Australian Government
Productivity Commission

Murray-Darling Basin Plan: Five-year assessment

Productivity Commission Draft Report

August 2018

This is a draft report prepared for further public consultation and input. The Commission will finalise its report after these processes have taken place.

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The Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

Further information on the Productivity Commission can be obtained from the Commission's website (www.pc.gov.au).

Opportunity for further comment

We invite examination of this draft inquiry report and comment on it by **written submission** to the Productivity Commission, preferably in electronic format, by **10 October 2018** and/or by attending a public hearing. Further information on how to provide a submission is included on the inquiry website: http://www.pc.gov.au/inquiries/current/basin-plan/make-submission#lodge.

The final report will be prepared after further submissions have been received and public hearings have been held and will be forwarded to the Australian Government by the 31 December 2018.

Public hearing dates and venues

Location	Date	Venue
Murray Bridge (SA)	Monday 15 October 2018	All venues to be confirmed and they will appear on our website
Shepparton (Vic)	Wednesday 17 October 2018	
Goondiwindi (Qld)	Monday 22 October 2018	
Sydney (NSW)	Wednesday 24 October 2018	
Dubbo (NSW)	Thursday 25 October 2018	
Canberra (ACT)	Friday 26 October 2018	

If you wish to speak at a public hearing please register on the Inquiry's webpage at http://www.pc.gov.au/inquiries/current/basin-plan/public-hearings.

Closer to the time of the hearings, further details will be provided on the inquiry website.

Commissioners

For the purposes of this inquiry and draft report, in accordance with section 40 of the *Productivity Commission Act 1998* the powers of the Productivity Commission have been exercised by:

Dr Jane Doolan	Commissioner
John Madden	Associate Commissioner

Disclosure of interests

The *Productivity Commission Act 1998* specifies that where Commissioners have or acquire interests, pecuniary or otherwise, that could conflict with the proper performance of their functions during an inquiry they must disclose the interests.

Dr Jane Doolan has advised the Commission that she is:

- Deputy Chair, Western Water
- Independent Chair, Yarra Consultative Committee

Terms of reference

I, Scott Morrison, Treasurer, pursuant to Parts 2 and 3 of the *Productivity Commission Act 1998*, hereby request that the Productivity Commission (the Commission) undertake an Inquiry into the effectiveness of the implementation of the Basin Plan and water resource plans.

Background

The Basin Plan provides for the integrated management of water resources of the Murray-Darling Basin in ways that promote the objects of the *Water Act 2007 (Cth)* (Water Act), including the objective of optimising social, economic and environmental outcomes.

Under section 87 of the Water Act the Commission is required to undertake five-yearly assessments of the effectiveness of the implementation of the Basin Plan and water resource plans. This inquiry is the first such assessment.

Scope of the inquiry

In accordance with the provisions of Part 3 of the Water Act, the Commission is to report on the matter of the effectiveness of the implementation of the Basin Plan and the water resource plans for the five year period ending 31 December 2018.

In undertaking the Inquiry, the Commission should assess:

- progress towards implementing the actions required under the Plan within legislated timeframes, including:
  - the extent to which stated water recovery and other targets are on track to be delivered within statutory timeframes; and
  - the likelihood that activities and arrangements now in place will ensure that these targets and timeframes will be met.
- the extent to which the current framework for implementing the Basin Plan, including the framework for monitoring, compliance, reporting and evaluation, is likely to be sufficient:
  - to support delivery of the objectives and outcomes identified in Chapter 5 of the Basin Plan, acknowledging that the Basin Plan is not yet fully implemented and that many of the outcomes will only be observable over a longer timeframe;
  - to enable assessment of risks and risk mitigation requirements and provisions associated with Basin Plan implementation; and
  - to enable an assessment of progress in meeting the Plan's objectives and outcomes under the next scheduled review of the Basin Plan in 2026.

In assessing progress towards Basin Plan implementation, the Commission should report on progress towards milestones agreed in the Murray-Darling Basin Ministerial Council's report to

the Council of Australian Governments, *Implementing the Basin Plan*. Specifically, the Commission should focus on progress towards a pathway for three key priorities including:

- supply measures to offset the Basin Plan water recovery target of 2,750 GL by 2019, using the Sustainable Diversion Limit (SDL) adjustment mechanism;
- constraints measures to address impediments to delivering environmental water; and
- efficiency measures to recover an additional 450 GL by 2024, consistent with the Basin Plan legal requirement to achieve neutral or improved socio-economic outcomes.

In undertaking this assessment, the Commission should have regard to the *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin (2013)*, and the *Basin Plan Implementation Agreement* between the Murray-Darling Basin Authority (MDBA), Basin states and the Commonwealth Environmental Water Holder (CEWH).

In undertaking this assessment, the Commission should also have regard to reviews and audits that have recently been completed or are ongoing, including those relating to compliance and Basin Plan implementation.

The Commission should also have regard to the differing responsibilities of the Basin states and the Australian Capital Territory, the Department of Agriculture and Water Resources (DAWR), the CEWH and the MDBA.

The Commission should assess progress towards full implementation in the context of the differing timeframes applicable to each key component of the Basin Plan. This includes an assessment of the extent to which Commonwealth and state-led water recovery efforts and state water resource plans are on track for when SDLs take effect from 1 July 2019.

The Commission should make findings on progress to date and recommendations on any actions required by the Commonwealth or Basin state or territory to ensure the timely implementation of Basin Plan requirements and the effective achievement of Basin Plan outcomes.

Process

In undertaking the inquiry, the Commission should consult widely including establishing a stakeholder working group in accordance with section 89 of the Water Act, inviting public submissions, holding public hearings, and releasing a draft report to the public. The Commission should consult with relevant Australian Government, Basin state and territory government agencies, key interest groups and affected parties. These consultations should include, but not be limited to, parties with interests in agriculture, industry and the environment, and Aboriginal groups. The Government has asked Basin jurisdictions to co-operate with this Inquiry, including by providing the Commission with the information it considers necessary in undertaking its Inquiry.

The final report is to be provided to the Government by 31 December 2018.

Scott Morrison
Treasurer

[Received 7 March 2018]

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Acknowledgments

The Commission has used a range of information sources in preparing this draft report. The Commission is grateful for the contributions made by stakeholders through their submissions and comments, and their participation in meetings, roundtables and workshops. The Commission also thanks the Stakeholder Working Group (members are listed in appendix A) for their participation.

The Commission requested information from the Murray-Darling Basin Authority, the Australian Department of Agriculture and Water Resources, and the Basin States. The Commission is grateful to them for providing this information and for their broader participation in the inquiry.

Abbreviations

ACCC	Australian Competition and Consumer Commission
ANAO	Australian National Audit Office
BDL	Baseline Diversion Limit
BOC	Basin Officials Committee
BPIA	Basin Plan Implementation Agreement
BPIC	Basin Plan Implementation Committee
BWEWS	Basin-wide environmental watering strategy
CEWH	Commonwealth Environmental Water Holder
CEWO	Commonwealth Environmental Water Office
CHWN	Critical human water needs
COAG	Council of Australian Governments
DAWR	Department of Agriculture and Water Resources (Australian Government)
DEE	Department of the Environment and Energy (Australian Government)
GL	Gigalitre
GMID	Goulburn-Murray Irrigation District
IAC	Independent Assurance Committee
IGA	Intergovernmental Agreement
LLCMM	Lower Lakes, Coorong and Murray Mouth
LTAAY	Long-term average annual yield
LTDLE	Long-term diversion limit equivalent
LTIM	Long-term intervention monitoring
MDB	Murray-Darling Basin
MDBA	Murray-Darling Basin Authority
ML	Megalitre
MLDRIN	Murray Lower Darling Rivers Indigenous Nations
NBAN	Northern Basin Aboriginal Nations
NBR	Northern Basin Review
NPA	National Partnership Agreement
NRM	Natural resource management

NWI	National Water Initiative
OECD	Organisation of Economic Co-operation and Development
OEH	Office of Environment and Heritage (New South Wales)
PC	Productivity Commission
PPMs	Pre-requisite policy measures
SCBEWC	Southern Connected Basin Environmental Watering Committee
SDL	Sustainable Diversion Limit
TLM	The Living Murray
WESA	Water for the Environment Special Account
WQM plan	Water Quality Management Plan
WRP	Water Resource Plan

OVERVIEW

Key points

- The Basin Plan is a significant step change in resetting the balance between environmental and consumptive use of water and establishing a new sustainable water management system.
- The Plan is a major investment — $13 billion in total and $4.9 billion is still to be spent by 2024.
- Significant practical progress has been made.
  - Recovery of water entitlements to *bridge the gap* between poorly-managed historical use and the new Sustainable Diversion Limits is almost complete.
  - New management arrangements, including those for managing both environmental watering and water trading are in place and are working well.
- An immediate improvement is nevertheless required in two important elements of the Plan.
  - The development and accreditation of Water Resource Plans is behind schedule. Basin Governments should agree to extend the 2019 deadline where there is a material risk to the quality of plans.
  - Basin Governments should substantially revise the Basin Plan Evaluation Framework and develop a monitoring strategy. This will enable the impacts of the Plan to be evaluated and communicated effectively in 2020 and 2025, and the Plan to be reviewed in 2026.
- In the future, there will also be major challenges and risks to implementing the measures to adjust Sustainable Diversion Limits by 2024.
  - The agreed package of supply measures (including constraints easing projects) is ambitious. If key projects fail, environmental benefits will be delayed and the additional costs to tax-payers are potentially in the order of $480 million. Basin Governments should establish sound governance and funding arrangements and develop an integrated plan to manage delivery of the projects. The current timeframe is unrealistic and should be extended.
  - Projects to ease or remove delivery constraints and achieve enhanced environmental outcomes are unlikely to be completed by 2024. The Australian Government consequently risks bringing forward significant expenditure for an asset that cannot be effectively used for many years. It should instead align additional water recovery with progress on easing constraints and include strategies to mitigate socioeconomic impacts.
- These complex challenges are made more difficult because of the way Basin Governments have developed and agreed to the projects. The process has lacked transparency and candour with stakeholders who are concerned about potential impacts.
- There are major shortcomings in the current institutional and governance arrangements and these pose a significant risk to successful implementation. Now is the time for Basin Governments to do some heavy lifting and provide strategic direction.
  - Basin Governments should take joint responsibility for leading implementation, not leave it to the Murray-Darling Basin Authority (MDBA).
  - The Basin Officials Committee should be assigned responsibility for managing the significant risks to successful implementation, including the integrated program of projects.
- The MDBA has two main roles: supporting Basin Governments to implement the Plan; and ensuring compliance with the Plan (in its role as regulator). These roles are conflicted and the conflicts will intensify in the next five years.
  - The MDBA should be separated into two institutions — the Murray-Darling Basin Corporation and the Basin Plan Regulator.
- This is an opportunity to make important 'stitch in time' changes to ensure an effective Plan. Failure will be costly for the environment and tax-payers and undermine confidence that the significant investment in the Basin Plan has been worthwhile.

Overview

1 The Basin Plan and the Commission's approach to assessing implementation

The Basin Plan is a step change in the management of the Murray-Darling Basin (the Basin) (box 1). It is part of a comprehensive effort by the Australian and Basin State Governments[1] to reset the balance between environmental and consumptive use of water across the Basin and establish a long-term, sustainable water management system.

The Plan sets environmental and other objectives for the Basin and establishes new, lower sustainable extraction limits to achieve them. It outlines key actions, decision-making processes and timeframes that Governments are to adopt to implement the Plan.

The development of the Basin Plan was a lengthy and an often-contested process, involving much negotiation and compromise before it was finalised and became law in November 2012. This involved a series of substantial trade-offs between balancing the environmental benefits across the Basin and the socioeconomic impacts on industries and regional communities of a permanent reduction in water available for irrigation.

Governments are to have largely established the new management arrangements embedded in the Plan by 30 June 2019. The activities to reset the balance between the environment and consumptive use are to be fully implemented by 30 June 2024.

The Productivity Commission has responsibility for assessing the effectiveness of implementation of the Basin Plan and associated Water Resource Plans (WRPs) every five years. This function was included in the *Water Act 2007* (Cwlth) to ensure there was a regular independent review. This type of comprehensive review is critical to ensure public confidence in the implementation of the Basin Plan. For these reasons, this review is different to the typical Productivity Commission inquiry.

For this assessment, the Commission has looked at:

- how the actions of Governments to implement the Basin Plan are tracking against the set timeframes
- the extent to which management arrangements will deliver on the objectives of the Plan and enable its impacts and outcomes to be evaluated
- whether actions to implement the Plan have been effective and efficient.

[1] The Basin States are New South Wales, Victoria, Queensland, South Australia, and the Australian Capital Territory.

Box 1 The Murray-Darling Basin and the Basin Plan

The Murray-Darling Basin

The Basin covers over 1 million square kilometres, including significant areas of inland New South Wales, Victoria, and the ACT, and parts of Queensland and South Australia. The Basin and its water resources support:

- the cultural, social, environmental, spiritual and economic needs of more than 40 Indigenous Nations whose traditional lands fall within the Basin
- over 30 000 wetlands, 100 of which are recognised as nationally important due to environmental, heritage or cultural significance
- about 41 per cent of the total gross value of Australia's agricultural production, including 46 per cent ($7 billion) of the gross value of national irrigated agriculture
- the supply of drinking water for approximately 2.1 million people that reside within it, as well as a further 1.3 million people outside of the Basin.

The Basin Plan

The 2012 Basin Plan is the legal framework to reset the balance of water use in the Basin. It sets environmental and other objectives for the Basin and establishes new, lower sustainable extraction limits to achieve them. It also outlines the key actions, processes and timeframes that Governments are to adopt to implement the Plan.

Responsibilities

The Basin Plan is an instrument of the Australian Parliament. Basin Governments comprising the Australian Government and the State Governments of New South Wales, Victoria, Queensland and South Australia and the Government of the Australian Capital Territory (known as the Basin States) have agreed to implement the Plan.

The Australian Government has responsibility for water recovery programs, and the management of this water (by the Commonwealth Environmental Water Holder) for environmental purposes.

As constitutional responsibility for water resource management ultimately resides with them, the Basin States have a key role to ensure that their own State-based arrangements reflect and are consistent with the Basin Plan.

Basin Governments agreed that the Murray-Darling Basin Authority (an independent Australian Government statutory authority) would be responsible for preparing, implementing, monitoring and enforcing the Basin Plan.

Funding

Successive Australian Governments have made substantial investments to implement the Plan. $13 billion has been ear-marked for reform, including:

- $3.1 billion to purchase water entitlements for the environment
- $4.8 billion for investment in modernised irrigation infrastructure, with a share of water savings from most projects transferred to the environment
- $1.0 billion for supply measures (box 2).

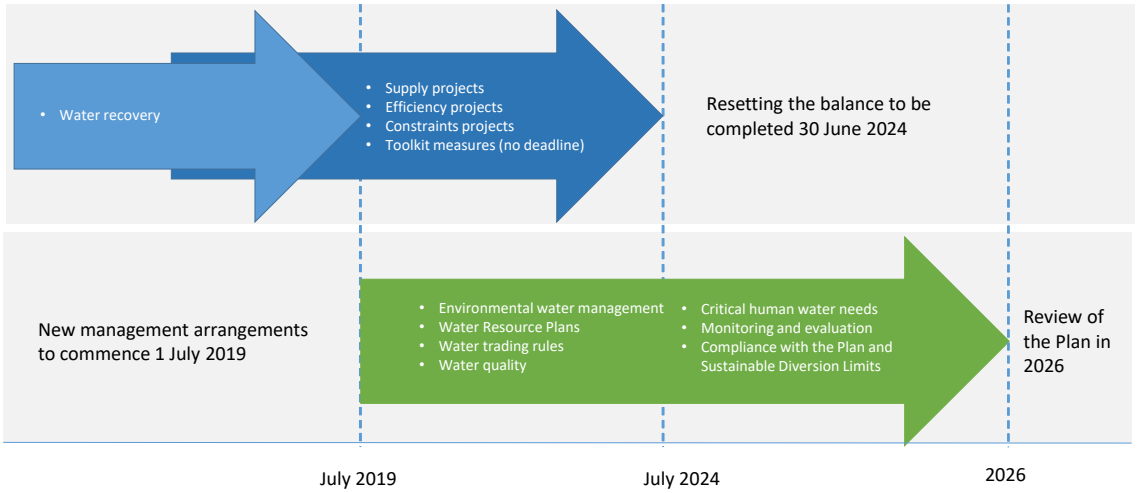
The Australian Government later committed a further $1.775 billion over ten years to a program to pursue enhanced environmental outcomes, by recovering an additional 450 GL (box 2).

The Commission's task in this review does not extend to examining the processes for setting the sustainable balance and associated targets in the Plan or measuring the impacts and outcomes of the Plan. However, it does examine the preparedness of Basin Governments and their institutions to undertake these activities effectively in the future.

2 Key elements to implementing the Basin Plan

The Basin Plan sets out a number of key elements that are required for implementation. Other elements, while not specified in the Plan (such as water recovery programs) are also necessary for successful implementation. Key implementation elements of the Plan and their timing is outlined in figure 1.

Figure 1 **Key elements of the Basin Plan implementation**



Resetting the balance by 30 June 2019

Sustainable Diversion Limits (SDLs) define how much water consumptive users can take from rivers and groundwater (the remainder is dedicated to the environment). SDLs are the core element of the Plan.

The SDLs in the 2012 Basin Plan required recovery of 2750 GL from consumptive use by 30 June 2019. To achieve this, the Australian Government committed to purchasing water entitlements directly and to investing in irrigation infrastructure.[2]

2 The Australian Government committed to *bridge the gap* between the Baseline Diversion Limits and the SDLs by recovering water in a way that ensured that water entitlements would not be eroded or compulsorily acquired.

The Plan allows for SDLs (and water recovery targets) to be adjusted under certain circumstances, prior to them taking effect on 1 July 2019. In the northern Basin, these adjustments are to account for new information. In the southern Basin, SDLs can be changed by projects to achieve environmental outcomes with less water (supply and constraints measures) or through projects which aim to achieve enhanced environmental outcomes through the recovery of additional water for the environment (efficiency and constraints measures) (box 2).

A package of supply measures (including measures to ease constraints) equivalent to 605 GL in water recovery has been approved and must be implemented by 30 June 2024. If this is not achieved, Governments may need to make up the shortfall with further water recovery. Basin Governments are required to notify the MDBA of the volume of water recovered through efficiency projects by the end of 2023. All recovered water is to be transferred to the Commonwealth Environmental Water Holder (CEWH) by 30 June 2024.

