act, in particular given the likely significance of such changes, would imply a formal amendment process, MDBA is open to a workable mechanism along these lines.

A key consideration is that such a mechanism should operate on a basis whereby:

- it allows for a decrease in SDLs only if the social and economic outcomes are at least equivalent (and no worse than) those proposed in the Basin Plan; or conversely
- it allows for an increase in SDLs only if the environmental outcomes are at least equivalent (and no worse than) those proposed in the Basin Plan.

For example, if an SDL adjustment mechanism were in place, it would be possible to decrease the surface water SDLs to, say, a 3,200 GL/y reduction on the basis that constraints were addressed and the additional water for the environment was sourced only from further investments in more efficient infrastructure.

Similarly, the mechanism could operate so as to increase SDLs to, say, a 2,400 GL/y reduction on the basis that investment in works and measures enabled the achievement of environmental outcomes with less water.

Of course, a further possibility is that the mechanism is applied such that overall improvements are made to social-economic and environmental outcomes.

While the desire to minimise the uncertainty that might arise from including adaptive mechanisms in the proposed Basin Plan is acknowledged by MDBA it is considered that, on balance, the benefits that may be accrued from a review of SDLs would outweigh this.

MDBA considers that there is significant information available which, upon further analysis through the review of river operations already commenced by Basin states and MDBA, can be used to usefully inform the review.

32. ISSUE

Some submissions expressed the view that the review of SDLs in 2015 should also consider other matters in addition to those listed in section 6.06 of the proposed Basin Plan. These other matters included:

- **more-specific environmental objectives at a water resource unit level**
- **consideration of how these objectives could best be met and their corresponding environmental water requirements**
- **a specific implementation plan**
- **specific monitoring, evaluation and adaptation plans.**

RESPONSE

MDBA agrees that the review of SDLs in 2015 should be sufficiently wide ranging to capture innovative approaches to improving the efficient use of water in the Basin. Section 6.06 of the proposed Basin Plan already allows for consideration of these matters in the 2015 review. In addition to works and measures and river operational rules and practices, MDBA will consider changed methods of delivering water, new knowledge and any proposals which could advance the objectives and outcomes of the Basin Plan. MDBA may also consider any other matter which it feels is relevant.

33. ISSUE

Some submissions expressed a view that there should be greater clarity around MDBA's plans for the 2015 review of SDLs, including a detailed program of future work and investment and a clear and transparent process for adjusting SDLs as a result of the review.

> ***'The review will be critical to implementing an adaptive management approach. The Plan must define what will be involved in assessing progress with water recovery and making any necessary adjustments to SDLs.'***

RESPONSE

MDBA agrees with this issue and is developing a workplan in collaboration with Basin states and the Australian government.

The program of work will cover reviews of river operational practices and rules, constraints, new knowledge and the potential role of works and measures.

The 2015 SDL review will consider and assess the contribution new works and measures, changed river management and operational practices, improved methods of delivering water, new knowledge, and other proposals to advance the objectives of the Basin Plan can make towards achieving Basin Plan outcomes. A robust assessment process to evaluate the impact of any possible SDL adjustments and the Basin Plan amendment process will provide a transparent process for adjusting the SDLs as a result of the review. These issues are discussed further in the responses to issues 172 and 173.

BASIN PLAN COMPLIANCE

34. ISSUE

Submissions expressed concerns that obligations under the Basin Plan, the consequences of non-compliance and the pathway to compliance were unclear. Furthermore, it was suggested that a compliance auditing role be established under the Basin Plan to provide assurance that various elements had been implemented appropriately. Submissions also questioned what type of measures would be taken to discourage breaches, including water theft, and what MDBA's role would be if an individual water holder exceeded their entitlement.

RESPONSE

MDBA will develop guidance material for compliance in consultation with stakeholders to complement the Basin Plan.

MDBA will exercise its functions in a consultative manner, working with Basin states, other Australian Government agencies, the Basin Officials Committee, operating

authorities, infrastructure operators and holders of water access rights to ensure that the objectives of the Basin Plan are met.

In establishing its compliance and assurance role, MDBA will seek to implement a best-practice compliance model that aligns compliance interventions with behaviour and allocates resources based on risk and cost effectiveness. The approach assumes that most of the regulated community will voluntarily comply with legislation if provided with the relevant information and assistance. It promotes voluntary compliance, with an emphasis on engagement and cooperative assistance.

Should these strategies fail to result in an acceptable level of compliance, a hierarchy of responses is available, including statutory enforcement.

Basin states remain responsible for the delivery of day-to-day compliance programs dealing with individual water holders based on state legislation. While MDBA has a significant interest in the effectiveness and consistency of these activities, it does not envisage playing a direct day-to-day regulating role in this space.

MDBA will generally operate at a strategic level, working to improve its understanding of compliance issues across the Basin, seeking cooperative solutions to significant compliance issues, researching and developing proactive strategic interventions, and educating and supporting people and organisations regarding their rights and obligations.

To this end, MDBA will develop a compliance and assurance strategy that will articulate its overarching compliance policy and how it will develop its compliance and assurance program. This will include the provision of information on the obligations of the Basin Plan and the Act, the various compliance tools available, and how they will be used.

The proposed Basin Plan has been amended to introduce a new audit function into chapter 12 to enhance the clarity of MDBA's approach to compliance and assurance.

35. ISSUE

Submissions highlighted concerns that setting Cap credits at zero penalised those who had faithfully implemented management systems to comply with the Cap. Submitters expressed the view that existing Cap credits and debits should be rolled over to allow for the continuation of effective long-term management, and avoid long-term averaging being restarted.

> ***'...is also concerned that the Register of Take will commence at a zero balance. This negates the prior careful management and restraint in many valleys, including the Lachlan, that have maintained extraction at a level below the MDB Cap in recent years and have accumulated a Cap credit.'***

Submitters also expressed concern that resetting Cap credits would reduce water availability to irrigators in the initial years of the new SDL compliance regime, thereby reducing reliability and impacting on the property rights of irrigators. Submitters felt this could invoke the risk assignment provisions in the Act related to the reliability of entitlements, and that water users could justifiably seek compensation under such circumstances.

Several submissions expressed concern that the setting of Cap credits and debits to zero would provide a perverse outcome by encouraging states to increase take to ensure Cap credits were zero in 2019.

RESPONSE

There is a fundamental difference between the Cap and SDLs. The Cap was introduced to limit further growth in diversions whereas SDLs are required to be set at a level that is environmentally sustainable. Further, the Baseline Diversion Limits (BDLs) adopted for the proposed Basin Plan are, in several cases, different to the Cap, reflecting the extent to which state arrangements have evolved since the introduction of the Cap. For example, in valleys where the BDL is lower than the Cap, this difference has generated Cap credits. It would not be appropriate to continue the credits generated when the Cap is not the BDL used for the purposes of the Basin Plan.

Because of these differences, MDBA's view is that it is not appropriate to roll over Cap balances when SDLs come into effect in 2019. Commencing the new arrangements with a zero credit does not affect the reliability of existing entitlements. Water entitlements under existing water plans do not need to change to implement SDLs because of the government's commitment to 'bridge the gap'. Therefore, existing entitlements do not need to be affected by the transition from the Cap to SDLs.

Regarding concerns that zeroing of credits might lead to states increasing take to ensure Cap credits are zero in 2019, it is unlikely that states would be able to significantly increase take and reduce credits because of the constraints of their existing water plans and water management law.

36. ISSUE

Submissions raised concerns that the method of determining compliance with the long-term annual diversion limit provided too much leeway and that the 20% cumulative balance was too high or should be removed. There were also concerns that significant use of cumulative credits in one year could result in short-term environmental impact. Other submissions were concerned that the 20% cumulative balance was too low to cover adequately the range of model and data uncertainties, particularly when compared with the current Cap arrangements.

'The proposed 20% buffer for compliance on meeting SDL's is too great. This will allow for regular extraction above sustainable limits. History shows that these extractions will never be repaid or when it isn't as critical.'

RESPONSE

The cumulative debit and credit provisions in the method of compliance, including a maximum debit of 20%, were chosen to align with the current process used for compliance with the Cap. The Cap compliance process has developed over a number of years and has proven effective in checking Basin state compliance with the Cap. The debit/credit provisions are necessary to accommodate the uncertainties that can occur in assessing permitted take, particularly for many of the large regulated systems where hydrologic models are used. Some submissions have misinterpreted that the 20% maximum debit would mean that SDLs could be exceeded by 20% in every year. This is not the case, as 20% is a cumulative maximum debit. For a 10-year period this means that the maximum cumulative debit can be no more than an average of 2% of the SDL per year.

The accredited water resource plans developed by Basin states will also play an important role in implementing SDLs and ensuring compliance. The requirements in chapter 9 of the proposed Basin Plan, especially part 3, in relation to the incorporation and application of the long-term annual limit, will ensure that water resource plans would limit diversions to no greater than the SDL under a repeat of the historical climate conditions (1895-2009), while retaining the features that allow the level of diversions to vary from year to year depending on climate variability. Accredited plans will also limit the ability of states to adjust allocations to water access rights in response to accumulated credits.

The submissions that expressed concern about the 20% cumulative balance being too low made the point that 20% of SDLs was a lower absolute margin than 20% of long-term valley Caps. However, MDBA is satisfied that 20% is an adequate margin. The Cap is based on comparing diversions that would have occurred under baseline conditions (e.g. under the level of development as at 30 June 1994, including the rules and other factors that applied at that time) with actual diversions for an accounting period. Part of the reasons for possible annual differences in this comparison is the changes that have occurred since 1994 to the rules, operating arrangements and how entitlements are used. These reasons will be reduced by the role played by accredited water resource plans in determining annual permitted take.

While the 20% maximum debit provision has been retained, the relevant section in chapter 6 of the proposed Basin Plan has had a note added to clarify the role of water resource plans. Also, section 6.13 has been amended to require a state to bring any cumulative balance back to zero rather than below the 20% maximum debit. The

requirements in relation to the incorporation and application of the long-term annual limit in part 3 of chapter 9 and other parts have also been reviewed and revised to ensure that water resource plans do have the features necessary to ensure ongoing compliance with SDLs.

37. ISSUE

Submissions described the reasonable excuse provision in section 6.13 (1)(b) of the proposed Basin Plan as inappropriate as it gave states an 'escape clause' for compliance against SDLs.

RESPONSE

MDBA does not agree that this provision will provide an "escape clause" for Basin states. This provision was introduced primarily to address two scenarios. A Basin state can report a reasonable excuse should a potential non-compliance be as a result of:

- situations that impact on actual take that are outside the control and interest of the Basin state, or
- instances where the Basin state acts in accordance with the obligations established under a water resource plan yet the SDL has still been exceeded.

Should a Basin state determine that a reasonable excuse exists in an instance where an SDL in an SDL resource unit is exceeded then the Basin state will be required to report to MDBA and provide details of the steps it will take to bring the SDL resource unit back in to compliance.

A note has been added to section 6.13 clarifying that a reasonable excuse may be claimed if the excess is due to the operation of an accredited water resource plan or circumstances beyond the State's control.

Prior to the commencement of compliance with SDLs in 2019, MDBA will prepare a guideline on how the reasonable excuse provisions will be applied. This will provide further clarification and guidance to support the reasonable excuse provisions of the Basin Plan.

RISK ALLOCATION

38. ISSUE

Some submitted that they believed there would be changes to the reliability of water allocations that could trigger the risk allocation provisions of the Basin Plan.

Submitters felt they might be entitled to compensation. One submitter stated that:

'it must be a fundamental principle of the Basin Plan that it will not reduce the security of any class of water entitlement, (and) any reduction in reliability or availability must be fully compensated.'

RESPONSE

The Australian Government has committed to bridge the gap by 2019 through water-saving infrastructure and water purchases from voluntary sellers. The proposed Basin Plan was prepared based on this commitment. Already more than half of the proposed reduction has been recovered, leaving the remainder to be recovered over the next seven years.

The proposed Basin Plan was prepared on the basis that states will not need to alter the reliability of allocations to meet the requirements of the Basin Plan. This intent is explicitly stated in section 6.15 of the proposed Basin Plan: 'Nothing in the Basin Plan requires a change in the reliability of water allocations of a kind that would trigger Subdivision B of Division 4 of Part 2 of the (Water) Act'.

MDBA will carefully monitor this issue during the implementation of the Basin Plan and will publish on its website the dates that the gap is bridged for the northern and southern zones.

CHAPTER 7: ENVIRONMENTAL WATERING PLAN

Chapter 7 and schedules 5, 6 and 7 deal with the proposed Basin Plan's Environmental Watering Plan (EWP), which includes criteria for identifying priority environmental assets and priority ecosystem functions and their watering requirements, and the targets to measure progress towards the overall objectives for water-dependent ecosystems.

The EWP is a strategic framework for the management of the environmental water in the Basin and seeks, for the first time, to coordinate water at a Basin scale, and across borders in order to protect and restore environmental assets and biodiversity dependent on Basin water resources, and achieve other environmental outcomes for the Basin as a whole. The Basin Plan will identify and set aside an increased, but still finite, amount of water to achieve the best possible environmental outcomes.

The EWP aims for sustainable ecosystems that can retain their ecological integrity so that they are healthy and resilient to future stressors.

Given the inherent variability within the Basin, the EWP is not prescriptive about what must be watered, where and when. Such a plan would inevitably lead to sub-optimal outcomes. Rather, the EWP is a statutory framework for decision making, and adapting to new information and better ways of operating, in the context of climatic and other variables.

Because it is a strategic framework, the EWP has a strong emphasis on setting overall objectives and establishing principles to guide decision-making on the use of environmental water. The framework sets out the way environmental watering will be managed, including Basin- and regional-scale planning and Basin- and regional-scale annual prioritisation. The framework also sets out arrangements for consultation and coordination to ensure that the overall objectives for the Basin's water-dependent ecosystems can be achieved.

To manage uncertainty successfully the EWP will also require periodic reviews to ensure that the best practices and knowledge are being used. These reviews are built into the Basin Plan and are consistent with the practice of adaptive management. As the EWP is implemented in the coming years, a greater understanding of the needs of ecosystems, communities and water managers will emerge and the EWP will be continuously refined to enhance environmental water management.

39. ISSUE

Submitters said that MDBA should not aim to restore the environment to a near-natural state. Concern was expressed that MDBA's commitment to address constraints might mean removing all structures that impede the natural flow of the river:

> ***'It would be inconceivable to suggest that the removal of all river constraints was achievable or even practicable. Mankind has changed the natural environment and it cannot ever be returned to the natural state prior to the settlement of Australia.'***

RESPONSE

MDBA does not aim to restore the environment to a near-natural state as reinforced in section 7.04 of the proposed Basin Plan.

40. ISSUE

Divergent views on the EWP were submitted. While some thought the EWP was too prescriptive, others expressed concern that it was not sufficiently prescriptive and lacked detail about what sites would be watered, how much water they needed and when they would be watered.

Some believed that the proposed Basin Plan did not include an EWP at all; in particular that the high-level objective set out in chapter 7 did not constitute a plan. Other submissions thought it was too prescriptive. For example:

> ***'Knowledge around managing large volumes of environmental water is still developing in Victoria and it is considered that Environmental Watering Plans (EWPs) need to be adaptive to allow for learnings over time. However the approach to EWPs in the Proposed Plan is very prescriptive.'***

> ***'There has been no explanation as to what the water will be used for, and what the results of its use will be.'***

> ***'Given the sheer volume of water already recovered for the environment by the State and Federal Governments and held or controlled by the Commonwealth Environmental Water Holder, there is an urgent need for a Basin wide long term Environmental Watering Plan to manage this water.'***

RESPONSE

MDBA acknowledges the desire for more detail in the proposed Basin Plan about where and when environmental water will be used however it is important to retain the Plan as a strategic framework so it is responsive to climate variability, new information and can incorporate local involvement.

As a strategic framework, the EWP focuses on setting overall objectives, on establishing principles for decision-making and the use of environmental water. It also sets out an environmental management framework for how information will be gathered, with a

strong emphasis on adaptive management and how decisions should be made to use environmental water with the benefit of this information.

Nevertheless the Plan will now include a Basin-wide environmental watering strategy to guide long-term water planning at the Basin and regional level which will feed into annual (or more frequent) decisions on environmental water use. Both local and Basin-scale perspectives will be considered, and there is a strong emphasis on coordination of the many players in environmental watering.

The Basin-wide environmental watering strategy will assist MDBA to act in the interests of the whole Basin. Consequently it will be flexible and adaptive, enhance the integration and coordination of the management of environmental water and provide guidance to Basin states when preparing water resource plans for accreditation by the Minister. The Basin-wide environmental watering strategy will also provide context and guidance for the development of Basin annual environmental watering priorities and the activities of the Commonwealth Environmental Water Holder (CEWH).

The Basin-wide environmental watering strategy will not replace the long-term EWPs prepared by Basin states; rather, it will operate at a broader scale to complement and guide them.

The environmental management framework within the EWP has been expanded to include the requirement that MDBA prepare a Basin-wide environmental watering strategy. The Basin-wide environmental watering strategy describes how the objectives for water-dependent ecosystems will be achieved and how MDBA will identify the Basin annual watering priorities. Accordingly, the strategy will inform all components of the environmental management framework.

41. ISSUE

Submitters were concerned that ensuring reliability of allocations would reduce optimisation of environmental watering. Some were concerned that the Australian Government's commitment not to change entitlements would mean that the environment would lose out in years when there was very little water.

RESPONSE

The proposed Basin Plan does not require a change to the reliability of allocations of any water access entitlement, including those held for the environment. Environmental water managers will be expected to operate according to the characteristics and rights associated with their water access entitlement. This could mean that environmental allocations will be low in dry years. However, the Basin annual environmental watering priorities set by MDBA will have a degree of flexibility to allow for changing climatic conditions and water availability in the Murray–Darling Basin. For example, in dry years the priority could be protecting wetland refuges for threatened species, whereas in wet

years the priority could be achieving widespread system connectivity and floods, building resilience and ensuring wetlands are in good condition to be able to withstand long periods of dry.

MDBA, in collaboration with Basin governments, is also working to address constraints and river operations to explore the potential to improve the effectiveness and efficiency of environmental watering. This issue is addressed further in the responses to issues 172 and 173.

42. ISSUE

Submissions expressed concern about the transparency and accountability of environmental water delivery. Comments relating to this issue were broad-ranging and included concerns regarding a perceived lack of obligation for Commonwealth environmental water to be used consistently with the EWP. Submissions also raised concern regarding accountability in relation to meeting environmental targets.

> ***'... without an "agreed" Environmental Watering Plan, it is not clear how the large volumes of environmental water generated through Government "buy-back" schemes, are to be used, implemented or managed to improve the environment.'***

RESPONSE

MDBA agrees that the use of environmental water should be clearly and transparently reported to ensure accountability to the community. The environmental management framework in chapter 7, together with the requirements in chapter 12 for monitoring and evaluation, ensures consistency and transparency while providing the flexibility necessary to adapt to the Basin's high degree of variability.

MDBA has responded to specific suggestions by making changes that improve clarity. These changes do not change the effect of the EWP provisions. In particular, as discussed previously, new provisions have been included to require the MBDA to prepare a strategy, which will include amongst other things explanation of how the Basin annual watering priorities will be identified.

MDBA has noted the concerns that the provisions in chapter 7 do not clearly enough compel the CEWH to act consistently with and give effect to the EWP. More-explicit provisions to address this have been added.

The Act requires that the EWP specify 'targets by which to measure progress towards achieving the environmental objectives'. The provisions of chapter 7 are consistent with this requirement. Chapter 7 includes targets as a basis for measuring progress, but the

achievement of the overall objectives for the water-dependent ecosystems of the Basin is given priority.

Section 7.02 of the proposed Basin Plan has been amended to provide greater clarity regarding the CEWH's role to act consistently with the EWP.

43. ISSUE

Submissions claimed there was too much focus on water volumes alone as a way to achieve environmental objectives:

> ***'The "how, when and frequency" of environmental water should be at the centre of the Basin Plan.'***

Submissions argued that achieving environmental objectives should not be solely dependent on hydrologic considerations and that other natural resource management issues had a much greater impact on the health of the environment:

> ***'The NSW Government's State of the Catchment Report (2010) for the Central West also raises concerns with non-flow-related drivers of the health of the region's wetland stating that the greatest pressure on wetlands in this region is from catchment and habitat disturbance caused by vegetation clearing/modification in the catchment, grazing, feral animals and impoundments.'***

Submissions argued that without parallel consideration and investment to address other drivers of river health, the environmental objectives for the Basin Plan were unlikely to be met.

RESPONSE

MDBA agrees that achieving good environmental outcomes is very much about the 'how, when and frequency' of environmental watering, and this flexibility is at the heart of how the EWP is written.

Section 7.51 (2) of the proposed Basin Plan specifies that environmental watering requirements are to be expressed in a range of terms, including duration, timing, frequency, the maximum period between flow events, groundwater dependency and inundation depth. These characteristics establish the nature of the volume of water and will maximise benefits for the environment.

MDBA agrees on the need for a broad natural resource management approach in the achievement of outcomes for water-dependent ecosystems. While water volumes are important in achieving environmental objectives, the EWP recognises that water-dependent ecosystems are influenced by more than water volumes alone.

Environmental watering under the EWP will be carried out within broader natural resource management planning. This is reflected in the principles for determining priorities: for example section 7.56(f) and section 7.57(e) of the proposed Basin Plan specify that other related natural resource management plans must be considered when prioritising and assessing the effectiveness of environmental watering. A broad natural resource management approach is also inherent in the guidelines for determining resource availability scenarios as part of the EWP. For example, the guidelines for section 7.60 address management outcomes such as maintenance of critical refuges, habitat connectivity, and threatened species and communities. Ultimately however, the Basin Plan cannot direct land-use planning, natural resource management or other aspects of catchment management that are not related to water.

However, the principles for delivering environmental water: for example, principles 3 in section 7.35 refers to maximising the multiple ecological benefits of environmental watering, and having regard to the views of local communities and state bodies (such as catchment management authorities) in relation to environmental watering.

Finally, the involvement of river operators is recognised as an essential element in achieving positive environmental watering outcomes. The inclusion of a requirement in the EWP for managers of environmental water to work collaboratively with river operators will enhance the effective delivery of environmental water.

44. ISSUE

Submissions expressed concern relating to risks involved in environmental watering. Submissions noted risk where environmental watering might not be consistent with the needs of the environment. The possible adverse effects involved in applying environmental water, such as spread of alien species and blackwater events, were raised, as was the risk to the environment of inadequate environmental watering. Submissions also noted the risk of inadvertent inundation of infrastructure and private property during environmental watering events.

RESPONSE

MDBA agrees with the importance of properly managing the risks involved in environmental watering.

In the EWP there is an environmental management framework that sets out requirements for planning at Basin and Regional scales, over the long term and annually. Every component of the environmental management framework must be undertaken consistently with principles that are set out in division 6 of part 4 of chapter 7; and principle 4 deals explicitly with risks.

Similarly, when determining priorities for applying environmental water, all parties must use principles that are set out in division 1 of part 6 of chapter 7; and principle 6 deals with risks and related matters.

Further, in considering the ESLT, MDBA took into account third-party constraints, including inundation of private property. This is discussed in the response to issue No. 161. For more information on how the ESLT was established, refer to *The proposed "environmentally sustainable level of take" for surface water of the Murray-Darling Basin: Method and Outcomes* report[12].

45. ISSUE

Submissions expressed concern about how the EWP would be consulted on, implemented and resourced; in particular that the costs of implementation would be borne by the state and local agencies and that consulting with river operators was essential to achieving good environmental watering outcomes.

RESPONSE

MDBA strongly supports the active involvement of local groups in environmental watering planning and implementation. The EWP sets out a framework for the preparation and delivery of environmental water. It establishes roles and responsibilities for federal and state agencies in consulting on planning and managing environmental water in a coordinated, consistent and adaptive manner across the Murray–Darling Basin.

The new environmental water planning requirements build on rather than override existing regional planning strategies. The Basin states will continue to be responsible for and manage their own rivers, catchments, and associated consultation processes within the context of the EWP. MDBA has a role in coordinating the effective use of environmental watering. This will be carried out in a number of ways, including by developing guidelines to help Australian government and state agencies apply the method to determine priorities for applying environmental water. The new provision in the proposed EWP to develop a Basin-wide environmental watering strategy will also contribute to improved coordination and consistency across the Basin.

MDBA agrees that the involvement of river operators is essential to achieving good environmental watering outcomes. This is the approach that MDBA uses for planning and implementing The Living Murray environmental watering, and is considered a best-practice approach.

[12] Available at: http://www.mdba.gov.au/draft-basin-plan/supporting-documents/mdba-eslt

The costing and resourcing of environmental watering is an important issue but it is outside of the remit of MDBA and the Basin Plan. Therefore, MDBA has prepared an implementation strategy, a compliance strategy and a range of complementary guidelines which together will clarify the roles and responsibilities of all parties in implementing the Basin Plan. These strategies and guidelines have been prepared in consultation with the states to help ensure they provide sufficient detail for all agencies to understand their obligations. MDBA is also preparing a regulation impact statement (RIS) to provide to the Minister for Water with the Basin Plan. The RIS will include information about the administrative costs to governments of implementing the Plan.

The EWP has been amended to require Basin states to consult with river operators when preparing long-term watering plans, and also to require that MDBA have regard to any advice provided by river operators when preparing Basin annual environmental watering priorities.

CHAPTER 8: WATER QUALITY AND SALINITY MANAGEMENT PLAN

The Water Quality and Salinity Management Plan (WQSMP) presents the key causes of water quality degradation, the water quality objectives for Basin water resources, and sets water quality targets relating to management of water flows, long-term salinity planning and management, and to inform, development of measures that will be included in water resource plans to improve water quality.

The WQSMP builds on existing water quality and salinity management agreements and arrangements, including the National Water Quality Management Strategy and the Basin Salinity Management Strategy. It provides a Basin-wide framework of objectives designed to enable Basin water to be 'fit for purpose' — that is, water quality suitable for irrigation and recreational uses, for maintaining aquatic ecosystems and for being treated for human consumption.

While the Basin states have programs to implement the recommendations and procedures set out in the National Water Quality Management Strategy, more consistent Basin level actions are required for the effective management of some water quality issues. For example, the most effective response to some water quality characteristics (particularly 'real time' low oxygen levels in water, elevated salinity and cyano-bacteria blooms) may include water flow management decisions, or joint action between jurisdictions, which require cross-jurisdictional planning, cooperation, coordination or action.

To assist in addressing these aspects of water quality management, the WQSMP requires MDBA, the Basin Officials Committee, the CEWH and the states to have regard to water quality issues relevant to salinity, oxygen levels in water, and cyano-bacteria (blue-green algae) blooms, when making certain management policies or decisions relevant to water flow management.

The WQSMP also provides water quality targets for irrigation, recreational use of water, and water dependent ecosystems, relevant to the preparation of water resource plans by the states. In this context, it encourages consideration of the impacts of wider natural resource management and land management on water quality within the water resource plans. States are able, under arrangements set out in chapter 9 of the proposed Basin Plan, to propose and incorporate alternative target values in the water resource plans, when these are developed using appropriate science and provide a better level of protection.

46. ISSUE

Submissions presented very polarised views on the degree of prescription in the WQSMP, saying that either:

- **the WQSMP was too prescriptive or costly to implement; it should merely reference the Basin Salinity Management Strategy (BSMS) and Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines; or**
- **the WQSMP was not prescriptive enough; the targets were aspirational only and should be more ambitious or enforceable; its targets took a minimalist interpretation of the Act; if (tougher) targets could not be met immediately then the Basin Plan should specify a pathway for them to be achieved over time.**

RESPONSE

The WQSMP explicitly includes the Basin salinity targets, and the end-of-valley salinity targets, adopted under the BSMS. In addition, the WQSMP closely follows the framework for setting water quality objectives and targets provided in the National Water Quality Management Strategy and published in the ANZECC Guidelines. In doing so the proposed Basin Plan builds upon the very successful BSMS.

Pursuant to the purpose of the Act to improve water management, MDBA considers that it is appropriate to go further than the current water quality management arrangements to ensure consistent and coordinated management to achieve improved water quality outcomes in the future. Hence the plan includes targets relating to managing water flows, targets for long-term salinity management and planning, and targets that will inform the development of measures which are required to be included in water resource plans to contribute to achieving the water quality objectives of chapter 8. These plans are required to set local water quality target values, and identify local measures to contribute to achieving the water quality objectives of chapter 8. Existing state arrangements currently follow a similar model, and can be included within the State's water resource plan that it prepares for accreditation or adoption.

Overall the WQSMP builds upon existing water quality planning and management arrangements, sets aspirational objectives and targets intended to improve water quality over time, and does not impose an unnecessary cost burden upon Basin states to implement.

47. ISSUE

Submissions referred to some confusion and uncertainty about how the targets are intended to function for water quality and salinity.

RESPONSE

MDBA agrees that the WQSMP could be presented in a way that improves clarity and readability. Consequently the water quality targets for planning and management of

water flows, the water quality targets that inform the development of water quality management plans within water resource plans, and the water quality targets for the purposes of long-term salinity planning and management are now placed in separate divisions in the proposed Basin Plan. This restructuring does not introduce new policy settings from those released for consultation.

The WQSMP has been restructured to improve its clarity and intent.

48. ISSUE

Targets set under the WQSMP were said to be too aspirational.

> ***'The water quality target values contained in the Basin Plan are not strong enough and are worded such as to leave broad discretion to the States to ignore them if they so choose'***

RESPONSE

MDBA does not think that the targets set in the WQSMP are too aspirational. The WQSMP provides a Basin-wide framework of objectives designed to enable Basin water to be 'fit for purpose' — that is, suitable for irrigation and recreational uses, for maintaining aquatic ecosystems and for being treated for human consumption.

The water quality and salinity targets are science based, and achieving these targets will help to maintain appropriate water quality for environmental, social, cultural and economic activities in the Basin.

49. ISSUE

Submissions expressed the view that insufficiently stringent water quality and salinity management could harm wetlands

RESPONSE

MDBA agrees that poor water quality outcomes can harm wetlands. Consequently the WQSMP sets out water quality targets for declared Ramsar wetlands and other water-dependent ecosystems to protect their ecological character.

The water quality targets for declared Ramsar wetlands and other water-dependent ecosystems were determined in accordance with the National Water Quality Management Strategy procedures (Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand 2000). The targets will be used to inform the development of water resource plans. They will also be used by MDBA to measure progress towards achieving water quality objectives.

50. ISSUE

Submissions queried why the targets set under the WQSMP were not tied to monitoring and evaluation; and why there was no direct compliance framework for the targets.

RESPONSE

Chapter 12 of the proposed Basin Plan sets out the program for monitoring and evaluating the effectiveness of the Basin Plan and includes a specific provision which requires MDBA to conduct a review of the water quality targets in the WQSMP every five years after the commencement of the Basin Plan.

The first review must consider the appropriateness of the existing salinity operational target values and sites, and whether it is necessary to increase the number of target sites in order to improve salinity management, having regard to the provisions in schedule B of the Murray–Darling Basin Agreement, which also deals with Basin salinity management. Furthermore, the Monitoring and Evaluation Program provides for the development of guidelines in relation to the reporting requirements. MDBA intends these to include guidelines about technical and operational aspects of monitoring and evaluation to help state and Australian Government agencies meet their reporting requirements. These guidelines will identify appropriate methods and monitoring points along the river to assess progress towards achieving objectives and targets set out in the WQSMP.

To this end, MDBA will develop a compliance and assurance strategy that will articulate its overarching compliance policy and how it will develop its compliance and assurance program. This will include the provision of information on the obligations of the Basin Plan and the Act, the various compliance tools available, and how they will be used.