Basin Governments have also agreed to implement the 'Toolkit' measures recommended by the MDBA in the Northern Basin Review. These Toolkit measures aim to target water recovery, protect environmental flows, improve the coordination and delivery of environmental water, ease constraints to environmental water delivery in the Gwydir River and construct works to improve fish passage.

The Australian Government (with the agreement of the Australian Parliament) has recently made two amendments to the Basin Plan reflecting these adjustments to SDLs.

New management arrangements are to be in place by 1 July 2019

Implementing the Basin Plan also involves establishing a new and ongoing management framework, which includes the following.

- **Environmental water management** activities whereby environmental water holders work together to deploy water to achieve the environmental objectives.
- Basin States embedding key parts of the Plan in their normal water planning and management processes through **Water Resource Plans,** with specific provisions relating to **water quality** and **critical human water needs**.
- Measures to establish consistent Basin-wide **water trading rules** for the trading and transfer of surface water and groundwater access rights, irrigation rights and water delivery rights; as well as consideration of third-party impacts of trading and provision of information to improve the operation of the market.[3]
- A whole-of-Basin framework for **monitoring and evaluating** the impact and effectiveness of the Basin Plan, which includes public reporting requirements.
- A role for the MDBA to enforce **compliance** with the Basin Plan, noting that Basin States are to enforce compliance with their water take laws.

[3] Most of the trading rules became effective in 2014 but Basin States have until July 2019 to ensure that their trade restrictions are consistent with the Plan.

Box 2 **Adjustments to Sustainable Diversion Limits**

SDL Adjustment Mechanism

In the southern Basin, the Plan allows for adjustments to surface water SDLs through:

- **Supply measures**, which allow for achievement of equivalent environmental outcomes with a lesser volume of water. Examples include using pumping stations, regulators and levees to deliver water to lakes and floodplains without creating overbank flooding.
- **Constraints easing,** to overcome some of the impediments to delivery of water down the system. They can include changes to physical features such as crossings and bridges, as well as negotiating easements where private land is flooded.
- **Efficiency measures,** to achieve enhanced environmental outcomes above those achievable with 2750 GL by recovering an additional 450 GL for the environment with neutral or improved socioeconomic outcomes. Examples of these projects include works to reduce on-farm water losses from irrigation, with a share of the water savings provided to the Australian Government as an entitlement. The enhanced environmental outcomes are in the southern Basin, and are achieved by watering larger areas of floodplains, higher stream flows, and meeting specific objectives for the Coorong, Lower Lakes and Murray Mouth in South Australia. Delivering these enhanced environmental outcomes is also dependent on easing water delivery constraints.

The aim of supply measures was to test whether environmental outcomes could be achieved with less water, thereby reducing the socioeconomic impacts on communities in the Basin. The inclusion of efficiency measures in the southern Basin reflects the opportunity to improve environmental outcomes (particularly in the Lower Murray) by recovering additional water for the environment.

Northern Basin Review

When the Plan was developed, the MDBA recognised that it required additional information to inform the setting of the SDLs in the northern Basin. As a result, Governments agreed that the MDBA would undertake a review into the northern Basin, which was completed by the MDBA in November 2016.

The key recommendation arising from this review was to reduce the water recovery target in the northern Basin from 390 GL to 320 GL on the provision that the Australian, Queensland and New South Wales Governments implement Toolkit measures to ensure effective management of environmental water in the north.

3 Significant progress has been made

Governments have made significant progress implementing elements of the plan, particularly in recovering water for the environment and establishing the planning and management arrangements to use this water.

Water recovery to *bridge the gap* is largely complete

The Australian Government committed to *bridge the gap* between historical levels of water use and the new SDLs of the Basin Plan. This is almost complete, with 1995.8 GL[4] of the adjusted target of 2075 GL delivered to environmental water holders. The Australian Government recovered almost 60 per cent of this water purchasing from willing sellers. Most of the remainder was recovered through programs that modernise water infrastructure and return a share of water savings to the Australian Government.

The main outstanding issue for resetting the balance is ensuring that the approved package of supply projects to offset the overall water recovery target by 605 GL are fully operational by 1 July 2024. If this is not achieved the MDBA may re-estimate the size of the SDL adjustment. If revised downwards, Basin Governments may need to recover more water to meet the SDLs.

New management arrangements for many elements are in place

Basin Governments have put in place the key foundations of the Basin Plan's new management arrangements and a number of these are working well.

- The Basin Plan's Environmental Management Framework formally outlines processes to coordinate the planning, prioritisation and use of environmental water. Over 750 environmental watering events have occurred over the past five years, targeted at specific environmental outcomes linked to the long-term objectives of the Plan. There is already some evidence of improved ecological outcomes at the local and system scale.
- New rules for providing critical human water needs in the River Murray are established, with stakeholders confident that these rules will ensure these needs can be met in extremely dry times.
- Basin Plan salinity targets are integrated into the Basin salinity management framework and have been consistently met for most areas.
- Basin States have improved their formal processes for engagement with Traditional Owners as part of WRP development, in particular they are taking a nation-by-nation approach to consultation.
- New requirements to improve water market information and market confidence (such as protocols to manage market sensitive information) are in place. The Basin Plan trading rules also include a mechanism to validate or remove restrictions on trade. Although this mechanism has not been applied extensively yet, it has the potential to improve the efficiency of water markets.

4 A further 121.7 GL is under contract to be delivered by 1 July 2019.

4 In other areas success is less certain

Some elements of the Basin Plan implementation have progressed more slowly than expected or have only just commenced.

Pre-requisite policy measures

The outcomes of the Basin Plan are based on an assumption that Basin States will implement pre-requisite policy measures (PPMs) to enable the efficient use of environmental water. PPMs provide the capacity to credit environmental return flows for downstream environmental use (rather than being used to meet the demands of other users) and allow the call of held environmental water from a specific storage to top up or 'piggy-back' on unregulated flow events. The PPMs were assumed in the original modelling used to set SDLs and were also incorporated in the environmental equivalence methodology that underpins supply measures and the associated adjustment to SDLs. Without PPMs, a water recovery target of more than 4000 GL would be required to achieve the outcomes of the Basin Plan. If Basin States do not implement PPMs by 1 July 2019, the MDBA may recalculate SDLs.

There is some risk that PPMs will not be implemented by 30 June 2019.

Water Resource Plans

The development and accreditation of WRPs is behind schedule with a number of key issues still to be finalised. Of the 33 WRPs that must undergo accreditation, 20 are in the early stages, 11 are in draft form, one is in the accreditation process and just one has been accredited.[5]

In some WRP areas, significant rules changes are needed to meet Basin Plan requirements and these changes could impact on the reliability and use of entitlements. In these areas, meaningful consultation is required to resolve these issues and there is a concern that not enough time is left to do this well. There is a risk that old rules will be rolled into the new arrangements, or new rules will be rushed and ill specified, resulting in WRPs being ineffective in addressing the issues. This risk is highest for New South Wales, given the number of outstanding WRPs and the magnitude of proposed rule changes in some plans.

Important technical work is still being undertaken by the Basin States and the MDBA to enable the SDLs to be fully operational by 1 July 2019. This includes work to enable SDLs to be accounted for, Basin States to report on the implementation of SDLs and the MDBA to assess compliance.

5 Based on the most recent quarterly report on progress, released in May 2018.

Supply measures

Basin States are required to implement supply measures in full by 2024. There were delays in the development of the package and this has compressed the timeframe for implementation. Significant challenges lie ahead.

- Basin Governments need to resolve governance, funding and managing risk before these projects can commence, straining the timeframe even further.
- The supply package relies heavily on six highly complex and interdependent projects that are still in the concept design stage of development (box 3). Past experience with similar projects shows that they require detailed consultation and take many years to plan and implement.
- There is a degree of dissatisfaction and mistrust in parts of the community, including Traditional Owners, arising from a lack of transparency and consultation.

The 2024 deadline for supply projects is highly ambitious, if not unrealistic.

Efficiency measures

Progress on implementing efficiency measures provides little confidence that the enhanced environmental outcomes of the Basin Plan will be achievable by 2024.

- Basin Governments have not yet agreed on a work plan for the efficiency measures to recover the additional 450 GL by 2024. The approach to meeting the Basin Plan's requirement for neutral or improved socioeconomic outcomes is still being contested and this is affecting program design and delaying progress.
- The proposed constraints projects are unlikely to be fully operational by 2024 and may not achieve the required flow rates at key sites to deliver the enhanced environmental outcomes.
- There has been no update to the modelling to estimate what environmental benefits can be realistically achieved, given proposed constraints easing projects are unlikely to achieve the anticipated flow rates at key sites or be fully operational by 2024.
- The current water recovery program is being rolled out Basin-wide, and risks recovering water in the northern Basin that is unlikely to be useful to achieving the enhanced environmental outcomes in the southern Basin.

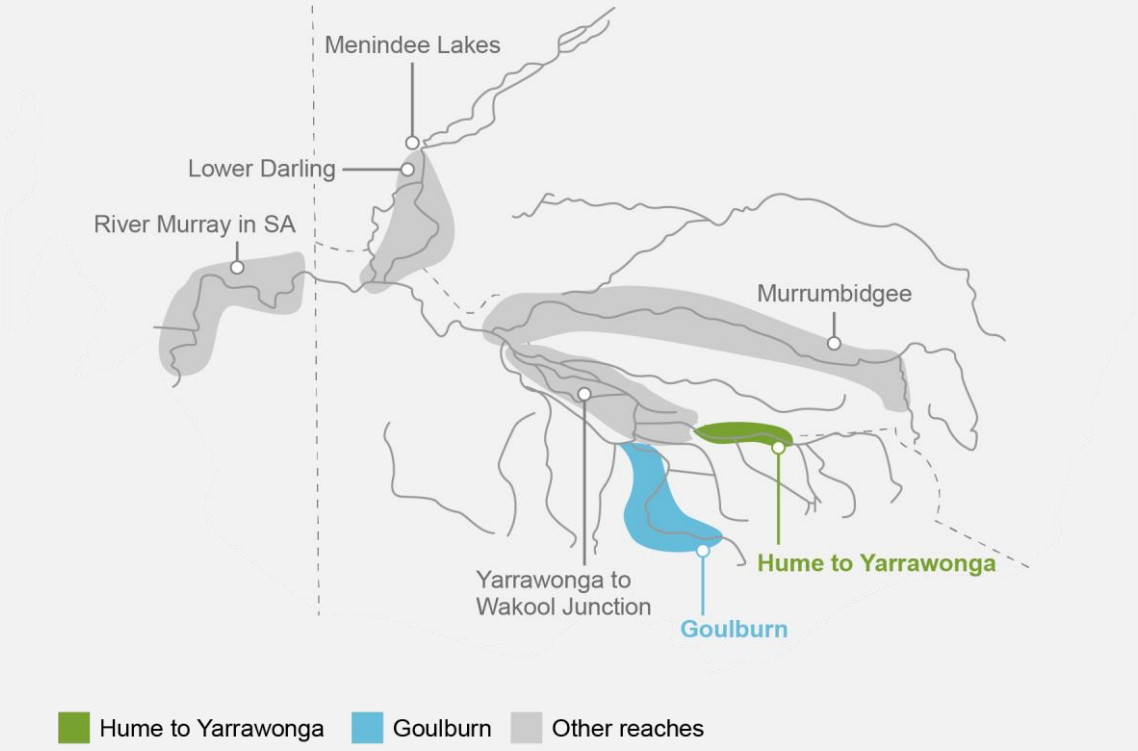
There is a material risk that recovering the additional 450 GL could be significantly more expensive than anticipated. The benefits and costs of the program as a whole have not been assessed, and there is no requirement to do so.

Box 3 Challenging components of the supply package

The supply package relies heavily on six highly complex and interdependent projects, which could account for between one-third and half of the 605 GL expected water recovery offset. These key projects are still in the concept design phase.

- **Menindee Lakes —** a project that aims to improve the operation of the Lakes to reduce evaporative losses. It involves changes to infrastructure and operational arrangements and easing constraints in the Lower Darling.
- **Constraints —** four projects that aim to increase the size of flows that can be delivered down the river system. This involves removing physical barriers (such as increasing the height of bridges), building levees to protect land from inundation and negotiating and signing agreements with landholders whose land is flooded by the higher flows.
- **Hydro-cues —** a project that aims to increase the ability of environmental water holders to coordinate environmental water delivery with increases in natural flows. It involves operational rules changes and system enhancements to achieve in-channel, floodplain and wetland environmental outcomes. It is dependent on easing constraints.

Easing constraints in the supply package will involve negotiations with over 3000 landholders across five reaches (figure below). In the early 2000s, negotiations to secure easements for the right to release 25 000 ML/day from Hume Dam (green in map below) took almost eight years and involved negotiations with 103 landholders from Hume to Yarrawonga. Easing constraints in the Goulburn (blue in map below) is not required for supply measures, but is for efficiency measures.



Northern Basin Toolkit

The Northern Basin Toolkit was a key recommendation arising from the Northern Basin Review (box 2). Although recommended by the MDBA in 2016, the amendment to the Plan was not confirmed by the Australian Parliament until mid-2018. The details for implementing the Toolkit (including key milestones for implementation, funding arrangements and program governance) are still to be settled by Basin Governments.

Monitoring and evaluation

Evaluating the outcomes of the Basin Plan is the responsibility of the MDBA. The current Basin-wide evaluation framework is not comprehensive and there is no clear strategy to coordinate the collection of information needed to monitor the outcomes of the Plan.

As a result, actions taken to monitor outcomes in the Basin are fragmented and inadequately integrated, and risk information gaps that will limit future evaluations of the Plan. This will impede the ability of Basin Governments to clearly communicate the outcomes of the Plan.

Summary of progress

Table 1 summarises progress made on implementing the Basin Plan. After five years of implementation, significant progress has been made in a number of elements. However, progress has been much slower than expected in a number of key areas.

Table 1 **Progress towards implementing Basin Plan elements**

Element	*On schedule*	*Risk to meeting its objectives*	*Nature of risks*
Resetting the balance			
Water recovery	✓	Low	
Supply measures	✗	High	Compressed timelines for implementation, with a range of issues to resolve. 2024 deadline is highly ambitious, if not unrealistic. No process for assessing whether individual projects in the supply package provide value for money. Risk to budget is hundreds of millions of dollars.
Efficiency measures	✗	High	The design of the efficiency measures program is contested. Enhanced environmental outcomes from additional water recovery require easing constraints, which is unlikely to meet timelines. Material risk that costs are significantly larger than anticipated.
Northern Basin Toolkit	n/a	Medium	No firm deadlines for implementation. Not subject to same checks and balances as supply measures (such as oversight by the MDBA).
New management arrangements			
Water Resource Plans (WRPs)	✗	Medium	Behind schedule. Complex issues in some WRPs yet to be resolved.
Critical human water needs	✗	Low	River Murray arrangements robust. WRP provisions for other areas behind schedule.
Water quality	✗	Low	Salinity targets largely being met. WRP provisions behind schedule.
Water trading rules	✓	Low	
Environmental water planning and management (including pre-requisite policy measures)	✓	Medium	Failure to implement pre-requisite policy measures is a low likelihood, but high consequence risk. Other risks associated with environmental water planning and management are low.
Reporting, monitoring, evaluation	✗	Medium	Monitoring to inform evaluation has been fragmented and poorly coordinated. Limited evidence of effective forward planning.
Compliance	ongoing	Low	

Note: A tick for on schedule means the element is progressing in line with agreed timelines. The level of risk assigned reflects the risk to achieving the objectives of the element, after taking into account actions to manage the risk. For example, while water take compliance is fundamental to achieving the outcomes of the Plan, Basin Governments have agreed on substantial changes that, when implemented, will provide greater confidence and assurance of compliance with water take rules.

5 Where does this leave us?

The next five years will be challenging

Over the next five years, the focus will shift from negotiating key details to implementation. The task ahead includes:

- implementing the supply and efficiency measures. This is particularly complex, and adequate time will be needed to plan, consult and obtain the necessary approvals
- embedding Basin Plan arrangements and ensuring compliance with them
- enhancing environmental watering efforts
- putting in place monitoring and evaluation arrangements to learn, adapt and review the outcomes of the Plan.

There is $4.9 billion remaining and it is critical it is spent effectively.

The task ahead is challenging in its own right. However, it is made more difficult by the context in which Basin Governments will commence the next phase of implementation.

The implementation of supply measures is facing growing opposition in some of the affected communities. Some stakeholders are concerned that, if done poorly, implementation will impinge on their land or water property rights. Others are concerned that the equivalent environmental outcomes envisaged from these projects cannot be achieved, or that their local environmental values will be compromised to achieve broader Basin Plan objectives.

Some communities are increasingly sensitive to the socioeconomic impacts of the Plan. They are concerned about the potential impacts of further water recovery, including the additional 450 GL through efficiency measures.

For both supply and efficiency measures there is a lack of decisive direction-setting leadership and clarity about responsibility for what increasingly will be polarising activities in some communities.

An overwhelming number of participants to the inquiry indicated that stakeholder confidence has been rocked by concerns that some Basin States have been lax in ensuring compliance with water take rules. An unwillingness to demonstrate that water acquired for the environment can be protected from extraction further downstream, and allegations of fraud in water recovery programs have compounded these concerns and left stakeholders sceptical of the motivations of Basin Governments.

Much of the community unease is driven by the way Basin Governments have sought to negotiate and navigate their way through issues. Their approach has lacked transparency and candour. Examples of this include the absence of detailed information on the business cases that describe the SDL adjustment measures, and the absence of strategies to deal with relatively minor issues such as potential over-recovery.

More than most other policy issues, the management of the Basin is prone to poor credibility created by decades of States promoting their own interests in negotiations and a recent history of over-promise in commitments on the Plan.

A stitch in time to rebuild confidence

The passing of amendments to the Plan (accepting the package of supply measures and the Northern Basin Review) and an agreement by Basin Governments to address compliance concerns provide a more credible platform for change. Basin Governments now have an opportunity to demonstrate their commitment to jointly implement the Plan and work together to re-build public confidence.

Basin Governments should openly acknowledge the issues for the next phase of implementation and transparently deal with them. Denial or blame-shifting will compromise the quality of outcomes, lead to poor investment decisions and further erode community confidence.

The Commission, in crafting its draft recommendations, has taken the view that the best way to restore community confidence in water management in the Basin is to go back to the basics of good management. This means:

- there is clarity about roles and responsibilities, where responsibility is given to institutions who can best achieve the outcome in the long term
- there are effective processes for collaboration for implementation with all parties having a genuine commitment to shared goals and co-operative working arrangements
- there is transparency and clear accountability for decisions and actions, and the costs and benefits of decisions are clearly articulated
- there is meaningful community engagement, with stakeholders informing the design of the processes used by Governments to engage with them to enable their issues and concerns to be understood and properly considered by decision makers.
- there are adequate reporting, monitoring, evaluation and review processes in place, providing the information and opportunity to review decisions in the light of experience.