The proposed Basin Plan has been amended to introduce a new audit function into chapter 12 to enhance the clarity of MDBA's approach to compliance and assurance.

51. ISSUE

Submissions suggested that complying with the water quality and salinity management targets would be too onerous.

RESPONSE

MDBA believes that the targets set out in the WQSMP are sufficient to maintain appropriate water quality for environmental, social, cultural and economic activities in the Basin. They are based upon current Basin state water quality and salinity management arrangements, and while intended to improve Basin water quality over time will not impose an onerous cost burden to implement.

52. ISSUE

It was submitted that there was a need to set salinity and flow targets specifically for the Lower Lakes, the Murray Mouth, the Coorong and other locations in the southern part of the system to ensure that water quality outcomes are met and that sufficient salt is exported from the Murray Mouth.

> ***...the Authority should consider setting a salinity target for Lake Alexandrina of less than 1,000EC units for at least 95% of the time. Achieving this target should also deliver acceptable water quality standards in other areas like Lake Albert, the Coorong and the Murray Mouth.'***

RESPONSE

MDBA agrees that achieving good water quality outcomes for the Coorong, Lower Lakes and Murray Mouth is important. Accordingly the WQSMP sets out a number of water quality target values, including salinity targets relating to management of water flows, to inform water resource planning, and a salt-load target for the River Murray System.

The targets relating to management of water flows as set out in section 8.12 of the proposed Basin Plan include target values for levels of salinity at reporting sites at Burtundy on the Darling River, and on the River Murray at Lock 6, Morgan and Murray Bridge. MDBA, the CEWH, Basin states and their agencies must have regard to these targets when making decisions relating to the management of water flows. The use of these targets, in conjunction with the adoption of targets to inform water resource planning, and increased flows arising from the adoption of the SDLs, will collectively result in improved water quality and salinity outcomes for the whole Basin, and consequently for the Coorong, Lower Lakes and Murray Mouth.

For example, Basin Plan modelling indicates that average and peak salinity will be reduced in Lake Alexandrina as a result of the Basin Plan. The salt-load target aims to achieve adequate flushing of salt into the ocean; this target is met when 2 million tonnes of salt is discharged through the Murray Mouth into the Southern Ocean each water accounting period.

Modelling carried out by MDBA indicates that this long-term-average salt export target will be met using the SDLs in the proposed Basin Plan. This work was based on detailed analysis of Basin salinity from 1972. The information derived from this analysis was then extrapolated to the 114-year modelled period used for the proposed Basin Plan (i.e. from 1895 to 2009).

Nevertheless, MDBA agrees that an additional target is appropriate, particularly for water quality in the Lower Lakes to guide and measure progress on the provision and management of water flows to protect these assets. The Morgan site does not

adequately reflect conditions in the lower reaches and Lower Lakes. Communities below Lock 1 have also sought specific water-quality-related targets to be included in the Basin Plan to enhance the level of protection for the water resources, consumptive users and ecosystems in this region.

The inclusion of a salinity target for Lake Alexandrina will provide for the management of salinity in both Lake Alexandrina and Lake Albert. The Milang location is proposed as there is a historical record for this site, and it is not influenced by the day-to-day operations of the barrages which could result in short-term salinity fluctuations at sites closer to the mouth.

The proposed Basin Plan has been amended to introduce a new target value for salinity for managing water flows in the Lower Lakes (measured at Milang) of 600mg/L for 95% of the time.

53. ISSUE

Submissions commented on the long-term average Basin-wide salt export target of 2 million t/y. These submissions often commented that there was no information on discussion provided in the proposed Basin Plan regarding whether this target could be achieved. Other submissions suggested it might not be achievable.

RESPONSE

MDBA modelling included an assessment of the ability to achieve this target. Salt mobilisation and transport processes are complex, and therefore the assessment has some uncertainty. However, MDBA's best estimates are that the proposed Basin Plan can achieve the target. Model results are presented on page 211 of the MDBA report, *Hydrologic modelling to inform the proposed Basin Plan: Methods and results*[13].

Modelling of salt mobilisation and transport will be refined and improved over time. MDBA will take new assessments into account, as they arise, in undertaking future Basin Plan reviews.

54. ISSUE

Concerns were expressed about general water quality and salinity issues and their effect on, for example, native fish, recreational activities and the frequency of blue-green algal blooms.

RESPONSE

Good water quality and salinity outcomes are essential to achieve our goal for having a healthy working Basin. To assess the outcomes of the Basin Plan, MDBA commissioned

[13] Available at: http://download.mdba.gov.au/proposed/Hydro_Modelling_Report.pdf

CSIRO to undertake a Basin-wide assessment of the multiple benefits of the Basin Plan, including hydrological, ecological, social and economic benefits. The report confirms the MDBA's modelling that the SDLs set out in the proposed Basin Plan are important in halting or reversing the widespread trend of declining health in the ecosystems of the Basin. In its report CSIRO concludes[14] that recovering 2,800 GL/y of water for the environment would improve water quality in at least three ways. Firstly, through reduced numbers of days of low flow when cyanobacterial blooms could develop. Secondly, through less-frequent periods of low water levels in the Lower Lakes when acidification could occur. Thirdly, through more-frequent inundation of vegetated floodplains, which reduces the number of days of high-oxygen demand due to oxidation of floodplain carbon sources, which in turn reduces the number of blackwater events and fish kills.

The WQSMP, in setting a Basin-wide framework of objectives designed to enable Basin water to be 'fit for purpose', will ensure these water quality outcomes are achieved in the future.

55. ISSUE

Submissions queried why the 2004 Australian Drinking Water Guidelines (ADWG) rather than the 2011 guidelines were used.

RESPONSE

The ADWG, developed by the National Health and Medical Research Council in collaboration with the Natural Resource Management Ministerial Council, provide the Australian community and the water supply industry with guidance about what constitutes good-quality drinking water. The guidelines represent the latest scientific evidence on good-quality drinking water and incorporate a framework for managing drinking water quality.

The WQSMP's targets were set with particular reference to the ADWG published in 2004 as well as other water quality and risk management water strategies and guidelines.

The 2011 revision of the ADWG occurred concurrently with the production of the proposed Basin Plan, and was therefore not available for use by MDBA. The 2011 guidelines are now incorporated into the proposed Basin Plan.

The definition for the ADWG appears in section 1.07 of the proposed Basin Plan; it has been amended in the revised Plan to refer to the 2011 revision of the guidelines.

[14] Available at: http://www.mdba.gov.au/files/bp-kid/2017-Assessment_Ecological_Economic_Benefits.pdf

CHAPTER 9: WATER RESOURCE PLAN REQUIREMENTS

Chapter 9 of the proposed Basin Plan sets out the requirements that water resource plans must meet to be accredited or adopted under the *Water Act 2007* (Cwlth). The water resource plan requirements provide a framework to establish a consistent Basin-wide approach to the management of Basin water resources. They are balanced between accommodating the wide variability of conditions across the Basin, in both bio-physical and management terms, while being sufficiently robust to deliver the intent of the proposed Basin Plan.

The requirements have been developed in consultation with State officials responsible for water resource planning and aim to build on existing water planning processes. The requirements outline what is necessary for water resource plans to contain so that they can be accredited by the Australian Government Minister for water.

The key elements of the chapter relate to requirements which will implement the SDLs, a risk assessment which will allow a fit-for-purpose approach to development of the plans, a catchment-scale EWP and water quality management plan, the need to accommodate water trading and the importance of monitoring, evaluation and reporting.

While water planning currently carried out by the Basin states already takes into account the views of the community, the water resource plan requirements provides for these views to inform development of the water resource plans. The requirements also specifically establish a process to involve Aboriginal representatives in water resource planning.

56. ISSUE

Submissions generally expressed support for the policy position set out in the proposed Basin Plan that it had been prepared on the basis that states would not need to alter the reliability of allocations to meet the requirements of the Basin Plan. However, the expression of this policy in chapter 9 (section 9.09) caused some concern that it could lead to inappropriate 'opting out' of meeting the other provisions of the chapter.

RESPONSE

MDBA considers the section is superfluous given the more general provision in section 6.15 of the proposed Basin Plan: 'Nothing in the Basin Plan requires a change in the reliability of water allocations of a kind that would trigger Subdivision B of Division 4 of Part 2 of the (Water) Act'.

Without any change in policy in regard to the impact of the Basin Plan on entitlement reliability, the former section 9.09 has been removed.

57. ISSUE

Submissions expressed concern regarding the lack of clarity in the water resource plan requirements, and in particular in the requirements of division 2 of part 3 of chapter 9, where a water resource plan is required to set out the arrangements for the incorporation and application of the long-term annual diversion limit.

RESPONSE

Water resource plans set out how all water resources (including regulated and unregulated) will be managed (usually for a 10-year period) in water resource plan areas. Water resource plan areas are geographical areas that have specific surface water or groundwater resources or a combination of both. The requirements set out in chapter 9 of the proposed Basin Plan apply to all water resource plan areas across the entire Basin, from the highly developed and regulated areas to those with very little regulation or development. They have therefore been prepared so that water resource plans can be developed in the most appropriate way for each water resource plan area.

A particularly important group of requirements is that a water resource plan applies the long-term diversion limit set by the Basin Plan to that water resource plan area. These requirements are set out in division 2 of part 3 of chapter 9, and aim to provide adequate flexibility in how the diversion limit is applied, while still ensuring that the consumptive take is managed in accordance with the limits set out in chapter 6 of the Basin Plan.

MDBA acknowledges the need to provide greater clarity about the application of these complicated arrangements.

The requirements in division 2 of part 3 have been redrafted to make them clearer and easier to implement. They explain how the quantity of water actually taken is allocated so that use does not exceed the SDL, and how this is accounted for each year, including the use of accredited models.

The requirements for water resource plans are set out in the proposed Basin Plan in a way that allows water resource plans to be prepared in the most appropriate manner for that area. To provide further assistance, the MDBA is preparing a handbook for practitioners in consultation with Basin states to provide guidance in the application of chapter 9 provisions and the preparation and accreditation or adoption of water resource plans, and respond to the needs of the States.

58. ISSUE

Submissions expressed dissatisfaction that water resource plan requirements did not specifically require Basin states to consult with local communities when preparing water resource plans.

RESPONSE

MDBA supports comprehensive consultation with local communities. A revised provision in chapter 9 requires each water resource plan to set out the consultation that has occurred in relation to its preparation and requires certain consultation to occur in specific circumstances.

Under the various state planning frameworks that states will use to develop water resource plans for accreditation or adoption under the Basin Plan, stakeholder consultation is already a clear requirement to be reflected in the water resource plan. If MDBA is required to prepare a water resource plan (under the relevant provisions of the Act), then section 4.03 of the proposed Basin Plan requires that it do so 'based on best available knowledge and in consultation with relevant stakeholders'.

Also, chapter 9 of the proposed Basin Plan includes some more-specific provisions related to consultation:

- Part 6 of the chapter states that, in relation to environmental watering, the water resource plans must be prepared having regard to the views of local communities; and
- Part 14 includes provisions requiring the plan to identify the objectives and management outcomes desired by Aboriginal people for the water resources, having regard to Aboriginal values and uses for those water resources, determined through consultation with relevant Aboriginal organisations.

A new provision in chapter 9 requires each water resource plan to set out the consultation that has occurred in relation to its preparation.

59. ISSUE

Concerns were expressed that the Basin states were not required to consider social and economic impacts in their water resource plans.

RESPONSE

The SDLs were established considering their likely social and economic impacts on communities. These SDLs will be a core element of water resource plans.

For water resource plans to be accredited or adopted, they will need to be consistent with the requirements set out in chapter 9 of the Basin Plan. In so doing, the accredited or adopted water resource plans are expected to contribute to achieving a healthy working Murray–Darling Basin, encompassing 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; and healthy and resilient ecosystems.

For example, in relation to environmental watering, the proposed Basin Plan requires that water resource plans be prepared having regard to the views of local communities. MDBA expects that local communities will express views related, among other things, to the likely social and economic impacts of environmental watering; and that the states will have regard to these views when developing water resource plans. In the event that the MDBA prepares a water resource plan, it will also be required to have regard to the views of local communities. There are also requirements in chapter 9 in relation to consultation on Aboriginal values and uses.

60. ISSUE

Submissions questioned how water resource plans would operate if the Australian Government did not recover sufficient water to meet the requirements for any local or shared reduction in a water resource plan area. It was also suggested that the Australian Government's commitment of 'bridging the gap' should be more strongly reflected in the proposed Basin Plan itself.

RESPONSE

MDBA is aware of this concern; however, the Australian Government has committed to bridge the gap by 2019 through water-saving infrastructure and water purchases from voluntary sellers. The proposed Basin Plan was prepared based on this commitment. Already more than half of the proposed reduction has been recovered, leaving the remainder to be recovered over the next seven years.

61. ISSUE

Submissions raised concerns about how the expiration of transitional water resource plans before 2019 would be managed.

RESPONSE

MDBA is committed to supporting a smooth transition in water planning arrangements over the next seven years to 2019. Over this period, as transitional and interim water resource plans expire, MDBA will work with the Australian Government and Basin states to ensure that planning arrangements are in place that provide clarity and certainty.

MDBA will also work closely with Basin States to ensure that by 2019, water resource plans are in place right across the Basin and that they are consistent with the Basin-wide planning framework. Through this work, water resource plans will reflect the outcome of water recovery programs and the 2015 review of SDLs.

62. ISSUE

It was submitted that water resource plan requirements were not prescriptive enough and were too weak.

RESPONSE

Provisions under chapter 9 are prescriptive but it is important that they are also flexible enough to ensure water resource plans consistent with the Basin Plan are developed and implemented successfully. This flexibility also allows for an appropriate level of planning considering the diverse nature of water resources in the Basin, including surface water and groundwater; highly regulated, modified systems and largely undeveloped, near-natural systems.

Water resource plan requirements under the proposed Basin Plan were developed through extensive consultation with the Basin states to ensure the requirements are effective and able to be implemented.

63. ISSUE

Submitters found that the adaptive management concept was not clear in the water resource plan requirements chapter of the proposed Basin Plan.

RESPONSE

MDBA is committed to an adaptive management approach to the implementation and review of the Basin Plan. This is fundamental to the architecture of the proposed Basin Plan, and is reflected in several areas throughout the plan. The provisions of chapter 9 collectively give effect to an adaptive approach to water resource management where this is appropriate.

The SDLs and other elements of the Basin Plan will be reviewed in 2015 and then at least every 10 years, consistently with an adaptive management approach. These reviews might lead to changes to the Basin Plan. Water resource plans will be accredited or adopted for 10 years, providing a basis for investment confidence over this period. Water resource plans may also be reviewed and amended during their 10-year life span (see part 11 of chapter 9).

64. ISSUE

Submissions argued that the Basin Plan should include greater clarity and more information on the transition pathway to 2019.

RESPONSE

MDBA is committed to providing clarity and certainty for all parties in the transition to the full operation of the Basin Plan arrangements from 2019. To this end it will continue consultation with Basin states throughout 2012 to finalise the implementation pathway for the transition. The Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) will also be actively involved in this consultation.

Much of the information regarding the arrangements for how water resource plans are made is set out in the Act. The Basin Plan is not required to set out such arrangements; however certain parts of the Basin Plan do commence at different times during this period.

65. ISSUE

Submissions raised that the Basin Plan should provide for independent audit mechanisms to complement the National Water Commission's audit role; and in implementing the Basin Plan, MDBA should build on and streamline existing water resource plan monitoring and compliance mechanisms and, where possible avoid duplication of existing reporting activities.

RESPONSE

MDBA agrees that there should be a rigorous and transparent monitoring, evaluation and reporting program to assess the success and effectiveness of the Basin Plan. In chapter 12 of the proposed Basin Plan there are specific reporting requirements regarding operation of and compliance with water resource plans (WRPs). The Monitoring and Evaluation Program (MEP) is guided by principles which will minimise the risk of duplicative reporting. These principles support the collection of information once to be used for many purposes, and the use of existing arrangements to support provision of information and reporting obligations. MDBA also acknowledges that there is value in establishing a compliance audit function for the whole Basin Plan, including compliance with WRPs, and has established a new provision to create this obligation.

The proposed Basin Plan has been amended to introduce a new audit function in chapter 12 to enhance the clarity of MDBA's approach to compliance and assurance.

Alignment with existing state arrangements will also be facilitated through the development of draft guidelines and agreements related to chapter 12 which will establish agreed reporting arrangements for WRP-related items listed under schedule 10. MDBA is also, in consultation with the Basin states, developing a handbook for practitioners for chapter 9 to assist water planners in understanding and implementing the water resource plan requirements, and clarifying the accreditation process.

66. ISSUE

Submissions raised that under the current Cap arrangements the states' models are independently audited. However, there is no requirement in the proposed Basin Plan for the models used to determine the Baseline Diversion Limit (BDL) and sustainable diversion limit (SDL) to be accredited.

RESPONSE

The water resource plan requirements include (division 2 of part 3 of chapter 9) that the water resource plan includes the necessary arrangements to give effect to the long-term annual diversion limits. Where the specification of diversion limits includes detailed methods and models, such as for many of those water resources currently managed under the Cap arrangements, MDBA will assess these methods and models in detail, before recommending to the Minister that they ensure that the water resource plan can be accredited as being consistent with the requirements of chapter 9. These methods or models will then form part of the accredited water resource plan.

The requirements in division 2 of part 3 have been redrafted to make them clearer and easier to implement. They explain how the quantity of water actually taken is allocated so that use does not exceed the SDL, and how this is accounted for each year, including the use of accredited models.

67. ISSUE

Submissions identified that water resource plans could play an important role in contributing to in-valley improvements in the condition of environmental assets and the provision of ecosystem functions, as well as providing environmental flows for downstream targets. To achieve this, the water resource plan requirements would have to be more prescriptive about environmental watering.

RESPONSE

Part 6 of chapter 9 sets out the requirements for environmental water planning as they relate to a water resource plan area. This part of the chapter describes the interaction with the Environmental Watering Plan (chapter 7).

The water resource plan requirements seek to support the management and use of environmental water in a number of ways. These include:

- requirements are included in part 4 of chapter 9 for water resource plans to include, if necessary, rules to ensure the water resource plans does not compromise meting the environmental watering requirements;
- requirements are included in part 6 of chapter 9 for environmental watering to occur consistently with the environmental watering plan and with the Basin-wide environmental watering strategy; and
- the risk assessment prepared in accordance with part 9 of chapter 9 is required to identify risks to environmental watering requirements.

MDBA believes this is an appropriate approach to environmental watering in the context of the water resource plans, as it allows for flexible planning which is important given the differing types of systems and levels of development across the Basin.

68. ISSUE

Some submissions raised concerns about managing the development of water resource plans (WRPs) that include water resources that are connected to resources outside the Murray–Darling Basin. More specifically, the concern was that the Wimmera is heavily reliant on contributions from the Glenelg Basin external to the Murray–Darling Basin, and also contributes to Hamilton's water supply, so consideration of these factors in terms of developing a WRP was challenging.

RESPONSE

The water resource plan requirements include that the plans be prepared having regard to the management and use of any water resources that have a significant hydrological connection, including those outside the Basin. MDBA acknowledges that this may be a challenging requirement, particularly where such connections are across state boundaries or the Basin boundary. However, it is also acknowledged that it is essential for the proper understanding and management of the water resources of the Basin. The requirement included in the proposed Basin Plan therefore seeks for water resource plans to have considered these connections, but does not extend to specifying actions.

69. ISSUE

Submissions raised concerns about the requirements for water resource plans (WRPs) to establish and maintain registers of both planned and held environmental water. Concerns related to privacy issues around identifying in such a register individual owners of held environmental water, and the perceived unfairness in requiring the WRPs to establish and maintain these registers when most environmental water is held by the Commonwealth Environmental Water Holder (CEWH).

RESPONSE

The proposed Basin Plan lists separate requirements for water resource plans in relation to planned environmental water and held environmental water. Planned environmental water is required to be specifically identified in the water resource plan, along with information on any associated rules or other arrangements. There is no need to have a register of planned environmental water.

A register is required to be established for held environmental water. This requirement is included in the proposed Basin Plan as it seeks to identify for what purpose the water is held and to be used. However, state and Commonwealth privacy legislation will still apply with regard to this register.

The requirement for a register of held environmental water also provides the option for a water resource plan to identify any register established and maintained for reasons

other than the WRP (for instance, an existing register maintained by the CEWH), as long as it contains the information required. Thus, while having a register is mandated, the location and owner of the register is not.

In consultation with the Basin states, MDBA is developing guidance documents for chapter 9 to assist water planners in understanding and implementing the water resource plan requirements, and clarifying the accreditation process. As part of this work, the different options for meeting the requirement for a register of held environmental water will be provided.

CHAPTER 10: CRITICAL HUMAN WATER NEEDS

Chapter 10 of the proposed Basin Plan sets out matters relating to Critical Human Water Needs (CHWN), including the amount of water needed to meet CHWN; water quality and salinity trigger points; monitoring, assessment and risk management relating to CHWN; and water-sharing arrangements under the Murray-Darling Basin Agreement.

CHWN is the water required in times of drought for core human needs (drinking, food preparation and hygiene) for essential community services (including emergency services, hospitals and schools) and for commercial and industrial purposes that are vital for the ongoing functioning of the community or national security.

The proposed Basin Plan must specify a volume for meeting the CHWN of communities dependent on the River Murray System. It also sets a volume for conveyance water, that is the water required to ensure sufficient flow in the river system to physically deliver water for CHWN. It includes arrangements that ensure conveyance water can be provided in the driest of seasons. The proposed Basin Plan also includes triggers for determining when water quality is unsuitable for CHWN and a process for responding to any such events.

The Basin states are responsible for securing and providing the water for CHWN. This means that while the plan sets the requirements, they are to be met by the Basin states. Cooperation between the states and MDBA is important, and the provisions in the proposed Basin Plan are supported by requirements in the Murray-Darling Basin Agreement, especially schedule H Water Sharing in Tiers 2 and 3.

Chapter 10 provides for CHWN for communities dependent on the River Murray system. Outside the River Murray system, CHWN will be met through the provisions of part 13 in chapter 9.

70. ISSUE

Submissions queried how communities that did not depend on the River Murray System were considered in the proposed Basin Plan's CHWN provisions.

RESPONSE

While the Act requires that the Basin Plan determine the CHWN of communities that depend on the River Murray System for water, MDBA is aware that these needs should be appropriately planned for across the whole of the Basin. The Basin states are responsible for meeting the CHWN of communities, both those dependent on the River Murray system and across the rest of the Basin.

Chapter 10 ensures these needs will be met for communities dependent on the River Murray system and in part 13 of chapter 9 of the proposed Basin Plan requires that all

water resource plans include measures to meet CHWN in extreme events that threaten the quality or quantity of water for CHWN. The requirements of both chapters 9 and 10 will be considered in the monitoring and evaluation of CHWN outcomes.

The monitoring and evaluation of the Basin Plan will help to ensure that CHWN are prioritised across the whole Basin.

71. ISSUE

Submissions questioned how water trade would be used to supplement a town's water entitlement and CHWN.

RESPONSE

MDBA agrees that the water market should be used where appropriate to supplement water entitlements for all uses, including town water supplies where appropriate. Water supply authorities are able to use water trading to help them meet demands for water. However, the use of traded water to meet CHWN will require careful consideration because water licences have different levels of security and water might not be available on the market when most needed to meet CHWN.

72. ISSUE

Submitters expressed the view that the salinity triggers for CHWN should consider water quality, not just quantity.

RESPONSE

MDBA agrees that the Basin Plan must ensure water for CHWN is of suitable quality and quantity. The proposed Basin Plan includes triggers for enacting an emergency response if water quality or salinity levels are not suitable to meet CHWN.

73. ISSUE

In submissions that did not support the proposed Basin Plan's approach to CHWN, issues raised included that Basin water should not be a major source of water for CHWN for Adelaide and other areas outside the Basin, CHWN should not impact environmental water requirements, and that CHWN would impact reliability of other water users.

RESPONSE

The Basin's water resources are used to support or supplement the water supplies of communities outside the Basin. The impact of this non-Basin use on the water volumes for CHWN overall will depend on the extent of dependence on the River Murray System of those communities. Adelaide is very dependent and is therefore included. Melbourne, on the other hand, has access to a range of alternative water sources and is not included in the CHWN volumes.

The Australian Government and Basin states have agreed that CHWN are the highest priority use for communities who are dependent on the Basin water resources. As such, they will be allocated before other consumptive uses. In the Millennium drought, actions to set aside enough water for critical human needs did have some environmental impacts. The provisions in chapter 10, and the new requirements in the Murray-Darling Basin Agreement will reduce the chance of this occurring and will ensure it is a last-resort measure.

Chapter 10 ensures a small volume of water is set aside to guarantee water for CHWN. All Basin states have recognised this as the first priority use under the SDL and as such will be allocated before water for other uses.

74. ISSUE

Submitters disagreed with excluding the needs of stock, permanent plantings and key industries from the CHWN component of the plan.

RESPONSE

Section 86A(2) of the Act defines CHWN as: 'the needs for a minimum amount of water, that can only reasonable be provided from Basin water resources, required to meet core human consumption requirements in urban and rural areas and non-human consumption needs which, if unmet, would cause prohibitively high social, economic or national security costs.

CWHN is the water required in times of extreme drought for core human needs (drinking, food preparation and hygiene), for essential community services (e.g. emergency services, hospitals and schools) and for commercial and industrial activities that are vital to a community's ongoing functioning.

Supplying water for stock, permanent plantings and many other industries is not considered vital to the ongoing functioning of a community (that is, to have prohibitively high social, economic or national security costs). Commercial and industrial activities that could be considered as CHWN may include a large employer or a significant contributor to the national economy. The CHWN provisions have been set up as a bulk volume for each State. This will allow the State governments to work with local water supply authorities to determine the best use of the available water in their area.

75. ISSUE

It was submitted that the Basin Plan should also include water for all the needs of towns and rural communities.

RESPONSE

Part 2A of the Act requires the Basin Plan to consider water for critical human needs. Chapter 10 fulfils this requirement for communities dependent on the River Murray

system and part 13 of chapter 9 for communities not dependent on the River Murray system. The states remain responsible for meeting the general water requirements for towns and rural communities.

The water use of towns that is not a 'critical human water need' will be managed through the water resource plans. Allowances for population growth will be covered in these plans in accordance with state water laws while remaining within the SDL for the water resources of the area. The setting aside of CHWN volumes enable towns to get through extreme events, the volumes stated do not reflect the water required by communities most of the time.

76. ISSUE

Submissions did not support the volumes proposed for CHWN. More specifically, submissions questioned Adelaide's reliance on the Murray as a domestic water supply. Some suggested Adelaide should rely on desalination, captured storm water and water recycling to provide its water needs.

RESPONSE

The Act requires the Basin Plan to set volumes for CHWN for communities dependent on the River Murray system (including Adelaide). This is a small proportion of urban and rural water use but ensures basic needs can be met in extreme conditions. Water for urban areas and stock and domestic use will continue to be managed through state water laws. Chapter 10 will help ensure that in the very dry conditions water for critical human needs can be provided without impacting environmental entitlements.

The South Australian government's water security plan, Water for Good, seeks, among other things, to reduce Adelaide's reliance on the River Murray system. However, the River Murray continues to play an important role in supplying water during drought, and because of this, Adelaide's needs are included in South Australia's CHWN volume.

This volume will be reviewed in the future and could be reduced if water provided from other water sources reduces the volume of water required from the River Murray system to meet Adelaide's CHWN.

77. ISSUE

Submissions discussed the apparent discrepancy between salinity and water quality triggers for CHWN in chapter 10 of the proposed Basin Plan and the WQSMP in chapter 8.

RESPONSE

Under the proposed Basin Plan, a salinity trigger of 840 mg/L total dissolved solids or greater, extracted from any site upstream of Wellington, South Australia, defines when water quality in the River Murray system becomes unsuitable for CHWN.

In chapter 10 of the proposed Basin Plan the salinity trigger that defines when water is unsuitable for CHWN is much higher than the salinity objectives set out in chapter 8 of the plan — 840 mg/L total dissolved solids compared to a target value of 500 mg/L.

This is because the objectives outlined in chapter 8 apply to normal river conditions; they represent the water quality desired for most circumstances. The water quality and salinity triggers in chapter 10 are about extreme conditions, usually when there is very little water in the river; they do not represent the level expected in normal conditions.

CHAPTER 11: WATER TRADING RULES

Chapter 11 of the proposed Basin Plan sets out the rules for the trading of water rights relating to Basin water resources.

The water trading rules will provide greater clarity and consistency around the operations of the water market in the Murray-Darling Basin. A well functioning water market enables water to move to its highest value use by giving irrigators and environmental water holders the flexibility to decide how and when to use water.

The water trading rules will apply to the trade and transfer of water access rights, irrigation rights and certain types of water delivery rights that are tradeable under state water management law within the Murray-Darling Basin.

The rules aim to ensure free trade in surface water, except where there are defined allowable restrictions. The rules also aim to increase the level of information available in the market, as access to information facilitates transparency and allows participants to make informed decisions.

A range of rules already exist at the state and local level governing trade. In many instances, the requirements under the water trading rules will simply reflect current approaches already operating within the Basin.

In some instances, chapter 11 will introduce new requirements and obligations which are currently addressed inconsistently or not at all in existing state and local rules. This is the case where existing (or lack of existing) arrangements are contrary to the achievement of the water market and trading objectives of the Act.

Clarity and certainty around the operation of a market enhances the confidence of market participants and their willingness to participate in the market. Consistency in the rules governing trade will ensure that all market participants have the same rights and are confident of their rights regardless of where they are trading within the Basin.

The water trading rules will not replace state level rules, which will continue to apply. However, in the event of an inconsistency between state water trading rules and the Basin Plan water trading rules, the Basin Plan water trading rules will generally prevail, except where interim and transitional Water Resource Plans have been recognised under the Act.

78. ISSUE

Water trading was said to have had positive impacts on water users. Submissions were positive about the introduction of the water trading rules.

Other submissions suggested that water trading had had negative impacts on water users, including:

> ***'... the privatisation of water enabled the selling of "our lifeblood" to overseas interests.'***

Some submissions remarked that trade should be restricted, such that water remained in the valley of origin, or should be traded only if it benefitted the environment.

Opposing viewpoints about the trade of stock and domestic water were raised. Some submitters wanted to be able to trade this type of water right, while others maintained that this would not be appropriate.

RESPONSE

The water trading rules will help to prevent unreasonable barriers to trade in water across the Basin. A well functioning water market enables water to move to its highest value use. Trade provides irrigators and environmental water holders with the flexibility to decide when best to use their water, based on climatic conditions, production decisions and watering objectives. This leads to a more efficient allocation of water, and benefits both buyers and sellers of water.

The water trading rules do not require, nor prevent, the trade of stock and domestic water rights. The ability to trade these rights will remain at the discretion of state governments. MDBA has made minor amendments to this section to reflect that, in some instances, rights may be separated into stock or domestic rights.

The purpose for which water is used under the trading rules to distinguish between stock and domestic rights in the proposed Basin Plan has been amended.

79. ISSUE

Concern was expressed about the regulation of the water market, including that the proposed Basin Plan did not address the issue of regulating water market intermediaries.

RESPONSE

The regulation of intermediaries is outside the scope of the Basin Plan. General conduct of intermediaries is addressed by the *Competition and Consumer Act 2010* (Cwlth), state/territory fair trading legislation, and the *Corporations Act 2001* (Cwlth).

MDBA has informed the Department of Sustainability, Environment, Water Population and Communities of submissions raising this issue.

80. ISSUE

Submissions raised concerns over the timing of the introduction of the water trading rules. Concerns included that state governments, water market participants, and others affected by the rules would not have sufficient time to adapt to the rules by 1 July 2013. The contrary view was also expressed, that the rules should be introduced on 1 July 2013 because of the importance of the rules in contributing to efficient water market outcomes.

RESPONSE

MDBA has considered changes to the timing of the commencement of the water trading rules and has amended the commencement of chapter 11 so that all sections within the chapter now commence on 1 July 2014. This will allow more time for everyone affected by the rules to understand and prepare for the changes that will be introduced under chapter 11.

In response to these submissions, MDBA has decided to align the commencement of all the water trading rules with a starting date of 1 July 2014.

In the period leading up to 1 July 2014, MDBA will implement an education program to assist stakeholders in understanding their obligations.

81. ISSUE

Concern was expressed about the regulation of irrigation infrastructure operators (IIOs).

Concerns were raised about duplication and overlap with the water market and water charge rules, and that IIOs would be required to comply with different rules multiple times.

Submissions considered that the information requirements were too prescriptive and that water market participants could already obtain the information they needed because it was in the best interests of IIOs to provide it.

Some submissions considered that the regulation of trade within irrigation networks, particularly of water delivery rights, was unnecessary. Changes were suggested to allow IIOs to restrict trade of water delivery rights if fees and charges were outstanding.

An amendment to allow IIOs to require security as a condition of trade in certain circumstances was requested, as was a clear definition of an IIO.

IIOs were concerned about the potential compliance costs associated with the rules.

RESPONSE

Obligations on IIOs are imposed under the Act through water market, water charge and water trading rules that regulate tradeable water rights and certain water charges across the Murray–Darling Basin. The aim in the obligations is to encourage free trade and the efficient use of water and water service infrastructure, and to improve pricing transparency and consistency across the Basin.

Part 2 of the Act requires that water trading rules be set out in the proposed Basin Plan, while part 4 of the Act sets out the powers to make the water market rules and water charge rules. Legislative instruments issued under part 4 are different to the water trading rules in the Basin Plan. The water trading rules are designed to operate concurrently with the Water Market Rules and Water Charge (Termination Fees) Rules and not be duplicative. Based on feedback through written submissions and other consultations, the water trading rules, water market rules and water charge rules were reviewed by MDBA, the Australian Competition and Consumer Commission and the Department of Sustainability, Environment, Water Population and Communities to check for duplication.

The availability of accurate and timely information is fundamental to the operation of an efficient water market. MDBA considers that requiring information to be readily available about the irrigation rights and water delivery rights of IIO members, as well as requiring IIOs to provide their trading rules and restrictions on trading, will allow IIO members to make informed decisions about the management of their water assets.

To minimise compliance costs on IIOs, MDBA will ensure flexibility in the way information can be provided. In addition, MDBA has amended the rules to ensure that IIOs are not required to provide information to their members if they have already done so under the water market rules or similar.

MDBA has determined that existing drafting will allow an IIO to restrict a trade in delivery rights if fees and charges are outstanding, so that no amendment is required. This will be clarified in guidelines being developed by MDBA.

MDBA consulted extensively with IIOs in preparing these rules and considered carefully the imposition of compliance costs on IIOs. MDBA has made several changes to the rules affecting IIOs in light of feedback it received during consultation.

Sections 11.32 to 11.35 of the proposed Basin Plan have been amended to ensure that IIOs are not required to re-specify the rights of their members if they have already done so under the water market rules or similar.

Section 11.47 of the proposed Basin Plan – IIOs must provide trading rules – has been amended to specify the types of trading rules that will be captured, and to focus on policy rather than procedural rules.

Section 11.29 of the proposed Basin Plan – allowable restrictions on water delivery rights has been amended – to expand the list.

The MDBA has moved (previous) section 11.30 of the proposed Basin Plan so that it more appropriately sits within chapter 11.

MDBA will release a compliance strategy for the water trading rules to provide more information on the framework it will use for assessing compliance.

As part of the strategy, MDBA will engage with stakeholders to increase understanding of the water trading rules and the obligations to different government agencies, to help in monitoring and ensuring compliance.

82. ISSUE

Submissions raised concerns about the administrative burden on Basin states as a result of the information provisions in the water trading rules.

RESPONSE

The current provisions are drafted to allow some flexibility for Basin states and information which must be reported in a prescribed form will be developed in consultation with Basin states. The prescribed form will set out the reporting period that is applicable, and the information will be required only once a year (unless the information is changed).

83. ISSUE

Submissions expressed the view that the trading rules applying to water delivery and/or irrigation rights held against irrigation infrastructure operators were an improvement for holders of those rights.

RESPONSE

The water trading rules under chapter 11 of the proposed Basin Plan are designed to operate concurrently with the Water Market Rules and Water Charge (Termination Fees) Rules.

The water trading rules will ensure the free trade of water delivery rights, subject to reasonable restrictions. The rules also require irrigation infrastructure operators (IIOs) to specify irrigation rights and delivery rights and to provide notice to their members.

The water trading rules under chapter 11 of the proposed Basin Plan are designed to operate concurrently with the Water Market Rules and Water Charge (Termination Fees) Rules, which regulate the process by which an irrigator can transform their irrigation right, and the fees payable by irrigators upon termination of a delivery right within an irrigation network.

MDBA considered how to strike the appropriate balance between ensuring the water trading rights of IIO members and the compliance costs imposed on IIOs, and has made several changes to the relevant sections of chapter 11, as outlined above.

84. ISSUE

Submissions raised concerns about the potential for the trading rules to allow preferential treatment for the environment under allowable restrictions on trade for physical or environmental reasons.

Concern was expressed that the water trading rules did not appropriately address the protection of third-party impacts on irrigators.

Submissions described the CEWH as the 'giant in the trading room' and questioned whether the proposed Basin Plan gave the CEWH too much preference

Some expressed the opinion that environmental water should be traded only in the temporary market, and proposed that new restrictions be placed on trade to return water to the environment or to enable a water user credit rating system.

RESPONSE

The water trading rules in the proposed Basin Plan will ensure a uniform right to trade water access rights across the Murray–Darling Basin. The water trading rules specify the right to trade free of certain restrictions, regardless of the class of persons to which a market participant belongs or the purpose for which the water is used.

The water trading rules aim to provide appropriate protection against third-party impacts by giving consideration to allowable restrictions on trade. For surface water trade, restrictions are allowable for physical, hydrologic or environmental reasons. For groundwater, trade between two locations within a groundwater resource is prohibited unless certain conditions are met.

Due to the associated third-party impacts, exchange rate may only be applied to address transmition losses or if MDBA has made a declaration permitting the use of the rate on the grounds that it is to redress the impact of a prior exchange rate trade.

MDBA considered feedback from consultation and has amended the allowable restrictions to provide greater clarity of the intent of this section. The revised drafting is

intended to ensure that allowable restrictions for environmental reasons are permitted only where a demonstrated need to protect the environment is applicable. Additional explanatory material and guidelines to accompany this section will provide further information.

The allowable restrictions on tradeable water are consistent with advice from the Australian Competition and Consumer Commission and the water market trading objectives and principles contained in schedule 3 of the Act. Under schedule 3, objective 3(d) is to recognise and protect the needs of the environment. This wording is now used in section 11.18 of the proposed Basin Plan, clarifying that a restriction is allowable only where it is necessary because of a need to protect the needs of the environment.

The trading strategies of the CEWH and other environmental water holders are not the responsibility of MDBA. MDBA has informed the Department of Sustainability, Environment, Water Population and Communities of submissions raising this issue.

MDBA has amended section 11.18(c) to replace 'the need to avoid compromising environmental watering requirements' with 'the need to protect the needs of the environment'.

MDBA is developing guidelines about:

- types of restrictions allowable for physical, hydrologic or environmental reasons (section 11.18)
- processes MDBA must follow to make a declaration about a restriction under section 11.20 or to permit an exchange rate under section 11.22
- conditions to be met to allow trade within and between groundwater systems and trade between groundwater and surface-water systems (sections 11.24, 11.25 and 11.26). Guidelines will assist in the preparation of water resource plans which will set out the circumstances in which groundwater trade of this type will be permitted (sections 9.37 – 9.39)

85. ISSUE

Submissions raised concerns about restrictions on trade.

Some submissions were concerned about the removal of restrictions and considered that some limits should remain in place.

Other submissions considered that the trading rules did not give MDBA sufficient scope to regulate the restrictions imposed by Basin states.

Submissions queried the interaction of the water trading rules and allowable restrictions with the Victorian 4% rule.

RESPONSE

The water trading rules provide that water access rights may be traded within a regulated system, between regulated systems, or within an unregulated system, free of any restrictions (including volumetric limits) on changing the location at which the water may be taken.

However, the rules provide that certain types of restrictions may be permitted if they are necessary because of physical constraints, the need to address hydrologic connections, the level of hydraulic connectivity and water supply considerations, or for environmental reasons. Any allowable restriction must still be consistent with the general right to free trade of surface water.

The commencement of the water trading rules on 1 July 2014 is consistent with the National Water Initiative which allows Victoria to maintain a 4 per cent limit on the volume of water shares each year traded out of irrigation districts in northern Victoria. An earlier commencement date would otherwise result in Victoria operating inconsistently with the water trading rules.

86. ISSUE

Submissions queried whether the water trading rules permitted trade between regulated and unregulated systems.

RESPONSE

The water trading rules do not prevent trade between regulated and unregulated systems. The trade of these rights remains at the discretion of state governments.

87. ISSUE

Submissions expressed concern that groundwater trading rules were too prescriptive.

RESPONSE

The rules governing groundwater trading differ to those for surface-water trading. This is partly because of the relative lack of knowledge about connectivity in groundwater systems and partly because groundwater markets tend to be less developed than surface-water markets. The rules impose conditions considered necessary as a prerequisite for such trades, to avoid undesirable impacts on third parties or on the resource itself.

Under the water trading rules, groundwater trading is prohibited unless certain conditions are met. The conditions differ depending on whether the trade is within the same groundwater sustainable diversion limit (SDL) resource unit, between two different units or between a groundwater SDL resource unit and a surface-water SDL resource unit.

The ability to trade between groundwater and surface water systems remains at the discretion of state governments but is prohibited unless the conditions in the Plan are met.

88. ISSUE

Submissions queried whether the restrictions on water trade related to water announcements were consistent with similar principles set out in the *Corporations Act 2001* (Cwlth) and other insider trading rules.

Submissions considered that the requirements to disclose information to the market did not go far enough.

RESPONSE

The relevant sections of the water trading rules are consistent with the intent and structure of the insider trading provisions set out in the Corporations Act. MDBA has made amendments to the proposed Basin Plan to improve consistency of these sections with similar insider trading provisions.

MDBA considers that the water trading rules will introduce appropriate restrictions on trade related to water announcements, so that water announcements must be made generally available, and those with knowledge of a water announcement before it is made generally available should be restricted from trading where the announcement may have a material impact on price in the market.

89. ISSUE

Submissions considered that the scope of the rules should be expanded to limit the ability of Basin states to make policy decisions which had the potential to restrict trade, should increase the requirements on Basin states to make water trading decisions more publicly available, and should limit the fees and charges that Basin states were able to impose.

Submissions also expressed concerns about delays and costs involved in processing trade, as well as inconsistent use of electronic trade processing.

RESPONSE

The water trading rules do not override the ability of Basin states to manage their own water trading arrangements and will not replace the state level rules, which will continue to apply.

In the event of inconsistency between state water trading rules and the Basin Plan water trading rules, the Basin Plan water trading rules will generally prevail. The exception is where interim and transitional water resource plans have been recognised under the

Water Act 2007 (Cwlth). If there is an inconsistency between an interim or transitional water resource plan and the Basin Plan, the water resource plan will take precedence. If the interim or transitional water resource plan is silent on a specific matter addressed in the Basin Plan water trading rules, then the Basin Plan water trading rules will apply. MDBA considers that the requirements under chapter 11 will not affect trade processing, times or costs.

90. ISSUE

Submissions raised concerns about the impact of rules in relation to tagged water access entitlements (section 11.23) on the further development of potential new products, namely, tagged allocation trading.

Submissions proposed the mandatory use of tagged trading.

RESPONSE

Tagged trading is an option available for the permanent trade of interstate water entitlements. The option to use tagging is at the discretion of the applicant based on their needs and preferences.

MDBA considers that the water trading rules will not affect the use of tagging.

91. ISSUE

Submissions included that trading rules should not permit the use of Murray–Darling Basin water outside the Basin.

Submissions suggested that allowing trade of a water access right free of any restriction based on the fact that a water resource is over-allocated was not appropriate and should be removed.

RESPONSE

Some water supply arrangements involve the physical movement of water into and out of the Murray–Darling Basin (e.g. diversions from the Snowy Hydro scheme into the Murray and Murrumbidgee systems, as well as pipelines to divert water from the Basin to Adelaide, which is outside of the Basin).

When water is traded out of the Murray–Darling Basin, the extraction point for the water resources remains within the Murray–Darling Basin. Similarly, when water is traded into the Basin, the point of extraction would remain outside the Basin. The purpose or location of the use of water, once it is extracted, is not determined through the trading process but rather is managed through a separate use approval process.

92. ISSUE

Submissions queried the clarity or consistency of the use of particular terms or the intents of specific sections within chapter 11.

RESPONSE

MDBA has made several changes to chapter 11 to improve clarity and ease of interpretation. These changes do not alter the original intent, but rather clarify matters where issues have been raised by Basin states or other stakeholders. Some changes have also been made to the ordering and structure of the chapter to improve sequencing and readability. Some amendments have been made to improve consistency of language with other chapters.

MDBA has made technical amendments to several definitions in chapter 11, and clarified the intent of several sections in part 1. MDBA has improved consistency of language throughout the chapter by standardising the use of, for example, 'give' where information is required to be provided. A range of other amendments has been made to improve clarity of drafting.

93. ISSUE

It was suggested that, in the event of a breach of the trading rules, the exclusion of agencies of a Basin state from providing compensation to affected parties was discriminatory and favoured Basin states.

RESPONSE

The inclusion of section 11.05 is to provide clarity about the sections of chapter 11 that would be subject to recovery of loss or damage, as section 26(5) of the Act provides the ability for the recovery of loss or damage under the Basin Plan water trading rules.

The exclusion of agencies of a Basin state from this section reflects the constitutional limitations associated with Australian Government laws and implied state immunity under the Constitution.

CHAPTER 12: PROGRAM FOR MONITORING AND EVALUATING THE EFFECTIVENESS OF THE BASIN PLAN

Chapter 12 sets out the program for monitoring and evaluating the effectiveness of the Basin Plan, including the principles that will be applied and a framework to be used, reporting requirements for Basin states and the Australian Government, as well as provisions concerning audit, review and adaptive management.

Implementation of the chapter will inform or fulfil key obligations for monitoring, evaluation, review and adaptive management of the Basin Plan and the *Water Act 2007* (Cwlth) (the Act). These include:

- Reporting annually on the effectiveness of the Basin Plan as required by the Act.
- Reviewing the SDLs as required by the Basin Plan;
- Reviewing the EWP and WQSMP targets every 5 years as required by the Basin Plan and the Act;
- Reviewing Basin Plan impacts after 5 years of implementation as required by the Act; and
- Reviewing the Basin Plan on a 10 yearly basis as required by the Act.

MDBA's primary roles under chapter 12 are to inform and/or meet its obligations above by:

- Undertaking and publishing periodic evaluations of effectiveness of the Basin Plan against the objectives and outcomes in chapters 5, 7, 8, by reference to the matters listed in schedule 10 of the Plan.
- Leading and coordinating ongoing monitoring of the Basin Plan implementation and progress towards its targets and objectives;
- Consulting with states, the Australian Government and other relevant stakeholders;
- Carrying out its functions consistently with the principles outlined in chapter 12
- Setting and administering reporting requirements for state and Australian Government agencies;
- Publishing Guidelines on how monitoring, evaluation and reporting should occur;
- Assessing and recommending improvements to monitoring and evaluation capability across the Basin; and
- To the extent possible, publishing all information and reports.

The primary role of State and Australian Government agencies (including MDBA in some instances) is to provide information in accordance with the reporting requirements set in chapter 12. These requirements concern reporting on matters relevant to

implementation and outcomes of the Basin Plan, as well as informing MDBA's work in monitoring and evaluating the Basin Plan. States and the Australian Government will also be guided by the principles in chapter 12, for example by working collaboratively with MDBA to implement monitoring and evaluation, to the extent relevant to their responsibility for each matter.

94. ISSUE

MDBA received submissions expressing concern about whether monitoring of socioeconomic impacts would be adequate. Submissions received on this issue presented quite different views.

A. The environment was being considered above the needs of Basin communities.

It was suggested that the socioeconomic wellbeing of individuals and their communities was regarded by MDBA, government and city dwellers as being of less importance than other considerations. A call was made for the proposed Basin Plan to be revised to include a capacity to monitor socioeconomic impacts in Basin communities:

> ***'A balanced Plan would not just have a framework to monitor the effectiveness of environmental watering; it would also have a framework to monitor the related social and economic impacts. The absence of such a plan sends a clear message and that is that the social and economic wellbeing of our communities is clearly of lesser priority.'***

> ***'...Communities need to be considered more; surely people are just as important as the environment.'***

B. Monitoring and evaluation of socioeconomic impacts would be pointless if the Basin did not receive sufficient water to support its environment and biota.

Some submissions expressed the view that if the plan were to go ahead with its currently proposed levels of extraction, a Monitoring and Evaluation Program based on improving environmental outcomes and minimising social and economic impacts would not

> ***'...demonstrate any positive impacts or improvements as envisioned on the Murray–Darling Basin...because the volume of environmental water... is not enough and will signal the death of a magnificent environmental system ...'***

RESPONSE

The key objective of the Basin Plan is to ensure the use and management of Basin water resources in a way that optimises economic, social and environmental outcomes. With this objective in mind, MDBA is committed to measuring progress across the Basin

towards a sustainable and healthy working condition while also supporting strong communities and a productive economy.

The provisions and scope of the proposed Basin Plan's Monitoring and Evaluation Program (chapter 12) are intended to enable ongoing monitoring and evaluation of the overall effectiveness of the Plan, including monitoring its social and economic impacts.

MDBA recognises these monitoring and evaluation commitments will require robust information about underlying social and economic trends and drivers in the Basin — and overlying those trends and drivers, information about social and economic changes that could result from the Basin Plan. Chapter 12 requires that one of the key evaluation questions that MDBA must consider is how the Basin Plan has contributed to changes in the environmental, social and economic conditions in the Basin.

The existing provisions and scope of chapter 12 are sufficient to enable and drive ongoing monitoring and evaluation of the Basin Plan's social and economic impacts.

MDBA is planning an ongoing program of social and economic monitoring and evaluation to gain further knowledge of the Plan's impacts. This knowledge will inform key reviews, such as the 2015 review of SDLs and the 5th year review of Basin Plan impacts. It will also inform longer-term Plan implementation, including potential future amendments to the Plan.

To provide a basis for this program of social and economic monitoring and evaluation, MDBA is developing guidelines which will propose a conceptual framework, indicators, and methods to be used. MDBA will consult with stakeholders in developing these guidelines, for finalisation in time for Basin Plan commencement. In addition, MDBA is continually developing its own capacity in social and economic monitoring and analysis, as well as working with key partners (e.g. ABS and ABARES) to access suitable data and enhance modelling capacity. MDBA will also work with and consult communities and stakeholders to develop understanding of locally-based information, that will inform Plan monitoring and evaluation.

Section 12.11 has been added to chapter 12 to provide that the MDBA may undertake periodic assessments of the trends in the condition and availability of the Basin water resources and the social, cultural and economic contexts in which they are used.

95. ISSUE

Submitters queried whether the frameworks of the CEWH and MDBA would be aligned.

RESPONSE

The provisions and principles in chapter 12 of the proposed Basin Plan seek to maximise alignment and minimise duplication between the Basin Plan Monitoring and Evaluation

Program and existing monitoring, evaluation and reporting arrangements in the Basin, including national, state and joint arrangements.

Both MDBA and the CEWH have responsibilities to monitor and evaluate the effectiveness of their actions, and it is therefore appropriate that each has its own framework. However, it is equally important that where the CEWH and MDBA have shared interests in monitoring, they utilise a common framework.

This common framework will be driven by chapter 12 of the Basin Plan, in particular the reporting requirements that have been imposed on the CEWH, which are listed in schedule 10. The CEWH will need to report on implementation of the environmental management framework, the use of environmental water, and the environmental outcomes at Basin scale, with respect to EWP targets in schedule 7. CEWH reporting will be done in accordance with a chapter 12 guideline published by MDBA which, by listing common indicators, methods and design, will ensure a consistent approach.

More broadly, it should be noted that chapter 12 sets out monitoring and evaluation principles which must be followed by the CEWH and MDBA, including that monitoring and evaluation should use the same conceptual framework (program logic), that evaluation and reporting should be consistent and that there should be collaboration on the technical details of the program.

Schedule 10 of the proposed Basin Plan has been revised to ensure that the CEWH and MDBA both need to report on outcomes where there is common interest, such as ecological outcomes across the Basin.

MDBA will undertake further discussions with the CEWH to ensure monitoring and evaluation frameworks align. Any future arrangements will be reflected in guidelines supporting chapter 12.

96. ISSUE

It was submitted that MDBA had not demonstrated how it would review the Basin Plan.

RESPONSE

MDBA agrees that a clearer outline of how the Basin Plan and parts thereof will be reviewed and monitored and evaluated is desirable.

There are a number of specific reviews of the Basin Plan (or parts of it) that are required under the Act and the proposed Basin Plan itself, including:

- review of the SDLs in 2015 - section 6.06 and section 6.07 of the proposed Basin Plan

- review of the EWP and WQSMP targets every 5 years – section 22(1) item 13(a) of the Act.
- reviewing Basin Plan impacts after the first 5 years of implementation – section 49A of the Act
- reviewing the Basin Plan on a 10 yearly basis – section 50 of the Act.

Changes have been made to chapter 12 to include new or amended provisions to improve clarity about how the Basin Plan will be reviewed, monitored and evaluated. In relation to reviews of the EWP and WQSMP targets, these changes also include:

- **the purpose of key reviews**
- **any key issues to be considered as part of the review**
- **Australian and state government agencies from which MDBA can request information to inform the review**
- **parties to be consulted.**

To drive adaptive management, provisions have also been added requiring MDBA to have regard to the findings of these reviews when considering any amendments to the Basin Plan.

MDBA intends to develop and make available further details on how these reviews will be undertaken in the future. This will be done separately from, but in accordance with, the Basin Plan (e.g. through guidelines). Such details may include things like the methodology, implementation timeframes, stakeholder engagement processes, and information sources for these reviews.

97. ISSUE

Submissions expressed the view that MDBA should be able to demonstrate how the Basin Plan would benefit the health of the Basin's rivers in the future.

RESPONSE

This is agreed and is already the intention of the MDBA. Setting SDLs, managing environmental water under the EWP, and ensuring water quality under the WQSMP are the key mechanisms by which the Basin Plan will benefit the health of the Basin's rivers.

Chapter 12 sets out how the Basin Plan will be monitored and evaluated by listing a series of outcomes in schedule 10 to be reported on as the Basin Plan is implemented. In brief, environmental outcomes at the scale of both environmental assets and the Basin will be monitored and reported on every five years with reference to the targets in

schedule 7. The indicators of river health are being developed in a chapter 12 guideline and are likely to include fish, vegetation, and waterbirds. Water quality targets will also be monitored to track progress towards the water quality objectives. The Sustainable Rivers Audit is providing a Basin-wide assessment of condition, with the first assessment completed in 2008 and the second due in 2012, which will form a useful basis for assessing trends in ecosystem condition.

Together, the information will be used to evaluate whether the health of the Basin's rivers and other key environmental assets are benefiting from the Basin Plan.

Both the EWP and the WQSMP will be reviewed five years after the commencement of the Basin Plan, and the outcomes of these and future reviews will demonstrate the ecological benefit of the Basin Plan.

Schedule 10 of the proposed Basin Plan has been revised with the intention that monitoring and reporting of ecological outcomes occur at key environmental assets and across the Basin.

98. ISSUE

Submissions suggested that MDBA's monitoring and evaluation benchmarks and measures of success were unclear. The drafting and intent of principles 4 and 6 of the monitoring and evaluation framework, particularly, were queried.

RESPONSE

The benchmarks and measures of success have been deliberately set at a high level. Chapter 5 sets out the management objectives and outcomes for the Basin Plan, and chapter 12 and schedule 10 list the outcomes to be monitored and reported on in order to evaluate Basin Plan effectiveness. While the outcomes in schedule 10 are similar, but not identical, to the outcomes in chapter 5, the outcomes in schedule 10 are those against which the Basin Plan's effectiveness in achieving the outcomes in chapter 5 can be evaluated and against which certain parties are required to report to MDBA.

MDBA will publish a guideline listing specific indicators to be reported for each of these outcomes against which progress will be evaluated.

The benchmarks of the Basin Plan comprise the targets listed in the EWP and the WQSMP. Progress towards these targets will be measured under chapter 12, by reporting against the outcomes listed in schedule 10. Benchmarks (such as those for reporting against environmental assets, which will have targets developed for them as part of long-term EWPs) may also be detailed in the chapter 12 guideline.

The broad intent of principle 7 is that best available science is critical to monitoring and evaluating the effectiveness of the Basin Plan, but there may be circumstances where this cannot occur (for example, due to investment constraints).

The intent of principle 9 is that investment (because it is often limited) in monitoring and evaluation should target those areas of the Basin where the monitoring of outcomes is of greater importance; for example, around key environmental assets as opposed to the broader environment.

The chapter 12 guideline being prepared will provide further detail on how the risk-based approach should be applied, and how the move to best available science can be achieved within investment constraints.

99. ISSUE

It was submitted that requirements for Australian and state government agencies under chapter 12 of the proposed Basin Plan would prove too onerous and expensive.

RESPONSE

Reporting requirements for Australian and state agencies are set in a way that minimises resourcing implications for reporting parties. Chapter 12 of the proposed Basin Plan contains several provisions intended to facilitate this, including:

- Principles that seek cost-effective and efficient monitoring and evaluation arrangements, align the scope of a reporter's reporting obligations to its responsibilities under the plan, and harness existing monitoring programs where possible.
- A provision whereby MDBA can enter into agreements with reporting parties to tailor reporting requirements to specific situations, with the intent of avoiding unnecessary duplication of effort.

Chapter 12 of the proposed Basin Plan has been revised to provide greater clarity about how the Basin Plan will be monitored and evaluated, including to clarify and streamline, where possible, reporting requirements.

Changes have been made to ensure the reporting requirements for national and state agencies do not generate unreasonable burdens. These include:

- **additional principles requiring MDBA to undertake Basin-scale monitoring in ways that ensure efficient collection of information, use existing information supply arrangements, and eliminate duplication and fragmentation where possible**

- **addition of provisions that promote open access and sharing of information collected for, used in, or generated by monitoring and evaluation**
- **addition of a new provision and principles requiring MDBA to collaborate with national and state agencies to improve adaptively the monitoring arrangements for the Basin Plan as well as existing programs.**

100. ISSUE

It was submitted that the proposed Basin Plan did not demonstrate how the Monitoring and Evaluation Program would feed into the 2015 SDL review of the Basin Plan.

RESPONSE

Section 6.07(3) of the proposed Basin Plan states the 2015 SDL review must take into account all relevant information available to MDBA. While MDBA intends to incorporate information being produced from the monitoring and evaluation plan into the 2015 SDL review, it is not considered appropriate to put this level of operational detail into the Plan itself. Nevertheless, a closer link between the Monitoring and Evaluation Program and the 2015 SDL review has been made in chapter 12.

Chapter 12 has been revised to amend section 12.05, which refers to 'Purpose of evaluation', to state that MDBA must, for the purposes of the 2015 SDL review required by section 6.07, evaluate the effectiveness of the Basin Plan against the outcomes listed in schedule 10.

101. ISSUE

Submissions supported the adaptive management approach but sought more information and detail on the role that monitoring and evaluation would play in this process.

RESPONSE

MDBA considers that, to give further effect to the adaptive management philosophy of 'learning by doing', findings from the Monitoring and Evaluation Program should inform the implementation of the Basin Plan.

A provision has been added to the proposed Basin Plan requiring evaluations and reviews to inform future changes to, and implementation of, the Basin Plan.

102. ISSUE

Submissions questioned the perceived lack of a role for localism in monitoring and evaluation.

RESPONSE

MDBA recognises and supports the role of localism in implementing the Basin Plan and realising adaptive management. MDBA agrees that the role for localism, while specified clearly in various parts of the proposed Basin Plan, is not clearly articulated in chapter 12.

Localism will contribute to the Basin Plan Monitoring and Evaluation Program. For example, communities and other local stakeholders will be able to contribute to the design and implementation of ongoing social and economic monitoring and evaluation, given their knowledge of Basin Plan impacts at the local level, and will also be able to provide data and information on the environmental outcomes achieved through Basin-Plan-related actions.

It should be noted that the scope of chapter 12 will also include monitoring and evaluation of whether localism provisions in the Basin Plan have been implemented, the outcomes arising from these, and how they could be improved. Item 6 in schedule 10 gives effect to this.

A change has been made to principle 7 regarding the use of best available scientific knowledge, to expand this to include local and cultural knowledge in recognition of the role that localism can play in chapter 12.

ISSUES RELATING TO BROADER PROPOSED BASIN PLAN CONTENT

While a significant proportion of submissions received specifically addressed the provisions of the proposed Basin Plan chapters and schedules, many others raised issues that cut across the content of the proposed Basin Plan. These are discussed below.

ABORIGINAL VALUES AND USES AND OTHER RELATED MATTERS

103. ISSUE

Submissions raised concerns about the negative impact on Aboriginal culture and wellbeing directly resulting from the over-allocation of water licences and floodplain harvesting.

Other submissions included strong support for improved environmental conditions within the Basin.

RESPONSE

The MDBA agrees that it is imperative Aboriginal people participate in water resource planning and management and that their values, aspirations and views about the impacts of various decisions are fully considered. The investment in cultural flows research will assist Aboriginal people to demonstrate to MDBA and governments how, in a practical way, cultural water objectives could be delivered to satisfy water-dependent cultural purposes. Aboriginal participation in the development of water resource plans and environmental water planning, as prescribed in the Basin Plan will assist in addressing these concerns.

MDBA notes that improved environmental conditions in the Basin as a result of the Basin Plan will contribute to cultural values, uses and obligations. The agreed Murray-Lower Darling Rivers Indigenous Nations (MLDRIN) and Northern Basin Aboriginal Nations (NBAN) definition of cultural flows specifically supports improved environmental outcomes related to values, uses and cultural obligations.

Relevant sections of the proposed Basin Plan relating to Aboriginal input to water resource plans and environmental planning and delivery have been strengthened.

The MLDRIN and NBAN agreed definition of cultural flows has been included in schedule 1 of the proposed Basin Plan.

Cultural knowledge has been incorporated into principle 7 in chapter 12, to help determine the effectiveness of the Basin Plan.

104. ISSUE

Submissions wanted cultural flows better and more strongly explained and expressed in all chapters of the Basin Plan. A specific cultural-flows entitlement / allocation to be managed by Aboriginal people was suggested. Submissions called for an allocation of Aboriginal water and the establishment of an Aboriginal water holder to manage this water.

RESPONSE

The MDBA agrees that the proposed Basin Plan could be strengthened in relation to the articulation of cultural flows. The cultural flows research program can allow for cultural flows to be further taken into account in future water planning, including the Basin Plan reviews.

The MDBA is recommending that governments consider making specific allocations of environmental water available for cultural water purposes. Such allocations could be studied as part of a cultural flows research program.

The definition of cultural flows agreed by Murray-Lower Darling Rivers Indigenous Nations (MLDRIN) and Northern Basin Aboriginal Nations (NBAN) has been included in schedule 1 of the proposed Basin Plan.