These are the principles the Commission has used when making draft recommendations. Our draft recommendations are forward-looking and are aimed at improving current arrangements to ensure that the Basin Plan is implemented effectively, that reforms are long-lasting, and that they have the confidence of the community.

There are three broad areas where the implementation of the Basin Plan needs to be improved.

Governance and leadership

Governance and leadership are important across all elements of Basin Plan implementation. The Plan is a joint responsibility of Basin Governments and they need to work together to implement it. A fundamental foundation of collaboration is a real commitment by the parties to the Plan and accepting accountability for implementing it. Co-operative working arrangements need to be reformed so that collaborative efforts are coordinated and effective.

Program design and delivery

Collaboration is a key issue for delivery of the supply measures, efficiency measures and the Toolkit measures. An immediate focus on design of these programs should be to establish clear roles and responsibilities and ensure that there is accountability for decision making. Transparency is required for confidence in the projects, and to allow for meaningful engagement with key stakeholders so that their issues and concerns can be taken into account.

Ensuring quality and the durability of outcomes is more important than timelines, providing there is clear commitment to ultimate delivery.

Continuous improvement

The emphasis of the past five years was on establishing the Plan. Going forward, it is important that the adaptive management ethos in the Plan is translated into a genuine focus on continuous improvement across all elements. Effective arrangements for reporting, monitoring and evaluation are required to underpin this focus, and to provide the information and lessons learned so that scheduled reviews of elements and the Plan as a whole can be informed by new information and by experience.

6 The way forward

While significant progress has been made for many elements of the Plan, when considered as a whole, ensuring the success of the Plan in a way that maximises the benefits to the Australian community is still at risk.

Supply measures require integrated management

These highly complex, interlinked notional projects are potentially more cost effective than recovering 605 GL of water entitlements to achieve the environmental outcomes. Giving them every opportunity to succeed could save the Basin Governments in the order of hundreds of millions of dollars and significantly reduce community angst. They could also provide additional benefits to improve the long-term health of the Basin, such as the ability

to provide additional delivery capacity, greater flexibility for river operations and capacity to water new areas of the floodplain.

Having decided to progress with a package of supply projects, Governments must now commit to delivering them lest persistent delay, deferral of community agreement and subsequent potential for abandonment undermine the credibility of the Plan itself.

Interdependencies are a risk

Stakeholders are fully aware of the magnitude of issues to be resolved to implement supply measures and are concerned about likely impacts on cultural assets, the reliability of water entitlements, and impacts on land use. The apparent reluctance of Basin Governments to recognise the reality of these issues and to plan to undertake the projects with full consultation and appropriate issue resolution is further eroding community confidence.

Successful implementation of the supply measures package will require:

- recognition that the supply projects are an integrated package of projects with clear interdependencies between some projects in the planning, building and operation stages and which will ultimately need to be integrated into the operation of the River Murray and shared resources
- clear roles and accountabilities for project implementation and oversight
- realistic timeframes which enable consultation, approvals processes, planning and implementation to be undertaken properly
- meaningful engagement with communities, with fewer platitudes and greater incorporation of local knowledge. Stakeholders should be provided with information to understand the possible impacts on them and how these will be mitigated
- commitment to engagement with Traditional Owners not only at the local scale (as required by current legislation) but also at the program scale on the design, sequencing and operation of the package.

To address these issues, Basin Governments should develop an integrated plan for delivering supply projects to enable:

- management of interdependencies within the portfolio of supply projects
- the development of common policy principles and consistent approaches where required
- logical sequencing of projects
- coordinated community and stakeholder engagement including with Traditional Owners
- integration into ongoing river operations and management.

There is an important role for the MDBA (as the agent of Governments) to assist in the development and implementation of this integrated plan.

The Australian Government should establish a process to ensure individual supply measures offer value for money. Funding agreements for supply measures should be robust enough to hold Governments to account for their performance. This should include an independent and publicly available assessment of progress.

The 2024 deadline for supply projects is looking unrealistic

Due to delays in the development and approval of the package of supply measures, Basin States now face compressed timelines to implement these projects — with a range of significant policy issues still to be resolved before they can commence. Governments urgently need to agree on governance and funding arrangements and then establish the approach to implementing supply measures.

Failure to successfully implement these projects by 2024 would mean that either Basin States or the Australian Government may need to make good any shortfall in the offset, which could include further water recovery. However, the 2024 deadline for a number of these projects (particularly the constraints projects) is looking to be highly ambitious, if not unrealistic.

Governments should establish a process to extend the 30 June 2024 deadline for supply measures to be operational where an extension would allow retention of those projects where there is a high degree of confidence that they are likely to be effective.

Extending timeframes could be interpreted as a lack of commitment to the Basin Plan, thereby reducing public trust and confidence. But a greater threat to credibility is for Governments to persist while appearing ignorant of the risks that local communities see as obvious. An unwillingness to confront these risks head-on will feed the view of communities that Governments are incapable of implementing the plan, further increasing discontent across the Basin.

Governments should address these concerns on a case-by-case basis. For example, Basin Governments could agree to only allow extensions where independent assurance shows that an extension would facilitate desired benefits, there is a clear pathway for successful delivery and the proposed new timeline is credible. Governments should still be subject to make good if projects fail to meet revised deadlines.

The cost of poor implementation of supply projects is considerable

The changes proposed by the Commission would maximise the likelihood of supply measures succeeding in meeting their objectives and could potentially reduce the cost to taxpayers of meeting SDLs by hundreds of millions of dollars. For example, failure to implement the Menindee Lakes, constraints and hydro-cues projects (box 3), which together are estimated to account for between one-third and half of the total 605 GL offset, could

increase costs by the order of $480 million, if the Government needs to make good on any shortfall by recovering water through purchases or infrastructure works.[6]

Prudent design of the efficiency measures program is needed

There are currently significant risks to achieving the enhanced environmental outcomes being pursued through additional efficiency measures.

- These additional outcomes are dependent on progress in easing or removing constraints. However, these projects are unlikely to be fully operational by 2024 and may not deliver the full range of flow rates required to deliver the additional outcomes. If constraints are not eased, rushing to recover the full 450 GL by 2024 would risk the Australian Government bringing forward significant expenditure for an asset that cannot be effectively utilised for many years, at a cost of up to $184 million in present value terms.[7]
- There is at present no coherent water recovery strategy that aligns water recovery with progress on easing constraints, ensures that recovered water will contribute to achieving the enhanced environmental outcomes in the southern Basin, and demonstrates how socioeconomic impacts will be mitigated.

With almost $1.8 billion available in the Water for the Environment Special Account, there is a critical need to rethink the implementation of the efficiency measures program before the Australian Government spends large sums of money. The Australian Government (in agreement with Basin States) should:

- undertake further modelling to establish the benefits of additional water recovery with the current suite of constraints proposals
- develop a strategy for the recovery of the additional 450 GL to ensure water recovery is effective, efficient and genuinely 'no-regrets'
  - this should include sequencing additional water recovery with progress in easing constraints (so that environmental water can be delivered at the flow rates required to achieve the enhanced environmental outcomes) and designing the program to identify and minimise socioeconomic impacts
- assess the benefits and costs as a whole through the independent statutory review of the Water for the Environment Special Account in 2021, which should examine: the updated modelling results; the progress and realistic timelines for easing constraints; and the likely costs of water recovery.

6 This estimate compares the average cost of implementing the key projects (based on their business cases) and the potential cost of recovering 250 GL through infrastructure works (the middle estimate of their water offset). Details of this estimate are in Appendix B.2 of the main report.

7 The estimate compares the net present value of the cost of recovering water through efficiency measures by 2024 and increasing the time over which water is recovered to 2030 (Appendix B.4).

Ensuring accountability for the Northern Basin Toolkit

A lack of firm deadlines and checks and balances for implementing the Northern Basin Toolkit means accountability for outcomes is limited. Basin Governments should ensure that the arrangements to implement the Toolkit measures are transparent, enable progress to be tracked and ultimately lead to understanding the effectiveness of the measures.

In the absence of such arrangements, there is a risk that the timeframes for implementing the Toolkit will blow out, or that some may never be put in place to the degree originally intended.

Significant issues in Water Resource Plans should not be rushed

Given the remaining workload, there is a significant risk that some WRPs will either not be accredited by 30 June 2019 (leaving SDLs on uncertain ground) or rushed through without appropriate consultation having been undertaken.

Issues such as defining permitted water take or changes to water management rules to protect environmental flows, could impact the property rights of entitlement holders. Other issues, such as ensuring critical human water needs can be met in extreme events and the identification of Indigenous values and uses, are important to achieving the outcomes of the Basin Plan. Where WRPs are dealing with significant issues such as these, it is critical that Basin Governments provide adequate time for consultation to ensure that stakeholders can understand the issues and have some input into solutions.

The MDBA and Basin States should immediately negotiate a pathway for granting extensions to the 30 June 2019 deadline for accrediting WRPs where there are outstanding issues with material impacts. Extensions should only be allowed in limited circumstances, in particular to enable adequate community engagement and negotiation of substantive changes to water management rules.

In the longer term, there is a need to clarify the purpose and effective format of WRPs and associated compliance processes.

The arrangements for evaluation are inadequate — and critical

Effective arrangements for monitoring and evaluation are critical to the successful implementation of the Basin Plan. Improvements are required to enable informed judgements about the extent to which the Plan is meeting its objectives to be made and to provide the information base for the review of the Plan in 2026.

The MDBA (as Basin Plan Regulator) should urgently publish a revised Basin Plan evaluation framework. Basin Governments should develop and publish a monitoring and evaluation strategy to meet its requirements.

The Basin Plan evaluation framework should define the specific questions that will be used to comprehensively evaluate the effectiveness of the Plan in achieving environmental, socioeconomic and cultural outcomes at both a region and Basin scale. This will enable Basin Governments to communicate the outcomes of the Plan in a clear, cogent and consistent manner.

The Basin Plan monitoring and evaluation strategy should describe the process by which the information needed to answer these evaluation questions will be obtained. This includes what information will be collected and by whom; the process to address information gaps; and the arrangements for sharing the costs of monitoring and evaluating the Plan between Basin Governments.

Institutional and governance arrangements need reform

Basin Governments should set firm direction for this phase of the Plan

It is unclear who is responsible for leading the implementation of the Basin Plan — the MDBA or Basin Governments. The MDBA has played the central role in developing the Plan and recommending key amendments. However, since the Plan was agreed in 2012, there has been a shift and Basin Governments have taken a more central role in deciding how it would be implemented as the responsibility for the management of water resources ultimately resides with them.

This shift has occurred implicitly. The MDBA has positioned itself as leading the implementation, and stakeholders most often perceive them to be an Authority that is in charge (although of what is unclear). Basin Governments have not sought to challenge this position, or explicitly claim this role. There is consequently uncertainty about who should respond to issues as they arise and an exposure to a lack of accountability. As a result, key risks to successful implementation have not been strategically managed with default to last minute negotiations as a crisis looms.

For the outcomes of the Basin Plan to be achieved and sustained, the Plan must be integrated into State water resource management frameworks and in joint arrangements for shared water resources.

A complex task lies immediately ahead for Basin Governments. The MDB Ministerial Council must set a much clearer tone of firm commitment *to the Basin itself, not just to their own patch,* with unmistakable collective direction for delivering on commitment. The Basin Officials Committee should put substance into this *Basin-wide* direction-setting at the detailed implementation level.

Structural reform of the MDBA is also required to manage its conflicting roles

The MDBA will continue to be critical in driving collaboration between and providing technical support to Basin Governments on key issues, particularly the implementation of supply, constraints and efficiency measures.

However, the MDBA is also the regulator of the Basin Plan. It is required to make final judgments on the success or otherwise of its own coordinated activity via supply projects and to manage breach or non-compliance of all aspects of the Plan. At times it may have to call out States when they are non-compliant.

Being an agent of those same Governments (a role that involves providing collaborative leadership, advice and technical capability to the Basin States) compromises the MDBA's ability to be an impartial regulator. This latter role is critical to restoring public confidence in the Plan. Conversely, having to regulate and stand in judgment of the States undermines the MDBA's ability to work closely and openly with them as a trusted adviser.

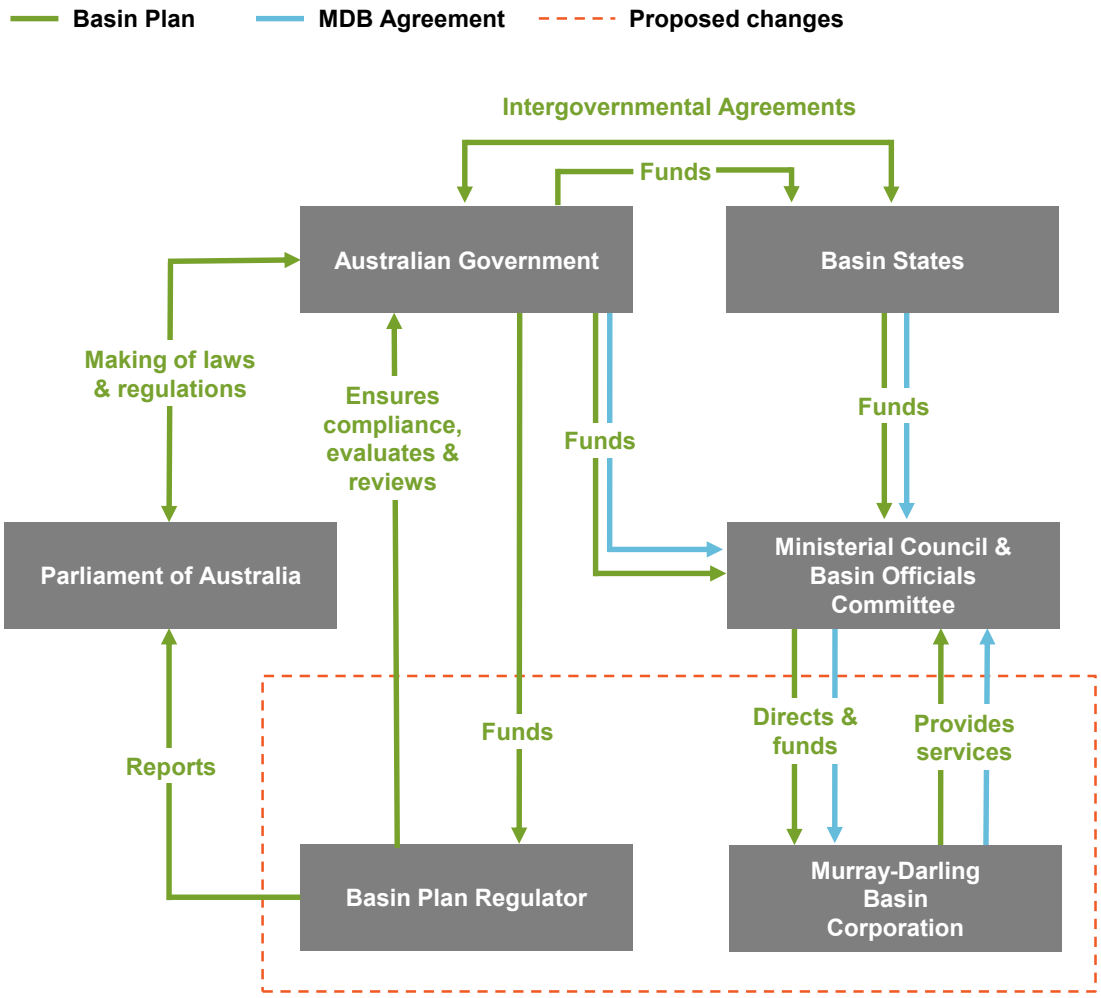
The MDBA has recognised and sought to manage these conflicts through their internal structure and processes. In the early phase of Basin Plan implementation, this was a pragmatic solution. However, the MDBA is an inherently conflicted entity and is perceived as such by stakeholders.

The conflict in the MDBA's roles will be exacerbated over the next five years. Its agent of Government role will grow, as Basin Governments draw on its technical capability and river operations skills to implement supply projects. Its role as regulator of the Basin Plan comes into full effect when WRPs are accredited. This conflict cannot be successfully managed through internal controls. In its current form, the MDBA cannot be a trusted adviser to Basin Governments and be a credible regulator.

Structural reform is required to assign the MDBA's two key roles to separate institutions (figure 2). Failure to do so will compromise the credibility of the MDBA and Basin Governments; the effective implementation of the Plan and community confidence that the significant investment made in the Basin Plan has led to meaningful change in the way water resources in the Basin are managed.

The agent of Governments roles of the MDBA should be assigned to a new Murray-Darling Basin Corporation (the Corporation). The Corporation would be governed, directed and funded by Basin Governments. It would provide them with the support, capability and services they require to implement the Plan and to manage joint water resources.

Figure 2 **Recommended institutional arrangements**



The compliance, evaluation and review functions of the MDBA should be assigned to a new independent Commonwealth statutory entity, the Basin Plan Regulator (the Regulator). The Regulator should be governed by a board comprising of members with skills that are aligned to its compliance and evaluation role.

As an interim measure, the MDBA should ensure its internal structure fully aligns with this separation of functions.

7 The potential costs of inaction are massive

Much is riding on how Governments implement the Basin Plan from this point forward. There is still about $4.9 billion in Australian Government funding left for implementing the Plan. Most of this is allocated to 'resetting the balance' through supply and efficiency projects. If major shortcomings in current arrangements are not addressed, projects are likely to fail or be implemented poorly. Failure will mean:

- the future costs of resetting the balance could be in excess of $480 million higher (the cost of having to make good by acquiring water entitlements plus any cost of wasted expenditure on failed projects)
- poor environmental outcomes as the anticipated benefits of projects are either delayed or do not eventuate
- community trust and confidence in the Plan and Basin Governments will be reduced further, particularly if there is a perception that money is being wasted as Governments are unaware of issues, or unwilling to confront them
- there will be shortcomings in key arrangements that will have potentially significant implications for how water is managed for the environment and to meet users' needs.

The Commission has made 35 draft recommendations that would significantly improve the arrangements for implementing the Plan, if accepted. The recommendations are organised by timeline and responsible institution in boxes 4 and 5.

Most of our recommendations are essential but incremental improvements to the current arrangements.

By their less dramatic nature, there will be a strong temptation to ignore many. How often is planning or compliance or governance really treated seriously, when there is the capacity to focus on drought or environmental disaster?

But absent such changes, delivery of the Plan is at risk. It has been a real achievement to get this far, and the objectives remain vital to an iconic region of Australia.