105. ISSUE

Submitters objected to having Aboriginal stakeholders rights aligned with environmental outcomes when no other stakeholders were required to do so.

RESPONSE

MDBA agrees that the Basin Plan should not require Aboriginal rights to align with environmental outcomes.

Chapter 7 of the proposed Basin Plan has been amended to remove restrictive provisions.

The text, 'where these align with or enhance environmental outcomes' has been removed.

106. ISSUE

Submitters concerned for the protection of Aboriginal heritage sites would like the Basin Plan to include a requirement that water resource plans include a reference to federal and state heritage legislation in water resource plans.

RESPONSE

MDBA agrees with the point set out in these submissions and has amended the proposed Basin Plan accordingly.

Each jurisdiction has its own heritage protection legislation which needs to be considered during all water and other natural resource management implementation programs. The planning documents prepared under the Basin Plan will be required to abide by state heritage legislation.

The provisions of part 14 of chapter 9 have been revised to include a requirement that a water resource plan must be prepared having regard to the views of relevant Aboriginal organisations with respect to registered Aboriginal heritage.

107. ISSUE

It was submitted that the current MDBA approach to consultation with Aboriginal people was not sufficiently comprehensive. Submissions expressed concern regarding the basis of consultation with Traditional Owners in the Basin through the Murray-Lower Darling Rivers Indigenous Nations (MLDRIN) and Northern Basin Aboriginal Nations (NBAN). It was submitted that Aboriginal representation on MDBA water management committees was not sufficient and an Aboriginal role in all decisions related to water management was requested.

RESPONSE

MDBA is committed to consulting with MLDRIN and NBAN on accreditation of water resource plans and the establishment of other committees to be established for the implementation of the Basin Plan. The proposed Basin Plan also requires consultation with relevant Aboriginal representatives within each water resource plan area in preparing water resource plans. The primacy of Traditional Owners is recognised but the proposed Basin Plan does not restrict the consultation requirements for preparation of water resource plans to Traditional Owners; the consultation requirement includes MLDRIN and NBAN, but is not restricted to them.

MDBA has undertaken extensive consultation with individuals and non-Traditional Owner groups throughout the development of the proposed Basin Plan and during the formal 20 week consultation process.

Murray-Lower Darling Rivers Indigenous Nations (MLDRIN) and Northern Basin Aboriginal Nations (NBAN) will be consulted regarding the most appropriate Aboriginal involvement in the formation of any MDBA committees arising from the Basin Plan.

Chapters 7 and 9 of the proposed Basin Plan have been amended to address this issue.

Part 14 of chapter 9 has been amended to clarify the roles on relevant Aboriginal organisations, including MLDRIN and NBAN where appropriate, in consultation on the development of water resource plans and has also been amended to incorporate reference to Aboriginal heritage and to be clearer in relation to having regard to the views of relevant Aboriginal organisations.

Sections 7.15 (4)(e), 7.29 (3)(g) and 7.35(b)(iv) of the proposed Basin Plan have been amended to read: having regard to indigenous values and uses.

108. ISSUE

Submissions sought funding to resource Aboriginal engagement in water planning and management.

RESPONSE

MDBA agrees that Aboriginal people, as with all local communities, need to be included closely in the implementation of the Basin Plan and water resource plans.

Funding, however, is not an issue that can be addressed in the Basin Plan.

MDBA and the states currently contribute substantial funding to Aboriginal organisations through the Murray-Lower Darling Rivers Indigenous Nations (MLDRIN), Northern Basin Aboriginal Nations (NBAN), Use and Occupancy Mapping and the Cultural Flows Research program.

109. ISSUE

Submissions called for MDBA to recognise the sovereign rights of Aboriginal peoples. This recognition would include sovereignty, dominion and ultimate title over water within the Murray–Darling Basin. Full Aboriginal management of all environmental water was proposed.

RESPONSE

Land and water titles are a matter for state and territory governments. This is not an issue within the remit of the MDBA.

110. ISSUE

Submitters sought clarification on the intent to restore environments subject to past and ongoing destruction, such as degradation of wetlands and infrastructure interfering with natural flows.

RESPONSE

MDBA agrees that complementary natural resource management is critical to restoring water-dependent ecosystems within the Basin. Local complementary natural resource management activities and management of infrastructure are primarily the

responsibility of the state-based natural resource management and water agencies. The local management of environmental water will be subject to water resource plans and local EWPs that will be managed primarily by state agencies which will require Aboriginal input. The proposed Basin Plan requires Aboriginal input to EWPs and water resource plans.

MDBA is contributing funding to the national cultural flows program. This will assist Aboriginal people, MDBA, the CEWH, state governments and other holders of environmental water in undertaking environmental water planning and management.

111. ISSUE

Submissions expressed concern that the proposed Basin Plan contained no specific water resource plan objectives or outcomes for Aboriginal values and uses.

RESPONSE

Water resource plans are required to identify Aboriginal values, uses and objectives as stated in part 14 of chapter 9 of the proposed Basin Plan. They must also identify strategies to achieve these objectives. These will vary across the Basin. The proposed Basin Plan does not prescribe or limit the meaning of the phrase 'indigenous values and uses'.

Information contained in the many submissions MDBA received from Aboriginal people will be important to Australian Government and states water resource planning. Consultation with Aboriginal people during the development of water resource plans will assist in further developing objectives and outcomes reflecting Aboriginal values and uses.

112. ISSUE

Submissions from Aboriginal stakeholders referred to the importance of fishing as a cultural practice and for food sources, noting declines in river health leading to loss of fish.

RESPONSE

MDBA agrees that the Basin Plan should aim to improve fish habitat. Fish health has been included in determining the ESLT. MDBA expects improvements to fish populations as a result of the improved environmental flows under the Basin Plan.

Aboriginal input will be important in the planning and management of environmental water to achieve a range of environmental outcomes including fish stocks.

113. ISSUE

Submissions suggested that changes to water allocations would impact negatively on Aboriginal communities in terms of job losses

and other economic change. It was submitted that Aboriginal people would not leave areas due to water cuts, but would suffer from demographic changes and social impacts. Submissions expressed a view that their well-being has been eroded in line with environmental degradation, but that they had gained nothing through the diversion of water for consumptive purposes.

RESPONSE

Results from the socioeconomic analysis of the proposed Basin Plan indicate that impacts on the regional economies, household consumption and employment will be relatively small and spread across the Basin. In those regions of the Basin where the impacts are likely to be relatively more pronounced, the economic implications of a reduction in water entitlements may be largely offset by the Australian Government's investment in infrastructure improvements. A more-detailed assessment of the potential effects from the proposed Basin Plan on those local government areas likely to be most sensitive to a reduction in the SDLs similarly indicates relatively small impacts on employment within those areas. Through a gradual transition to the Basin Plan over the period 2012 to 2019, MDBA anticipates all communities will have sufficient time to adjust to the Plan. The scale of change required to implement the plan—approximately a 1% reduction in agricultural output per year to 2019—is expected to be more than offset by productivity growth in agriculture.

114. ISSUE

It was submitted that trading of water entitlements with regard to NSW cultural water licences was discriminatory because the NSW cultural water licences were non-tradable whereas other classes of licences could generally be traded or transferred.

RESPONSE

This matter relates to the terms under which these NSW licences are granted and is a NSW government matter. It is beyond the remit of the Basin Plan.

115. ISSUE

Submissions said the proposed Basin Plan did not take into account the possible existence of native title rights to water.

RESPONSE

The proposed Basin Plan establishes SDLs and the associated water-management regime for the Murray-Darling Basin. It does not address water ownership and does not impact on any entitlements arising from the *Native Title Act 1993* (Cwlth). The proposed Basin Plan states (9.53 (1)(a)) that water resource plans must be prepared having regard to the views of relevant Aboriginal organisations with respect to native title rights, native title claims and Aboriginal Land Use Agreements provided for by the Native Title Act.

116. ISSUE

Submissions said that extraction of coal-seam gas would impact on Aboriginal water-dependent sites, use and values.

RESPONSE

The Basin Plan has the role of setting a sustainable limit on the consumptive use of Basin water resources – not determining how this water is used.

State governments are responsible for approval and regulation of mining activities. The volume of water used by mining, including coal seam gas mining, will need to be within the limits specified by the Basin Plan. This includes any leakage from groundwater resources caused by mining activities.

117. ISSUE

Submissions argued that lack of access to river frontage and wetlands was a major issue preventing Aboriginal people from fishing and undertaking other cultural activities.

RESPONSE

This is matter for state and territory governments to consider. This is outside the remit of the MDBA.

Examples identified through the submission process will be collated and referred to appropriate state agencies.

THE UNDERPINNING SCIENCE – ENVIRONMENTALLY SUSTAINABLE LEVEL OF TAKE

To determine Sustainable Diversion Limits (SDLs), MDBA established the Environmentally Sustainable Level of Take (ESLT), a level of water that can be taken from the Basin's water resources which, if exceeded, would compromise key environmental assets, key ecosystem functions, the productive base or key environmental outcomes for Basin water resources.

118. ISSUE

Submissions argued that the science showed that either more or less water was needed for the environment. These statements were sometimes made with reference to other scientific analysis, such as that undertaken by the Goyder Institute for Water Research.

Some focussed specifically on the needs in the lower River Murray and South Australia, arguing that more or less water was needed for that part of the Basin. Some argued more water was required to maintain the health of the lower River Murray wetlands and

floodplain, reduce salinity in the Lower Lakes and ensure that the Murray Mouth was open and water could flow out to sea, carrying out suspended salts, pollution and other contaminants. This issue was common in environmental campaigns but was also raised by a number of individuals and organisations.

On the other hand, some submissions argued that South Australia did not require so much water. This was usually combined with the argument that the Murray Mouth did not need to be open most of the time and that the Lower Lakes and Coorong had a natural saline state; keeping them 'artificially' fresh required water that could be put to better use upstream, either in agricultural production or as environmental water.

Some submissions expressed the view that the Basin Plan should target water recovery of at least 4,000 GL/y, as suggested in the *Guide to the proposed Basin Plan* (the Guide).

Some expressed the view that the Basin Plan would recover insufficient water to meet its own objectives, particularly with regard to watering the higher elevation parts of the floodplain.

RESPONSE

The SDLs reflect a judgement made by the MDBA about the amount of environmental water needed to reflect an ESLT in a way that optimises economic, social and environmental outcomes. MDBA has taken into account current environmental and hydrologic science, socioeconomic knowledge and system constraints that limit the flows along river channels.

In developing the proposed Basin Plan, MDBA assessed outcomes associated with 2400, 2,800 or 3,200 GL/y water recovery scenarios. MDBA modelling indicated that each of the three scenarios could achieve significant Basin-wide benefits, but that there would be some key differences. In comparing the three scenarios MDBA observed that the most significant differences occur during drier periods and towards the end of the system, particularly the 1100+km section of the River Murray downstream of its junction with the Murrumbidgee River.

Modelling and analysis indicates that the ability to manage salinity levels within the Coorong, maintain an open Murray Mouth, and maintain the resilience of lower elevation parts of the River Murray floodplain and associated wetlands downstream of the Murrumbidgee junction during dry periods, is likely to be compromised with the 2,400 GL/y reduction in diversions scenario.

Both the 2,800 and 3,200 GL/y reduction in diversions scenarios have a marked greater capacity to mitigate periods of potential extreme environmental stress during extended dry periods with the ability to reinstate flows that 'break the drought' (reinstate flows

that would have occurred but which are now captured in storages or extracted). On the basis of modelled outcomes MDBA considered the 2,800 GL/y scenario would achieve the specified Basin wide environmental objectives as there are only minor deviations from the various indicators.

Whilst the 3,200 GL/y reduction in diversions scenario shows incremental improvements in some indicators compared to the other scenarios, given that the environmental objectives are anticipated to be achieved with a 2,800 GL/y reduction in diversions, and the greater socioeconomic impacts associated with a further 400 GL/y reduction to secure a marginal increase in environmental outcomes, MDBA considered this option would not optimise economic, social and environmental outcomes.

The proposed ESLT will provide enough environmental water in the Basin to achieve most environmental objectives for instream, riparian, wetland and low-level floodplain habitats. MDBA acknowledges that the modelling shows that a number of flow indicators are not fully achieved with the proposed ESLT. Many of the indicators that don't meet their desired value fall just short of that value, achieve significant improvement, are subject to model uncertainty, and/or are constrained by factors other than the volume of the held environmental water that are outside the responsibility of MDBA (for example water management policy or river operating constraints). On balance, taking all these things into account, MDBA believes the proposed ESLT meets the requirements of the Act, will achieve the proposed Basin Plan objectives, and will provide a healthy working basin.

The ability to get water to mid- and high-level floodplain habitats in the regulated rivers of the Basin is largely limited by delivery constraints, such as dam outlet capacities and the obligation of river operators to avoid flooding private land and infrastructure. This means that increases in water for the environment will not necessarily achieve better outcomes for these habitats. Investment in works and measures to overcome these constraints would be needed to improve outcomes for these parts of the ecosystem. Reflecting this, the 'managed floodplain area' is often considered to be the area that can be feasibly watered with held environmental water. This means that increases in water for the environment will not necessarily achieve better outcomes for these habitats as they are beyond the 'managed floodplain area' which can be feasibly watered within existing delivery constraints using held environmental water. Investment in reviewing river operations and addressing constraints to increase the 'managed floodplain area' would be needed to improve outcomes for these parts of the ecosystem. These issues are addressed further in the responses to issues 172 and 173.

With regard to the specific outcomes for the Coorong, Lower Lakes and Murray Mouth, MDBA's assessment is that the water requirements for these sites will be mostly met within the proposed ESLT. This will enable mitigation of periods of elevated salinity in the Coorong, minimisation of acidification risk in the Lower Lakes during periods of

extended drought, and the Murray Mouth to be maintained in an open state through freshwater flows in about 9 out of 10 years on average. This should provide improved conditions for migratory birds and aquatic biota, and improved ecosystem services (including recreation and tourism) for local communities. Further, MDBA considers that there are a number of options for governments to consider, and ascertain the feasibility of, to improve the salinity levels in the Lower Lakes and Coorong. These options include the upper south east drainage scheme which returns some of the fresher flows into the southern lagoon of the Coorong and the Lake Albert pipeline (pipeline connecting Lake Albert and the Coorong). MDBA will encourage the consideration by governments of such actions but notes they are outside the scope of the Basin Plan.

A number of submissions argued that other sources of science indicated that the water recovery volume should be around 4,000 GL/y. MDBA has undertaken a thorough review of all previous assessments related to the issue of determining an ESLT. Many of these assessments, such as those undertaken as part of developing The Living Murray, were undertaken many years ago, before the 'millennium drought', or used simplified methods. These assessments also typically estimated recovery volumes compared to the Cap, and don't take into account the water recovery programs and other adjustment mechanisms that have already been completed, which add up to about 823 GL/y. Consequently MDBA believes its modelling and assessments are the best available. The CSIRO-led science review also gives MDBA confidence that its work is robust. The review concluded that MDBAs methods are sufficiently robust, and that the current knowledge base and application of that knowledge by MDBA in developing the proposed Basin Plan is sufficient to provide a suitable starting point for an adaptive management process, as proposed by the plan.

MDBA also welcomes the recent work undertaken by the Goyder Institute for Water Research. The institute was commissioned by the South Australian Government to analyse modelling undertaken by MDBA to assess the extent to which this modelling achieved South Australia and MDBA environmental flow indicators and associated environmental objectives. MDBA has undertaken a thorough review of this work and considered the findings in its decision making. Two key issues highlighted by the Goyder reports are the importance of overcoming delivery constraints in achieving some environmental outcomes, and differences in opinion regarding environmental objectives and associated flow indicators.

As part of the 2015 and future Basin Plan reviews, MDBA will take into account new science that informs the determination of the ESLT and changes to river operations and constraints. This will include implementing the recommendations of the CSIRO-led science review, and considering issues or recommendations raised in submissions by stakeholders – including those group and individual submissions provided by Australia's leading environmental scientists. If this shows that more or less water is needed to

achieve certain environmental objectives then this will be taken into account at that time.

119. ISSUE

Submissions expressed concern that inappropriate environmental objectives were used to determine the ESLT.

Many submissions put forward very different views on whether the proposed Basin Plan had established the right balance between environmental and socioeconomic objectives in determining the ESLT and SDLs. Some expressed the view that MDBA had given too much weight to social and economic objectives in determining that balance, whilst other submissions expressed the opposite view: that too much weight had been given to environmental issues.

Many submissions also questioned the way river operating constraints had been considered by MDBA, arguing that the ESLT should be determined on the basis of what is required to achieve a healthy environment assuming that the constraints can be overcome. Similarly, many submissions argued that the hydrologic modelling should assess the environmental water requirements of the Basin independent of social and economic impacts and river operating constraints.

RESPONSE

MDBA developed the proposed Basin Plan to meet the requirements set out in the Act. The Act sets out requirements in terms of high-level objectives and requirements, including that SDLs must be set at levels that reflect an ESLT. The objects of the Act include giving effect to relevant international agreements and, in giving effect to those agreements, promoting the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes.

MDBA's overall objective of a healthy working Basin, together with the more specific environmental objectives set out in the EWP, and the ecological targets used to inform the determination of environmental water requirements, are all aligned with the requirements of the Act. These objectives and targets are intended to achieve a healthy environment, strong communities and a productive economy by ensuring the Basin's water resources are used in a way that optimises environmental, social and economic outcomes; gives effect to relevant international agreements; and improves water security for all uses of Basin water resources.

Consistent with the requirements of the Act, MDBA has proposed an ESLT that is based on what is achievable within the working, regulated river system that currently exists. The Act does not provide MDBA with the powers to change river operating arrangements. However, MDBA recognises that there could be significant environmental

benefits from overcoming constraints, and is committed to working with Basin governments to identify and implement opportunities where they are considered feasible and beneficial. This issue is further discussed further in the response to issue No. 174.

MDBA considers that the proposed Basin Plan strikes the correct balance by optimising environmental, social and economic outcomes and therefore complies with the requirements of the Act. Notwithstanding this, the adaptive management process (including the 2015 SDL review and future Basin Plan reviews) provides sufficient opportunity to review the appropriateness of the SDLs for achieving the environmental and socioeconomic objectives of the Plan.

MDBA is also committed to working actively with Basin governments to identify, assess and implement opportunities to overcome river operating constraints where that is considered feasible and beneficial. Progress on identifying and overcoming constraints, and the opportunities this provides to achieve additional environmental outcomes, will be considered as part of the 2015 SDL review and other future Basin Plan reviews.

120. ISSUE

MDBA received submissions that queried or disputed how environmental watering requirements used in determining the ESLT, were determined and the scientific basis for those requirements, either for specific locations or for the Basin as a whole.

Submissions wanted further justification for environmental watering requirements with evidence showing how much water the environment needed and the environmental benefits of meeting this need.

Some suggested the environmental water requirements of specific locations or for the Basin as a whole were underestimated, whilst other submissions suggested the water requirements were overestimated.

Some submissions queried the selection of indicator sites, suggesting additional or different indicator sites were warranted. Some were concerned about the water needs of their local environment and associated assets not included as indicator sites.

Some submissions criticised the scientific references used, or omitted, from the determination of environmental water requirements.

The environmental water requirements of the Coorong, Lower Lakes and Murray Mouth were identified as an issue in many submissions. Some argued that the barrages should be removed and the Lower Lakes returned to an estuarine state to reduce the environmental

water requirements, whilst other submissions argued that the environmental water requirements of the site had been underestimated and current proposals would not meet the needs of the site.

Other submissions discussed river heights in the lower Murray and the need to maintain a certain height to avoid soil acidification and bank slumping, to reduce salinity in Lake Albert, and to allow pumping access.

'The Basin Plan must provide enough water to keep the Murray Mouth open without the need for dredging and maintain salinity levels below critical thresholds in all years, including those of severe drought'

RESPONSE

To fulfil its responsibilities under the Act, MDBA developed a hierarchy of environmental objectives for the proposed Basin Plan. MDBA then undertook assessments and modelling to determine the flows and volumes of water required to achieve those objectives. The flows were determined and expressed at indicator sites – predominantly large wetland and floodplain systems that have flow requirements representative of the flow requirements at a reach or catchment scale, and have a good knowledge base from which environmental water requirements can be estimated.

The assessment of environmental flow needs at each indicator site uses the best available information and considers local water management arrangements, opportunities and constraints. It is not expected that the environmental water requirements assessments will remain static; rather it is intended that they will evolve over time in response to new knowledge from future studies or gained by implementing environmental watering actions.

The indicator site method has focussed environmental water requirement assessments on high-flow (freshes, bankfull flows and overbank flows) requirements reflecting the prioritisation of effort on parts of the flow regime that are most volumetrically sensitive to determination of the ESLT and SDLs. It is acknowledged that all elements of the flow regime have important roles in maintaining a healthy river, and this does not infer that low-flow parts of the flow regime are any less important than higher flow events to achieve certain desired ecological outcomes such as maintaining native fish populations. This approach to establishing the ESLT gives a different focus compared to the work required to inform environmental water delivery and river operations, where all elements of the flow regime are of importance. In practice, environmental watering will be a flexible and adaptive process guided by the framework of the EWP and natural eco-hydrological cues, with the managers of environmental water, state government agencies and local communities deciding how best to use the available environmental

water during any one year to achieve environmental outcomes (which includes provision of low flows). In addition, water resource plans will be required to ensure water sharing arrangements can deal with a range of climatic extremes including drought.

CSIRO reviewed this approach and concluded that at a Basin scale the adopted method was sufficiently robust. The review also concluded that the current knowledge base and application of that knowledge by MDBA in developing the proposed Basin Plan is sufficient to provide a suitable starting point for an adaptive management process, as proposed by the Plan.

Notwithstanding this, CSIRO highlighted in its review that the Basin's ecosystems are complex and dynamic, and scientific understanding will always be imperfect and incomplete. The review provided recommendations for future work to improve the existing knowledge base. It is not possible to complete this work in the short term. However, the 2015 review and future Basin Plan reviews will provide an adaptive management process to consider new information as it becomes available.

MDBA considers the current knowledge base is sufficiently robust to commence implementation of the Basin Plan and that the proposed adaptive management process provides the appropriate mechanisms to take on board new information.

MDBA is committed to implementing the recommendations of the CSIRO science review, and working with stakeholders and state agencies to refine the ESLT method and knowledge base in the future. New information that becomes available through these processes will feed into the proposed 2015 review and future Basin Plan reviews.

In relation to the many views received in the submissions about the Murray Mouth, Lower Lakes and Coorong further discussion is provided in the responses to issues No.118 and 174 below and in a fact sheet prepared by MDBA on this matter[15]

121. ISSUE

Submissions questioned why sensitivity analysis of SDLs was undertaken by MDBA, and how it informed SDLs.

Related to this, some submissions expressed the view that since the modelled social and economic impacts were about the same for the options assessed, MDBA should have set a higher level of reductions in diversions. Other submitters expressed the opposite view, that the environmental outcomes were not significantly different, and that MDBA should have set a lower reduction in diversions as a consequence.

[15]Available at: http://download.mdba.gov.au/proposed/FS_barrages.pdf

RESPONSE

MDBA selected three Basin-wide ESLT options to test against the achievement of environmental objectives and socioeconomic impacts. These options corresponded with reduction in diversions of 2,400, 2,800 and 3,200 GL/y across the Basin. The selection of these options was informed by previous environmental and socioeconomic assessments undertaken by MDBA and other organisations.

The sensitivity analysis involved varying the overall water reductions by increasing and decreasing (±) the base figures by 400 GL/y in the southern-connected Basin. No changes were made in the northern Basin (although a separate analysis was undertaken for the Condamine–Balonne, which resulted in a lessening of the reduction in diversions by 50 GL/y in this region).

A consistent modelling method and environmental water-use approach was used so that the results would demonstrate the implications of changes in the volume of available environmental water, not in changes to the modelling approach.

These three options represent a relatively small scale of change in total environmental water availability as a long-term average (i.e. the total environmental water availability incorporating existing environmental water and that recovered under each of the three options). Consequently, environmental outcomes associated with 'median' type conditions show relatively small changes of a similar scale (i.e. ± 5%).

However, MDBA modelling indicates that differences under dry conditions are more significant, particularly for the River Murray downstream of the Murrumbidgee junction, where the full effect of the ± 400 GL/y change associated with the options is felt, and the achievement of environmental outcomes is more sensitive to the volume of available environmental water.

The analysis focused on outcomes for the River Murray floodplain downstream of the Murrumbidgee junction, and outcomes for the Coorong, Lower Lakes and Murray Mouth, specifically on stress under drought conditions where the differences in volumes available to the environment are most evident.

The analysis showed a number of key ecological targets and objectives of the proposed Basin Plan might not be achievable with the 2,400 GL/y scenario, whereas the 3,200 GL/y achieved some marginal improvements over the 2,800 GL/y scenario, but not sufficient to justify the potential additional socioeconomic impacts.

In addition, flow delivery constraints, such as regulated flow limits that are set to avoid flooding private land, limit the capacity to actively use extra environmental water available under the 3,200 GL/y scenario.

122. ISSUE

Submissions questioned whether the SDLs took into account extreme drought and forecast impacts of climate change, and how they would affect the environment.

Submissions suggested that future droughts would be more extreme than those in the historical dataset (i.e. 1895–2009) and using these figures to calculate SDLs did not cover the duration, extent or frequency of future droughts. They pointed out that SDLs would be most challenged by maximum dry events and this was when the environment might lose out to social, agricultural and industrial water needs.

RESPONSE

In developing the proposed Basin Plan, MDBA formed the view that there is considerable uncertainty regarding the potential effects of climate change, and that more knowledge is needed to make robust water planning and policy decisions that include some quantified allowance for climate change. Until there was greater certainty MDBA considered that the historical climate record remains the most useful climate benchmark for planning purposes.

Thus the hydrologic models and analysis used by MDBA to inform the determination of the proposed ESLT and SDLs use the historic 1895–2009 climate sequence as the climate baseline. This climatic record offers an appropriate sequence for such analyses because it takes into account extremes of climate, including the three prolonged droughts (federation drought, Second World War drought and the millennium drought) and wet periods (e.g. 1950s and 1970s).

The achievement of environmental water requirements has been assessed across this full climate record, including consideration of outcomes during extended dry times, as well as overall outcomes over the full climate record. MDBA recognises that much of the decline in the health of the Basin's aquatic ecosystems has occurred during extended dry periods and that achieving Basin Plan objectives for improving resilience will require reducing the length of dry periods for key wetlands and floodplains, closer to what would have occurred without consumptive use.

MDBA therefore undertook analysis of the potential for the proposed Basin Plan to reduce the maximum length of dry periods for key parts of the Basin. This work tested the ability to reduce maximum dry periods and the extent to which this ability would change under each of the three ESLT scenarios (associated with reductions in diversions of 2,400, 2,800 and 3,200 GL/y).

MDBA analysis shows some key differences between environmental outcomes associated with the three ESLT scenarios assessed. The most significant differences are

evident for the River Murray downstream of the Murrumbidgee junction, including the Coorong, Lower Lakes and Murray Mouth, particularly during dry conditions. Both the 2,800 and 3,200 GL/y reduction in diversions options have a marked greater capacity to mitigate periods of potential extreme environmental stress with reinstatement of flows that 'break the drought'. The results of this analysis were considered by MDBA in its decision-making on the ESLT.

In addition, other provisions in the proposed Basin Plan work in conjunction with the ESLT to maintain the resilience of the Basin's aquatic ecosystems in dry times. For example, section 9.22 of the proposed Basin Plan requires consideration of the need for water resource plan rules to ensure that environmental watering requirements of environmental assets and ecosystem functions are not compromised. This may include the need to develop rules concerning the times, places and rates at which water is permitted to be taken in order to protect key components of the ecosystem in times of drought.

MDBA supports further research into the extent of climate change and its implications for water availability, communities and the environment. The Basin Plan implementation process provides an opportunity for improved knowledge to be incorporated during the proposed 2015 review and future reviews of the Basin Plan. The response to issue No. 143 below provides further discussion on climate change under the Basin Plan.

123. ISSUE

Submissions argued that the science behind the SDLs and the ESLT had not gone through proper peer review.

RESPONSE

The hydrologic indicator site method, from which the ESLT and the SDLs are determined, was peer-reviewed throughout its development. The method was subject to an initial peer review by leading Australian scientists in early 2010, and also included as a broader peer review of the process undertaken by international experts in mid-2010. The recommendations from these peer reviews were used to refine further and to implement the method to inform the proposed Basin Plan.

In mid-2011, MDBA then invited CSIRO to lead a review[16] on how the hydrologic indicator site method was being applied to determine the sustainable level of diversion

[16] Young WJ, Bond N, Brookes J, Gawne B and Jones GJ, 2011. *Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray-Darling Basin. A report to the Murray-Darling Basin Authority from the CSIRO Water for a Healthy Country Flagship.* CSIRO, November 2011, 36pp. Available at: http://www.mdba.gov.au/draft-basin-plan/science-draft-basin-plan/science-review

in the Basin. This review looked at the scientific information and models and modelling used by MDBA in developing the proposed Basin Plan.

This review made many short-term recommendations for improvements to the process, which were adopted before the ESLT report was finalised. The review also made recommendations for long-term improvements which will be undertaken over the next few years.

MDBA has set up the Advisory Committee on Social, Economic and Environmental Sciences under the Act to oversee this future work program and other related activities[17]. The science advisory group will also play a proactive role in developing the work plan of MDBA in the lead-up to the 2015 review and subsequent reviews, and also in informing the ongoing implementation of the Basin Plan in the future.

Further information on peer review of the Basin Plan science is provided in the response to issue No. 149.

124. ISSUE

Submissions claimed there were factual errors or inconsistencies in the proposed Basin Plan and/or supporting documentation regarding the ESLT.

Some commented that comprehensive modelled outcomes against hydrological and ecological objectives for SDLs had not been published.

RESPONSE

MDBA has assessed these matters and is not aware of any other scientific work that supports the claims that there are significant factual errors in the evidence supporting the proposed Basin Plan.

During the 20-week consultation period key information which underpinned the proposed Basin Plan was published. This included a number of technical documents that provide a comprehensive analysis and description of modelled hydrological and ecological outcomes expected with the proposed reduction in diversions. These MDBA reports included:

- *Environmentally Sustainable Level of Take for surface water: Method and outcomes*[18]
- *Hydrologic modelling to inform the proposed Basin Plan: Methods and results*[19]

[17] for further information see: www.mdba.gov.au
[18] Available at: http://download.mdba.gov.au/proposed/ESLT_MDBA_report.pdf

- CSIRO report *Assessment of the ecological and economic benefits of environmental water in the Murray–Darling Basin*[20]
- Environmental water requirements reports[21].

Some stakeholders identified potential inconsistencies with regard to the reported maximum dry period between environmental flow events between MDBA's ESLT and modelling reports. As identified in those reports, the different numbers are an outcome of two different analytical techniques, with improved methods being used in the ESLT report. The more-robust numbers presented in the ESLT report have informed MDBA decision-making.

125. ISSUE

Submissions raised questions about the ecosystem services and benefits that Basin communities would get from a 2,750 GL/y reduction in the consumptive use of water.

> ***'You have not identified what benefits the Draft Basin Plan will bring. You make nefarious claims about environmental good, but are unable to detail exactly what is that is currently wrong, what needs to be righted and how you plan to do that'***

RESPONSE

The supporting material that accompanied the proposed Basin Plan described the case for reform and the array of benefits expected.

MDBA also commissioned CSIRO to identify and quantify the ecological and ecosystem services benefits that are likely to arise from the proposed Basin Plan and, where possible, to estimate the monetary value of those benefits. Ecosystem services are the aspects of ecosystems that contribute to human wellbeing. The proposed Basin Plan will lead to improvements in a wide range of ecosystem services including services associated with habitat provision, carbon sequestration, water quality, tourism, visual amenity, recreational activities such as fishing and boating, and floodplain grazing.

The project found that assessing the economic value of some ecosystem services was difficult. Of those that were valued, enhanced habitat and carbon sequestration

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[19] Available at: http://download.mdba.gov.au/proposed/Hydro_Modelling_Report.pdf
[20] Available at: http://www.mdba.gov.au/files/bp-kid/2017-Assessment_Ecological_Economic_Benefits.pdf
[21] Available at: http://www.mdba.gov.au/draft-basin-plan/science-draft-basin-plan/assessing-environmental-water-requirements

ecosystem services were considered to provide the largest benefits, valued at $3 billion to $8 billion and $120 million to $1 billion respectively[22].

The environmental and ecosystem service benefits of the proposed Basin Plan are extensive and offset the negative social and economic impacts of implementing the plan. For example, benefits include:

- Achieving enhanced flows will lead to beneficial outcomes for native fish abundance, increased numbers of waterbirds and improved condition of water-dependant vegetation communities such as river redgums.
- Environmental benefits will enable improvement in the condition, health and resilience of the Basin's most important environmental assets. These include Ramsar-listed wetlands such as the Coorong, and iconic river redgum forests along the Murray. Along with improved water flows, this will improve conditions for rare and endangered species, such as Murray cod, that rely on these habitats.
- Additional environmental water will provide positive outcomes for the Coorong and Lower Lakes, including mitigating periods of elevated salinity in the Coorong and preventing acidification of the Lower Lakes during periods of extended drought. This should provide improved conditions for migratory birds and aquatic biota, and improved ecosystem services (such as recreation and tourism) for local communities.
- More frequent higher flows will lead to improved floodplain health, providing benefits to the environment and for floodplain graziers, particularly those in the northern Basin.

THE UNDERPINNING SCIENCE – HYDROLOGIC MODELLING

Hydrologic modelling was a fundamental part of the development of the proposed Basin Plan, particularly in determining the ESLT and SDLs. MDBA used 24 well-tested river models, developed by Basin states and MDBA, linked together and adapted for the Basin Plan's specific needs.

126. ISSUE

Submissions disputed or questioned how the Baseline Diversion Limit (BDL) was determined.

[22] The report of the CSIRO study on multiple benefits of the Basin Plan is available at: http://www.mdba.gov.au/files/bp-kid/2017-Assessment_Ecological_Economic_Benefits.pdf

RESPONSE

The BDLs for surface water were estimated using best available models developed by state agencies, MDBA and CSIRO, and best available estimates for the components of use for which no detailed model exists. MDBA has published a report that details this information for each catchment[23].

The modelled component represents a baseline scenario that generally reflects the water sharing arrangements that were in place in June 2009. These arrangements include entitlements, water allocation policies, water sharing rules, operating rules and infrastructure such as dams, locks and weirs. Any water recovered under The Living Murray initiative and Water for Rivers is included as part of the baseline scenario, but water recovered under current programs is not.

Non-modelled components of the BDL estimate include water course diversions not included in the river system models (i.e. diversions from catchments upstream of storages or inflow points to the models) and interceptions (e.g. by farm dams and plantation forestry). The non-modelled water-course diversions estimates are based on information provided by state agencies for Cap reporting (for the period 1997/98 to 2009/10), and interception estimates are based on most recent available estimates of the impact of these interception activities on runoff.

Surface water BDLs are included in schedule 3 of the proposed Basin Plan as a description, and the best estimate for each component of the BDLs is included in a note. The BDL is set by a specific description; as the estimating capacity improves the quantity of water the BDL reflects will improve in its accuracy. MDBA will continue to work with Basin states and local groups to improve the accuracy of these calculations.

127. ISSUE

Concern was raised about the interception estimates used in the proposed Basin Plan.

RESPONSE

Interception activities of runoff dams, floodplain harvesting, and commercial plantations have been recognised as presenting a potential risk to the achievement of environmental objectives as well as to the future integrity of water access entitlements. In recognition of such risks and assessments to date, the proposed Basin Plan includes estimates of these activities under Baseline Diversion Limits (BDLs) and SDLs. Estimates in the proposed Basin Plan of interception activity take are based on two studies

[23] Refer to MDBA (2011). *Comparison of watercourse diversion estimates in the proposed Basin Plan with other published estimates*. Available at http://www.mdba.gov.au/bpkid/

published by scientific groups (SKM, CSIRO & BRS 2010[24] and SKM 2007[25]). The accuracy of these estimates is limited due to the lack of available water-use data, however these estimates are the best available.

Specifying the SDL as a formula (SDL is the BDL minus any local and/or shared reduction amounts) provides scope for any improvements in estimating interception activity take or changes across various forms of take while maintaining an SDL that accurately reflects an ESLT.

128. ISSUE

Submissions expressed the opinion that further modelling of SDLs and the ESLT, including various scenarios above and below 2,750 GL/y, should be undertaken.

> ***'It is also important that urgent work is conducted on the hydrological models to remove or relax the effect of the constraints on modelled outcomes to enable a wider range of environmental water scenarios to be studied...'***

Some submissions argued that modelling should be undertaken based on overcoming constraints, rather than being hampered by them; specifically that MDBA should model the outcomes for 4,000 GL/y reduction in diversions with constraints managed or removed.

Some submissions suggested that higher water recovery scenarios should be modelled in the northern basin, because the rivers in the northern basin are less regulated, and there are fewer operational constraints on environmental water delivery.

RESPONSE

MDBA undertook comprehensive modelling to inform the ESLT and SDLs in the proposed Basin Plan. This included the modelling of three Basin-wide ESLT options, representing reductions in diversions of 2,400, 2,800 and 3,200 GL/y. This modelling showed that a number of key environmental objectives were not achieved with the 2,400 GL/y scenario. The 3,200 GL/y scenario achieved marginally improved environmental outcomes compared to the 2,800 GL/y scenario that did not justify the increased social

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[24] SKM, CSIRO & BRS (Sinclair Knight Merz, CSIRO & Bureau of Rural Sciences) 2010, *Surface and/or groundwater interception activities: initial estimates*, Waterlines report No. 30, National Water Commission, Canberra.

[25] SKM (Sinclair Knight Merz) 2007, *Projections of effect of future farm dam development to the year 2030 on run-off*, report to the CSIRO Murray–Darling Basin Sustainable Yields Project, CSIRO, Canberra, available at www.mdba.gov.au/files/bp-kid/1145-FarmDamsProjectionsReportFinal.pdf

and economic impact associated with an extra 400 GL/y of water recovery. On this basis, and after some additional exploration of options in the Condamine-Balonne region, MDBA determined a proposed ESLT representing a reduction in diversions of 2,750 GL/y. See also the response to issue No. 118.

The experience gained from various model runs showed that, due to existing physical and operational constraints, the improvement in achievement of high-flow targets with increasing water recovery for environmental purposes is marginal.

Sufficient modelling has been undertaken to prepare the proposed Basin Plan in the context of the adaptive management approach. This adaptive management approach includes a review of SDLs in 2015, and ongoing reviews of the Basin Plan in accordance with the requirements of the Act. MDBA undertook extensive modelling, based on existing understanding of environmental water requirements and options to achieve those outcomes, but new information will come to light over time. MDBA has set up appropriate mechanisms to allow this information to be considered in the future. For example, section 6.06 of the proposed Basin Plan sets out a number of matters that will be considered in the 2015 review of SDLs. Assessment of those issues will involve additional modelling.

As discussed in the responses to issue No. 172 and 173, MDBA will continue to work with Basin governments on identifying key system constraints and the implications of removing these constraints

129. ISSUE

Submitters indicated that the most recent two years of climate data should be included in the modelling assessments for the Basin Plan.

RESPONSE

The SDLs were determined using detailed and sophisticated modelling techniques. Determining SDLs is not a simple averaging and subtraction exercise.

MDBA used the historic climate record (the 114-year period 1895 and 2009), which included a wide range of climatic conditions, to model the environmental outcomes of different SDL reduction scenarios. This variability allows the testing of the performance of each scenario in the very dry, the very wet and all the times in between. However, it is the relative differences between the various scenarios and Baseline Diversion Limit (BDL) conditions and the extent to which each scenario meets the environmental objectives that is important, not the climate baseline. If the MDBA changed the climate baseline to include 2010 and 2011 data, the frequency with which environmental targets are met between the SDL scenarios and BDL conditions would not change. The last two years have been very wet, but no more wet than the very wet periods already included in the 114-year period we have used to test the scenarios.

130. ISSUE

Submissions claimed MDBA had used an inconsistent approach with regard to constraints in its modelling.

RESPONSE

In the modelling for the proposed Basin Plan, environmental flow releases were limited by the existing operational constraints in various river valley models, except in the case of the River Murray system, for which the flow constraint at the Barmah Choke was relaxed to 40,000 ML/d for meeting environmental water requirements of downstream sites. This is considered feasible and would be needed to achieve some of the environmental outcomes for the downstream sites. The nature of the constraints at the Barmah Choke is well understood, and can be readily overcome, and the environmental outcomes that can be achieved by doing so are considerable. Consequently the modelling was undertaken with the expectation that the constraints would be overcome in the future.

MDBA is aware of some concerns on the relaxation of the channel capacity at Barmah Choke for the purposes of modelling the ESLT. The following points provide further explanation as to the choice of this modelling assumption:

- In the upper Murray, flows are constrained at two points. Firstly, regulated flows are typically constrained to 25,000ML/d at Doctors Point to minimise flooding of private land. Then during the summer regulated period downstream of Yarrawonga, regulated flows are constrained at the Barmah Choke to minimise unseasonal flooding of the forest and for efficient delivery of consumptive water. Under current conditions, flows through the Barmah Choke are modelled as a maximum flow constraint downstream of Yarrawonga of 10,600 ML/d during summer and 22,000 ML/d during spring when flooding of Barmah forest may be desirable.

- For the purposes of modelling the Basin Plan scenario, the Doctors Point constraint is maintained at 25,000ML/d and the constraint of 10,600 ML/d downstream of Yarrawonga during summer is also maintained. However, the Barmah Choke constraint was relaxed to 40,000 ML/d during winter/spring, allowing for some contribution from tributaries like the Ovens to increase downstream flows above 25,000 ML/d. Environmental flows target the winter/spring period, so unseasonal flooding of the forest is not an issue.

- However, MDBA is undertaking more detailed work on this, to look at the potential third-party impacts in line with concerns raised in the submissions.

The focus of MDBA modelling for the proposed Basin Plan was to assess environmental outcomes possible due to change in flow regime as a consequence of different levels of reduction in consumptive use.

SOCIAL AND ECONOMIC ANALYSIS

Many people in the Basin and their representatives have told MDBA about the impacts they think that cuts in water availability for irrigation will have to communities along the Murray-Darling system, including the possible negative impacts of the Basin Plan on employment and economic activity. The feedback from these communities has greatly influenced the MDBAs position in developing the proposed Basin Plan. These concerns, which repeated those expressed after the release of the *Guide to the proposed Basin Plan*, have affected the starting point for the SDL, the creation of the 2015 SDL review before SDLs are enforced, and the seven year transition period to allow time for communities to adjust.

In preparing the proposed Basin Plan MDBA commissioned 22 studies to help understand the likely social and economic impacts of the Basin Plan on communities. A full analysis of this work is presented in a synthesis report[26]. Since this report was released in November 2011, MDBA has also released the final report of a CSIRO study on the multiple benefits of the Basin Plan[27]. The findings of all of this work were considered, together with findings from ecological, hydrological and other studies, in coming to a judgement about the scale of change required to achieve a healthy working Basin.

While the macro-economic studies commissioned by MDBA indicate that in the long run, the impact on gross regional product of the Basin will be less than 1%, and the employment impact at the Basin-scale will be relatively small (less than 2,000 fewer jobs, out of total employment in the Basin of over 920,000, including around 90,000 persons employed in the agricultural sector), every job is important and some people might experience difficulties in finding new local employment, or might not be in a position to relocate or retrain to find new work. Even where new jobs are found there are often social costs associated with this.

More than half of the water required to achieve the SDLs in the proposed Basin Plan has already been recovered and the remainder will be recovered over the period to 2019. This provides time to adjust and more certainty for water users, resulting in an improved climate for investment in the irrigation sector.

MDBA considers that the short-term economic impacts associated with the Basin Plan can be minimised by:

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[26] The synthesis report is called *Socioeconomic Analysis and the Draft Basin Plan (Part A)* and is available for download at: http://download.mdba.gov.au/proposed/social_economic_analysis_part_a.pdf

[27] The report of the CSIRO study on multiple benefits of the Basin Plan is available for download at: http://www.mdba.gov.au/files/bp-kid/2017-Assessment_Ecological_Economic_Benefits.pdf

- governments continuing to recover water to achieve the SDLs, in such a way that the entitlements of individual irrigators are not affected by the Basin Plan. Further, impacts will be minimised if there is a bias towards recovery via more-efficient irrigation infrastructure (which actually stimulates jobs in the short term, and are neutral in the longer term) compared with buybacks;

- considering different approaches to environmental watering, including how water is used, the type of water that is acquired for the environment, and the methods used to acquire that water.

- reviewing river operations for improved ability to deliver environmental water, whether through new operating rules, works and measures, or addressing constraints (this will be examined in the lead-up to the 2015 SDL review); and

- governments providing targeted assistance to the most-affected communities, with a focus on maintaining employment.

There are additional external factors that have the potential t influence short-term impacts of the Basin Plan such as changes in exchange rates and commodity prices.

MDBA is developing a framework for monitoring and evaluating the effectiveness of the Basin Plan, including the extent to which the Basin Plan has affected social, economic and environmental outcomes in the Basin.

131. ISSUE

Submissions were concerned that towns would be severely damaged by reforms, including the Basin Plan and its impact on job losses or communities becoming unviable. They expressed fear that towns throughout the Murray–Darling Basin would become ghost towns, and that after 10 years of drought, followed by severe flooding, industries would not survive to have their water allocations reduced.

Submitters believed that communities were being ignored through aspects of the proposed Basin Plan. Many said they felt that their town or community (particularly communities dependent on large irrigation districts) was being punished. Another common sentiment was that the plan would destroy communities and industries.

Submitters commented that many irrigation communities had worked and invested so much to build their towns based on assurances of irrigated water availability. They highlighted the extensive emotional, financial and physical investment given to build a legacy for their town and industry.

> ***'People came from all over Australia and the world to Coleambally and the Riverina to invest their life into this area and raise their families and pass on their businesses to their children.'***

Some expressed concern with the idea that the 'pain should be shared equally' as they felt it did not properly reflect the effort of many communities to make massive efficiency gains before the Basin Plan process.

Some suggested that a longer timeline for implementation could help alleviate some of the stress communities in transition might have to undergo. Others expressed a wish to see support programs to help towns and industries adapt.

There was a significant subset of submitters empathising with irrigators in South Australia, drawing attention to their past achievements in increasing irrigation efficiency.

> ***'Many irrigators have invested thousands out of their own pockets - they had no choice as water was very scarce and they needed more value for their money!'***

Long-time members of the community highlighted the difficulty that an older demographic would have to find jobs elsewhere or retrain for other industries.

RESPONSE

Some towns in the Basin are likely to face more significant adjustment pressure as a result of the Basin Plan. These communities are more vulnerable because they are relatively more sensitive to changes in water available for consumptive use, while being exposed to a greater degree of change and, in some cases, having a diminished capacity to adapt because of the millennium drought.

MDBA also recognises that in some areas there is relatively less capacity to make gains through further investment in irrigation efficiency, because significant investment has already occurred in the past. The Riverland in SA and Coleambally in NSW are two examples of this situation.

MDBA recognises that, while water entitlement holders will be paid for any water they decide to sell during the water-recovery process, other businesses and organisations in communities do not have similar opportunities to offset any impacts on them. Changes in irrigated agricultural productive capacity could result in flow-on economic impacts (such as to the associated supply chain, agricultural processing, and freight and transport businesses) and social impacts (such as on social services and community well-being).

Communities that have been identified as being more likely to experience significant changes include:

- towns in the cotton growing areas of the Lower Balonne

- smaller towns in the NSW Murray which could be affected by reductions in rice production
- the central and western parts of the Murrumbidgee region, which are highly reliant on irrigated horticulture and rice production, and are already struggling with the continuing impacts of the drought and low commodity prices
- smaller dairying communities in the Goulburn–Broken and Victorian Murray catchments, which have a high dependence on irrigated agriculture, and less capacity to adapt to reductions in water availability
- communities in the Victorian Murray and South Australian Riverland that are reliant on horticulture, particularly if the profitability of irrigated permanent horticulture remains low.

Given these potential effects, it is imperative that the Basin Plan implementation is managed carefully. As indicated above, MDBA has adopted a significant transition period for implementing the Basin Plan, and has made several recommendations about other practical steps that governments could take to reduce impacts.

The Australian Government is implementing programs that are helping the Basin's communities and their stakeholders adapt to change. This includes the government's investments in the Basin under the Water for the Future program and programs aimed at assisting rural communities, such as through the Regional Development Australia fund.

132. ISSUE

Submissions disagreed with MDBA's approach to socioeconomic modelling. Most of these submissions questioned the assumptions used in establishing socioeconomic models, calling on personal experience from within their communities. Submitters also asserted that the modelling would not stand up to commercial scrutiny, and did not incorporate the effect of human sentiment:

> ***'If the economic analysis used was a business plan... there would not be a lending institution within Australia that would lend them money...'***

More-specific analyses of long- and short-term community-focused goals were also called for, in line with global best practice:

> ***'Basin planning that does not consider both existing, and potential environmental issues, and medium- to long-term (up to 40 years) planning/development scenarios (with social impact assessments) just cannot be credible in the modern era of integrated water resources/river basin management'.***

Submissions disputed the accuracy of the employment figures published in the synthesis report of the social and economic studies around the Basin Plan undertaken by MDBA. Submissions cited 'independent experts' as saying that:

'Hundreds and likely thousands of jobs in regional communities are at risk'

RESPONSE

The modelling commissioned by MDBA has used a range of scenarios in an effort to inform the community about the range of possible outcomes.

MDBA commissioned advice from three external modelling providers (Monash University, ABARES and University of Queensland) to ensure that results were robust, and not prone to bias. The results of this work were all comparable[28].

MDBA notes that some organisations have commissioned their own modelling which suggests there may be larger economic impacts, including job losses, than those estimated in the reports commissioned by MDBA. The main reasons for this relate to differing assumptions between the reports.

Assumption in reports	MDBA comment
100% of water required to meet SDLs is recovered by buy-back	a considerable portion is being recovered through infrastructure improvements
all water recovery is yet to occur	the target has been half achieved already
water continues to be used in fixed proportions with other inputs	with no substitution between water, land, labour, capital, materials and services
no trading of water between industries or between the water resource planning regions	which might include farmers in one area selling temporary water allocations to farmers in the same area or other areas as a source of income in low allocation years
when farmers sell their water entitlements to the government, they sell all of their entitlements and exit the industry altogether	In many situations this is not the case
a proportional impact on irrigated agriculture flows through to an equivalent proportional effect on the size of the Basin economy and employment	There are many other variables that need to be considered

[28] Available from: http://www.mdba.gov.au/bpkid

For example, responses to the drought during the second half of the past decade show the significant changes in practice adopted by farmers. Between 2005-06 and 2007-08, the effects of the drought reduced the total volume of water available for irrigated agriculture by almost 60%, while over the same period the gross value of irrigated agricultural production in the Basin fell by less than 10%—with markedly different experiences across industry sectors. The changes in sectoral output are a consequence of water trading between sectors and regions within the Basin, and changes in the way water is used, both in terms of the efficiency of water use and in association with the other factors of production.

Modelling commissioned by MDBA sought to incorporate the likely responses of farmers to changes in water availability, for example by incorporating the potential effects of water trade within and between the water resource planning regions. While the total volume of surface-water use was estimated to fall by 26% with a 2,800 GL/y reduction in water diversions, gross value of irrigated agricultural production (GVIAP) was estimated to fall by 16% with no inter-regional trade and by 13% if water was traded between the regions. When the modelling accounted for the Australian Government's investment in infrastructure improvements (and so a lesser requirement to recover water for the environment by purchasing water entitlements) the projected reduction in GVIAP fell to 9%.

MDBA notes that the assumptions underpinning the economic modelling are critical to the modelling outcomes. MDBA has been transparent about the assumptions in its modelling, and all of the studies commissioned by MDBA and the findings from other studies are summarised in the synthesis report Socioeconomic analysis and the proposed Basin Plan (November 2011)[29].

133. ISSUE

Submissions expressed concern about the implications of data underpinning the socioeconomic modelling and suggested that MDBA could have considered other studies. There were calls for more valley-specific studies to be conducted and previous studies to be updated.

RESPONSE

MDBA commissioned studies from a range of organisations with expertise and the capacity to model the impacts of the proposed Basin Plan from different perspectives. The socioeconomic implications were considered at four scales: national, regional,

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[29] [29] *Socioeconomic analysis and the proposed Basin Plan,* parts A and B, MDBA 2011, available at: http://www.mdba.gov.au/draft-basin-plan/socioeconomic-analysis/social-and-economic-analysis-key-reports

sectoral and local. The findings from these and other studies, together with the assumptions underpinning that analysis, are summarised in the MDBA's synthesis report, *Socioeconomic analysis and the proposed Basin Plan* (November 2011)[30].

The studies commissioned by MDBA are listed in appendix B of the *Plain English Summary of the proposed Basin Plan*[31]. It also lists the other social and economic studies considered by MDBA in preparing the socioeconomic synthesis report, including an assessment of 12 representative local areas that could potentially be more heavily impacted by the Basin Plan.

134. ISSUE

Submissions mentioned that properties along Macquarie River relied heavily on floodplains and that over-allocation of water resources to irrigated production had impacted on floodplain graziers' productivity and livelihoods.

RESPONSE

Primary producers on the floodplains in the Basin claim the reduced frequency of small to medium flood events has had a negative impact on farm productivity in these areas. MDBA acknowledges these concerns.

While information currently available about floodplain-based agricultural production is considered insufficient to support a robust analysis of the potential benefits for croppers, graziers and mixed farming enterprises from improved environmental flows[32]. MDBA has commissioned a research project to assess the benefits of the proposed Basin Plan for agricultural production on floodplains across the Basin.

135. ISSUE

It was submitted that the timing for the Basin Plan was wrong given the likely impacts on communities which had suffered through drought. Sentiments included:

> ***'We ask that MDBA postpone any further decisions on water allocation and delivery for a number of years to allow a "normal flow regime" to be established back into the Basin river systems. We have had the worst drought in decades, followed by the biggest floods in decades...'***

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[30] *Socioeconomic analysis and the proposed Basin Plan,* parts A and B, MDBA 2011, available at: http://www.mdba.gov.au/draft-basin-plan/socioeconomic-analysis/social-and-economic-analysis-key-reports

[31] *Plain English summary of the proposed Basin Plan – including explanatory notes*, MDBA 2011, available at: http://www.mdba.gov.au/draft-basin-plan/draft-basin-plan-chapter-summary

[32] Arche Consulting, 2010 available from: https://www.mdba.gov.au/bpkid

'The devastation of this unmerciful drought, followed by a locust plague, then a mouse plague, took its toll on our farmers and has left them wary and very tentative to get back into it. Even today when we have water running everywhere (the flooding rains) there is still the fear of uncertainty and what about next year and the one after. It's "WATER SECURITY" they need'

RESPONSE

MDBA recognises the significant impact of the millennium drought and subsequent floods on farming communities and rural towns. They have affected the financial viability of many enterprises, eroded business and consumer confidence, and had negative impacts on mental health, family relationships, and community stability and cohesion. These effects have been exacerbated by subsequent flooding in many regions, the global financial crisis, low commodity prices, and high value of the Australian dollar.

The fact that many Basin communities are still recovering is one of the reasons that MDBA has proposed a long transition period between introducing the Basin Plan and fully implementing the SDLs in 2019. This period will allow the irrigation sector and associated communities further time to adjust to the lower SDLs.

136. ISSUE

Submissions expressed concern over the potential long-term viability of some irrigation infrastructure operators and the possibility of remaining water users in the irrigation districts facing higher water supply fees and charges as the volume of water available for consumptive users is reduced under the proposed Basin Plan. These concerns also related to the subsequent impacts on farm viability and the potential social and economic costs in areas of the Basin which are highly dependent on irrigated agriculture.

RESPONSE

MDBA considers the long term viability of irrigation infrastructure operators as an important component of a healthy working Basin. MDBA commends the value of the Australian government's investments in the irrigation renewal projects in many irrigation districts so that they are able to have long term sustainable businesses.

Ultimately, however a range of factors will collectively affect the commercial viability of the irrigation infrastructure operators, including the changing demands for water within and between the respective irrigation districts, with those demands being a function of commodity prices and other economic variables, and ongoing changes in the number of irrigators along the reaches of various infrastructure networks.

137. ISSUE

Submissions said that the Australian Government could not guarantee reliability of water allocations.

RESPONSE

The Australian Government has made the commitment to bridge the gap by 2019 through the recovery of water by investment in water-saving infrastructure and direct water purchase. Consequently, the proposed Basin Plan has been prepared on the basis that states will not need to alter the reliability of allocations in order to meet SDLs. This intent is explicitly stated in section 6.15 of the proposed Basin Plan: 'Nothing in the Basin Plan requires a change in the reliability of water allocations of a kind that would trigger Subdivision B of Division 4 of Part 2 of the (Water) Act'.

138. ISSUE

Submissions raised concerns about reductions in food security as a result of the Basin Plan. They cited studies from the Australian Bureau of Statistics that showed the majority of Australian agricultural produce was sold domestically; the priorities of China and India in the area of food security; and the economic benefit to Australia of a strong agricultural industry.

RESPONSE

A growing world population with an expanding middle class will contribute to growing global demand for food. Questions regarding the capacity of the world's agricultural systems to meet the growing demand, together with potential environmental constraints on production (such as the limitations on water availability, soil degradation, the loss of agricultural land to urban development, and climate change) have heightened concerns about issues of food affordability and security.

Australia makes a positive contribution to global food supply. While Australia's share of global trade in food products has fallen from around 4% in 2000 to less than 2.5%, Basin farmers are well placed to continue leveraging productivity enhancements to capitalise on the increasing global demand for food. The proposed Basin Plan aims at supporting sustainable agricultural production from Basin water resources and ensures farmers have the capacity to make a sustainable long-term contribution to the domestic and international supply of food and fibre.

139. ISSUE

Submissions highlighted anticipated mental health impacts of the Basin Plan as it related to both industry and communities. Depression and suicide as a consequence of deserted towns, debt pressure, and long-time farm owners having to move off unviable family farms were mentioned.

Submissions showed that there is considerable anxiety in Basin communities, with farmers and other community members perceiving that they were being abandoned by governments and the broader Australian community in favour of the pursuit of environmental outcomes.

RESPONSE

MDBA recognises that some people in Basin communities facing the prospect of reduced water used in their district, might suffer mental and physical health issues because of stress about financial or other issues, including those that might require hard decisions about whether to sell some water or even whether to exit farming altogether. These concerns come on top of pressures from changing foreign exchange rates, poor commodity prices and the challenge of recovering from the latest drought.

As well as these stresses, MDBA recognises that people are developing a degree of water-reform fatigue, which comes on top of long-term, ongoing structural adjustment in the agricultural sector and rural communities, and the effects of drought and (more recently) floods.

Feelings of uncertainty and lack of control by farm families over their lives, including concern over lack of input into water policies, planning and decision-making that will affect their future livelihoods can add to their emotional distress

The Australian government and some state governments have supported farming families and rural communities over many years to manage the many pressures facing these communities. It will be essential that effective programs can continue to provide this important support. The Australian government's *Mental Health Services in Rural and Remote Areas* Program continues to provide support for rural communities.[33]

140. ISSUE

Submissions contended that the regions impacted most, socioeconomically, by the Basin Plan were in decline anyway, referring to industries that had been affected by a range of factors in the past, such as falling terms of trade, demographic shifts and drought.

RESPONSE

MDBA notes the views expressed in submissions, however notwithstanding the broader changes in circumstances for rural and remote communities considers that they and the

[33] *Mental Health Services in Rural and Remote Areas* Program: http://www.health.gov.au/internet/mentalhealth/publishing.nsf/Content/rural-remote-areas-1

industry's most affected by the proposed Basin Plan should be supported through the transition to the new SDLs.

141. ISSUE

Submissions expressed a belief that many irrigation communities must reform and modify their practices to remain viable and provide food security. Suggestions included relocating crops to northern Australia and reusing the Basin land for renewable energy purposes, requiring less irrigation.

RESPONSE

While these issues are beyond the scope of the Basin Plan, MDBA recognises that many irrigator communities have invested significantly to improve the efficiency of their infrastructure and their use of water in an attempt to remain viable and considers that ongoing technological improvements will continue to play an important role in helping to offset the effects of moving to SDLs by 2019.

142. ISSUE

Submissions promoted the value of environmental assets and the added value that a healthy ecosystem brings to communities, including health benefits and ecotourism. Submitters claimed that these aspects were undervalued in the proposed Basin Plan and made calls for further reviews to assess the potential ecosystem services value.

Submissions included commentary on the need to recognise the recreational aspects of the Murray–Darling Basin. Common examples were of submitters themselves using water for kayaking, boating, fishing and other water sports. Many recalled stories over 20 years or more, of crowded swimming beaches along the river and pristine river conditions.

RESPONSE

MDBA agrees that more work is needed to provide a better assessment of the economic values and benefits of healthier environmental flows. To date MDBA has commissioned extensive research to build this knowledge base, including major studies by the Centre for International Economics, Morrison and Hatton McDonald, and the CSIRO. These studies are described in detail in the MDBA's November 2011 synthesis report, *Socioeconomic Analysis and the proposed Basin Plan* – parts A and B[34].

[34] *Socioeconomic analysis and the proposed Basin Plan,* parts A and B, MDBA 2011, available at: http://www.mdba.gov.au/draft-basin-plan/socioeconomic-analysis/social-and-economic-analysis-key-reports

MDBA further recognises that Basin water resources provide a broader amenity that contributes greatly to the social values that communities and individuals consider important. Rivers, lakes, creeks and streams engender a sense of place for communities, which in turn helps to maintain the social fabric that the Basin's communities value. Water resources are used for recreational activities such as fishing, boating, swimming, and camping; and to maintain sporting ovals, school grounds, and community facilities such as parks and gardens.

MDBA commissioned a major project by the CSIRO[35] to assess the multiple benefits of the Basin Plan. This work found that fish such as Macquarie perch, golden perch and silver perch which use the floodplain wetlands benefit most from the increased water and the returned water will provide more minor breeding events for water birds, which should help sustain populations. People living in the basin will also benefit from these healthier river environments as improvements to water quality, healthy red gum forests, full lakes and increased numbers of native fish and water birds are highly valued by society.

MDBA has recently commissioned three further projects to assess the benefits of the Plan for floodplain agriculture, boating, and fishing in the Basin. It will continue to undertake work to assess the benefits of ecosystems to communities.

CLIMATE CHANGE

143. ISSUE

Submissions expressed concern about the proposed Basin Plan's approach to dealing with climate change. Submitters felt that the scientific case for action on climate change was too strong and that the proposed Basin Plan did not adequately consider this.

> ***'Climate change is likely to lead to reduction in the average level if future water availability. The proposed SDLs do not explicitly take into account future climate change, but accept the climate change risk sharing in current planning arrangements'***

Some submitters also mentioned that leaving climate change adaptation to the states to handle independently would be likely to prove inadequate.