Box 4 **Short-term priorities (within 12 months)**

Basin Governments

- Take joint responsibility for implementing the Basin Plan (14.1)
- Review the capability and resourcing required to jointly implement the Plan (14.3)
- Develop an integrated plan for delivering the package of supply measures (4.1)
- Extend the deadline for delivery of supply measures to enable projects that offer value for money to be delivered in credible timeframes (4.2)
- Develop a Basin Plan monitoring and evaluation strategy (13.3)
- Put in place transparent and accountable governance arrangements for implementing the Northern Basin Toolkit (4.5)
- Agree on a policy and timeframe for addressing over-recovery (3.1)
- Negotiate a pathway for granting extensions to the timelines for WRP accreditation where there are outstanding issues to give sufficient time for adequate community engagement. (6.1)
- Publish a work plan that describes how delivery capacity and constraint issues associated with changes in water use and trade will be investigated and managed (10.2)
- Formalise arrangements to coordinate connected environmental watering activities (11.4)
- Consider the costs and benefits of metering policies, including the role of metering standards (12.2).

The Australian Government

- The Australian Government to ensure there are specific milestones and clear responsibilities in any future intergovernmental agreements and there is a process of independent assessment of progress against these (13.1)
- The Department of Agriculture and Water Resources (DAWR) to establish a review process to determine if supply projects offer value for money prior to funding (4.4)
- DAWR to publish the advice it has received on environmental priorities for water recovery once transactions are complete (3.2)
- DAWR to update its water recovery strategy to include the no regrets principles (5.2)
- CEWH to ensure processes are in place for coordinating event-based watering decisions (11.5).

Murray-Darling Basin Authority

- Change its internal structure to create the Office of the Basin Plan Regulator to house all compliance and evaluation functions (14.4, 12.1)
- Revise its compliance policy to convey its role in system-wide Basin Plan compliance and that water take enforcement is a Basin State responsibility (12.3)
- Develop a revised Basin Plan evaluation framework (13.2)
- Devise a strategy for undertaking SDL reconciliation to enable adaptive management and to assess reasonable progress (4.3)
- Update its modelling to establish the environmental benefits of additional water recovery (5.1)
- Determine the extent of any over-recovery (3.1)
- Clarify the annual reporting obligations of Basin States to enable them to demonstrate compliance with WRPs and the process for amending WRPs (6.2)
- Develop a detailed terms of reference for the 5-yearly evaluation of the effectiveness and efficiency of WRPs in consultation with Basin Governments (6.3)
- Include in the 2019 Basin-wide environmental watering strategy clearer guidance on the relative priority of assets and types of watering activities (11.1)
- Develop an assessment framework for evaluating trade restrictions (10.1).

Box 5 **Medium-term priorities (2-5 years)**

Basin Governments

- Agree and embark on the institutional reform to establish the Murray-Darling Basin Corporation — an agent of Basin Governments, and the Basin Plan Regulator — an independent Commonwealth statutory authority (14.2)
- Target any further assistance to communities where substantial adverse impacts from water recovery have been identified (3.3)
- Direct the 2021 review of the Water for the Environment Special Account to review the benefits and costs of pursuing the enhanced environmental outcomes, to inform how the Australian Government should proceed with water recovery (5.3)
- Amend the Basin Plan to remove the requirement for Basin Annual Environmental Watering Priorities (11.3)
- Review the skills mix of the statutory appointments in establishing the Basin Plan Regulator (14.5).

Basin States

- Ensure processes are in place for identifying social and cultural outcomes that could be achieved from environmental watering (11.6)
- Manage the risks to achieving environmental outcomes by delivering complementary management activities (11.7).

Murray-Darling Basin Authority

- Review the salt export objective (8.1)
- Provide material to Basin States to guide the first revision of long-term watering plans (11.2).

Draft findings and recommendations

Chapter 3 — Recovering water for the environment

The Australian Government (through the Australian Department of Agriculture and Water Resources) is required to recover 2075 GL of surface water and 40.4 GL of groundwater by 1 July 2019. The surface water target was revised down from 2750 GL, after adjustments to the Sustainable Diversion Limits (SDLs) were made in 2018. The water recovered contributes to a held water portfolio that is managed to achieve the environmental objectives of the Basin Plan. The Australian Government has spent $6.4 billion on bridging the gap, which includes purchasing water and investing in water-saving infrastructure. In addition, $189 million has been provided through structural adjustment programs to support communities adjust to reduced water availability.

DRAFT FINDING 3.1

A total of 1995.8 GL of the 2075 GL needed to meet the adjusted Sustainable Diversion Limits has been delivered.

Finalising water recovery by 1 July 2019 is contingent on:

- recovering a further 29.1 GL from the northern Basin, 37.7 GL from two Queensland groundwater resources and 0.4 GL in one surface water resource in Victoria
- the delivery of 121.7 GL that is contracted, but has not yet been delivered
- recovering 62 GL through efficiency measures
- any changes to planning assumptions that affect the contribution of those water entitlements already recovered towards water recovery targets.

Although a small gap remains, the risk of not meeting the water recovery target is low.

DRAFT RECOMMENDATION 3.1

Once Water Resource Plans are finalised in July 2019, the Murray-Darling Basin Authority should assess and determine the extent of over-recovery.

Basin Governments should then agree to a policy and timeframe to address any over-recovery where it has occurred.

DRAFT FINDING 3.2

The Department of Agriculture and Water Resources does not have a systematic and transparent process to demonstrate that water recovered has environmental value.

DRAFT RECOMMENDATION 3.2

The Department of Agriculture and Water Resources should ensure that water recovery aligns with environmental requirements and its processes for doing this are transparent.

To ensure accountability, it should publish all advice provided by the Commonwealth Environmental Water Holder (including advice on strategic purchases) once transactions are complete.

DRAFT FINDING 3.3

The Department of Agriculture and Water Resources has accounted for the impacts of improving irrigation efficiency on return flows in some major water recovery projects, but has not systematically accounted for these impacts in all water recovery programs.

The overall impact of improved irrigation efficiency on water resources is not precisely known. The Murray-Darling Basin Authority (as Basin Plan Regulator) is responsible for determining this risk to Sustainable Diversion Limits.

DRAFT FINDING 3.4

The size and speed of water purchases has had negative impacts on some regional communities.

Recovering water through infrastructure modernisation has partially offset pressure for structural adjustment in some communities, but at a significant cost to taxpayers.

However, higher water prices, water trade, and other ongoing pressures for change in the agriculture sector mean that some structural change is inevitable.

DRAFT FINDING 3.5

The Department of Agriculture and Water Resources has not always demonstrated that water recovery has been cost-effective in meeting its goal of mitigating adjustment pressures while sourcing water entitlements. It has:

- not systematically released information for strategic water purchases acquired by direct negotiation
- paid a substantial premium above market prices to recover water through infrastructure modernisation
- not undertaken a comprehensive assessment of benefits and costs of these approaches.

DRAFT FINDING 3.6

Grants-based structural adjustment programs are unlikely to have been effective at supporting communities.

- Assistance was not provided to those areas considered most vulnerable prior to the Basin Plan.
- Some projects considered to provide community assistance have not done so.

DRAFT RECOMMENDATION 3.3

If provided, the Australian Government should target any further assistance to communities where substantial adverse impacts from water recovery have been identified. This should:

- have clear objectives and selection criteria
- be subject to monitoring and evaluation.

Any support for regional development should align with the Productivity Commission's strategies for transition and development, set out in its report on *Transitioning Regional Economies*.

Chapter 4 — Supply measures and Toolkit

In the southern Basin, a package of 36 supply projects was agreed in May 2018, with funding of up to $1 billion.[8] These projects provide equivalent environmental outcomes, enabling the water recovery target to be offset by 605 GL and are required to be fully operational by 2024. Some of these projects are at the scoping or concept design stages of development. The Murray-Darling Basin Authority may undertake a reconciliation of the actual equivalent environmental outcomes of projects compared with their predicted outcomes in 2024. Failure to deliver projects by the deadline may require Governments to make good the shortfall through further water recovery. Similar projects are proposed for the northern Basin (referred to as Toolkit measures), although there are no formal consequences if these projects fail.

8 Constraints projects included in the supply package will also be able to seek up to $200 million in funding from the Water for the Environment Special Account.

DRAFT FINDING 4.1

It is likely that some key projects in the approved supply package will not be fully operational in 2024.

- They are behind schedule and the timeframe for implementation has been compressed due to delays in developing the projects.
- They are still in an early stage of development.
- History has shown that these types of projects are complex, interdependent and require extensive consultation to implement.
- A range of issues still need to be resolved between Governments before these projects can proceed. These include project risk sharing, monitoring, governance and funding.

DRAFT RECOMMENDATION 4.1

Basin Governments must resolve governance and funding issues for supply measures. They should develop an integrated plan for delivering supply projects to improve understanding and management of interdependencies within the package of supply projects within 12 months.

DRAFT RECOMMENDATION 4.2

Basin Governments should extend the 30 June 2024 deadline for supply measures to be operational where it would allow projects that offer value for money to be retained and their full benefits to be delivered within credible timeframes.

DRAFT RECOMMENDATION 4.3

The Murray-Darling Basin Authority (as Basin Plan Regulator) must devise a strategy for undertaking the reconciliation of supply measures against environmental equivalence. This strategy should include an adaptive management approach to assessing reasonable progress to enable projects to be delivered in realistic timeframes.

DRAFT RECOMMENDATION 4.4

The Department of Agriculture and Water Resources should establish a review process to determine if projects offer value for money and to determine credible timelines before final funding is approved.

DRAFT RECOMMENDATION 4.5

Northern Basin Governments should put in place transparent and accountable governance arrangements for implementing the Northern Basin Toolkit. These arrangements should include:

- a mechanism to establish clear milestones to ensure the Toolkit measures are implemented within reasonable timeframes
- an independent assessment by the Murray-Darling Basin Authority, as Basin Plan Regulator, of progress and effectiveness in implementing the measures.

Chapter 5 — Efficiency measures

The Basin Plan allows for the recovery of an extra 450 GL of water to pursue environmental outcomes additional to those that can be achieved by recovering the equivalent of 2750 GL (outlined in Schedule 5 of the Plan). These enhanced environmental outcomes are also dependent on easing or removing constraints (for example, flooding on private land). This extra water is to be recovered through efficiency measures — infrastructure investments to reduce water loss. Efficiency measures must meet the Basin Plan requirement for neutral or improved socioeconomic outcomes. $1.575 billion is set aside in a special account for water recovery through efficiency measures.

DRAFT FINDING 5.1

The current test of neutral or improved socioeconomic outcomes (based on voluntary participation in infrastructure projects) does not fully address stakeholder concerns about impacts of additional water recovery on regional communities.

However, addressing these concerns by requiring efficiency projects to have no adverse impacts is impractical, and risks ruling out projects that achieve the outcomes at least cost.

Potential adverse impacts of further water recovery would be better addressed through program design, including close consultation with water users and irrigation infrastructure operators.

DRAFT FINDING 5.2

Current progress in implementing efficiency measures provides little confidence that the enhanced environmental outcomes of the Basin Plan will be achieved by 2024 or on budget.

- There has been no update to the modelling to estimate what environmental benefits can be realistically achieved, given proposed projects to ease or remove constraints are unlikely to achieve the anticipated flow rates at key sites or be fully operational by 2024.
- Basin Governments have not yet agreed on an efficiency measures work plan to recover 450 GL by 2024, including how major socioeconomic impacts will be addressed.
- Despite this, the Australian Government is rolling out a water recovery program Basin-wide, which risks recovering water in the northern Basin that may not be useful to achieving the enhanced environmental outcomes in the southern Basin.
- There is a material risk that recovering 450 GL could be significantly more expensive than anticipated. The benefits and costs of the program as a whole have not been assessed (and there is no requirement to do so).

DRAFT RECOMMENDATION 5.1

The Murray-Darling Basin Authority should immediately update and publish its modelling to establish the environmental benefits of additional water recovery with the current proposals for easing or removing constraints.

DRAFT RECOMMENDATION 5.2

The Department of Agriculture and Water Resources should release a new strategy for recovering the additional 450 GL in a no regrets fashion in early 2019. No regrets water recovery requires that:

- the strategy should plan for a range of scenarios for constraint easing or removing and costs, and evolve as new information becomes available
- water recovery should align with progress in easing or removing constraints
- the volume, type and location of water recovered should clearly contribute to achieving the enhanced environmental outcomes in Schedule 5 of the Basin Plan
- alternative water products (such as leases and options) should be considered where capable of meeting enhanced environmental outcomes at a lower cost than the permanent recovery of entitlements
- program design and implementation should explicitly consider potential socioeconomic impacts and include mitigation strategies. This should include close engagement with affected communities and industries
- prices paid for water (per ML and total expenditure) should be within predetermined benchmarks. Where they exceed this benchmark, projects should be subject to independent scrutiny and the reasons made publicly available.

DRAFT RECOMMENDATION 5.3

The Water Minister should direct the independent review of the Water for the Environment Special Account scheduled for 2021 to review the benefits and costs of pursuing the enhanced environmental outcomes in Schedule 5. This should include:

- identifying what enhanced environmental outcomes can be achieved, given progress in easing or removing constraints, and how much environmental water would be required to do so
- the benefits and costs of other approaches to achieving those environmental outcomes.

The Australian Government should use this information to determine how to proceed with water recovery in a way that maximises net benefits to the community, or whether to pursue the enhanced environmental outcomes through other means.

Chapter 6 — Water resource planning

Water Resource Plans (WRPs) ensure that the Basin Plan (particularly the SDLs) is reflected in state-based water management arrangements. The MDBA's accreditation of WRPs is due to be finalised by 30 June 2019, at which time its role in ensuring compliance with the Plan takes full effect.

DRAFT FINDING 6.1

The development and accreditation of Water Resource Plans is well behind schedule and there are key issues still to be finalised in some Water Resource Plan Areas.

There is a risk that attempting to accredit all Water Resource Plans by the 30 June 2019 deadline will:

- compromise the quality of some plans
- not allow sufficient time to consider and consult on key issues with affected stakeholders
- inadvertently impact the entitlements of water users or the environment
- reduce the effectiveness of Water Resource Plans in implementing key elements of the Plan including Sustainable Diversion Limits, the protection of environmental water and providing water for critical human needs.

This risk is highest for New South Wales, given the number of outstanding plans and the magnitude of proposed rule changes in some Water Resource Plan Areas. There is currently limited public information on how the Murray-Darling Basin Authority will address the risk of some plans not having accreditation by 30 June 2019.

DRAFT RECOMMENDATION 6.1

Basin Governments should immediately negotiate a pathway for granting extensions to the timelines for accrediting Water Resource Plans where there are outstanding issues to give sufficient time for adequate community engagement.

Extensions should only be given in limited circumstances, particularly where there are material impacts that require negotiation of substantive changes to state-based water management rules.

DRAFT FINDING 6.2

There are concerns that the process of developing Water Resource Plans has been onerous and unnecessarily costly because of inadequate guidance on the requirements of plans and little clarity of the Murray-Darling Basin Authority's expectations for accreditation.

Key details for the implementation of Water Resource Plans have not yet been agreed including the:

- requirements for annual compliance reporting, risking unnecessary compliance costs
- process for updating plans, risking an amendment process that inhibits adaptive management.

DRAFT RECOMMENDATION 6.2

In the next 12 months, the Murray-Darling Basin Authority (as Basin Plan Regulator) should:

- clarify what Basin States are required to self-report annually to show compliance with Water Resource Plan obligations
- articulate the compliance assessment regime relevant to Water Resource Plan obligations
- develop guidance and consult on how it proposes to assess future amendments to Water Resource Plans by Basin States.

DRAFT RECOMMENDATION 6.3

The Murray-Darling Basin Authority (as Basin Plan Regulator) in consultation with Basin Governments should develop a detailed terms of reference to assess the effectiveness and efficiency of Water Resource Plans in preparation for the five-yearly evaluation in 2020.

This evaluation should enable an assessment of the utility of Water Resource Plans for delivering on the objectives and outcomes of the Basin Plan.

Chapter 7 — Indigenous values and uses

The Basin Plan specifies how Indigenous values and uses are to be considered by Basin States in the preparation of Water Resource Plans and provides for Traditional Owners to be involved in the development of environmental watering priorities. Two organisations — the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and the Northern Basin Aboriginal Nations (NBAN) — represent Traditional Owners and work in partnership with the Murray-Darling Basin Authority to provide culturally authoritative advice.

DRAFT FINDING 7.1

Basin States have improved their formal processes for engaging Traditional Owners as part of Water Resource Plan (WRP) development.

Given that so few WRPs have been submitted for accreditation to date, there is a risk that Basin States have left too little time before July 2019:

- to complete effective engagement with Traditional Owners
- to have regard to the views of Traditional Owners in preparing their WRPs
- for MLDRIN and NBAN to develop their advice about whether the WRP requirements for Indigenous values and uses have been met.

This concern is greatest for New South Wales.

DRAFT FINDING 7.2

In addition to the development of Water Resource Plans, Basin Governments have developed a range of tools and processes to support the recognition of cultural values and uses in state water planning and environmental management and planning.

The Australian Government has committed $40 million to administer a program to support Indigenous investment in cultural and economic water entitlements in the Basin. The objectives and principles guiding the implementation of this program have not yet been articulated. It is unclear why this funding is limited to Indigenous communities in the Basin, rather than being available to all Indigenous communities in Australia.

Chapter 8 — Water quality

The Basin Plan sets out specific objectives and targets for water quality that aim to ensure that water is suitable for a range of purposes. These include: an objective for salt export of two million tonnes per year from the Basin into the Southern Ocean, site-specific salinity targets for flow management in the River Murray and the Lower Darling, and end-of-valley salinity targets. The main Basin Plan mechanism by which water quality is to be managed is through Water Quality Management Plans which form part of Water Resource Plans.

DRAFT FINDING 8.1

Salinity targets for flow management have been met at four of the five reporting sites.

The salt export objective has not been met. In periods of low flows, there can be an inherent conflict between meeting site-specific salinity targets and meeting the salt export objective.

DRAFT RECOMMENDATION 8.1

The Murray-Darling Basin Authority should review the Basin Plan salt export objective in its 2020 review of salinity and water quality targets. This review should consider:

- the relationship between the salt export objective and site-specific salinity targets that require a higher prioritisation to meet water quality objectives
- whether the objective should be respecified or abolished.

DRAFT FINDING 8.2

In the Lower Darling, the management of water quality during periods of low flow is of concern. The development of the Water Quality Management Plan for the New South Wales Murray and Lower Darling Water Resource Plan is the process to resolve this concern.

Chapter 9 — Critical human water needs

The Basin Plan sets specific water volumes required to meet critical human water needs in communities that are dependent on the River Murray for water. For communities that rely on water from sources other than the River Murray, the Basin Plan requires that Water Resource Plans describe how critical water needs will be met during extreme events such as drought and water quality events.