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[35] *Assessment of the ecological economic benefits of environmental water in the Murray-Darling Basin* available at: http://mdba.gov.au/files/bp-kid/2017-Assessment_Ecological_Economic_Benefits.pdf

RESPONSE

MDBA agrees that climate change poses a significant risk to the availability of surface water in the Murray–Darling Basin, and the proposed Basin Plan incorporates this in its framework and SDLs.

Decisions set out in the proposed Basin Plan, and a starting point for the adaptive management framework, are based on what is known about the past (i.e. the historic climate sequence of 1895-2009). This sequence includes wide climate variability, including three prolonged droughts.

Importantly, the proposed Basin Plan's adaptive management framework provides an opportunity for improvements in knowledge related to climate change to be taken into account.

The proposed Basin Plan also has mechanisms for continuous adjustment and adaptation:

- environmental watering priorities will be determined every year with the State water agencies – and these priorities will be adjusted as a result of experience and new information, as well as seasonal predictions.
- the existing water allocation arrangements will be continued. These arrangements have been developed over many years and allow for conservative annual adjustment in response to preceding and forecast conditions - a critical feature of sustainable water management in a highly variable climate
- creating an unrestricted water market through the proposed Basin Plan trading rules. An effective water market provides an important avenue for adaptation for Basin industries and communities in the Basin – both to the climate extremes of flood and drought, and to future climate change.

The Productivity Commission draft report, *Barriers to Effective Climate Change Adaptation*[36], has reaffirmed that MDBA is on the right path. First, by addressing the current, and pressing, need for reform to address environmental problems already evident under our existing climate variability. And second by establishing a flexible and adaptive framework that allows new information to feed into future management decisions. The Productivity Commission report makes the point that where there is uncertainty, and where the up-front costs are high, there is likely to be a benefit to the community in deferring action until better information becomes available.

This is where we are now with water management in the Murray-Darling Basin. There is an urgent need to reform our use of water under the current known climate.

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[36] *Barriers to Effective Climate Change Adaptation*, Draft Report, Productivity Commission 2012, Canberra. Available from: www.pc.gov.au

These reforms deliver direct community benefits from a more resilient environment, and help build adaptive capacity for responding effectively to future impacts.

The adjustments in consumptive water use set out in the proposed Basin Plan will buffer the environment from potential reductions in water availability.

The proposed Basin Plan contains arrangements for meeting CHWN along the River Murray System in extremely dry scenarios.

Groundwater supplies are not expected to be affected by climate change in the life of the first Basin Plan, but this resource will continue to be monitored throughout the life of the Basin Plan.

The Basin Plan will be implemented through water resource plans, which will be required to describe how water will be managed should climatic extremes occur, such as a prolonged dry period.

MDBA is committed to increasing knowledge of the effects of climate change on environmental water needs, water availability and other water requirements. This is being done in a number of ways, including through the South Eastern Australia Climate Initiative (SEACI). Further, a number of submissions, including that provided by CSIRO, provide valuable suggestions as to further work in relation to climate change analysis. MDBA is committed to doing these analyses and continuing to explore this issue in consultation with Basin States, the community and scientific experts. MDBA views ongoing discussion and analysis of this issue as highly important to developing suitable policy solutions.

Between now and 2015, MDBA will undertake a thorough analysis of the implications of future climate change for the environmental outcomes being sought under the Basin Plan and the future availability of water for consumptive use.. Any new information and analysis will be considered in the 2015 review of SDLs. Subsequently, the Basin Plan will be reviewed at least every 10 years.

COAL-SEAM GAS AND OTHER MINING ACTIVITIES

144. ISSUE

Submitters were concerned about how the Basin Plan would treat coal-seam gas and other mining activities, with some expressing the view that extraction for coal-seam gas and mining should be limited by the Basin Plan. Others expressed the view that the WQSMP should address potential saline inputs to surface water from coal-seam gas and other mining activities.

RESPONSE

The Basin Plan has the role of setting a limit sustainable on the consumptive use of Basin water resources – not determining how this water is used.

State governments are responsible for approval and regulation of mining activities. The volume of water used by mining, including coal-seam gas mining, will need to be within the limits specified by the proposed Basin Plan. This includes any leakage from groundwater resources caused by mining activities.

Water resource plans required to meet sustainable use and management criteria will need to be developed. These plans will need to describe what action has been taken to comply with these requirements and, where necessary, include rules to ensure the impacts of groundwater take are sustainable. This will include considering the impacts on environmental assets, surface-water base-flow and hydraulic relationships between surface-water and groundwater systems.

States will be responsible for ensuring that any disposal of groundwater into surface-water systems is consistent with the Basin Plan, including in respect of the WQSMP, and ensuring flows are consistent with EWPs. MDBA will be responsible for monitoring and ensuring compliance. The water resource plans will also have to consider the need for rules to prevent any unacceptable level of salinity or contaminants as the result of taking groundwater. In addition, if the outcome of this consideration is that rules are needed, then the water resource plan must include those rules. Further, state environmental authorities have strong legislative provisions in relation to discharges.

The Australian Government is investing $150 million to establish a new independent expert scientific committee to provide advice to governments and relevant coal-seam gas and large coal mining projects and to commission and fund water resource assessment for priority regions. The advice of the committee will be public and will be available to assist MDBA when it reviews and makes changes to the Basin Plan

BASIN PLAN IMPLEMENTATION

145. ISSUE

Submissions sought greater clarity as to how the Basin Plan would be implemented, particularly between now and 2019 when SDLs commence. Submissions also sought greater clarity as to how the wider reform elements being progressed by the Australian Government and Basin states would be achieved. In particular, clarity was sought in relation to the:

- **relative balance of future water recovery efforts on infrastructure investment versus water buybacks**

- **conduct of buybacks in terms of product mix, location and timing**
- **availability of assistance for the wider community in most-vulnerable areas.**

'Where water recovery is likely to have an impact, Commonwealth Government support for industry development assistance and economic diversification must be provided'

RESPONSE

MDBA is working with the Australian and Basin state governments to develop holistic implementation arrangements for the Basin Plan and associated water reforms.

Implementing the Basin Plan will involve a wide range of activities by different parties, at different times and at different scales, from Basin-wide to local or valley scale. Successful implementation of the Plan will require governments, agencies and communities to work together and understand the various requirements and obligations under the Plan.

In addition to the elements of the Basin Plan itself, there are numerous associated commitments and complementary activities that will support implementation of the Plan and help achieve the Basin Plan goals. These include commitments to community involvement and localism, the development of new knowledge, improvements to information and science (including continued socioeconomic assessments), and the review of river operations and works and measures to feed into a review of the SDLs.

In relation to specific issues of the relative balance of buybacks versus infrastructure, the conduct of buybacks, and the availability of assistance for the wider community in most vulnerable areas, these are the lead responsibility of the Australian Government.

146. ISSUE

It was submitted that roles, responsibilities and legal obligations in the proposed Basin Plan, including the consequences of non-compliance and administrative costs of implementation, were unclear, particularly for the Basin state governments.

'Implementation of the Basin Plan will result in increased planning, compliance, monitoring, evaluation and reporting requirements. While the costs associated with these increased requirements are currently difficult to accurately quantify, they are expected to be substantial'

RESPONSE

In addition to the proposed Basin Plan, MDBA is working with Basin states to prepare an implementation strategy, a compliance strategy and a range of complementary guidelines. Together, these will help to clarify the roles and responsibilities of all parties in implementing the Basin Plan.

MDBA is also preparing a regulation impact statement (RIS) to provide to the Australian Government Water Minister along with the Basin Plan. The RIS will contain additional information about the environmental, social and economic implications of the Basin Plan for the Minister to consider when making his decision on adoption of the Basin Plan. The RIS is being prepared in consultation with the Australian Government and Basin states. As part of considering the overall costs and benefits of the Basin Plan, the RIS will include information about the administrative costs of implementing the Plan.

2012-2019 TIMELINE

147. ISSUE

Submitters commented on the 2012-19 pathway timeline, including the review of SDLs in 2015, with some approving of the timeline's length and others expressing concern that it was either too long or too short to allow successful adaptation and adjustment to changed water management requirements.

The opinion that the timeline was too long was generally expressed with the view that this timeline would hinder the timely achievement of environmental outcomes. One submitter commented that:

> ***'implementation lasting until 2019 is far too slow. By this time, irrigators may be disadvantaged, drought may have recurred and governments could have come and gone.'***

The opinion that the timeline was too short was generally expressed with the view that more scientific or local information was needed to inform (SDLs) or that communities would need more time to adapt to the Basin Plan.

RESPONSE

Australian Government and Basin state Ministers have agreed that SDLs in the Basin Plan should not be enforced until 2019. The 2019 commencement date will give communities time to adjust to the new arrangements; and the Australian Government time to meet its commitment to bridge the gap.

It is estimated that by 2015 the Australian Government will have completed about three-quarters of the water recovery through water entitlement purchases and investment in infrastructure. This provides sufficient time after 2015 for MDBA to

propose an amendment to the Basin Plan by 2017 to amend the SDL, for water resource plans to be finalised before SDLs come into effect in 2019 and for the Australian Government to complete any remaining water recovery that is necessary between 2015 and 2019.

While a later review point could allow more time to implement works and measures and similar proposals for SDL adjustments, this would not allow enough time for the Australian Government to complete any remaining water recovery before SDLs came into effect in 2019.

The pathway process over the next seven years will include opportunities for consultation and adaptive management, while also providing states and communities with sufficient time to prepare and adjust.

148. ISSUE

It was submitted that the timing of the 2015 review of SDLs would mean that the reviews of the EWP and WQSMP, which are not due until 2017, would not be able to contribute to the review of SDLs.

Some of these submissions also expressed concern that the timing of the 2015 review might not align with the states' development of water resource plans, and as a consequence those water resource plans would not be consistent with the Basin Plan as it might be amended in 2017.

RESPONSE

MDBA supports the intent to ensure any available information about the effectiveness of the EWP and WQSMP helps inform the 2015 SDL review. The timing of the five-yearly EWP and WQSMP reviews is unable to be amended as it is set by section 22(1) item 13 of the Act. However, through the Basin Plan Monitoring and Evaluation Program, MDBA intends to use any information available by 2015 about the Basin Plan's effectiveness to inform the 2015 SDL review. This would include, but not be limited to, information relating to the effectiveness of EWP and WQSMP.

MDBA will aim to work collaboratively with the states to ensure that timelines for monitoring and reporting, as well as the development of water resource plans, align as much as practicable.

KNOWLEDGE AND INFORMATION

149. ISSUE

Submissions suggested a need for further peer-reviews of the science underpinning the proposed Basin Plan.

RESPONSE

MDBA strongly supports peer review as an important element in developing evidence-based policy. Peer review was used in developing the proposed Basin Plan, for example the CSIRO-led report *Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray-Darling Basin*[37]. In all, some seventeen peer reviews were undertaken in developing the proposed Basin Plan itself, as well as a number of peer reviews undertaken in 2010[38].

The peer reviews undertaken supported the integration of environmental, economic and social science into policy within the proposed Basin Plan and confirmed that the best available science was used. They also made recommendations for future directions in research activity. MDBA will use this work to guide its ongoing investment in targeted research to increase understanding of the social, economic and environmental interactions that underpin a healthy working Basin.

150. ISSUE

Some submissions were optimistic about opportunities from new knowledge, suggesting that the Basin Plan should be flexible and allow scope for change, particularly in respect to less-understood variables such as the effects of climate change. Other submissions were concerned with the limitations on the knowledge base used by MDBA.

RESPONSE

MDBA considers the current knowledge base that was used to develop the proposed Basin Plan is the best currently available but agrees that it is essential to keep improving our understanding of the Basin's hydrology, ecology, and social and economic system. For example, after reviewing the hydrologic indicator site approach underpinning the surface water SDLs in the proposed Basin Plan, CSIRO concluded that, given the knowledge derived from more than 30 years of Australian water research, and in the context of an adaptive management framework being adopted for the implementation of the Basin Plan, there is sufficient scientific knowledge to make an informed decision on an ecologically sustainable level of take. CSIRO also made suggestions about how knowledge could be improved. MDBA intends to implement these suggestions over the next few years to ensure that new knowledge is integral to the ongoing implementation of the Basin Plan, including the 2015 review.

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[37] *Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray–Darling Basin*, CSIRO 2011, available for download at: http://download.mdba.gov.au/proposed/CSIRO_ESLT_Science_Review.pdf

[38] These reports are available in the Basin Plan Knowledge and Information Directory at: http://www.mdba.gov.au/bpkid/

151. ISSUE

Submissions suggested there needs to be a process to incorporate new data into the modelling for the Basin Plan regularly, that the Basin Plan was a starting point only, and that it needed to be flexible enough to allow real-time changes in approach and methodology, for example issues around climate change.

RESPONSE

MDBA agrees with the need for a flexible approach to water planning, and the ability to incorporate new knowledge as it becomes available. This need for flexibility must also be balanced by the need to provide stable conditions around water access for those investing in and using the resource. In this context, MDBA considers that the proposed Basin Plan strikes the right balance – in addition to the proposed 2015 SDL review, the Plan itself contains a five-yearly evaluation cycle and must be reviewed on a cycle of five to 10 years.

152. ISSUE

Submissions recommended that MDBA prepare local valley-level technical summaries which would help to address the communication at a local level regarding technical components of the Plan.

RESPONSE

MDBA is committed to providing information on the work underpinning the Basin Pan at the valley scale. MDBA is aware of the diversity and complexity of the Basin and concerns expressed when only Basin-wide analyses are available.

To meet this need, a significant amount of local valley-level technical information is contained in the reports used to determine the proposed ESLT. In particular, the following parts of two key reports provide valley by valley descriptions of the hydrologic modelling and environmental outcomes work behind the Basin Plan proposals:

- Part 9 of the report: *The proposed 'environmentally sustainable level of take' for surface water of the Murray–Darling Basin: Method and Outcomes*[39]
- Part 5 of the report: *Hydrologic modelling to inform the proposed Basin Plan: Methods and results*[40]

MDBA will continue to work with Basin states and communities to provide information its work in a way that is both useful and relevant.

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[39] Available at: http://download.mdba.gov.au/proposed/ESLT_MDBA_report.pdf
[40] Available at: http://download.mdba.gov.au/proposed/Hydro_Modelling_Report.pdf

153. ISSUE

Submissions suggested that more research, development and extension be performed to offset lost production due to water purchases, and that it would be necessary to produce food and fibre with less water. This investment would assist irrigators to adjust to a future with less water.

RESPONSE

MDBA agrees that further potential exists to increase production by improvement in water-use efficiency or by improving the 'non-water' parts of the production cycle, and that this should be investigated as a high priority. This issue is beyond the scope of MDBA's current responsibilities, however, MDBA is recommending that governments support communities as the Basin Plan is implemented in a way that acknowledges the social and economic effects of water reforms and expands future economic development opportunities.

MDBA notes that the Australian Government already provides matching funding to many rural research and development corporations to support productivity improvements in agricultural industries.

154. ISSUE

Submissions requested that data regarding environmental targets and water quality be made publicly available in an accessible and timely fashion. In addition, submitters asked that MDBA release all reports and information on which the Basin Plan was based to allow all stakeholders time to analyse and comment.

RESPONSE

MDBA has made available all information on which the proposed Basin Plan is based, with the main reports posted on the website as supporting documents to the proposed Basin Plan and many further reports available via the Basin Plan Knowledge and Information Directory[41].

LOCALISM

155. ISSUE

Submissions expressed optimism about the role of localism and emphasised the need for localism to be implemented through partnerships with communities dependent on water. Some were

[41] The Basin Plan Knowledge and Information Directory (BPKID) is available at: http://www.mdba.gov.au/bpkid/

unclear about the meaning of localism and how it was included in the proposed Basin Plan.

Some submissions requested greater clarity around how localism would be resourced, including greater support for existing local water networks and groups.

Some submissions specifically welcomed the development of the Northern Basin Advisory Committee.

RESPONSE

Engaging local communities in the management of their part of the Basin is a critical feature of the proposed Basin Plan and is something that will require support from government. Localism is about working with local people to find localised solutions to achieve the objectives of the Basin Plan.

The proposed Basin Plan includes specific requirements for Basin states and MDBA to consult local communities (including Catchment Management Authorities) and have regard to their views when preparing long-term EWPs, water resource plans and Basin annual watering priorities, and to ensure that local knowledge and experience is utilised when undertaking environmental watering.

Opportunities for local input have been built into the proposed Basin Plan to ensure that communities are given the chance to have their say in the ongoing development, implementation and management of environmental water. When possible, localism will be implemented through existing local groups and networks.

To help implement localism, MDBA is intending to establish two overarching advisory committees to facilitate local involvement and provide advice on proposals for the 2015 review of SDLs. These committees, calling upon input from existing regional groups and networks, will help to engage communities and encourage participation in the implementation of the Basin Plan. In the case of the Northern Basin Advisory Committee, it will provide advice on environmental watering, improvements in scientific knowledge and issues specific to the northern Basin.

Additionally, the 2015 review will be an opportunity for locally-driven solutions to be brought forward and considered as part of the further assessment of how much water is needed to meet environmental watering requirements across the Basin.

ENGAGEMENT

Following criticism of MDBA's engagement with Basin communities and stakeholders during 2010, MDBA devoted considerable effort to improving its engagement and communication strategies and products in the lead-up to the consultation period for the proposed Basin Plan.

In particular, MDBA followed recommendations by the House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan in regional Australia (the Windsor inquiry). The Committee report recommended that MDBA improve its engagement strategies for all Basin communities and stakeholders, including by ensuring that engagement processes were transparent, inclusive and respectful, and draw on the local knowledge and expertise of all Basin stakeholders.

In the 20-week consultation period following release of the proposed Basin Plan on 28 November 2011, MDBA held more than 170 tailored meetings with a broad range of stakeholders at locations across the Basin. These meetings included 10 town hall style public meetings, 14 open-house/drop-in-centre meetings, and meetings with Aboriginal communities in more than 30 towns across the Basin. MDBA also hosted about 60 round-table and technical meetings with community leaders and key stakeholder groups such as peak bodies, environmental NGOs, water user groups, councils and the scientific community, as well as 18 financial institution briefings in nine regions, five water-trade meetings with a range of irrigation infrastructure operators, at least 31 meetings with Basin states, and two joint Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and Northern Murray–Darling Basin Aboriginal Nations (NBAN) meetings.

MDBA also used social media such as Twitter and Facebook and the MDBA website and blog to engage with the broader Australian community. These forums enable individuals or groups to ask questions, make comments or seek further information on the proposed Basin Plan in easily accessible ways. From November 2011 to April 2012 the blog attracted about 6,000 visits and 14,500 views, and MDBA has more than 1,180 followers on Twitter.

MDBA will continue working with communities and other stakeholders to design appropriate engagement as it implements the Basin Plan.

156. ISSUE

Some submissions commented positively on MDBA's improved engagement with Basin communities and stakeholders, praising its efforts to be more transparent and inclusive in consultation about the proposed Basin Plan.

Some claimed that MDBA consultation on the proposed Basin Plan and management of public meetings continued to be inadequate.

RESPONSE

MDBA is very appreciative of the constructive role played by many community leaders in assisting with the design and running of consultations in their communities.

MDBA recognises and respects that each community is unique and so adopted a flexible approach to engagement during the consultation period on the proposed Basin Plan. This included meetings seeking substantial local input to meeting formats and arrangements according to the needs and preferences of specific communities. Wherever possible, MDBA sought local community leaders to facilitate and/or open public meetings, and most importantly provided local leaders the opportunity to present prior to broader question-and-answer sessions.

MDBA received positive feedback on the format of public meetings during the consultation process, particularly in regard to the opportunity for local community leaders and key local stakeholder group representatives to present their thoughts on the proposed Basin Plan before general questions and answers from the floor.

Open-house meetings had relatively small attendance but were also well received by attendees who were able to have in-depth discussions with senior MDBA technical staff and managers about concerns, questions, or comments on the proposed Basin Plan.

MDBA looks forward to continuing to work with communities and other stakeholders to design appropriate engagement as it implements the Basin Plan.

COMPLIANCE WITH THE WATER ACT AND OTHER LEGAL MATTERS

The proposed Basin Plan was made under Part 2 of the *Water Act 2007* (Cwlth) (the Act) and needs to comply with its provisions. A number of submissions raised concerns about legal aspects of the Plan.

157. ISSUE

Some submissions questioned the proposed Basin Plan's level of compliance with the provisions of the Act.

RESPONSE

MDBA obtained external legal advice on compliance with the Act at all stages prior to the release of the proposed Basin Plan and prior to providing the proposed Basin Plan to Ministerial Council for comment. On the basis of this advice, MDBA is satisfied that the proposed and proposed Basin Plan comply with the Act.

158. ISSUE

Submissions included that the proposed Basin Plan did not adequately apply the precautionary principle.

RESPONSE

An overarching requirement of the Act (section 21) is that the Minister and MDBA must 'act on the basis of the best available scientific knowledge and socio-economic analysis when developing the Basin Plan'. This does not justify inaction on the basis that scientific information is lacking.

On the contrary, paragraph 21(4)(a) of the Act requires the Minister and MDBA to take into account the 'principles of ecologically sustainable development' in exercising their powers and performing their functions relating to preparation of the proposed Basin Plan. That term is defined in section 4 (2)(b) of the Act to include the precautionary principle, that is, that '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'.

MDBA is satisfied that it has taken into account the precautionary principle in developing the proposed Basin Plan in accordance with legislative requirements.

159. ISSUE

Submissions raised issues relating to whether the proposed Basin Plan addresses matters within the Australian Government's legislative power, for example, the heads of power listed in section 51 and section 52 of the Australian Constitution.

Submissions also raised issues relating to whether the Basin Plan complies with restrictions on the Australian Government's legislative power, for example, section 100 of the Constitution relating to reasonable use of water.

RESPONSE

The constitutional basis for the Act is set out in sections 9 and 9A of the Act. Section 11 of the Act addresses issues associated with sections 99 and 100 of the Constitution.

The Act relies upon the referral of certain state powers relating to water to the Australian Government. The 'Agreement on Murray–Darling Basin Reform – Referral' was signed in 2008, enabling the referral of those powers to the Australian Government. Legislation implementing the referral was passed by relevant state parliaments.

160. ISSUE

Submissions claimed that the proposed Basin Plan might be legally invalid as the ESLT and SDLs were set taking into account considerations such as physical constraints and socioeconomic impacts that did not accord with the requirements of the Act.

RESPONSE

MDBA has in fact taken into account constraints and socioeconomic considerations when setting the ESLT and SDLs. External legal advice sought by MDBA prior to the release of the proposed Basin Plan is that the methods used are compliant with Act.

161. ISSUE

Some submissions were concerned about legal liabilities related to the delivery of high flows that risk flooding private land and assets.

Some submissions welcomed the likely increased availability of water on floodplain areas resulting from the Basin Plan, and its potential for both improved productivity and environmental outcomes.

RESPONSE

The method used by MDBA for setting the ESLT and SDLs assumed that existing operating rules and physical constraints would continue, and hence regulated releases for delivering environmental water would not go beyond minor flood level. Notwithstanding this, MDBA recognises the complexity of this issue and has commissioned further modelling and assessment of these risks and will discuss this work with potentially affected stakeholders. MDBA has also committed to considering this issue in the proposed river management review to be undertaken jointly by the Basin states and MDBA, and in the development of environmental water plans. Constraints are discussed further in the response to issue No. 172 and 173.

162. ISSUE

It was submitted that the proposed Basin Plan's use of the term 'have regard to' is internally inconsistent. It was argued that this raised risk of third-party legal action against states.

RESPONSE

The term 'have regard to' is commonly used in drafting legislation and legislative instruments. Its meaning has been the subject of judicial interpretation. This term has been consistently used across the proposed Basin Plan.

163. ISSUE

Submissions questioned whether the proposed Basin Plan was consistent with the *Native Title Act 1993* (Cwlth).

RESPONSE

Yes, this is the case. Section 13 of the Act specifies that the Act does not affect the operation on the *Native Title Act* 1993 (Cwlth)

Section 21 of the Act requires that both MDBA and the Australian Government Minister for Water consider 'social, cultural, Aboriginal and other public benefit issues' during the development of the Basin Plan. External legal advice sought by MDBA prior to the release of the proposed Basin Plan is that the proposed Basin Plan complies with the Water Act.

164. ISSUE

Submissions questioned whether the proposed Basin Plan complied with the *Racial Discrimination Act 1975* (Cwlth).

RESPONSE

Section 21 of the Act requires that both MDBA and the Australian Government Minister for Water consider 'social, cultural, Aboriginal and other public benefit issues' during the development of the Basin Plan. MDBA took Aboriginal issues into account in developing the proposed Basin Plan and, following extensive consultation, is satisfied that the Basin Plan is not racially discriminatory.

165. ISSUE

Submissions questioned whether the proposed Basin Plan adequately gave effect to obligations under international agreements, in particular the Ramsar Convention on Wetlands of International Importance.

RESPONSE

The proposed Basin Plan was developed in accordance with the Act, which includes requirements for the Plan to implement certain international agreements such as the Ramsar Convention.

In fact, the proposed Basin Plan is an example of giving effect to the agreement by determining a sustainable level of water use in the Basin and an approach to the future management of the Basin's water resources.

MDBA modelling indicates that the proposed 2,750GL/y to be returned to the environment will provide significant benefits to important environmental sites across the Basin, including the Ramsar sites at Narran Lakes, Macquarie Marshes, on the Chowilla floodplain and at the Coorong, Lower Lakes and Murray Mouth.

166. ISSUE

Submissions expressed the opinion that the Act should require the Basin Plan to consider Aboriginal values.

RESPONSE

Section 21 of the Act requires that both MDBA and the Australian Government Minister for Water consider 'social, cultural, Aboriginal and other public benefit issues' during the

development of the Basin Plan. Section 13 of the Act also specifies that the Act does not affect the *Native Title Act 1993* (Cwlth).

167. ISSUE

Submissions argued that the Act was clearly biased towards the environment.

RESPONSE

Section 3(d) provides that an object of the Act is, in giving effect to relevant international agreements, to promote the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes.

Similarly, section 20 of the Act specifies that the Basin Plan's purpose is to provide for the integrated management of the Basin water resources in a way that promotes the objects of the Act, in particular, by providing for 'the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes'. This requires consideration of economic, social and environmental factors when making a discretionary choice in applying the particular provisions of the Act.

168. ISSUE

Submissions questioned whether the proposed Basin Plan took into account water ownership issues arising in individual court proceedings and associated settlements.

RESPONSE

The proposed Basin Plan addresses water management issues and does not purport to address matters relating to particular disputes between individuals.

ISSUES RELATING TO BROADER WATER REFORM

Many submissions covered issues dealing with the broader water reform process — for example the need for a review of river operations, the Australian Government's water buyback program, minor and major infrastructure, and land management issues relating to water.

MDBA has provided copies of submissions raising broader water reform issues to the relevant Australian government or state agencies that are responsible for those issues. Many of the issues are also considered in MDBA's recommendations contained at the front of this report.

RIVER OPERATIONS REVIEW

This section covers issues relating to the river operations review proposed in the lead up to 2015, including how constraints are addressed, the potential for environmental works and measures and suggestions for augmenting water supplies.

169. ISSUE

Submissions commented on the need to review river operations. This was a theme common to submissions seeking better environmental outcomes from the Basin Plan, and from submissions seeking reduced impacts on the irrigation sector. Issues to be addressed included revised operational rules to allow for optimisation of consumptive use and environmental outcomes; addressing physical constraints to water delivery for example through purchasing flood easements; and support for new works and measures to improve efficiency, such as installing regulators at particular wetlands to achieve wetland inundation from less water than the volumes required for overbank flows.

RESPONSE

MDBA considers there is scope to make changes to river operations across the Basin to allow for more effective and efficient delivery of environmental water in conjunction with water for irrigation and towns. MDBA considers this a high priority for future action. MDBA notes that possible actions in this area are the responsibility of governments. In this context, MDBA is working with Basin states and the Australian Government to develop a work program to investigate options and assess their potential for adjusting SDLs and improving environmental outcomes from the Basin Plan.

MDBA is committed to ensuring there are opportunities for community engagement in this work program, which is expected to be rolled out over the next three years and will inform the 2015 review of SDLs.

CONSTRAINTS

170. ISSUE

Some opposing views in relation to constraints were received.

Some submissions expressed the view that MDBA had not addressed constraints yet, so the environmental outcomes could not be achieved and as a consequence the proposed 2,750GL/y reduction is inappropriate. Submitters who addressed this issue commonly referred to the Barmah Choke as a constraint on delivering water

Others suggested that activity was already underway to address constraints. As a consequence, water could be delivered more efficiently to the environment, so less reduction in consumptive use of water was required.

RESPONSE

MDBA has taken existing system constraints into account when proposing SDLs as discussed in the response to issue No. 118.

While MDBA is investigating what can be done to address some of these constraints, many of the constraints are outside the scope of the Basin Plan and will need the cooperation of Basin states and the Australian Government to address. MDBA and Basin states are undertaking further technical assessments to investigate, and where possible address these constraints. Community consultation will be an important element in the development of any proposals to address constraints.

171. ISSUE

Submissions expressed the view that constraints were not a relevant limiting factor to environmental flows in the northern Basin, and the Darling River in particular. Some referred to floodplain graziers and other landholders in the northern Basin who have shown willingness to offer flood easements on their land. The submissions suggested that higher environmental flows could possibly be achieved in the northern Basin.

RESPONSE

MDBA recognises the different characteristics, and largely unregulated nature, of the northern Basin. Barriers to delivering environmental water in the northern Basin are generally related to the physical connectivity of the rivers. MDBA has considered these characteristics in its determination of SDLs for the northern Basin.

Further work to explore what can be done to improve environmental flows in the northern Basin will need to take these characteristics into account.

In consultation with the Queensland and NSW governments, MDBA is developing a work program for the northern Basin to consider what opportunities there are for new works and measures, changed river management and operational practices, improved methods of delivering water, new knowledge, and other proposals to assist in achieving Basin Plan outcomes.

The Northern Basin Advisory Committee will provide advice on environmental watering, improvements in scientific knowledge and issues specific to the northern Basin.

ENVIRONMENTAL WORKS AND MEASURES

172. ISSUE

Submissions suggested that MDBA should use environmental works and measures or rule changes to deliver water to the environment more efficiently and effectively to offset the need to recover water from consumptive use so the 2,750 GL/y reduction in diversion limits could be reduced.

Some of these submissions mentioned works and changed operations at Menindee Lakes as an example. Other submissions mentioned the review of river operations envisaged by the recent Windsor inquiry, the removal of delivery constraints in various parts of the river system, and the inclusion of more environmental works and measures.

> ***'...the review should include the substantial offsets that can be provided by reviewing the operation, maintenance and management of public infrastructure such as the barrages at the Lower Lakes and Menindee Lakes'***

Alternatively, some submissions suggested that any additional efficiencies arising from such actions should be used to improve environmental outcomes or a combination of improved outcomes and reduced water recovery.

> ***'The MDBA should conduct a systematic assessment of the feasibility, costs and benefits of redesigning river management operations and infrastructure to deliver ecological outcomes, followed by a prioritisation of works & measures'***

There were yet other submissions that identified that the benefits of the rules review, and especially from addressing delivery constraints, could lie in the ability to re-examine the balance between environmental and social and economic issues in the determination of the ESLT, which would be likely to result in a lower SDL.

'Engineering solutions and environmental works and measures are critical to the delivery of a balanced outcome for the Basin'

Submissions proposed that the range of options for reviewing river operations should be implemented as soon as possible, and that SDLs should be prepared on the basis that these efficiencies had already been realised.