DRAFT FINDING 9.1

The Basin Plan provisions for supplying critical human water needs in the River Murray system in periods of low water availability are robust and no changes to the provisions are warranted.

DRAFT FINDING 9.2

The management of critical human water needs during periods of low flow in the Lower Darling is of concern. The development of the extreme event provisions in the New South Wales Murray and Lower Darling Water Resource Plan is the process to resolve this concern.

Chapter 10 – Water trading rules

The Basin Plan water trading rules aim to contribute to more efficient water markets by introducing new requirements to improve market information and promote confidence in the market, and defining the types of trade restrictions that are permissible in the Basin.

DRAFT FINDING 10.1

Some trade restrictions that were inconsistent with the Basin Plan trading rules have been removed.

The Murray-Darling Basin Authority (MDBA) has raised 16 instances of potential non-compliance with the trading rules with Basin States. Ten of these matters remain unresolved and the MDBA has not been clear with Basin States about the steps to resolve these in a timely way.

DRAFT RECOMMENDATION 10.1

The Murray-Darling Basin Authority (as Basin Plan Regulator) should:

- develop and publish an assessment framework for evaluating the consistency of trade restrictions against the Basin Plan trading rules, which gives guidance about how to estimate the costs and benefits of removing trade restrictions
- specify the timeframes that it will endeavour to meet in resolving trading rule compliance matters
- notify Basin States whether the ten unresolved matters raised with them amount to non-compliance and what action is required by Basin States to resolve them
- publish the reasons given by Basin States for restrictions on surface water trade
- publish its compliance determinations and the assessments that support each determination.

DRAFT FINDING 10.2

New information and reporting requirements specified under the Basin Plan trading rules are largely in place.

DRAFT FINDING 10.3

Growth of trade has increased demands on delivery capacity and put pressure on delivery constraints in some parts of the Basin. A range of community members are concerned about the effects on third parties and the environment.

Basin States and the Murray-Darling Basin Authority are aware of this strategic policy issue, but the process to resolve it is unclear.

DRAFT RECOMMENDATION 10.2

Basin Governments should set and publish a work plan within the next 12 months that describes how delivery capacity and constraint issues associated with changes in water use and trade will be investigated and managed. The work plan should specify responsibilities, timeframes and how this information will be communicated to the water market.

Basin Governments should assign the Murray-Darling Basin Authority (as an agent of governments) responsibility for identifying and managing risks related to changes in water use and trade in connected systems.

Chapter 11 — Environmental water planning and management

The outcomes of the Basin Plan are based on an assumption that Basin States would implement pre-requisite policy measures (PPMs) to enable the efficient use of environmental water. PPMs provide the capacity to credit environmental return flows for downstream environmental use and allow the call of held environmental water from storage to piggy-back on unregulated flows. The PPMs were assumed in the original modelling to determine the Sustainable Diversion Limits (SDLs) and have been incorporated in the environmental equivalence methodology that underpins supply measures and the associated adjustment to SDLs. By assuming PPMs would be implemented, a higher SDL could be determined. If PPMs are not implemented, SDLs may be recalculated.

The Basin Plan establishes an environmental management framework that outlines the principles and processes to coordinate the planning, prioritisation and use of environmental water. It includes a Basin-wide environmental watering strategy and catchment scale long-term environmental watering plans.

DRAFT FINDING 11.1

Although the Murray-Darling Basin Authority has approved the Pre-requisite Policy Measure (PPM) Implementation Plans for all relevant Basin States, there is some risk that PPMs will not be implemented by 30 June 2019.

DRAFT FINDING 11.2

The 2014 Basin-wide environmental watering strategy (BWEWS) has provided a strategic foundation for the environmental water planning of significant environmental water holders and has been used to inform their portfolio planning and watering decisions.

The 2014 BWEWS does not provide clear guidance on how to prioritise those assets or types of watering events that are most important for achieving the Basin Plan objectives and expected outcomes.

DRAFT FINDING 11.3

Only seven out of 20 long-term watering plans (LTWPs) have been developed and published, with the remaining 13 due to be published by the ACT, New South Wales and Queensland Governments by 30 June 2019 or earlier.

LTWPs are likely to be an important component of the Environmental Management Framework as they are:

- undertaken at the catchment scale and facilitate top-down and bottom-up input
- a mechanism to facilitate local input into environmental water planning activities and the prioritisation of assets within a catchment.

Basin States have adopted different approaches to specifying priorities, objectives and targets in LTWPs.

DRAFT RECOMMENDATION 11.1

The Murray-Darling Basin Authority, when developing the next five-year Basin-wide environmental watering strategy in 2019, should strengthen its value as the key strategic plan governing environmental watering across the Basin by:

- including a clear objective to 'maximise environmental outcomes through effective and efficient environmental water management'
- including a secondary objective that environmental watering should seek to achieve social or cultural outcomes, to the extent that environmental outcomes are not compromised
- providing clear guidance, under all water availability scenarios, on the relative priority of key Basin environmental assets (including instream assets) to achieving the overall environmental objectives of the Basin Plan and the expected outcomes set out in the strategy
- providing clear guidance, under all water availability scenarios, on the priority for achieving flow connectivity at the system scale relative to watering within an individual Water Resource Plan Area.

DRAFT RECOMMENDATION 11.2

Following the publication of the 2019 Basin-wide environmental watering strategy (BWEWS), the Murray-Darling Basin Authority (MDBA) should provide clear guidance material to Basin States on the expected content of long-term watering plans (LTWPs) when they are revised. This guidance material should include the need for LTWPs to articulate:

- realistic long-term objectives to be achieved from the available environmental water portfolio through watering activities within current operational constraints
- environmental watering requirements in the catchment including the required magnitude, timing and frequency of watering for priority assets, ecosystem functions and system connectivity
- the relative priority of assets within the catchment for achieving the objectives of the Basin Plan and the expected outcomes of the BWEWS
- the risks to the achievement of the long-term watering objectives.

The MDBA should seek the strategic input of asset managers and environmental water holders and managers when preparing this guidance material to ensure that the utility of LTWPs for environmental water decision making can be improved over time.

To improve the accessibility of information, the MDBA should maintain a register of LTWPs on its website, including relevant deadlines, progress towards completion, final documents when they are completed, and the status of each plan as they are reviewed and adapted over time.

DRAFT FINDING 11.4

The Basin annual environmental watering priorities:

- do not add value to the decision making of environmental water managers as they are released too late for consideration in their planning processes
- are becoming increasingly redundant as significant environmental water holders are moving to rolling multi-year plans.

DRAFT RECOMMENDATION 11.3

The Basin Plan should be amended to remove the requirement for the Murray-Darling Basin Authority to produce Basin annual environmental watering priorities.

DRAFT RECOMMENDATION 11.4

By 2020, Basin Governments should:

- agree to formalise the role of the Southern Connected Basin Environmental Watering Committee as the mechanism for intergovernmental coordination for environmental watering. Governance arrangements including terms of reference, membership and reporting responsibilities should be established
- establish a Northern Connected Basin Environmental Watering Committee as a mechanism for intergovernmental coordination for planning and coordinating connected environmental watering events in the northern Basin.

DRAFT RECOMMENDATION 11.5

Where not yet in place, the Commonwealth Environmental Water Holder (CEWH) should set out the processes it will use to consult and coordinate with key stakeholders to make event-based watering decisions — including water managers, asset managers and other environmental water holders.

These processes should be in place and documented in the CEWH's 2019-20 annual portfolio management plans.

DRAFT RECOMMENDATION 11.6

Before the first revision of long-term watering plans, Basin States and environmental asset managers should have processes to engage with local communities and Traditional Owners. These activities should identify opportunities to achieve social or cultural outcomes with environmental water, while ensuring environmental outcomes are not compromised.

DRAFT RECOMMENDATION 11.7

Basin States should manage the risks to achieving the environmental watering objectives set out in long-term watering plans by delivering complementary waterway and natural resource management measures (such as habitat restoration or weed and pest control).

Chapter 12 — Compliance

The Murray-Darling Basin Authority is responsible for ensuring compliance with the Basin Plan. This role comes into full effect once Water Resource Plans are accredited by 1 July 2019. Basin States are responsible for ensuring compliance with their own water laws to prevent illegal water take and ensure entitlement holders fulfil their licence obligations. Basin Governments have instigated a number of reforms in response to recent reviews, including developing a Compliance Compact which outlines their commitments to reform. This Compact is still to be endorsed by COAG.

DRAFT FINDING 12.1

The Murray-Darling Basin Authority's reforms of its regulatory approach (including the establishment of an Office of Compliance) are a step forward in establishing its capability, but it is too early to gauge the likely effectiveness of the new arrangements. The Productivity Commission will examine these in its 2023 review of Basin Plan implementation.

DRAFT RECOMMENDATION 12.1

As a transitional measure, the Murray-Darling Basin Authority should house its Sustainable Diversion Limit and Water Resource Plan compliance functions within the Office of Compliance, before its compliance role comes into full effect in July 2019.

DRAFT FINDING 12.2

Compliance reforms by Basin State Governments are a step forward in improving water take compliance regimes. Their efficiency and effectiveness will be reviewed in 2023 by the Productivity Commission.

DRAFT RECOMMENDATION 12.2

Basin States should consider the role, costs and benefits of consistent metering policies including the role of metering standards.

Basin Governments should work with Standards Australia to formally revise standards to ensure quality and cost effectiveness in water measurement.

The new metering implementation plans being developed by Basin States should be supported by publicly available business cases.

DRAFT RECOMMENDATION 12.3

Enforcement of illegal water take is the responsibility of Basin States.

The Murray-Darling Basin Authority (MDBA) should publicly report instances where Basin States are not effectively responding to concerns of illegal water take.

In instances where public reporting is ineffective, the MDBA should use system-wide enforcement levers such as Sustainable Diversion Limit accounting compliance mechanisms to enforce limits on water take.

Chapter 13 — Reporting, monitoring and evaluation

The Basin Plan specifies annual and five-yearly reporting requirements that Basin Governments must meet. Reporting arrangements are also set out in the intergovernmental agreements that underpin the implementation of the Plan. The Plan sets out a program for evaluating its effectiveness. Completing these evaluations is the responsibility of the Murray-Darling Basin Authority, but the information required to conduct the evaluations comes from many different parties.

DRAFT FINDING 13.1

There are weaknesses with the National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin that reduce its usefulness as a means to hold Basin Governments to account for meeting their commitments in implementing the Plan.

These deficiencies include that:

- milestones are inadequately defined and have been assessed as met when there is evidence to the contrary
- key information that informs assessments of progress against National Partnership Agreement milestones is not publicly released
- there have been delays in the release of assessments of progress against National Partnership Agreement milestones in some years.

DRAFT RECOMMENDATION 13.1

Given deficiencies in past agreements, for any future intergovernmental agreements relating to the implementation of the Basin Plan, the Australian Government should ensure:

- the roles of the Australian Government and Basin States are clearly identified
- specific performance milestones are identified, and that clear responsibility is assigned for the delivery of each milestone
- where milestones are linked to payments, that these payments are disaggregated with a payment per milestone to provide a genuine incentive for implementation
- reporting on the progress of Basin Governments in meeting milestones is timely
- independent assessment of the progress of Basin Governments is undertaken
- advice provided by relevant agencies, such as the Murray-Darling Basin Authority or the Commonwealth Environmental Water Holder, that is used to inform assessments of progress is published in full.

DRAFT FINDING 13.2

The current Basin-wide evaluation framework is unclear and there is a lack of a clear strategy to coordinate the collection of the information needed to monitor the outcomes of the Plan. This means that:

- actions taken to monitor outcomes in the Basin are fragmented and inadequately integrated
- there is the potential for information gaps that may result in future evaluations being unable to accurately and comprehensively assess the impacts and outcomes of the Plan
- there is a risk of monitoring activity being duplicated
- the ability of Basin Governments to clearly communicate the outcomes of the Plan is impeded.

DRAFT RECOMMENDATION 13.2

The Murray-Darling Basin Authority (as Basin Plan Regulator) should develop a revised Basin Plan evaluation framework. This framework should define the specific questions that are to be used to evaluate the outcomes and effectiveness of the Plan, and the scales and times at which these questions will be answered. The framework should be made publicly available, and be published no later than 2019.

DRAFT RECOMMENDATION 13.3

Basin Governments should develop a Basin Plan monitoring and evaluation strategy to implement the evaluation framework. This should describe the process by which the information needed to answer the evaluation questions set out in the framework will be collected. This includes:

- outlining what information will be collected and by whom
- identifying any information gaps, who will be responsible for addressing them and the process by which they will be addressed
- establishing the arrangements for sharing the costs of monitoring and evaluating the Plan between Basin Governments.

This implementation strategy should be developed by Basin Governments, supported by the Murray--Darling Basin Authority (as the agent of governments).

The strategy should be made publicly available and be published no later than 2019.

Chapter 14 — Institutions and governance

The *Water Act 2007* (Cwlth), Murray-Darling Basin Agreement and the Basin Plan have resulted in a complex suite of institutional and governance arrangements for water management in the Basin. Responsibilities are shared by Basin Governments and key agencies (such as the Murray-Darling Basin Authority (MDBA)) have been assigned multiple roles. There has been an implicit shift in responsibility for leading implementation from the MDBA to Basin Governments.

DRAFT FINDING 14.1

There are major shortcomings in the current institutional and governance arrangements and these pose a significant risk to the next phase of implementation of the Basin Plan.

- Responsibility for leading the implementation of the Basin Plan is not clear and there has been a lack of strategic leadership. There is uncertainty about who should respond to issues as they arise.
- The Murray-Darling Basin Authority has conflicting roles. Its ability to effectively perform its collaborative service delivery functions (as an agent of governments) and be an independent and credible regulator that ensures compliance with the Plan has been compromised by these conflicts.

These key deficiencies in institutional and governance arrangements have led to:

- a lack of transparency and accountability
- ineffective processes for intergovernmental collaboration
- stakeholders who are confused and frustrated by the efforts made to engage them due to a perceived lack of responsiveness
- key risks not being strategically managed and timelines slipping
- implementation being managed through last minute negotiations as a crisis emerges or a deadline looms.

DRAFT RECOMMENDATION 14.1

Basin Governments should demonstrate strategic leadership, take joint responsibility and direct the implementation of the Basin Plan.

The Murray-Darling Basin (MDB) Ministerial Council should collaborate to provide the strategic leadership and policy direction required to implement the Plan, and be ultimately accountable for implementation.

The MDB Ministerial Council should reform the institutional and governance arrangements for implementing the Basin Plan by:

- enhancing the role of and delegating accountability for implementation to the Basin Officials Committee (BOC). BOC should be responsible for managing the significant risks to successful implementation and ensuring effective intergovernmental collaboration
- ensuring that formal directions to BOC regarding implementation are publicly available
- ensuring that arrangements to assess progress, evaluate outcomes, and ensure compliance with the Plan are fully independent
- recognising that the Murray-Darling Basin Authority will continue to be key to driving collaboration between and providing technical support to Basin Governments as they implement the Plan
- ensuring that Basin Governments are individually and collectively resourced to perform their roles to implement the Plan.

DRAFT RECOMMENDATION 14.2

Basin Governments should agree to the restructure of the Murray-Darling Basin Authority to separate its service delivery and regulatory functions into two institutions.

The Australian Government should then embark on the necessary institutional reforms to establish the:

- Murray-Darling Basin Corporation — as the agent of Basin Governments
- Basin Plan Regulator — an independent Commonwealth Statutory Authority.

These institutional reforms should be in place by 2021.

DRAFT RECOMMENDATION 14.3

To enable it to carry out its enhanced role, by 2020 the Basin Officials Committee should:

- comprehensively review the capability and the resourcing it requires to jointly implement the Plan
- agree on the capability and services Basin Governments require of the Murray-Darling Basin Corporation to support them to implement the Plan and for shared water resource management
- establish new arrangements and processes to support ongoing intergovernmental collaboration.

DRAFT RECOMMENDATION 14.4

As a transitional measure, and before the Murray-Darling Basin Authority's compliance role comes into full effect in July 2019, the Office of Compliance should be broadened to be the Office of the Basin Plan Regulator, and include compliance and evaluation functions.

DRAFT RECOMMENDATION 14.5

In establishing the Basin Plan Regulator by 2021, the Australian Government should ensure that it will be effective, including by reviewing the skills mix of the statutory appointments and establishing a statement of expectations.

1 About this inquiry

1.1 About the Basin Plan and this inquiry

The introduction of the Basin Plan was a step change in the management of the Murray-Darling Basin (the Basin) (box 1.1). It is part of a comprehensive effort by the Australian and Basin State Governments[9] to reset the balance between environmental and consumptive use of water across the Basin and establish a sustainable water management system that can adapt over the long term.

The Plan sets environmental and other objectives for the Basin and establishes new, lower sustainable extraction limits to achieve them. It outlines key actions, decision making processes and timeframes that Governments are to adopt to implement the Plan.

The development of the Basin Plan was a lengthy and an often-contested process, involving much negotiation and compromise before it was finalised and became law in November 2012. Its development involved the consideration of a series of substantial trade-offs between balancing the environmental benefits across the Basin and the socioeconomic impacts on industries and regional communities of a permanent reduction in water available for irrigation.

Governments are to have largely established the new management arrangements embedded in the Plan by 30 June 2019. The activities to reset the balance between the environment and consumptive use are to be fully implemented by 30 June 2024.

The Productivity Commission has responsibility for assessing the effectiveness of implementation of the Basin Plan and associated Water Resource Plans (WRPs) every five years. This function was included in the *Water Act 2007* (Cwlth) to ensure there was a regular independent review. This type of comprehensive review is critical to ensure public confidence in the implementation of the Basin Plan. For these reasons, this review is different to the typical Productivity Commission inquiry.

9 The Basin States are New South Wales, Victoria, Queensland, South Australia, and Australian Capital Territory.

Box 1.1 The Murray-Darling Basin and the Basin Plan

The Murray-Darling Basin

The Basin covers over 1 million square kilometres, including significant areas of inland New South Wales, Victoria, and the ACT, and parts of Queensland and South Australia. The Basin and its water resources support:

- the cultural, social, environmental, spiritual and economic needs of more than 40 Indigenous Nations whose traditional lands fall within the Basin
- over 30 000 wetlands, 100 of which are recognised as nationally important due to environmental, heritage or cultural significance
- around 41 per cent of the total gross value of Australia's agricultural production, including 46 per cent ($7 billion) of the gross value of national irrigated agriculture
- the supply of drinking water for approximately 2.1 million people that reside within it, as well as a further 1.3 million people outside of the Basin.

The Basin Plan

The 2012 Basin Plan is the legal framework to reset the balance of water use in the Basin. It sets environmental and other objectives for the Basin and establishes new, lower sustainable extraction limits to achieve them. It also outlines the key actions, processes and timeframes that Governments are to adopt to implement the Plan.

Responsibilities

The Basin Plan is an instrument of the Australian Parliament. Basin Governments comprising the Australian Government and the State Governments of New South Wales, Victoria, Queensland and South Australia and the Government of the Australian Capital Territory (known as the Basin States) have agreed to implement the Plan.

The Australian Government has responsibility for water recovery programs, and the management of this water (by the Commonwealth Environmental Water Holder) for environmental purposes.

As constitutional responsibility for water resource management ultimately resides with them, the Basin States have a key role to ensure that their own State-based arrangements reflect and are consistent with the Basin Plan.

Basin Governments agreed that the Murray-Darling Basin Authority (an independent Australian Government statutory authority) would be responsible for preparing, implementing, monitoring and enforcing the Basin Plan.

Funding

Successive Australian Governments have made substantial investments to implement the Plan. $13 billion has been ear-marked for reform, including:

- $3.1 billion to purchase water entitlements for the environment
- $4.8 billion for investment in modernising irrigation infrastructure, with a share of water savings from some projects transferred to the environment
- $1.0 billion for supply measures (box 1.2).

The Australian Government later committed a further $1.775 billion over 10 years to a program to pursue enhanced environmental outcomes, by recovering an additional 450 GL (box 1.2).

Sources: ABS (*Gross Value of Irrigated Agricultural Production, 2016-17, Australia, July 2018*, Cat. no. 4610.0.55.008); DAWR (pers. comm., 22 June 2018); DAWR (pers. comm., 10 August 2018); MDBA (2015b); Senate Select Committee on the Murray-Darling Basin Plan (2016).

1.2 Key elements to implementing the Basin Plan

The Basin Plan sets out a number of key elements that are required for implementation. Other elements, while not specified in the Plan (such as water recovery programs) are also necessary for successful implementation. Key elements of the Plan and their timing is outlined in figures 1.1 and 1.2.

The Australian Government has had a central role in resetting the balance by bridging the gap to the Sustainable Diversion Limits (SDLs) and investing in SDL adjustment projects. The Plan also establishes ongoing roles for the Australian Government including setting Basin-wide environmental watering priorities, managing of the Commonwealth Environmental Water Holdings and ensuring compliance with the Plan.

The Basin States have been responsible for developing WRPs, for working with environmental water holders to plan and manage environmental water, and for ensuring water take compliance. They are also responsible for delivering SDL adjustment projects.

Resetting the balance by 30 June 2019

SDLs define how much water consumptive users can take from rivers and groundwater (the remainder is dedicated to the environment). SDLs are the core element of the Plan.

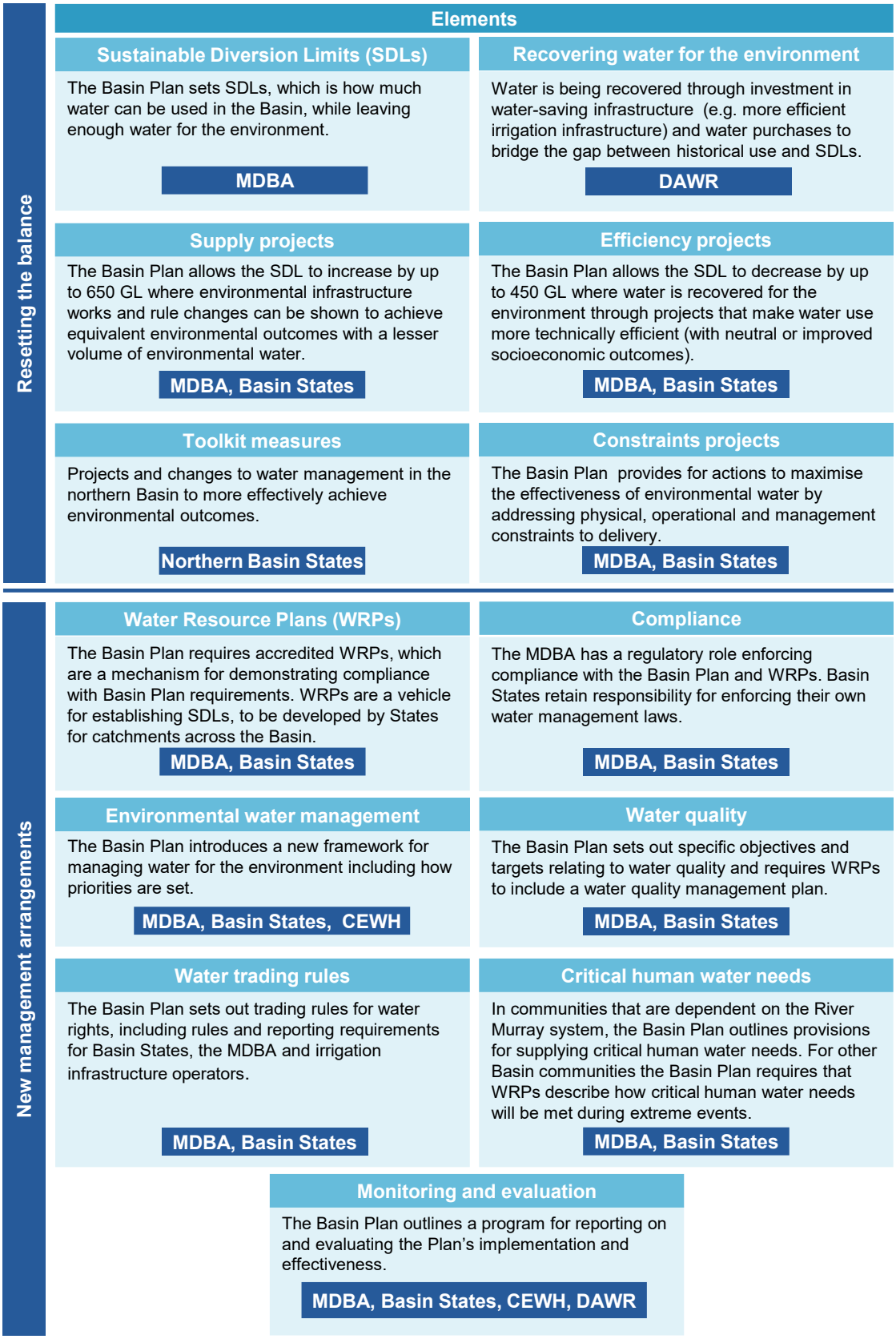
The SDLs in the 2012 Basin Plan required recovery of 2750 GL from consumptive use by 30 June 2019. To achieve this, the Australian Government committed to purchasing water entitlements directly and to investing in irrigation infrastructure.[10]

The Plan allows for SDLs (and water recovery targets) to be adjusted under certain circumstances, prior to them taking effect on 1 July 2019. In the northern Basin, these adjustments are to account for new information. In the southern Basin, SDLs can be changed by projects to achieve environmental outcomes with less water (*supply* and constraint measures) or through projects which aim to achieve enhanced environmental outcomes through the recovery of additional water for the environment (*efficiency* and constraint measures) (box 1.2).

A package of supply measures (including constraint measures) equivalent to 605 GL in water recovery has been approved and must be implemented by 30 June 2024. If this is not achieved, Governments may need to make up the shortfall with further water recovery. Basin Governments are required to notify the Murray-Darling Basin Authority (MDBA) of the volume of water recovered through efficiency projects by the end of 2023. All recovered water is to be transferred to the Commonwealth Environmental Water Holder by 30 June 2024.

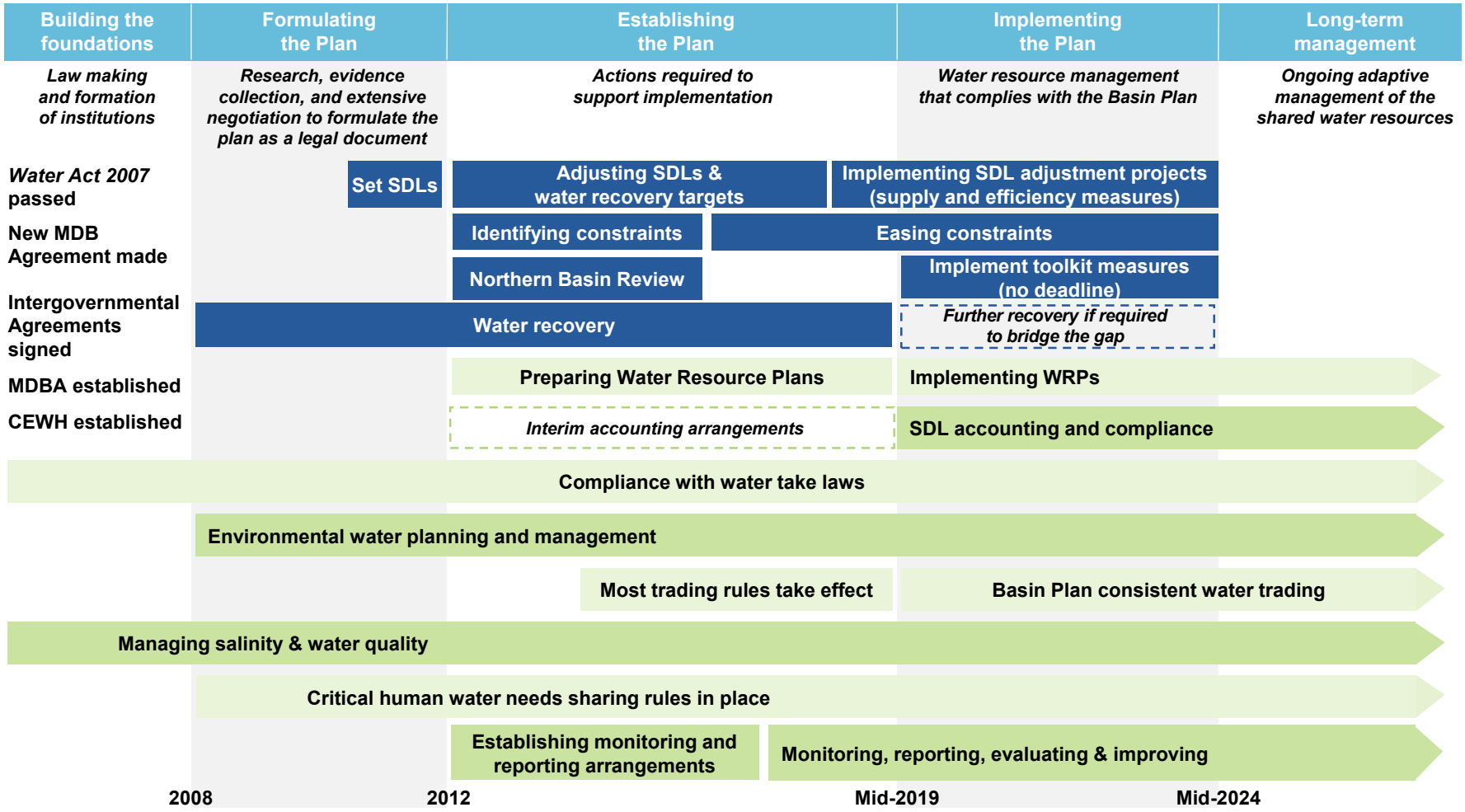
[10] The Australian Government committed to *bridge the gap* between the Baseline Diversion Limits and the SDLs by recovering water in a way that ensured that water entitlements would not be eroded or compulsorily acquired.

Figure 1.1 **Key elements of Basin Plan implementation**[a]



[a] Dark blue boxes in each element denote the key institutions responsible.

Figure 1.2 **Timelines for implementing the Basin Plan**



Box 1.2 Adjustments to Sustainable Diversion Limits

SDL Adjustment Mechanism

In the southern Basin, the Plan allows for adjustments to surface water SDLs through:

- **Supply measures**, which allow for achievement of equivalent environmental outcomes with a lesser volume of water. Examples include using pumping stations, regulators and levees to deliver water to lakes and floodplains without creating overbank flooding.
- **Constraints easing,** to overcome some of the impediments to delivery of water down the system. They can include changes to physical features such as crossings and bridges, as well as negotiating easements where private land is flooded.
- **Efficiency measures,** to achieve enhanced environmental outcomes above those achievable with 2750 GL by recovering an additional 450 GL for the environment with neutral or improved socioeconomic outcomes. Examples of these projects include works to reduce on-farm water losses from irrigation, with a share of the water savings provided to the Government as an entitlement. The enhanced environmental outcomes are in the southern Basin, and are achieved by watering larger areas of floodplains, higher stream flows, and meeting specific objectives for the Coorong, Lower Lakes and Murray Mouth in South Australia. Delivering these enhanced environmental outcomes is also dependent on easing water delivery constraints.

The aim of supply measures was to test whether environmental outcomes could be achieved with less water, thereby reducing the socioeconomic impacts on communities in the Basin. The inclusion of efficiency measures in the southern Basin reflects the opportunity to improve environmental outcomes (particularly in the Lower Murray) by recovering additional water for the environment.

Northern Basin Review

When the Plan was developed, the MDBA recognised that it required additional information to inform the setting of the SDLs in the northern Basin. As a result, governments agreed that the MDBA would undertake a review into the northern Basin, which was completed by the MDBA in November 2016.

The key recommendation arising from this review was to reduce the water recovery target in the northern Basin from 390 GL to 320 GL on the provision that the Australian, Queensland and New South Wales Governments implement Toolkit Measures to ensure effective management of environmental water in the north.

Basin Governments have agreed to implement the Toolkit measures recommended by the MDBA in the Northern Basin Review. These Toolkit measures aim to target water recovery, protect environmental flows, improve the coordination and delivery of environmental water, ease constraints to environmental water delivery in the Gwydir River and construct works to improve fish passage.

The Australian Government (with the agreement of the Australian Parliament) has made two amendments to the Basin Plan reflecting the adjustments to SDLs arising from the operation of the SDL adjustment mechanism and the Northern Basin Review.

New management arrangements are to be in place by 1 July 2019

Implementing the Basin Plan also involves establishing a new and ongoing management framework, which includes the following.

- Environmental water management activities whereby environmental water holders work together to deploy water to achieve the environmental objectives.
- Basin States embedding key parts of the Plan in their normal water planning and management processes through WRPs, with specific provisions relating to water quality and critical human water needs.
- Measures to establish consistent Basin-wide water trading rules for the trading and transfer of surface water and groundwater access rights, irrigation rights and water delivery rights; as well as consideration of third-party impacts of trading and provision of information to improve the operation of the market.
- A whole-of-Basin framework for monitoring and evaluating the impact and effectiveness of the Basin Plan, which includes public reporting requirements.
- A role for the MDBA to enforce compliance with the Basin Plan, noting that Basin States are to enforce compliance with their water take laws.

1.3 What was the Commission required to do?

The terms of reference require the Commission to assess progress towards implementing actions required under the Basin Plan within legislated timeframes, including the:

- extent to which stated water recovery and other targets are on track to be delivered within statutory timeframes
- likelihood that activities and arrangements now in place will ensure that these targets and timeframes will be met.

The Commission has also been asked to examine the extent to which current arrangements for implementing the Basin Plan — including for monitoring, compliance, reporting and evaluation — are likely to be sufficient to:

- support delivery of the objectives and outcomes of the Basin Plan and associated reforms (as listed in chapter 5 of the Plan)
- enable assessment of risks and risk mitigation requirements and provisions associated with Basin Plan implementation
- enable an assessment of progress in meeting the Plan's objectives and outcomes when the MDBA reviews the Plan in 2026.

The Commission has been asked to make findings on progress towards implementing the actions required under the Basin Plan. In particular, the Commission is to make recommendations on any actions required by the Australian Government or Basin States to

ensure timely implementation of the Basin Plan and the effective achievement of its intended outcomes.

The Commission's task in this review does not extend to examining the processes for setting the sustainable balance and associated targets in the Plan or measuring the impacts and outcomes of the Plan. However, it does examine the preparedness of Basin Governments and their institutions to undertake these activities effectively in the future.

1.4 The Commission's approach

The Commission has assessed the effectiveness of individual elements of the Basin Plan (such as WRPs and supply measures) as well broader governance and institutional arrangements (incorporating monitoring, compliance, reporting and evaluation) (figure 1.1). For individual elements, the assessment broadly involved:

- defining the purpose of the element and how it operates
- assessing Governments' progress in implementing agreed actions, taking into account whether Governments are on track to complete agreed actions within agreed timelines, whether those action are likely to achieve their intended outcomes, and whether implementation has been cost-effectiveness and followed good process
- identifying options for improving implementation, with the broader aim of maximising net benefits to the community.

The assessment of institutional and governance arrangements assesses the extent to which these align with well-established principles for good governance and are sufficient to manage the risks to future implementation.

The Commission placed greatest emphasis on assessing key implementation issues identified by inquiry participants and the Commission's own investigations. It has not sought to undertake a detailed audit of Plan implementation, such as reporting on each and every supply project or WRP requirement.

The Commission consulted widely

The Commission has consulted widely with stakeholders, drawing on input from participants through meetings and visits. Appendix A provides details of the individuals and organisations that have participated in the study to date.

Public forums were held in 14 locations across the Basin during March and April to enable members of the community to provide informal input into the inquiry. In accordance with the requirements of the Water Act, a stakeholder working group was established to provide a forum for the exchange of information and views on matters relevant to this inquiry.

A total of 89 submissions and 10 brief comments were received in response to the Issues Paper that was released in March 2018. Submissions are available on the Commission's website.

The Commission's assessment has been informed by a comprehensive review of relevant documents — including confidential documents — and detailed interviews with the agencies responsible for implementing the Plan, including:

- the Department of Agriculture and Water Resources
- the Murray-Darling Basin Authority
- Basin State water agencies
- Environmental water holders.

The Commission thanks all inquiry participants for meeting with Commissioners and staff, making submissions, and providing helpful information and looks forward to continued engagement with participants in the lead up to the final report.

Further opportunities for participation

You are invited to examine this draft report and comment on it by written submission to the Productivity Commission by **10 October 2018**. Further information on how to provide a submission is included on the inquiry website at http://www.pc.gov.au/inquiries/current/basin-plan.

The Commission will be conducting a series of regional briefings in locations throughout the Basin during September and October. The opportunity to provide formal oral evidence to the inquiry is available by participating in a public hearings. More information on the dates and locations of regional briefings and public hearings can be found on the inquiry website.

The final report for the inquiry will then be prepared and forwarded to the Australian Government by 31 December 2018.

1.5 A guide to the rest of the report

The rest of this report is set out as follows:

Chapter 2 provides a summary of progress to date.