It was submitted that the proposed 2015 review should be used as an opportunity to improve the Basin Plan, not simply to increase SDLs. Some expressed concern that the review—including environmental works and measures, and rules changes—might result in environmental outcomes being eroded as the SDLs were adjusted.

Some also mentioned the need to develop a robust and transparent method for evaluating any SDL adjustments owing to works, measures, and changes to river operations or improved environmental watering.

RESPONSE

MDBA strongly supports the exploration of opportunities for more efficient river operations, such as through consideration of environmental works and measures, river management rules that balance environmental and consumptive outcomes and the most effective and efficient use of environmental water.

Environmental works and measures on their own will not be able to deliver some of the key objectives of the proposed Basin Plan, such as increasing the frequency of floodplain inundation or providing additional watering events during extended dry periods. However, targeted works could play a role in overcoming system constraints, enhancing environmental outcomes under the proposed Basin Plan and, in some cases, might enable an increase to SDLs.

The proposed Basin Plan includes a proposed review of SDLs in 2015. This review will consider the contribution new works and measures, changed river management and operational practices, improved methods of delivering water, new knowledge, and other proposals to advance the objectives and outcomes of the Basin Plan. This review will include a robust and transparent assessment process to evaluate the impact of any possible SDL adjustments.

MDBA agrees that river management arrangements need to change to deliver environmental water more efficiently and effectively. Consequently, MDBA is working with Basin state governments on a river management review work program. This work program will include opportunities for community input.

This work is detailed and complex and will involve the resolution of many issues including third-party impacts, legal liability and detailed modelling of options. Basin states have the responsibility to set operational rules and policies in their jurisdiction and will need to be full participants in this work. MDBA is actively working with Basin states on these issues, including progressing the river operations review agreed by Ministerial Council in November 2011.

The Australian and New South Wales governments are in negotiations regarding the implementation of the Menindee Lakes Water Savings Project. Any impacts on SDLs as a result of this project will be considered in the 2015 review.

173. ISSUE

Submissions argued that environmental outcomes could be better addressed with works, projects or measures to improve the condition of various sites, thus reducing the need for more water to be taken from consumptive use.

Some submissions put forward proposals for infrastructure projects to improve the condition of the Lower Lakes, including proposals to extend existing south-east drainage programs, to refurbish the Lake Albert channel, and to improve flow between the Lower Lakes and the Coorong. There were also submissions seeking removal of the barrages, and the delivery of lower flows to the Murray Mouth.

Some of these submissions mentioned proposals for measures to address barriers to fish movement, deteriorating water quality and disconnection of floodplains.

RESPONSE

MDBA concurs with the general view expressed in these submissions that achieving a healthy working Basin requires more than restoring volumes of water. The complementary management of this water through improved river management practices and infrastructure is an important part of achieving improved outcomes.

However, given the-time consuming nature of implementing infrastructure projects, including ensuring that community viewpoints are received and considered, progressing major environmental infrastructure projects prior to the finalisation of the proposed Basin Plan was not possible.

To address this issue, the Basin Officials Committee is developing a work program of activities, which will complement the 2015 review of SDLs, to explore opportunities for infrastructure projects to improve the condition of rivers and wetlands. The work program, being developed in cooperation with Basin states and the Department of Sustainability, Environment, Water, Population and Communities, will provide an opportunity for locally-driven solutions to be brought forward and considered as part of

the further assessment of how much water is needed to meet environmental watering requirements across the Basin.

In relation to changes at the Lower Lakes, Murray Mouth and Coorong, suggestions received in submissions are responded to in issue No. 118 and 174.

Some submissions suggested that the Basin Plan should include provisions to incorporate the benefits of infrastructure projects without requiring an amendment of the Basin Plan for them to be recognised in terms of their ability to change the sustainable diversion limit (SDL) (i.e. 'change the gap'). Given the concerns about the amendment process in the Act, MDBA is exploring whether a workable option could be developed that would allow SDL adjustment without amendment, at least for a subset of measures.

The 2015 SDL review will allow a comprehensive reassessment of the SDL, however, it can encompass the contribution new works and measures, changed river management and operational practices, improved methods of delivering water, new knowledge, and other proposals can make towards achieving Basin Plan outcomes.

174. ISSUE

Submissions referred to the desirability of projects to improve the condition or water availability in the Lower Lakes and Murray Mouth.

Some included proposals to improve the condition of infrastructure in the Lower Lakes, to construct a new break-wall at the Murray Mouth or to set priorities in the maintenance of the barrages and other infrastructure in and around the Lower Lakes and the Coorong. Most of these proposals were aimed at promoting a predominantly freshwater environment, particularly in Lakes Albert and Alexandrina.

On the other side, some believed that the Lower Lakes and Coorong should be more saline. This idea was usually accompanied by the opinion that the barrages should be permanently opened and that a new regulator should be constructed at the bottom of the River Murray (above the Lakes), with pipelines extending from either side of the river supplying water from above the new regulator for urban and agricultural use.

RESPONSE

There is strong scientific evidence to support a view that before European settlement, the Lower Lakes were predominantly freshwater lakes. It is true that construction of the barrages has significantly changed the ecology of the Coorong, Lower Lakes and Murray Mouth, particularly in times of drought. However, because of the level of upstream diversions in the Basin, simply removing the barrages would not reinstate the Lower

Lakes to their original condition. Water used for agriculture and town water supplies has significantly reduced flows from natural conditions, and it would be neither practical nor desirable to stop these activities.

Some proposals intended to improve the environments of the Lower Lakes, Coorong and Murray Mouth do not involve removing the barrages or increasing flows. These are being investigated by Basin state governments and a variety of other groups and people interested in improving the health of the region.

The 2015 SDL review will consider what contribution can be made towards achieving Basin Plan outcomes by carrying out new works and measures, changing river management and operational practices, improving methods of delivering water and developing new knowledge and other proposals to advance the Plan's objectives. This includes consideration of works and measures and alternative operational practices for the Coorong, Lower Lakes and Murray Mouth.

AUGMENTING WATER SUPPLIES

175. ISSUE

Submissions supported the construction of infrastructure projects to divert water into the Murray–Darling Basin, transporting water from areas with high rainfall or water storage into the Murray–Darling Basin.

The opinion was usually accompanied by the belief that an infrastructure scheme such as the Bradfield scheme would provide water to communities in the Murray–Darling Basin during times of drought and would also provide water to the environment.

RESPONSE

Recent studies have investigated proposals to transport water from higher to lower rainfall areas. All have concluded that proposals to transport water typically have very high economic, energy, social and environmental costs.

As water becomes scarcer, it becomes more valuable. However, if water prices become high enough to make a long pipeline or canal economically viable, then alternative water supplies such as desalination may also become economically viable. Using available water more efficiently, and developing new local water supply sources — particularly those that rely less on rainfall — are considered better options than transporting water long distances.

The viability of such proposals must also consider the negative environmental and social impacts in the system from which the water would be transferred.

176. ISSUE

Submissions expressed a desire for more dams to increase water supply. This was often expressed along with praise for past dam construction and existing infrastructure such as the Snowy Mountains scheme.

Some submissions did not support further water infrastructure projects, including opposing the construction of more water storage projects, such as dams.

RESPONSE

The proposed Basin Plan does not provide for large-scale infrastructure projects such as new dams because this is outside the Plan's scope. Proposals for new dams are the responsibility of state governments.

While new dams cannot be ruled out, MDBA notes there are real obstacles to them proceeding. These include lack of options for suitable dam sites in the Basin, the high financial cost and the requirement to ensure cost recovery from users, the environmental impacts (at a time when the Basin Plan is trying to establish a more-natural flow regime in the Basin's regulated rivers) as well as likely difficulties in obtaining environmental approvals.

177. ISSUE

Submissions called for more desalination to increase water security. These submissions generally expressed this view in respect to urban water supply, and supported existing desalination plants.

RESPONSE

Proposals for desalination plants are not within the Basin Plan's scope; however, proposals for desalination for metropolitan areas have been supported by state agencies, often with Australian government assistance.

WATER BUYBACK PROGRAM

178. ISSUE

Submissions about the potential role of water buybacks ranged from strong support for the buyback program to concern about how it was being implemented and the potential for unintended social and economic impacts. Some expressed the view that the buybacks would cause significant economic damage to communities; others questioned how voluntary some sales were and expressed concern over the 'Swiss cheese' effect.

Concern was also expressed about the transparency and accountability of the buyback scheme that it was not well-targeted,

and that buybacks alone could not adequately solve the problems of the Murray–Darling Basin.

Some also questioned the value of the water purchased to date, and whether the government should be buying only high-security water.

Submitters held strong views that the 'bridging the gap' program should focus first upon improving irrigation infrastructure and efficiency, arguing that leaks and inefficiencies should be fixed before water was taken from productive use. There was a view that, although more expensive than purchasing water, upgrading infrastructure would bring longer term benefits to communities. Submissions supported the MBDA Chair's commitment to advise governments to put an emphasis on infrastructure upgrades to save and recover water.

There were also submissions that expressed support for buybacks and the positive impact buybacks have had for some irrigators. Comments indicated the view that in some areas, buybacks were the only option because all water reform policy and infrastructure work had already been done and buybacks remained the last option to recover and save water.

Submitters also expressed the view that buybacks had underpinned water prices, provided a genuine and much-needed option that brought money into Basin communities, worked to the advantage of remaining irrigators and provided options for those exiting. Some submissions also referred to the Productivity Commission's findings that buybacks were economically preferable because they provided better value for money than infrastructure upgrades.

RESPONSE

MDBA considers that the Australian Government's water purchase program is an important part of the mix of options to recover water for the environment. The water purchase program provides important opportunities for many irrigators who wish to sell part or all of their water entitlements at a reasonable price; to reinvest in their farms; to diversify their operations; to retire debt; or to exit irrigation altogether.

However, based on MDBA socioeconomic analyses, MDBA notes that recovering water through purchases alone could have serious detrimental effects in communities that rely heavily on irrigated agriculture. MDBA acknowledges that if farmers sell their water and stop irrigating, there could be flow-on effects on the communities that support and rely on irrigation farming.

For this reason, MDBA considers it important that, where there is a clear benefit over costs, there should be an investment bias towards water recovery that supports

infrastructure and environmental works and measures that can deliver efficiency savings.

MDBA also notes that it is a long-standing Australian Government policy that there will be no compulsory acquisition of water entitlements. The Australian Government has committed to 'bridge the gap' through water-saving infrastructure and water purchases from willing sellers.

MDBA considers that where buybacks are used as a tool for water recovery, it needs to be made very clear where and what type of entitlements (e.g. high or low security) will be purchased. The mix and location of entitlements will clearly determine which agricultural industries and communities are affected.

MORE EFFICIENT IRRIGATION INFRASTRUCTURE

179. ISSUE

Submitters referred to the need to increase efficiency in irrigation to ensure maximum effectiveness of irrigation water. Views expressed ranged from general comment about irrigation methods and age and/or repair of infrastructure to specific local examples of improvements that could be made. Submissions also referred to the efficiencies that had already been achieved in irrigation, often referring to the improvements that had been made in a particular region to ensure efficient use of water.

RESPONSE

Significant work has already been done in many communities to increase efficiency in the use of water for irrigation. Infrastructure works for on-farm and off-farm efficiencies are a major part of the Australian Government's Water for the future program.

COMMUNITY ADJUSTMENT

180. ISSUE

Submissions raised the need for a whole of Government approach to identifying and implementing community structural adjustment assistance. Some submissions stated that adjustment assistance should go beyond acquiring water entitlements or investment in water infrastructure and include resources to address wider economic and social impacts on communities. Other submissions said Regional Development funding should be reviewed and be more targeted to ensure Basin Communities affected by the Basin Plan can access the funding.

RESPONSE

MDBA agrees that there needs to be a concentrated effort by governments to enhance the economic capacity of communities (both water and non-water related) as well as a clear demonstration of an investment bias toward water recovery that supports infrastructure, both on and off farm, as well as environmental works and measures.

The Australian Government is taking steps to gain a better understanding of potential impacts of the proposed Basin Plan and consider possible responses. For example, Regional Development Australia (RDA) has, through its regional committees, been consulting to better understand local Basin community needs and to encourage and seek community solutions to build industry productivity and strengthen economic resilience.

The Australian Government has previously committed to 'bridge the gap' through water-saving infrastructure and water purchases.

The Australian Government is also investing in other programs to assist in bolstering economic activity and addressing social pressures in regional areas, including in the Basin. For example:

- $1 billion for infrastructure projects and initiatives that contribute to the long-term growth for communities through the Regional development Fund
- $13.3 million in 2011-12 to fund the Rural Financial Counselling Service
- $144 million over four years to expand the provision of short term psychological strategies services under the Access to Allied Psychological Services program
- Development of Education, Skills and Jobs Plans by Regional Education, Skills and Jobs Coordinators in consultation with local stakeholders, including RDAs, to improve participation, education and training outcomes in communities
- The introduction of Small Business Support Line to provide small business owners with a single point of contact to access information and referral services to improve their business sustainability and help better manage their business.

MDBA will continue to monitor the social and economic effects of the Basin Plan and Basin governments will need to continue to work with communities and be responsive to any significant pressures.

LAND MANAGEMENT

181. ISSUE

Submissions emphasised the importance of integrating water planning with wider natural resource management issues at the regional level, and the need to ensure that catchment management authorities and other regional NRM bodies are properly engaged in implementing the Basin Plan, in particular with developing and implementing EWPs.

Other land management issues raised in submissions included the view that highly water-dependent crops should not be grown in a dry continent such as Australia, or should be grown only in areas where water was more abundant such as Northern Australia. Some mentioned that growing crops requiring intensive irrigation such as rice and cotton in the Basin should be discouraged or prohibited.

Some submissions called for a restoration program for drought-affected and degraded areas.

RESPONSE

Achieving a healthy working Basin requires a broader focus than just water management. Catchment Management Authorities (CMAs) and other Natural Resource Management (NRM) bodies have had a long and successful role working with communities and governments to ensure water management and natural resource management activities are integrated There are many examples of CMAs and other NRM bodies working with industry and communities to improve natural resource management outcomes in their catchments. We have heard there is much support for the CMAs and other NRM bodies to continue playing this role as we implement the Basin Plan. The MDBA will work closely with CMAs, as well as other NRM bodies and existing committees, in particular with planning and management of environmental water. We encourage other holders of environmental water, such as the CEWH to do the same.

In addition to CMAs and other NRM bodies, local, state and the Australian governments work together to ensure water resource management, including environmental water management, is considered in the broader context of natural resource management, including through weed and pest management, planting native trees and many other projects funded under programs, such as Caring for our Country and State government-funded projects. The MDBA strongly encourages governments to continue investing in this important area. The MDBA and Basin states have a long history in broader NRM issues in the Basin including river operations, the Basin Salinity Management Strategy and the Native Fish Strategy, and will continue to invest in these programs to

complement the objectives and outcomes being sought for water resource management in the Basin Plan.

Crop suitability is an issue beyond the scope of the Basin Plan. Governments are investing heavily to support irrigators to use water more efficiently rather than dictating what crops should be grown, where and when.

Australian and state government agencies are responsible for determining funding priorities for programs related to restoring drought-affected and degraded areas.

ABBREVIATIONS AND ACRONYMS

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ADWG	Australian Drinking Water Guidelines
ANZECC	Australian and New Zealand Environment and Conservation Council
BCC	Basin Community Committee
BDL	Baseline diversion limit
BOC	Basin Officials Committee
BOM	Bureau of Meteorology
BPKID	Basin Plan Knowledge and Information Directory
BPWG	Basin Plan Working Group
BRS	Bureau of Rural Sciences
BSMS	Basin Salinity Management Strategy
CEWH	Commonwealth Environmental Water Holder
CHWN	Critical human water needs
CLLMM	Coorong, Lower Lakes and Murray Mouth
CMA	Catchment management authorities
CSG	Coal-seam gas
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cwlth	Commonwealth
DAFF	Department of Agriculture, Fisheries and Forestry
DoRA	Department of Regional Development Australia
ESLT	Environmentally sustainable level of take
EWP	Environmental watering plan
GAB	Great Artesian Basin
GL	Gigalitres
GVIAP	Gross value of irrigated agricultural production
IIO	Irrigation infrastructure operator
MDBA	Murray–Darling Basin Authority
MDBC	Murray–Darling Basin Commission
MEP	Monitoring and evaluation program
MLDRIN	Murray-Lower Darling Rivers Indigenous Nations
NRM	Natural resource management

NBAN	Northern Basin Aboriginal Nations
NCGRT	National Centre for Groundwater Research and Training
NHMRC	National Health and Medical Research Council
NVIRP	Northern Victoria Irrigation Renewal Project
NWC	National Water Commission
PDF	Portable document format
PEL	Preliminary extraction limit
RIS	Regulation impact statement
RRAM	Recharge risk assessment method
SDL	Sustainable diversion limit
SEACI	South Eastern Australia Climate Initiative
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SKM	Sinclair Knight Merz
SRA	Sustainable Rivers Audit
TLM	The Living Murray
USE	Upper south east
WRP	Water resource plan
WQSMP	Water quality and salinity management plan

GLOSSARY

Adaptive management	Adaptive management provides structured links between knowledge, management, evaluation and feedback over time. It recognises that working with social and ecological systems means that new information is always becoming available, and must be considered. It includes setting clear objectives, identifying and testing uncertainties, improving knowledge, 'learning by doing' and changing practices and policies in response to new knowledge.
Acidification	The process of change or conversion into an acid. Acid sulfate soils are formed naturally when sulfate-rich water (e.g. saline groundwater or sea water) mixes with sediments containing iron oxides and organic matter. Under waterlogged, anaerobic (oxygen-free) conditions, bacteria convert sulfates to sulfides, which can form sulfidic sediments. When these sediments are exposed to oxygen, such as during drought conditions, chemical reactions may lead to the generation of sulfuric acid.
Algal bloom	A sudden increase in the number of algae in a water body, to levels that cause visible discolouration of the water.
Alien species	Alien species refers to a species living outside its native distributional range, which has arrived there through human activity, either deliberate or accidental.
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. Under New South Wales' *Water Management Act 2000*, water allocations in that state are called 'available water determinations'.
Australian Competition and Consumer Commission	The Australian Competition and Consumer Commission (ACCC) promotes competition and fair trade in the marketplace to benefit consumers, businesses and the community. It also regulates national infrastructure services. Its primary responsibility is to ensure that individuals and businesses comply with the Commonwealth competition, fair trading and consumer protection laws. It has a role in enforcing the *Water Market Rules 2009* and the *Water Charge (Termination Fees) Rules 2009*. In this, the ACCC intends to use a cooperative approach, including working with irrigation infrastructure operators to achieve compliance. However, when necessary, it is prepared to use remedies available to it under the *Water Act 2007* (Cwlth).
Australian Drinking Water Guidelines	The Australian Drinking Water Guidelines, developed by the National Health and Medical Research Council in collaboration with the Natural Resource Management Ministerial Council, provide the Australian community and the water supply industry with guidance about what constitutes good quality drinking water. The guidelines represent the latest scientific evidence on good-quality drinking water, and incorporate a framework for managing drinking water quality.
Authority	The Murray–Darling Basin Authority
Bankfull	The maximum amount of discharge that a stream channel can carry without overflowing. Bankfull flows are an important trigger for fish breeding in the Murray–Darling Basin.
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, which floods 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. The barrages also help to control the water level 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. In the Basin Plan, the baseline is defined by a number of elements, including the time under consideration; climate characteristics; each jurisdiction's policies, water management rules, entitlement systems and operating rules; the configuration and specification of water resource models; and the mix and location of various water uses and water sources.
Baseline diversion limits	Baseline diversion limits (BDLs) establish a baseline from which to determine required reductions in diversions. The baseline adopted is a combination of limits established by state law (e.g. existing water resource plan limits), defined levels of take where there are no established limits and, in some cases, the limits established by the Murray–Darling Basin Cap arrangements where these establish the lowest limit.
Basin; the Basin	The Murray–Darling Basin
Basin Community Committee	The Basin Community Committee advises the Murray–Darling Basin Authority about the performance of its functions, including engaging the community in the preparation of each proposed Basin Plan; community matters relating to the Basin water resources; and matters referred to the committee by MDBA.
Basin Officials Committee	A committee set up to facilitate cooperation and coordination between the Australian Government, the Murray–Darling Basin Authority and the Basin states in funding works and managing the Basin's water and other natural resources.
Basin Plan	A plan for the integrated management of the water resources of the Murray–Darling Basin, to be adopted by the Commonwealth Minister for Water under section 44 of the Water Act.
Basin Salinity Management Strategy	A 15-year plan for communities and governments in cooperating to control salinity in the Murray–Darling Basin. The strategy establishes targets for the river salinity in each major tributary valley and across the Murray–Darling system. The strategy was agreed by the Murray–Darling Basin Ministerial Council on 17 September 2001.
Basin state agencies	Under the Water Act, a person or entity appointed or established by, or on behalf of, a Basin state. For a more detailed definition, see section 4 of the Water Act.
Basin states	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	The Basin water resources include all water resources within or beneath the Murray–Darling Basin, except for groundwater in the Great Artesian Basin.
Biodiversity	Biodiversity refers to the variety of species of plants, animals and microorganisms, their genes and the ecosystems they comprise, often considered in relation to a particular area.
Blue-green algae	A group of photosynthetic bacteria more correctly referred to as 'cyanobacteria'.
Blackwater	When accumulations of organic matter such as eucalypt leaves and twigs decay in wetlands or waterways, the decay process darkens the water turning it black. As the organic matter decays, oxygen in the water is consumed, sometimes at a rate faster than it can be replenished. This can result in a low level of dissolved oxygen that may cause stress to fish, crayfish and other aquatic animals. When the dissolved oxygen reaches a very low level it can result in fish deaths. Blackwater events are a natural part of the ecology of lowland river systems

	during flooding.
Bridging the gap	A commitment made by the Australian Government to ensure sufficient water is recovered to make up the difference between current water diversions and the final sustainable diversion limits set in the Basin Plan. They will do this through water savings generated by infrastructure investments and water purchases from willing sellers.
Bureau of Meteorology	Under the Water Act, the Bureau of Meteorology has a water information role — compiling and delivering Australia's water information — to accurately monitor, assess and forecast water availability, condition and use.
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 proposed Basin Plan, the Cap will be replaced by long-term average sustainable diversion limits.
Caring for Our Country	An Australian Government program that supports management of our natural resources by communities, farmers and other land managers.
Carryover	Carryover describes an arrangement that allows the holder of a water access entitlement to retain water allocation not taken in one water accounting period, and then take or trade it in the next water accounting period.
Catchment	The area of land drained by a river and its tributaries.
Channel	Of a watercourse, a natural or artificial streamflow with definite bed and banks to confine and conduct water. Of a landform, the bed of a watercourse that commonly is barren of vegetation and is formed of modern alluvium (deposited during relatively recent geologic time).
Climate change	A significant change in usual climatic conditions, especially those thought to be caused by global warming.
Commonwealth Environmental Water Holder	The Commonwealth Environmental Water Holder manages water rights that the Commonwealth acquires. Under the Water Act, this official has the responsibility for using water rights that relate to water in the Murray–Darling Basin in accordance with the environmental watering plan.
Connectivity	Connectivity refers to the connections between natural habitats, such as a river channel, adjacent wetland areas and along the length of rivers, including connections above ground (surface water) or below ground (groundwater).
Consumptive use	Consumptive use describes the use of water for irrigation, industry, urban and stock and domestic use, or other private purposes.
Conveyance water	Conveyance water describes the water required to ensure that there is sufficient flow in the river to physically deliver the supply of water for other uses (such as critical human needs) without it evaporating or seeping into the riverbed.
Critical human water needs	Critical human water needs refers to the minimum amount of water, that can only reasonably be provided from Basin water resources, required to meet core human needs in urban and rural areas, and to meet non-human consumption needs, which if unmet would cause prohibitively high social, economic or national security costs.
CSIRO	CSIRO is Australia's national science agency. Water for a Healthy Country is one of CSIRO's national research flagships. CSIRO's Land and Water Division takes part in a wide range of research relevant to the Murray–Darling Basin.
Cultural flows (or cultural water flows)	These are water entitlements legally and beneficially owned by the Aboriginal Australian nations of the Murray–Darling Basin. Such water entitlements are of sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of Aboriginal Australians.

Cyanobacteria	Cyanobacteria, often referred to as blue-green algae, are a group of bacteria that occur naturally in freshwater environments. If the population of the bacteria proliferates or 'blooms', the level of toxin produced by the bacteria may make the water unsuitable for consumption and recreational activities, and potentially harmful to health.
Discharge	Flow of groundwater from a saturated zone to the earth's surface; flow of surface water out of a defined catchment.
Dredging	The mechanical removal of mud and other material to deepen a waterway.
Drought refuge	An area that a species can retreat to during times of drought; for instance, a permanent pool that remains when a river dries out during droughts.
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life, now and in the future, can be increased.
Ecology	The study of the interrelationships of living things to one another and to the environment.
Ecosystem	An ecosystem describes a community of plants, animals and microorganisms interacting with one another and with the environment in which they live.
Ecosystem functions	Ecosystem functions refer to the physical, chemical and biological processes that support water-dependent ecosystems; for example, the movement of nutrients, organic matter and sediment in rivers.
Ecosystem services	Ecosystem services describes the benefits people obtain from ecosystems, the most visible being food, water, timber and fibre. Less tangible services include the regulation of climate, floods, disease, wastes and water quality; recreational, aesthetic and spiritual benefits; and soil formation, photosynthesis and nutrient cycling.
Electrical conductivity (EC)	Electrical conductivity (EC) units are one of the measurement methods for salt concentration. Local conversion ratios, which vary due to differences in water temperature, can be applied to estimate milligrams per litre (mg/L) from EC. At Morgan, South Australia, 800 EC is approximately 500 mg/L.
Environmental assets	Environmental assets include water-dependent ecosystems, ecosystem services and sites of ecological significance.
Environmental objectives	Environmental objectives are statements of desired longer term outcomes.
Environmental water	Environmental water is the water provided to wetlands, floodplains or rivers to achieve a desired outcome, including benefits to ecosystem functions, biodiversity, and water quality and water resource health.
Entitlement (or water entitlement)	The volume of water authorised to be taken and used by an irrigator or water authority, including bulk entitlements, environmental entitlements, water rights, sales water and surface-water and groundwater licences.
Entitlement holder	An irrigator or water authority.
Environmental asset	A key environmental asset for the purposes of the Basin Plan is a water-dependent ecosystem that meets one or more criteria outlined in the Water Act. Environmental assets include water-dependent ecosystems, ecosystem services and sites of ecological significance.
Environmental connectivity	Environmental connectivity consists of links between water-dependent ecosystems that allow migration, colonisation and reproduction of species. These

	connections also enable nutrients and carbon to be transported throughout the system to support the healthy functioning and biodiversity of rivers, floodplains and wetlands. Hydrological and ecological links are between upstream and downstream sections of river (longitudinal connectivity), and between rivers and their floodplains (lateral connectivity).
Environmental flow	Any river flow pattern provided with the intention of maintaining or improving river health.
Environmental outcome	An outcome (usually of a project) that benefits the ecological health of the river system.
Environmental water	Water used to achieve environmental outcomes, including benefits to ecosystem functions, biodiversity, water quality and water resource health.
Environmental watering schedule	A voluntary agreement between MDBA and holders of held environmental water, owners of environmental assets and/or managers of planned environmental water, which is made to coordinate environmental water use.
Environmental water requirements	The amount of water needed to meet an ecological or environmental objective.
Environmental watering plan	A plan to restore and sustain the wetlands and other environmental assets of the Basin and to protect biodiversity dependent on the Basin water resources.
Environmental works and measures program	A program to deliver works and measures to improve the health of the River Murray system by making the best use of available water, optimising the benefits of any water recovered in the future, and considering other policy interventions.
Environmentally sustainable level of take (ESLT)	The Water Act describes the environmentally sustainable level of take as the level at which water can be taken from a water resource which, if exceeded, would compromise one or more of the: • key environmental assets of the water resource • key ecosystem functions of the water resource • productive base of the water resource • key environmental outcomes for the water resource.
Exchange rate	An exchange rate refers to the rate of conversion to be applied to water being traded from one trading zone or jurisdiction to another.
Farm dam	Small dams (usually of less than5 ML storage capacity) designed to capture run-off from rainfall events. While most farm dams are located on farms, the term includes dams on other types of properties, such as public or urban land.
Fish passage	The capacity for fish to travel upstream and downstream; weirs and dams obstruct the passage of fish within streams, and structures such as fishways are built to restore fish passage by enabling fish to pass.
Fishway	A structure that provides fish with passage past an obstruction in a stream.
Floodplain	Any normally dry land area susceptible to inundation by water from any natural source.
Floodplain harvesting	The taking of water from a floodplain after it leaves a watercourse during a flood.
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.
Flow variability	When applied to the Murray–Darling Basin, refers to the combined variability of the magnitude (size in height and volume), the duration (the time the flow lasts) and the frequency (how often a flow occurs).
Form of take	A form of take is a way to take water, usually for consumptive purposes. Forms of take include taking by floodplain harvesting, from regulated rivers, from groundwater and by farm dams.
Geoscience Australia	Geoscience Australia is an Australian Government agency that provides geoscientific information to facilitate informed decisions on exploitation of resources, environmental management and safety of critical infrastructure.
GL	A gigalitre; 1 billion litres.
Global warming	The increase in the average temperature of Earth's near-surface air and oceans since the mid-20th century and its projected continuation, believed to be caused in part by the greenhouse effect.
Great Artesian Basin (GAB)	The Great Artesian Basin (GAB) is one of the largest underground water reservoirs in the world. It lies under approximately 22% of Australia, occupying an area of more than 1.7 million km^2 beneath Queensland, New South Wales, South Australia and the Northern Territory. It is not included as a Basin water resource under the Water Act.
Groundwater	Groundwater describes water which occurs below ground level (in an aquifer or otherwise).
Groundwater connectivity	Surface-water and groundwater systems are not separate resources but components of one system. Their connectivity is a dynamic relationship that fluctuates both seasonally and over the long term in response to climatic variations and the delayed impact of groundwater extractions. Where the connection is strong, groundwater extraction might directly affect surface-water streamflow by inducing leakage to groundwater, or intercepting stream base flow over short and long timeframes. Similarly, surface-water extraction and management regimes can affect the availability of groundwater.
Groundwater water resource plan area	Each groundwater water resource plan area incorporates all Basin groundwater resources beneath that area, including aquifers (regardless of whether there is water in them). (The Gunnedah–Oxley Basin is an exception, being counted as entirely part of the Eastern Porous Rock area.)
Guide	The Guide to the proposed Basin Plan
Habitat	The natural environment or place where living things exist and grow.
Held environmental water	Held environmental water is water available under a water right, for achieving environmental outcomes.
High flow	A persistent increase in seasonal base flow that remains within the channel; high flows do not fill the channel to 'bankfull'.
High security water	In regulated systems water allocations are managed in accordance with rules that prioritise seasonal allocations to high security or reliable licences that can also expect to receive full allocation in all but severe periods of drought.
Hydrologic indicator sites	Hydrologic indicator sites are key sites across the Basin used to determine how much water can be sustainably taken from the river system. These indicator sites are representative of broader key ecosystem functions — interactions between organisms and their physical environment that are critical to the health of the river system, and key environmental assets — sites such as lakes, wetlands and