Chapters 3 to 5 explore those elements that relate to resetting the balance:

- Chapter 3 Recovering water for the environment
- Chapter 4 Supply measures and Toolkit
- Chapter 5 Efficiency measures

Chapters 6 to 11 explore elements that relate to establishing new management arrangements:

- Chapter 6 Water resource planning
- Chapter 7 Indigenous values and uses
- Chapter 8 Water quality
- Chapter 9 Critical human water needs
- Chapter 10 The water trading rules
- Chapter 11 Environmental water planning and management

Chapters 12 to 14 explore cross cutting elements that support implementation:

- Chapter 12 Compliance
- Chapter 13 Reporting, monitoring and evaluation
- Chapter 14 Institutions and governance.

2 Summary of progress

The Basin Plan aims to reset the balance between environmental and consumptive uses of Basin water resources, and to establish new, more sustainable, water management arrangements. It requires the Australian and Basin State Governments to work together to complete a number of one-off tasks to establish the Plan, as well as ongoing tasks under the new business as usual.

This five-year assessment has considered the effectiveness of individual elements of the Basin Plan (such as Water Resource Plans (WRPs) and supply measures) as well as broader governance and institutional arrangements (incorporating monitoring, compliance, reporting and evaluation). This chapter provides a summary of the Commission's findings on progress to date and the key tasks that lie ahead. Subsequent chapters provide detailed assessments and recommendations.

2.1 There has been significant progress in establishing elements of the Plan

Basin Governments have made progress in many elements of the Plan, particularly in recovery of water for the environment, and the establishment of planning and management arrangements for the use of this water.

Water recovery to *bridge the gap* is largely complete

The Australian Government committed to *bridge the gap* between historical levels of water use and the new Sustainable Diversion Limits (SDLs) of the Basin Plan. This is almost complete, with 1995.8 GL[11] of the adjusted target of 2075 GL delivered to environmental water holders. The Australian Government recovered almost 60 per cent of this water through purchases from willing sellers. Most of the remainder was recovered through programs that modernise water infrastructure and return a share of water savings to the Australian Government.

The main outstanding issue for resetting the balance is ensuring that the approved package of supply projects to offset the overall water recovery target by 605 GL are fully operational by 1 July 2024. If this is not achieved the Murray-Darling Basin Authority (MDBA) may

11 A further 121.7 GL is under contract to be delivered by 1 July 2019.

re-estimate the size of the SDL adjustment. If revised downwards, Governments may need to recover more water to meet the SDLs.

New management arrangements for many elements are in place

Basin Governments have put in place the key foundations of the Basin Plan's new management arrangements and a number of these are working well.

- The Basin Plan's Environmental Management Framework formally outlines processes to coordinate the planning, prioritisation and use of environmental water. Over 750 environmental watering events have occurred over the past five years, targeted at specific environmental outcomes linked to the long-term objectives of the Plan. There is already some evidence of improved ecological outcomes at the local and system scale.
- New rules for providing critical human water needs in the River Murray are established, with stakeholders confident that these rules will ensure these needs can be met in extremely dry times.
- Basin Plan salinity targets are integrated into the Basin salinity management framework and have been consistently met for most areas.
- Basin States have improved their formal processes for engagement with Traditional Owners as part of WRP development, in particular they are taking a nation-by-nation approach to consultation.
- New requirements to improve water market information and market confidence (such as protocols to manage market sensitive information) are in place. The Basin Plan trading rules also include a mechanism to validate or remove restrictions on trade. Although this mechanism has not been applied extensively yet, it has the potential to improve the efficiency of water markets.

2.2 In other areas success is less certain

Some elements of the Basin Plan implementation have progressed more slowly than expected or have only just commenced.

Pre-requisite policy measures

The outcomes of the Basin Plan are based on an assumption that Basin States will implement pre-requisite policy measures (PPMs) to enable the efficient use of environmental water. PPMs provide the capacity to credit environmental return flows for downstream environmental use (rather than being used to meet the demands of other users) and allow the call of held environmental water from a specific storage to top up or 'piggy-back' on unregulated flow events. The PPMs were assumed in the original modelling used to set SDLs and were also incorporated in the environmental equivalence methodology that underpins

supply measures and the associated adjustment to SDLs. Without PPMs, a water recovery target of more than 4000 GL would be required to achieve the outcomes of the Basin Plan. If Basin States do not implement PPMs by 1 July 2019, the MDBA may recalculate SDLs.

There is some risk that PPMs will not be implemented by 30 June 2019.

Water Resource Plans

The development and accreditation of WRPs is behind schedule with a number of key issues still to be finalised. Of the 33 WRPs that must undergo accreditation, 20 are in the early stages, 11 are in draft form, one is in the accreditation process and just one has been accredited.[12]

In some WRP areas, significant rules changes are needed to meet Basin Plan requirements and these changes could impact on the reliability and use of entitlements. In these areas, meaningful consultation is required to resolve these issues and there is a concern that not enough time is left to do this well. There is a risk that old rules will be rolled into the new arrangements, or new rules will be rushed and ill-specified, resulting in WRPs being ineffective in addressing the issues. This risk is highest for New South Wales, given the number of outstanding WRPs and the magnitude of proposed rule changes in some plans.

Important technical work is still being undertaken by the Basin States and the MDBA to enable the SDLs to be fully operational by 1 July 2019. This includes work to enable SDLs to be accounted for, Basin States to report on the implementation of SDLs and the MDBA to assess compliance.

Supply measures

Basin States are required to implement supply measures in full by 2024. There were delays in the development of the package and this has compressed the timeframe for implementation. Significant challenges lie ahead.

- Basin Governments need to resolve governance, funding and managing risk before these projects can commence, straining the timeframe even further.
- The supply package relies heavily on six highly complex and interdependent projects that are still in the concept design stage of development (box 2.1). Past experience with similar projects shows that they require detailed consultation and take many years to plan and implement.
- There is a degree of dissatisfaction and mistrust in parts of the community, including Traditional Owners, arising from a lack of transparency and consultation.

The 2024 deadline for supply projects is highly ambitious, if not unrealistic.

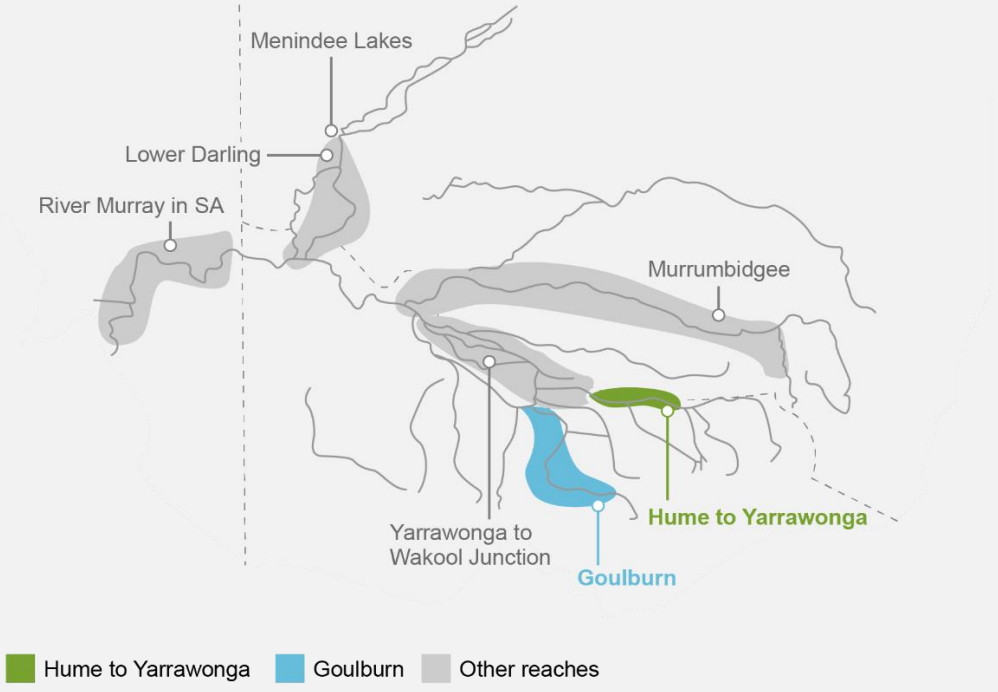
[12] Based on the most recent quarterly report on progress, released in May 2018.

Box 2.1 Challenging components of the supply package

The supply package relies heavily on six highly complex and interdependent projects, which could account for between one-third and half of the 605 GL expected water recovery offset. These key projects are still in the concept design phase.

- **Menindee Lakes —** a project that aims to improve the operation of the Lakes to reduce evaporative losses. It involves changes to infrastructure and operational arrangements and easing constraints in the Lower Darling.
- **Constraints —** four projects that aim to increase the size of flows that can be delivered down the river system. This involves removing physical barriers (such as increasing the height of bridges), building levees to protect land from inundation and negotiating and signing agreements with landholders whose land is flooded by the higher flows.
- **Hydro-cues —** a project that aims to increase the ability of environmental water holders to coordinate environmental water delivery with increases in natural flows. It involves operational rules changes and system enhancements to achieve in-channel, floodplain and wetland environmental outcomes. It is dependent on easing constraints.

Easing constraints in the supply package will involve negotiations with over 3000 landholders across five reaches (figure below). In the early 2000s, negotiations to secure easements for the right to release 25 000 ML/day from Hume Dam (green in map below) took almost eight years and involved negotiations with 103 landholders from Hume to Yarrawonga. Easing constraints in the Goulburn (blue in map below) is not required for supply measures, but is for efficiency measures.



Efficiency measures

Progress on implementing efficiency measures provides little confidence that the enhanced environmental outcomes of the Basin Plan will be achievable by 2024.

- Basin Governments have not yet agreed on a work plan for the efficiency measures to recover the additional 450 GL by 2024. The approach to meeting the Basin Plan's requirement for neutral or improved socioeconomic outcomes is still being contested and this is affecting program design and delaying progress.
- The proposed constraints projects are unlikely to be fully operational by 2024 and may not achieve the required flow rates at key sites to deliver the enhanced environmental outcomes.
- There has been no update to the modelling to estimate what environmental benefits can be realistically achieved, given proposed constraints easing projects are unlikely to achieve the anticipated flow rates at key sites or be fully operational by 2024.
- The current water recovery program is being rolled out Basin-wide, and risks recovering water in the northern Basin that is unlikely to be useful to achieving the enhanced environmental outcomes in the southern Basin.

There is a material risk that recovering the additional 450 GL could be significantly more expensive than anticipated. The benefits and costs of the program as a whole have not been assessed, and there is no requirement to do so.

Northern Basin Toolkit

The Northern Basin Toolkit was a key recommendation arising from the Northern Basin Review. Although recommended by the MDBA in 2016, the amendment to the Plan was not confirmed by the Parliament until mid-2018. The details for implementing the Toolkit (including key milestones for implementation, funding arrangements and program governance) are still to be settled by Basin Governments.

Monitoring and evaluation

Evaluating the outcomes of the Basin Plan is the responsibility of the MDBA. The current Basin-wide evaluation framework is not comprehensive and there is no clear strategy to coordinate the collection of information needed to monitor the outcomes of the Plan.

As a result, actions taken to monitor outcomes in the Basin are fragmented and inadequately integrated, and risk information gaps that will limit future evaluations of the Plan. This will impede the ability of Basin Governments to clearly communicate the outcomes of the Plan.

Summary of progress

Table 2.1 summarises progress made on implementing the Basin Plan. After five years of implementation, significant progress has been made in a number of elements. However, progress has been much slower than expected in a number of key areas.

Table 2.1 **Progress towards implementing Basin Plan elements**

Element	*On schedule*	*Risk to meeting its objectives*	*Nature of risks*
Resetting the balance			
Water recovery	✓	Low	
Supply measures	✗	High	Compressed timelines for implementation, with a range of issues to resolve. 2024 deadline is highly ambitious, if not unrealistic. No process for assessing whether individual projects in the supply package provide value for money. Risk to budget is hundreds of millions of dollars.
Efficiency measures	✗	High	The design of the efficiency measures program is contested. Enhanced environmental outcomes from additional water recovery require easing constraints, which is unlikely to meet timelines. Material risk that costs are significantly larger than anticipated.
Northern Basin Toolkit	n/a	Medium	No firm deadlines for implementation. Not subject to same checks and balances as supply measures (such as oversight by the MDBA).
New management arrangements			
Water resource plans (WRPs)	✗	Medium	Behind schedule. Complex issues in some WRPs yet to be resolved.
Critical human water needs	✗	Low	River Murray arrangements robust. WRP provisions for other areas behind schedule.
Water quality	✗	Low	Salinity targets largely being met. WRP provisions behind schedule.
Water trading rules	✓	Low	
Environmental water planning and management (including pre-requisite policy measures)	✓	Medium	Failure to implement pre-requisite policy measures is a low likelihood, but high consequence risk. Other risks associated with environmental water planning and management are low.
Reporting, monitoring, evaluation	✗	Medium	Monitoring to inform evaluation has been fragmented and poorly coordinated. Limited evidence of effective forward planning.
Compliance	ongoing	Low	

Note: A tick for on schedule means the element is progressing in line with agreed timelines. The level of risk assigned reflects the risk to achieving the objectives of the element, after taking into account actions to manage the risk. For example, while water take compliance is fundamental to achieving the outcomes of the Plan, Basin Governments have agreed on substantial changes that, when implemented, will provide greater confidence and assurance of compliance with water take rules.

Table 2.2 presents Australian Government expenditure on implementing the Plan to date and shows there are still large sums of funding allocated to programs to be implemented over the coming years.

Table 2.2 **Expenditure on implementing the Basin Plan[a]**

Expenditure as at 30 June 2018

Australian Government Program	*Committed funding*	*Expenditure*	*Share of total expenditure*	*Water recovered[b]*
	$ million	$ million	per cent	GL (LTAAY)
Bridging the gap programs	**8 017**	**6 385**	**79**	**1 940.0**
Direct purchase	3 094	2 650	33	1 226.9
Infrastructure modernisation:[c]	4 803	3 636	45	..
- Gap-bridging water recovery projects	*3 100*	*2 788*	*34*	*677.1*
- MDB Water Infrastructure program (gap-bridging component)	*150*	*0*	*0*	*0.0*
- Other projects and activities	*1 553*	*848*	*10*	..
SARMS (water recovery)	120	99	1	36.0
Structural adjustment assistance	**189**	**189**	**2**	**..**
MDB Regional Diversification [d]	100	100	1	..
Strengthening Basin communities	64	64	1	..
SARMS (regional development)[d]	25	25	0	..
Other implementation programs [e]	**4 796**	**1 548**	**19**	**1.3**
SDL adjustment mechanism	3 075	46	1	1.3
MDBA for Basin Plan functions[d]	59	59	1	..
Implementation payments to States	136	76	1	..
Other programs and activities[f]	1 526	1 367	17	..
Total	**13 002**	**8 122**	**100**	

[a] The table does not include ongoing funding secured for Australian Government statutory authorities (MDBA, CEWH, BOM and MDB Joint Programs) for essential Australian Government water functions in the 2016 Mid-Year Economic Fiscal Outlook. [b] Under contract as of 10 July 2018; excludes state recoveries and water gifted to the Australian Government. Water recovered under the SDL adjustment mechanism is attributable to the Commonwealth On-Farm Further Irrigation Efficiency (COFFIE) program and is not gap-bridging water. [c] Infrastructure modernisation funding includes non-water recovery projects, including environmental works such as the South Australia Coorong, Lower Lakes and Murray Mouth project and other activities. [d] Funding was provided to other agencies to deliver these programs and is reported as per original funding and as fully expended when funds were transferred to the relevant agency. [e] Includes funding for the SDL adjustment mechanism through the Sustainable Rural Water Use and Infrastructure Program (SRWUIP) and the Water for the Environment Special Account, Basin Plan activities (initial funding provided through the SRWUIP) and implementation payments to Basin States. [f] Includes funding for South Australia Riverland Floodplains Integrated Infrastructure project ($155 million), the industry assistance component of South Australia River Murray Sustainability (SARMS) program ($120 million) and other Basin programs.

.. Not applicable; LTAAY = Long-term average annual yield

Source: DAWR, pers. comm. 16 August 2018.

2.3 Outcomes of the Plan

As noted in chapter 1, the Commission's task in this review does not extend to measuring the impacts and outcomes of the Plan. The MDBA's *Basin Plan Evaluation*, released in December 2017, considered the environmental, social, cultural and economic outcomes of

the Basin Plan so far, drawing on a series of technical reports (MDBA 2017b). The MDBA has subsequently released Southern Basin community modelling by KPMG (February 2018) and an addendum to the Basin Plan evaluation (June 2018) which included additional analysis of irrigation-dependent communities in the southern Basin (MDBA 2018d).

The socioeconomic impacts of water recovery

Recovering water for the environment has been a highly contentious element of establishing the Basin Plan (chapter 3). This is because it results in a permanent reduction in the volume of water available for irrigated agriculture, with flow-on impacts for regional communities.

Water recovery occurred rapidly between 2008 and 2012, on the back of large open-market tenders to purchase water. Community opposition soon emerged to the open tenders. The impacts of these programs, coupled with ongoing drought conditions and the legacy of pre-Basin Plan water recovery, were seen to create considerable hardship in communities and undermine the viability of some irrigation districts.

Concerns over the flow-on impacts of water purchases — and a change of government — led to a revised water recovery strategy in 2014 (DOE 2014). The Murray-Darling Basin Ministerial Council agreed to slow the rate of water recovery to mitigate the risk of over-recovery. The Australian Government imposed a legislative cap of 1500 GL on surface water purchases, and stated a preference for infrastructure projects to recover the remaining water.

Directly purchasing water has generally had positive outcomes for participating irrigators, particularly for those who transitioned out of irrigated agriculture. Selling water compensates the irrigator, facilitating adjustment by providing them with financial resources to pay down debt, invest on-farm, or exit the industry. However, the flow-on impacts of water purchases on Basin communities are less clear cut. Purchasing water leads to a permanent reduction in water availability and limits potential irrigated agricultural production. How irrigators (cumulatively) adjust will affect service providers, employment opportunities, and the viability of regional communities. There can be significant distributional impacts as some areas benefit, while others do not.

Some water purchases have had adverse impacts at the local scale, such as where significant irrigation businesses sold large parcels of water. This has created rapid and significant adjustment pressures on some small irrigation-dependent communities. In the northern Basin, the MDBA has identified towns that were adversely affected by early, relatively large water purchases. For example, the largest employer in the Collarenebri area sold its entire water holdings in 2009 and converted to dryland farming — this has been one driver of falling agricultural employment in that community (MDBA 2016f).

Box 2.2 outlines key findings on socioeconomic impacts of the Plan from the MDBA reports mentioned above.