	floodplains that are significant for their conservation value.
Icon sites	Six locations chosen for The Living Murray program because of their regional, national and international ecological value, and the concurrence that they are at risk and require improved water flow regimes. The sites are Barmah-Millewa Forest; Gunbower-Koondrook-Perricoota Forest; Hattah Lakes; Chowilla Floodplain and the Lindsay-Wallpolla islands; Murray Mouth, Coorong and Lower Lakes; and the River Murray Channel.
In-channel flows	In-channel flows are flows within the banks of a river or other watercourse.
Inflow	The 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.
Interceptions; interception activities	Interception activities include the capture of surface water or groundwater that would otherwise flow directly or indirectly into a watercourse, lake, wetland, aquifer, dam or reservoir. An interception activity may include building new dams on private property or establishing extensive tree plantations.
Irrigation infrastructure operator	An irrigation infrastructure operator may be a company or corporation (or other legal person) that operates the infrastructure for delivering irrigation water.
Key ecosystem functions	Key ecosystem functions include the most important physical, chemical and biological processes that support water-dependent ecosystems, such as the movement of nutrients, organic matter and sediment in rivers.
Key environmental assets	Key environmental assets were identified by MDBA on the basis that the assets met at least one of five criteria for significance. These five criteria are set out in Schedule 5 to the proposed Basin Plan and will be used as part of the method to identify environmental assets that require watering.
Lock	A rectangular chamber with gates at either end, allowing vessels to move from one water level to another.
Long-term Cap equivalent	An average that takes into account the different characteristics and reliability of water entitlements and allocations in New South Wales, Victoria and South Australia. This creates a common unit of measure, allowing equitable comparison of a broad range of water recovery measures.
Long-term annual diversion limit	A long-term annual diversion limit is defined in the Water Act as the sum of a sustainable diversion limit (SDL) and the temporary diversion provision. As the temporary diversion provision in the proposed Basin Plan is zero, the long-term annual diversion limit will be the same as the SDL.
Long-term average sustainable diversion limits (SDLs)	Long-term average sustainable diversion limits (SDLs) represent the maximum long-term annual average quantities of water that can be taken on a sustainable basis from Basin water resources as a whole, and from each SDL resource unit. The Water Act requires that this reflect an environmentally sustainable level of take.
Loss	Water lost from a river system that is not available to other users (e.g. water loss caused by evaporation and seepage).
Low flow	A continuous flow through a water channel that either maintains the flow above a cease-to-flow condition or provides habitat as a change from high flow.
Main channel	Many rivers of the Murray–Darling Basin have a large number of channels, particularly in their lower reaches; however, they usually have a main channel, which is the one given the name of the river.
ML	A megalitre; 1 million litres.
Modelling	The 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.
Monitoring and evaluation program	A program to monitor and evaluate the effectiveness of the proposed Basin Plan as required by the Water Act. This program must set out the principles to be applied and the framework to be used for monitoring and evaluation, including the requirements for reporting.
Murray Lower Darling Rivers Indigenous Nations	A confederation of 10 Indigenous Australian nations in the southern part of the Basin, comprising representatives of the Wiradjuri, Yorta Yorta, Taungurung, Wamba Wamba, Wadi Wadi, Mutti Mutti, Latji Latji, Ngarrindjeri, Barapa Barapa and Wergaia peoples.
Murray–Darling Basin	The entire tract of land drained by the Murray and Darling rivers, covering parts of Queensland, New South Wales, Victoria and South Australia and the whole of the Australian Capital Territory.
Murray–Darling Basin Agreement	An agreement between the Australian and Basin state governments to 'promote and coordinate effective planning and management for the equitable, efficient and sustainable use of the water and other natural resources of the Murray–Darling Basin, including by implementing arrangements agreed between the Contracting Governments to give effect to the Basin Plan, the Water Act and State water entitlements.' The Agreement was ratified by identical legislation that has been enacted by the Parliaments of all the signatory governments.
Murray–Darling Basin Commission	The Murray–Darling Basin Commission was the executive arm of the Murray–Darling Basin Ministerial Council, set up under the Murray–Darling Basin Agreement in 1992. The functions of the Commission were subsumed by the Murray–Darling Basin Authority in 2008.
Murray–Darling Basin Ministerial Council	The Murray–Darling Basin Ministerial Council has an advisory role in the preparation of the Basin Plan, and policy and decision-making roles for matters such as state water shares, critical human water needs, and the funding and delivery of natural resource management programs. The Ministerial Council is chaired by the Australian Government Water Minister and includes one minister from each Basin state.
National Water Commission	The organisation responsible for driving progress towards the sustainable management and use of Australia's water resources under the National Water Initiative.
National Water Initiative	An agreement between the Australian, state and territory governments to improve the management of the nation's water resources and provide greater certainty for future investment.
Native Fish Strategy	This strategy aims to ensure that the Murray–Darling Basin sustains viable fish populations and communities throughout its rivers. The strategy's goal is to rehabilitate native fish communities to 60% of their estimated pre-European settlement levels within 50 years.
Natural flow	Water movement past a specified point on a natural stream from a drainage area for which there have been no effects caused by stream diversion, storage, import, export, return flow, or change in consumptive use caused by human-controlled modification to land use.
Natural resource management	The management of natural resources such as land, water, soil, plants and animals, with a particular focus on how management affects the quality of life for both present and future generations.
Northern basin	The Darling River north of Menindee Lakes, and all its tributaries

Northern Basin Advisory Committee	The committee will consist of Queensland and New South Wales community representatives who will work with and support local and catchment-based groups in implementing the Basin Plan, and ensuring the unique needs of the northern Basin are addressed.
Northern Murray–Darling Basin Aboriginal Nations	A confederation of 21 Aboriginal nations in the northern part of the Basin, comprising representatives of the Barkindji, Barunggam, Bidjara, Bigambul, Budjiti, Euahlayi, Gamilaroi, Githabul, Gunggari, Jarowair, Gwamu (Kooma), Kunja, Kwiambul, Malangapa, Mandandanji, Mardigan, Murrawarri, Ngemba, Ngiyampaa, Wailwan and Wakka Wakka peoples.
Nutrient	An element or compound essential to life, which sustains individual organisms and ecosystems; the portion of any element or compound in the soil that can be readily absorbed and assimilated to nourish growing plants.
Plain English Summary of the proposed Basin Plan	*Plain English Summary of the proposed Basin Plan* summarises the content of the proposed Basin Plan, chapter by chapter.
Planned environmental water	Planned environmental water is water that is committed by legislation to achieving environmental outcomes, and cannot be used for other purposes except under very specific circumstances.
Precautionary principle	The precautionary principle, as applied to environmental watering, is that not being scientifically certain that an ecosystem is threatened by serious or irreversible damage does not justify deciding that the ecosystem does not require environmental watering.
Principles of ecologically sustainable development	The principles of ecologically sustainable development as defined in the Water Act are that : • 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 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.
Program logic	Program logic is an approach to planning and design. It uses diagrams or other methods to set out the steps in a program, linking assumptions, hypotheses, resources, activities, outputs, impacts and outcomes.
Ramsar Convention	The Ramsar Convention, officially called the Convention on Wetlands of International Importance, is an international treaty that provides a framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
Recharge	The process of replenishing an aquifer, usually from rainfall or losses from surface-water bodies such as rivers and lakes.

Reference condition	The condition of a river, as assessed by an audit, relative to how it would have been had it not been changed.
Refuges	In this context, refuges (referred to in the proposed Basin Plan as 'refugia') describe places where animals and plants can survive when times are hard. For example, semipermanent or core wetlands provide refuge for water-dependent plants and animals when they cannot survive in other parts of the landscape. Refuges such as these are vital for the long-term survival of species, as they sustain populations which can breed and repopulate larger areas when conditions improve.
Register of Take	Register of take shows the cumulative difference over the years between water that is permitted to be used for consumptive purposes, and water that is actually used in each water accounting period. The register will be used to assist Basin states with determining compliance with diversion limits.
Regulated	A water system in which water is stored or flow levels are controlled through the use of structures such as dams and weirs.
Regulated flow	A controlled flow rate resulting from the influence of a regulating structure such as a dam or weir.
Regulated river	A regulated river refers to where the flow is regulated through the operation of large weirs or dams.
Regulated system	A regulated system describes one in which surface water is stored and flow levels are controlled by structures such as dams and weirs.
Regulation	The artificial manipulation of the flow of a body of water.
Resilience	An ecosystem's resilience includes how completely or quickly it is able to recover from disturbances such as fire, flood, drought, insect plague, deforestation or invasion by exotic plants and animals.
Risk allocation	When there are reductions to the volume or change to the reliability of an entitlement holder's water allocation from the Basin Plan, the risks are shared between individual entitlement holders and governments according to a formula in the Water Act that recognises climate change and other natural events, new knowledge and changes in government policy.
River health	Status of a river system based on water quality, ecology and biodiversity.
RiverBank program	An initiative of the New South Wales government to buy water for the state's most iconic and valued inland rivers and wetlands.
Riverine	Relating to, formed by or resembling a river, including tributaries, streams, brooks and so on; pertaining to or formed by a river; situated or living along the banks of a river.
Run-off	Flow of surface water from a given area resulting from the effects of rainwater.
Saline	Water that contains a significant concentration of dissolved salts, predominantly sodium chloride.
Salinity	The concentration of dissolved salts in groundwater or river water, usually expressed in electrical conductivity units or milligrams of dissolved solids per litre.
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.
Salt load	The amount of salt carried in rivers, streams, groundwater or surface run-off in a given time.

Schedule for Water Sharing	Water-sharing arrangements that replace the 'normal' arrangements of the Murray–Darling Basin Agreement to deliver water to meet critical human water needs when water availability is so low that the normal arrangements cease to be appropriate. The schedule sets out how state and territory water entitlements are determined, delivered and accounted for during tiers 2 and 3 (see section 135(6)(a) of the agreement), and during the transition to and from tiers 2 and 3.
SDL	SDL see Long-term average sustainable diversion limit
SDL resource unit	An SDL resource unit describes a geographical area which contains a set of water resources. Boundaries of surface-water SDL resource units are generally based on catchments, while boundaries of groundwater SDL resource units are based on hydrogeology and existing state planning boundaries.
Southern Basin	The Murray River and its tributaries, including the Darling River south of and including Menindee Lakes.
Surface water	Surface water includes any water in a watercourse, lake or wetland, and any water flowing over or lying on the land after precipitation or after rising to the surface naturally from underground.
Surface-water diversion	Changing the natural flow of surface water to another location by artificial means, such as dams or pipelines.
Surface-water water resource plan area	Each surface-water water resource plan area incorporates all Basin surface-water resources in that area, including watercourses, lakes and wetlands (regardless of whether there is water in them).
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 Rivers Audit	A program designed to determine the ecological condition and health of river valleys in the Murray–Darling Basin, to give a better insight into the variability of river health indicators over time and to trigger changes to natural resource management.
'Swiss cheese' effect	The 'Swiss cheese' effect occurs when some irrigators decide to terminate their irrigation delivery rights, potentially creating 'holes' in the service area of an irrigation network if they cease irrigation.
Tagged water access entitlement	A tagged water access entitlement refers to an entitlement which is registered on a water register in one trading zone or location, under which the associated allocation is extracted in a different trading zone or location.
Take	The removal of water from, or the reduction in flow of water in or into, a water resource.
The Living Murray program	A partnership of the Australian Government and the governments of New South Wales, Victoria, South Australia and the Australian Capital Territory, aimed at achieving a healthy, working River Murray System.
Threatened species	Species or ecological communities considered threatened with extinction as defined by the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) or relevant jurisdictional legislation.
Water access right	A water access right describes any right, determined by state law, to hold and/or take water from a water resource (e.g. surface water or groundwater from a watercourse, lake, wetland or aquifer). Water access rights include stock and domestic rights, riparian rights, water access entitlements and water allocations.

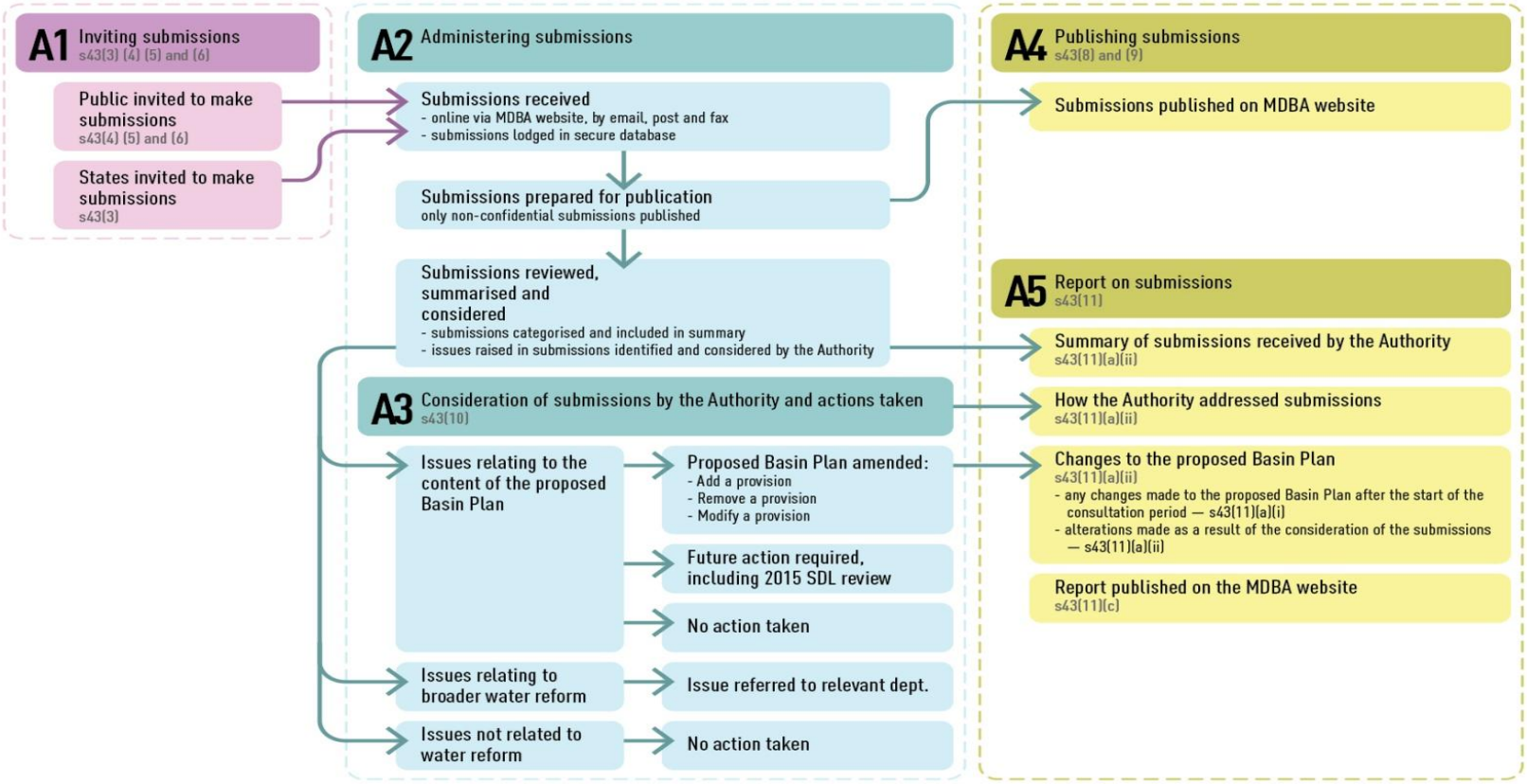
Water accounting	A systematic process of identifying, recognising, quantifying, reporting and assuring information about water, the rights or other claims to water, and the obligations against water. Water accounting applies Australian Water Accounting Standards.
Water accounting period	A water accounting period describes a 12-month period, similar in concept to a financial year. For the purposes of the proposed Basin Plan, it is the period from 1 July to 30 June, except that for critical human water needs it is 1 June to 31 May.
Water Act; the Act	*Water Act 2007* (Cwlth)
Water allocation	A water allocation represents the specific amount of water that can be taken under a water access entitlement in any given water accounting period. The amount of the allocation depends on the availability of water and the security of the entitlement, and is specified according to rules in the relevant water management plan.
Water announcement	A water announcement can be a public announcement about water allocations, or about a policy decision (e.g. carryover conditions or changes in ability to trade between trading zones) that may have an impact on the price or value of water access rights, and may influence a person considering buying or selling such rights.
Water-dependent ecosystems	Water-dependent ecosystems depend on periodic or sustained flooding, waterlogging or significant inputs of surface water or groundwater to continue functioning.
Water entitlement	Water users in the Basin hold legal entitlement, or licence, to a share of the available water. The entitlement usually specifies size (or volume) of the share; the source of the water (e.g. the river, catchment or aquifer); and the category (which can be a combination of priority and purpose).
Water for Rivers	A program established by the NSW, Victorian and Australian Governments to recover 282 gigalitres of water for the Snowy and Murray Rivers.
Water for the Future	An Australian Government long-term initiative to better balance the water needs of communities, farmers and the environment.
Water market intermediary	A person who acts as a broker in tradeable water rights, or who prepares the trading documentation, or who investigates trading opportunities on behalf of others, or provides a trading platform or water exchange.
Water market rules	Rules that apply to irrigation infrastructure operators holding group water entitlements on behalf of their members, which are designed to ensure that members can separate their portion of the group-held entitlement into a separate entitlement held by the individual. Water market rules are required under the Water Act, but are not within the Basin Plan. These rules are made by the Australian Government Water Minister.
Water quality	Water quality includes the condition of water and its related suitability for different purposes. It refers to a combination of physical, chemical and/or biological characteristics of water in the context of the proposed use of that water.
Water quality and salinity management plan	A plan to protect and enhance water quality in the Basin for environmental, social, economic and cultural uses. It will be included in the Basin Plan.
Water quality components	Salinity, turbidity, total nitrogen content and total phosphorous content.

Water quality objectives	Water quality objectives are a statement of the desired longer term outcome – achieving sustainable use of the Basin's water resources by protecting and enhancing their quality while also meeting economic and social objectives.
Water quality targets	Water quality targets are numerical concentration levels (or sometimes descriptive statements) used by water resource managers to measure and report on performance. They are based on water quality guidelines but may be modified by other factors, including social, cultural and economic considerations.
Water recovery measures	Water recovery measures in this context represent ways to acquire water, other than through reduction to entitlements, which will be returned to the environment.
Water recovery registers	Water recovery measures are approved and monitored using a system of staged registers — the developmental register, the eligible measures register and the environmental water register.
Water resource	A water resource describes surface water or groundwater, such as a watercourse, lake, wetland or aquifer; and includes the water, plants, animals and other organisms and components that contribute to the physical state and environmental value of the water body.
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 resource plans	Water resource plans set out how water resources will be managed, usually for a 10-year period. They will be developed by the Basin states, or in certain circumstances by MDBA, for approval by the Australian Government Water Minister.
Water resource plan area	A water resource plan area is a geographical area, of which there are 13 for surface water, 17 for groundwater, and an additional six for surface water and groundwater combined. As far as possible, proposed boundaries have been drawn up to match those of existing water management areas
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. The water year is used as a basis for processing streamflow and other hydrologic data.
Weir	A dam in a river to stop and raise the water (to conduct it to a mill, form a fishpond or the like).
Wetland	Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. An area that is periodically inundated or saturated by surface water or groundwater on an annual or seasonal basis that displays hydric soils and that typically supports, or is capable of supporting, hydrophytic vegetation.
Windsor inquiry	The House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan in regional Australia.
Without-development flow conditions	Without-development flow conditions means a modelled estimate of natural flow in rivers.

APPENDIX A:
PROCESS FOR CONSIDERING SUBMISSIONS ON THE PROPOSED BASIN PLAN

Section 43 of the Water Act 2007 (Cwlth) describes the process required to be carried out by the Murray–Darling Basin Authority (MDBA) following publication of the proposed Basin Plan — a draft for consultation and the plain English summary of the proposed Basin Plan. Following the release of the proposed Basin Plan and the plain English summary on 28 November 2011, MDBA began a 20-week consultation period that ended on 16 April 2012. A flow chart setting out how the MDBA considered submissions and met the requirements set out in section 43 of the Act is presented in figure A1.

Figure A1: Flow chart of submissions process



A1. Inviting submissions

MDBA invited members of the public and each Basin state to make submissions on the proposed plan.

The invitation for public submissions was published in the Commonwealth of Australia Special Gazette (S187, 28 November 2011). This invitation was also published in newspapers circulating generally in each Basin State (both state-wide and regional papers; see Table A1, Press advertisements calling for submissions) and on MDBA website (www.mdba.gov.au/have-your-say/make-submission).

Table A1: Press advertisements calling for submissions, 28 November to 10 December 2011

Newspaper	Date	Newspaper	Date
Adelaide Advertiser	28 Nov	Forbes Advocate	1 Dec
The Australian	28 Nov	Goondiwindi Argus	30 Nov
Courier Mail (Brisbane)	28 Nov	Area News (Griffith)	2 Dec
Canberra Times	28 Nov	Horsham Wimmera Mail Times	2 Dec
Herald Sun (Melbourne)	28 Nov	Koori Mail	30 Nov
The Age (Melbourne)	28 Nov	The Land	1 Dec
National Indigenous Times	30 Nov	Sunraysia Daily (Mildura)	3 Dec
Stock Journal	1 Dec	Moree Champion	1 Dec
Sydney Morning Herald	28 Nov	The Murray Valley Standard	6 Dec
Tamworth City News	28 Nov	Narrandera Argus	1 Dec
Weekly Times (Vic)	30 Nov	Queensland Country Life	1 Dec
Border Mail (Albury)	3 Dec	The Murray Pioneer (Renmark)	2 Dec
Western Herald (Bourke)	1 Dec	The Western Star (Roma)	2 Dec
Dalby Herald	2 Dec	Rural Weekly	1 Dec
Deniliquin Pastoral Times	2 Dec	Shepparton Advisor	7 Dec
Daily Liberal (Dubbo)	2 Dec	The Chronicle (Toowoomba)	3 Dec
Echuca Riverine Herald	2 Dec	Shepparton News	10 Dec

The invitation to make submissions included:

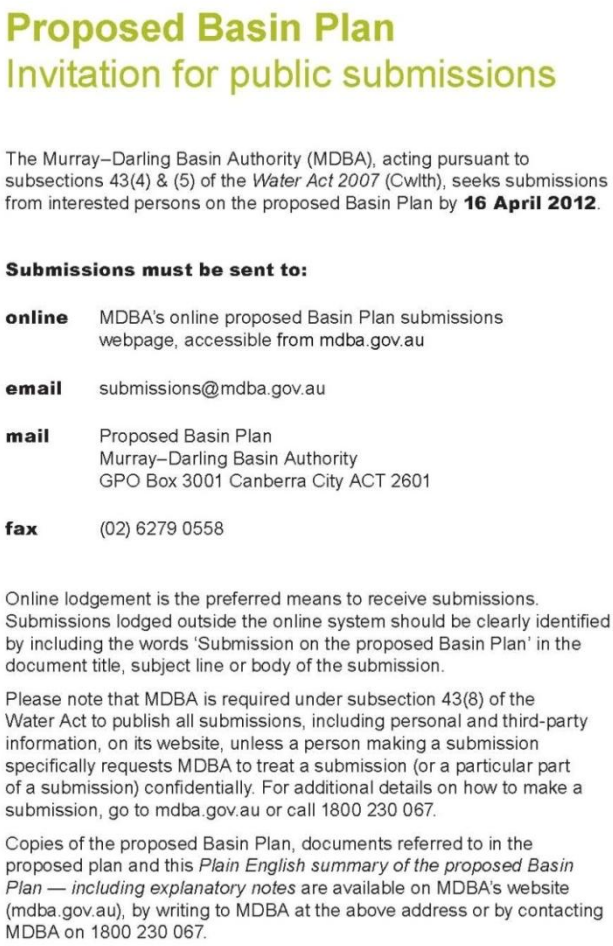
- how a person could obtain a copy of the proposed Basin Plan and the plain English summary
- the physical and email address to which people could send their submissions on the plan (MDBA also included fax and general email contact details)
- the date by which submissions must be received (16 April 2012)
- that every submission would be published on MDBA website unless the submitter requested full or partial confidentiality.

MDBA's invitation also included additional information about lodging submissions by means other than the online system; provided more detail about the requirement to publish all submissions in their entirety (i.e. including personal and third-party information), unless otherwise requested by the submitter; and specified a 1800 telephone number that people could call for further information on making submissions.

In addition to the statutory requirements for advertising submissions, MDBA publicised the submission process widely by conducting a press conference, issuing media releases and using other media (Twitter, Facebook, YouTube and Free Flow, MDBA blog). The plain English summary also included, on one of its preliminary pages, an invitation for public submissions, including how to make and lodge submissions on the plan (see Figure A2). Similar text was used in advertisements supplied to newspapers.

MDBA also produced a 'Make a submission' postcard, which was distributed through key stakeholder groups, and at meetings and other community engagement activities held during the 20-week consultation period.

Figure A2: Advisory note published in the plain English summary



Proposed Basin Plan
Invitation for public submissions

The Murray–Darling Basin Authority (MDBA), acting pursuant to subsections 43(4) & (5) of the *Water Act 2007* (Cwlth), seeks submissions from interested persons on the proposed Basin Plan by **16 April 2012**.

Submissions must be sent to:

online MDBA's online proposed Basin Plan submissions webpage, accessible from mdba.gov.au

email submissions@mdba.gov.au

mail Proposed Basin Plan
Murray–Darling Basin Authority
GPO Box 3001 Canberra City ACT 2601

fax (02) 6279 0558

Online lodgement is the preferred means to receive submissions. Submissions lodged outside the online system should be clearly identified by including the words 'Submission on the proposed Basin Plan' in the document title, subject line or body of the submission.

Please note that MDBA is required under subsection 43(8) of the Water Act to publish all submissions, including personal and third-party information, on its website, unless a person making a submission specifically requests MDBA to treat a submission (or a particular part of a submission) confidentially. For additional details on how to make a submission, go to mdba.gov.au or call 1800 230 067.

Copies of the proposed Basin Plan, documents referred to in the proposed plan and this *Plain English summary of the proposed Basin Plan — including explanatory notes* are available on MDBA's website (mdba.gov.au), by writing to MDBA at the above address or by contacting MDBA on 1800 230 067.

Figure A2 is a copy of the advisory notice published in the plain English summary; similar text was used in advertisements supplied to newspapers.

A2. Administering submissions

Defining what constituted a submission

Because of legal requirements about how MDBA was required to treat submissions (including the requirement to publish submissions and report on them), it was important to be able to clearly identify submissions from other items (such as correspondence).

General items

It was equally important that general items such as letters or emails were not treated as submissions and published on the website when that had not been the author's intention. Items that fell into this category included correspondence directed to MDBA Chair or Chief Executive, as well as the Australian Government Minister for Water and other Australian Government

ministers. As indicated in section A1 of this appendix, the invitation to make a submission on the proposed Basin Plan included the request that items sent to MDBA outside the online system be clearly identified as submissions by the inclusion of 'Submission on the proposed Basin Plan' in the document title, email subject line or in the body of the submission itself.

General submissions

General submissions were submissions lodged by individuals and organisations unaffiliated with a campaign or a petition. Submissions lodged by state agencies are included in this category.

MDBA established a process to help Aboriginal people and organisations make submissions on the proposed Basin Plan. It employed external consultants to help Aboriginal people prepare and lodge their submissions. Once a submission was completed, the consultant submitted it through the MDBA online submission system, where possible, or by post where they were unable to lodge submissions online (i.e. where facilities did not exist).

Petition submissions

In some cases submissions came in the form of petitions. MDBA treated and reported petitions as single submissions with many signatories. Petitions were published on MDBA website under the name of the person or entity that organised the petition or signed any covering documentation.

Campaign submissions

Some submissions contained identical text to others, and these were reported on as submissions sent as part of a campaign. MDBA defined a campaign as:

> ... an explicit and organised action by a group or organisation to encourage people to send in submissions advocating a particular viewpoint or position.

Campaign organisers usually provided content for the submissions and encouraged submitters to send that content either as their complete submission or as part of their own submission.

Following feedback from the public that it was difficult to find non-campaign submissions for viewing, MDBA published submissions it considered to be part of organised campaigns with the words 'campaign submission' included with the submitter's name.

In all other ways, campaign submissions were treated in the same way as other submissions.

Accessibility issues

In some instances people were unable to make their submission in writing because of language or other barriers, and MDBA responded to these on a case-by-case basis. See also section 4 of this appendix.

Preparing submissions for publication

Database management

MDBA used a custom-built database to receive, manage and publish submissions. The database allowed members of the public to lodge their submissions online. It also provided a secure administration interface for MDBA staff to manage and track submissions.

Submissions lodged online were entered directly into the submissions database. Submissions made by email, fax and post were entered into the database by MDBA staff.

All attached text files were converted to PDF and attached to the submission for uploading to the website.

Confidentiality and other requirements

Once submissions were received and entered onto the database, MDBA read them closely to determine whether they contained private, confidential, legal or other sensitive material (e.g. health or financial details, or the names and locations of family members).

To protect submitters' privacy, MDBA removed personal contact details of individuals (e.g. phone number, email and postal address) from submissions before publishing them online.

Where a submission contained personally sensitive material, MDBA contacted the submitters to confirm that they indeed wanted this material published online.

Submissions were also checked to ensure that they did not contain illegal material or defamatory content.

Reviewing and summarising submissions

Initial review of submissions involved identifying the issues raised and categorising submissions according to the topics they addressed. MDBA also recorded other information about submissions in the database to assist reporting on the feedback process. This information included:

- Basin region (where applicable)
- postcode
- whether the submission was from an individual, business or organisation (government or non-government)
- sector of interest (for organisations)

A3. Consideration of submissions by MDBA and actions taken

Following the initial review and categorisation of submissions, their content underwent further analysis. MDBA staff accessed the submissions database to review submissions and identify further technical issue.

Issues relating to the proposed Basin Plan chapters and schedules and issues relating to broader proposed Basin Plan content

When an issue related to the content of the proposed Basin Plan was identified, MDBA:

- considered the issue for the potential to inform a change to the proposed Basin Plan and developed a proposed policy response
- determined what action to take, such as:
    - amending the proposed Basin Plan (adding, removing or modifying a provision)
    - including the issue in the 2015 SDL review or taking longer term action (e.g. suggestions for further research)
    - deciding the issues required no action

Issues raised in submissions related to broader water reform

MDBA received submissions raising issues related to broader water reform (i.e. not related to specific content within the proposed Basin Plan).

The Department of Sustainability, Environment, Water, Population and Communities and the Department of Regional Development Australia have been provided access to submissions raising these types of issues.

Issues raised in submissions that are not related to water reform

Submissions raising issues not related to water reform were summarised and recorded in the database for reporting purposes, but MDBA took no further action.

Other changes to the proposed Basin Plan after the start of the consultation period

Changes made to the proposed Basin Plan following consideration of issues not included in a submission were captured separately. These issues came from sources such as:

- MDBA engagement activities, including public meetings, round-table meetings and social media forums
- MDBA's own work including work to incorporate new information and internal peer review processes
- external peer review processes
- advice from the Basin Community Committee
- advice from other committees and working groups such as the Basin Plan Working Group

A4. Publishing submissions

As noted earlier, all submissions received during the feedback period were published on MDBA website, unless submitters requested confidentiality for all or part of their submissions.

Accessibility requirements

Submissions were published in a format (.aspx) that meets government accessibility requirements, while attachments that form part of submissions were published in PDF only. The MDBA publication webpage included a note advising anyone who has difficulty viewing any submission to contact MDBA for assistance, and supplying a 1800 number and email address.

A5. Report on submissions

This report is compiled as directed in section 43(11) of the Act. It is structured to mirror the Proposed Basin Plan, with chapters referencing the proposed Basin Plan's layout. Issues raised are discussed in the appropriate chapter, and include MDBA's response and action (if required).

This structure was designed to explain clearly all elements of the submission process on the proposed Basin Plan and how MDBA treated submissions and responded to the issues raised in them.