Box 2.2 Murray-Darling Basin Authority's evaluation of the impacts of Basin Plan water recovery

The Murray-Darling Basin Authority's (MDBA's) 2017 *Basin Plan Evaluation* found that changes in the social and economic condition of the Basin were consistent with what was expected prior to the Basin Plan (MDBA 2017b). Overall, the population and economy of the Basin has continued to grow, even with the recovery of water for the environment.

The MDBA found that the Australian Government's approach to water recovery (prioritising recovering water through projects that modernise irrigation infrastructure and return a share of the saved water to the environment) has helped to lessen the effect of recovering water on industries and communities in the Basin. In the MDBA's view:

- on-farm infrastructure modernisation has allowed irrigators to retain a portion of the water saved through the Australian Government's programs, which has helped to improve farm productivity
- irrigators have benefited from the upgrading of irrigation delivery systems through off-farm programs
- the operation of the Sustainable Diversion Limit adjustment mechanism (and the associated 605 GL reduction in the water recovery target) will improve social and economic outcomes in the Basin.

The 2017 evaluation examined trends in irrigated agriculture, observing that the maximum gross value of irrigated agricultural production in the Basin has remained relatively constant in real terms over the period of water recovery. However, the MDBA also highlighted that Basin-wide statistics do not provide a clear picture of the effects of the Basin Plan, given other factors have also influenced the changes experienced at the community scale.

The MDBA provided additional analysis of irrigation-dependent communities in the southern Basin in the June 2018 *Basin Plan Evaluation addendum* (MDBA 2018d). The MDBA found that the effect of Basin Plan water recovery on employment varies from community to community.

- Across the 40 communities examined, 12 are likely to have experienced quite small employment effects arising from Basin Plan water recovery.
- In the remaining 28 communities, the effects of water recovery ranged from modest and identifiable (18 communities), through to quite large changes (10 communities).

The ten communities experiencing the largest changes are those where Basin Plan water recovery has led to effects on employment of greater than 6 per cent. However, the MDBA notes that those communities (Berri, Cobdogla-Barmera, Colignan, Lower Lakes, Loxton, Merbein, Red Cliffs, Rochester, Swan Reach and Wakool) have also been affected by factors other than the Basin Plan.

The environmental impacts of water recovery and new management arrangements

Recent evaluations and reports by the MDBA and the Commonwealth Environmental Water Holder point to some early evidence of improved environmental outcomes due to progress in implementing the Basin Plan to date. Box 2.3 summarises the findings of these reports.

Box 2.3 Reports on the environmental impacts of the Basin Plan

The Murray-Darling Basin Authority (MDBA) and the Commonwealth Environmental Water Holder (CEWH) have reported the following environmental outcomes associated with Basin Plan implementation.

- **Waterbirds** — Waterbird abundance in the Basin has been declining from the 1980s, but the rate of long-term decline in waterbird populations has slowed (MDBA 2017b). The CEWH's Long-Term Intervention Monitoring project has indicated that environmental water delivered in 2015-16 contributed to several bird breeding events, including colonial waterbird breeding in five monitored wetland sites in the Murrumbidgee (Wassens et al. 2016).
- **Native fish** — Environmental water flows have contributed to positive responses from native fish in Basin. Examples cited in the 2017 *Basin Plan Evaluation* include: the movement and dispersal of golden and silver perch, more successful recruitment (breeding) of Murray cod, freshwater catfish and silver perch, and maintaining critical habitats for the Murray hardyhead (MDBA 2017b).
- **Native vegetation** — Environmental watering has been found to have promoted the growth and establishment of numerous native plant species within six sites monitored by the CEWH's Long-Term Intervention Monitoring project (although variation was observed across these sites) (Capon and Campbell 2017). Additional environmental water has increased the diversity of vegetation communities at the landscape scale (Capon and Campbell 2017). The 2017 *Basin Plan Evaluation* also identified that the Basin Plan had helped maintain the condition of native vegetation, although noted that it is not yet possible to determine if the Plan is on track to meet some intermediate or longer-term targets (MDBA 2017o).
- **River flows —** The 2017 *Basin Plan Evaluation* found mixed outcomes with respect to river flows and connectivity. It cited increased longitudinal connectivity in the southern Basin, but no material improvement for flows into and downstream of the Barwon-Darling in the northern Basin (MDBA 2017b). Counterfactual modelling (undertaken by the CEWH and MDBA) indicated that environmental flows have 'significantly enhanced barrage flows since 2012' (MDBA 2018q, p. 36). For lateral connectivity, the MDBA found the Plan to have increased the number of freshes, but operational constraints have limited the ability of water managers to provide bankfull and overbank flows (MDBA 2017b).
- **Salinity —** Monitoring indicates that targets are being met at four of the five sites where salinity is measured in the Basin. The salt export objective of two million tonnes of salt reaching the sea per year has not been met because of relatively low inflows from 2012 (MDBA 2017b).

3 Recovering water for the environment

Key points

- Transitioning from historical water use to new sustainable levels of extraction under the Basin Plan requires the recovery of water rights from consumptive users for the environment.
- A number of state-led programs returned water to the environment prior to the Basin Plan. In 2008 the Australian Government commenced recovering additional water to *bridge the gap* in the Basin (prior to the setting of the Basin's Sustainable Diversion Limits (SDLs) in 2012).
  - Almost 2000 GL is currently held by Basin Governments towards bridging the gap, against the target of 2075 GL. A further 121.7 GL is under contract to be delivered by 1 July 2019.
  - About 60 per cent has been recovered through Australian Government purchases of water from willing sellers, with about 34 per cent recovered through projects that modernise water infrastructure and return a share of water savings to the Government.
- Almost 30 GL still needs to be recovered to meet local recovery targets. This is to be addressed through a new Basin-wide infrastructure program.
  - Finalising gap-bridging water recovery is also contingent on delivery of contracted water and recovering 62 GL of efficiency measures by July 2019.
- When all contracted water is delivered, some parts of the Basin are likely to be over-recovered. There is currently no process in place to address this.
  - The Murray-Darling Basin Authority should identify any over-recovery through the SDL accounting framework. Basin Governments should then agree to a process to address this.
- In addition to meeting the SDLs, all water recovered should contribute to a held water portfolio that enables environmental water holders to achieve the environmental objectives of the Basin Plan. It is not apparent whether existing processes do this, or whether all water recovered has environmental value.
  - After transactions are finalised, the Australian Government should publish advice received on the environmental utility of different entitlement types to provide confidence that water will contribute to outcomes.
- Recovering water through infrastructure modernisation, rather than direct purchase of entitlements has increased the budgetary cost of water recovery by about $1.9 billion. Basin Governments adopted this approach to manage the socioeconomic impacts of water recovery.
  - Some positive outcomes have been reported from prioritising infrastructure modernisation, but they are largely private benefits accruing to irrigators. No comprehensive assessment has been undertaken to determine whether these benefits have exceeded the costs.
  - Direct community assistance programs have also been delivered to address the impacts of water recovery, but these are unlikely to have been effective. Recent commitments must clearly outline (and report against) program objectives to avoid a similar outcome.

A key part of the Basin Plan reforms is to reset the balance between environmental and consumptive uses of Basin water resources through the development of new, lower Sustainable Diversion Limits (SDLs) on consumptive use. To *bridge the gap* from historical water use to the new SDLs, Basin Governments have committed to recover water rights from consumptive users by purchasing water from willing sellers and investing in modernised irrigation infrastructure. Environmental water holders can then use recovered water to protect and restore the Basin's environmental values. Under the Basin Plan, governments were required to recover 2750 GL[13] to establish the surface water SDLs.

Recovering water for the environment has been a highly contentious element of establishing the Basin Plan. This is because it results in a permanent reduction in the volume of water available for irrigated agriculture, with flow-on impacts for regional communities. Governments make decisions on how, where and when to recover water for the environment. These decisions have had wide-ranging (and, in some cases, acute) impacts on irrigators and communities — as well as significant budgetary costs to governments.

This chapter assesses how the Australian Government has recovered water to give effect to the SDLs in the Murray-Darling Basin (MDB). Section 3.1 outlines the background to water recovery in the Basin. Section 3.2 considers whether water recovery is on track to meet targets within scheduled timeframes. Section 3.3 examines the extent to which processes to recover water have resulted in a held water portfolio that allows environmental water holders to achieve the environmental objectives of the Basin Plan. Section 3.4 considers the cost-effectiveness of water recovery processes, and section 3.5 addresses structural adjustment assistance programs.

In addition to bridging the gap, the Australian Government has committed to recover an additional 450 GL through efficiency measures to pursue the enhanced environmental outcomes in Schedule 5 of the Basin Plan. This is discussed in chapter 5.

3.1 Background

Overallocation of the Basin's water resources was recognised prior to the Basin Plan

Reforms to address overallocation of water resources and to recover water for the environment first began in parts of the Basin in the 1990s. In some Basin States, governments provided water for the environment by eroding water access rights for all users in a resource area to reduce water take (for example, the commencement of some water sharing plans in New South Wales in 2004) (MDBA 2017p).

[13] Unless otherwise specified, all water volumes in this chapter are presented in long-term average annual yield (LTAAY).

From the mid-2000s, Basin States began investing in more efficient irrigation systems to recover water through The Living Murray program. The direct purchase of entitlements from willing sellers began under the New South Wales RiverBank program in 2005 (OEH (NSW) 2017b). These and other programs (such as the Living Murray program (488 GL) and Water for Rivers (70 GL for the River Murray)) were undertaken in partnership between Governments prior to 2009 — and are therefore included in the Basin Plan's Baseline Diversion Limit (BDL) (MDBA 2017p). As of June 2017, state-based environmental water holders held about 1053 GL (37 per cent) of environmental water in the Basin (MDBA 2018v).[14]

The Australian Government intervention

A sharp decline in the condition of the Basin's natural environment during the Millennium Drought made clear that these efforts were inadequate to achieve environmental sustainability in the Basin. In 2007, the Australian Government intervened to reset the balance in the Basin to a more sustainable level — a key part of which was recovering water from consumptive uses and making it available for environmental use.

The Australian Government committed more than $8 billion towards resetting the balance in the Basin under the *National Plan for Water Security* in early 2007, passing the *Water Act 2007* (Cwlth) later that year. The *National Plan* committed to *bridging the gap* between baseline levels and the new limits by recovering water entitlements — precluding the purchase of other water products or the wholesale erosion of access rights (Australian Government 2007). The Australian Government committed to recover water entitlements through two instruments — water purchase and improving irrigation efficiency (box 3.1).

The Australian Government commenced recovering water in 2008 (Wong 2008). By late 2012, when the Basin Plan was made, 1547 GL of gap-bridging water had already been recovered.[15] By the end of 2011-12, about 80 per cent of water recovered by the Australian Government was through direct entitlement purchase (DAWR 2017).

The Australian Government formally assumed full financial responsibility for bridging the gap to the SDLs in 2013, under the principle that water property rights would not be eroded or compulsorily acquired to return water to the environment (COAG 2013). It also agreed to manage the socioeconomic impacts of reduced water availability by prioritising on- and off-farm infrastructure modernisation programs, rather than water purchase, in future programs (DOE 2014). Basin Governments also agreed to the SDL adjustment mechanism to offset up to 650 GL of water recovery (chapter 4).

[14] Water recovered in the Basin prior to 2009 is not considered gap-bridging. About 162.6 GL (15 per cent of Basin State holdings) contributes to bridging the gap in the Basin (DAWR 2018h).

[15] See note on original compilation of *Basin Plan 2012* (Cwlth), s. 6.04(2).

Box 3.1 Approaches to recovering water for the environment

Water can be recovered from consumptive uses in a number of ways.

- **Administrative approaches** including resetting entitlements to a lower level, or changing rules over their use. These approaches affect the yield and reliability of entitlements, and the underlying property rights associated with them.

Basin Governments agreed that water recovery to bridge the gap would not affect property rights. The two primary instruments to acquire water for the environment are direct purchase and investment in modernised irrigation infrastructure.

- **Direct purchase** of water entitlements from willing sellers has occured through:
  - open tenders available to all water users in an area (also known as buyback and delivered through programs such as *Restoring the Balance*)
  - direct negotiation with water users ('strategic purchases' such as the 2017 purchase of Lower Darling entitlements from the Tandou property), which are subject to approval by Basin States
  - arrangements with Basin States under bilateral agreements (such as the Nimmie-Caira project).
- **Investment in modernised irrigation infrastructure** provides a share (at least 50 per cent) of expected water savings to the Australian Government for environmental use.
  - *On-farm* projects include converting flood irrigation systems to drip irrigation systems or deepening on-farm storages to reduce evaporative losses. Irrigators keep a share of those savings — and although they have a lower volume of entitlements, improved water use efficiency can allow irrigators to provide the same or more water to crops.
  - *Off-farm* projects include lining delivery channels to reduce seepage or decommissioning underutilised parts of a network. The irrigation infrastructure operator provides a share of the saved water to the Australian Government, and the entitlements of irrigators are unchanged.

Sources: DAWR, sub. 81; PC (2010).

The Basin Plan established targets for water recovery …

The Basin Plan established an environmentally sustainable level of take, setting a new balance between economic, social and environmental outcomes in the Basin.[16] The water recovery target was set to bridge the gap between the historical level of allowable take (the BDL) and the new sustainable level of take (the SDL) in each water resource unit of the Basin.[17]

16 *Water Act 2007* (Cwlth), s. 3(c).

17 The BDL is not an estimate of actual diversions, but is instead an estimate of maximum *permitted* diversions in 2009, under the rules in place and level of resource development at that time. Surface water BDLs are calculated in Schedule 3 of the Basin Plan.

The Basin Plan set a headline surface water recovery target of 2750 GL to be recovered prior to the SDLs coming into force on 1 July 2019.[18] Meeting this target reduces average annual diversions (excluding interception) by 25 per cent of the BDL and requires water recovery in almost every surface water SDL resource unit in the Basin (MDBA 2017q). The Basin Plan also set a water recovery target of 40.4 GL to meet SDLs in two Queensland groundwater SDL resource units.

The Basin-wide surface water recovery target consists of:

- local targets for individual SDL resource units, which are designed to achieve local environmental outcomes
- shared targets for zones that span multiple SDL resource units, which are designed to contribute to environmental outcomes for connected resources.

Water recovery must meet both local and shared targets. Local targets must be met by recovering water in that SDL resource unit, while the shared targets can be met by recovering water from any resource unit within a connected zone. Two SDL resource units — Wimmera-Mallee (Victoria) and Lachlan (New South Wales) — are considered disconnected and cannot contribute to shared targets.

… but these targets have only been recently finalised

The SDLs (and thus water recovery targets) have been adjusted twice since 2012. The SDL adjustment mechanism was included in the Basin Plan to allow projects (supply measures) to substitute for water recovery in the southern Basin — but only where environmentally equivalent to recovering water (chapter 4). The SDLs could then be increased, and the water recovery target decreased, by up to 650 GL. This was originally scheduled to be completed by 2016 (well prior to the finalisation of water recovery in 2019), but the final offset of 605 GL was only confirmed in May 2018.[19]

The Basin Plan also included a review of the SDLs for surface water in the northern Basin and for some groundwater areas (chapter 4). The *Northern Basin Review* was completed in 2016, and recommended both a 70 GL increase in the SDLs in the northern Basin and a redistribution of local and shared targets (MDBA 2016c). The groundwater reviews increased the SDLs in those resources, but did not change recovery targets as extractions did not exceed those SDLs. The consequent amendment to the Basin Plan was disallowed by the Australian Parliament in February 2018, and the final northern Basin target was not set until the Basin Plan was again amended on 3 July 2018.

[18] Original compilation of *Basin Plan 2012* (Cwlth) s. 6.04.

[19] The offset of 605 GL is subject to recovering 62 GL through efficiency measures to keep the change to the Basin-wide SDL within the 5 per cent limit (*Basin Plan 2012* (Cwlth), s. 7.19).

As of 10 July 2018, the Basin-wide target for gap-bridging surface water recovery has been reduced from 2750 GL to 2075 GL. This must be recovered by 1 July 2019.

Institutional arrangements for recovering water

The Department of Agriculture and Water Resources (DAWR) is responsible for implementing the Australian Government's commitment to bridge the gap by July 2019. This is done in accordance with the Australian Government's 2014 water recovery strategy (DOE 2014).

Under the 2013 *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin*, Basin States are responsible for facilitating the Australian Government's gap-bridging projects. This includes approving purchases and delivering water recovery projects (state priority projects) agreed to in 2008 (COAG 2008, 2013).

Recovered water entitlements are transferred to the Commonwealth Environmental Water Holder (CEWH), who independently manages that water to maintain or improve the environmental outcomes of the Basin Plan (chapter 11).

The Commission's framework for assessing gap-bridging water recovery

The effectiveness of gap-bridging water recovery in supporting the objectives and outcomes of the Basin Plan has been assessed against two primary criteria.

- Water recovery targets should be met in accordance with scheduled timeframes (section 3.2).
- Water recovered should contribute to a secure water portfolio that allows environmental water holders to achieve the environmental objectives of the Basin Plan (section 3.3).

The Commission has also assessed the cost-effectiveness of water recovery programs (section 3.4). This considers whether water recovery programs have met targets cost-effectively, but also acknowledges that the Australian Government agreed to manage the socioeconomic impacts of the Basin Plan on communities and industries primarily through its approach to water recovery. Structural adjustment assistance was also provided to address these impacts; this is considered in section 3.5.

3.2 Progress to bridge the gap

The first part of the assessment concerns progress towards meeting the water recovery targets set by the Basin Plan within scheduled timeframes. This has two aspects — a backwards-looking assessment of whether progress to date has been on-track, and an assessment of whether current settings are likely to enable the Australian Government to meet those targets by July 2019.

Progress to date is broadly on track

Significant amounts of water have been recovered for the environment across the Basin

As of 10 July 2018, Basin Governments had registered[20] 1995.8 GL of environmental water against the gap-bridging surface water target of 2075 GL (table 3.1). The CEWH holds most of this gap-bridging water (1833.2 GL). State-based environmental water holders hold 162.6 GL (96.7 GL in Victoria, 59.5 GL in New South Wales and 6.4 GL in South Australia) (DAWR 2018h).

The Australian Government has contracted a further 121.7 GL, which has not yet been delivered to the CEWH.

If all contracted entitlements are delivered in full, it is expected that surface water recovery will stand at 2117.5 GL. The headline figure implies that the Basin is over-recovered, but water recovery remains incomplete because some local targets have not been met (totalling 29.5 GL). While local over-recovery may have occurred, this is yet to be confirmed by DAWR or the Murray-Darling Basin Authority (MDBA).

About 60 per cent (1226.9 GL)[21] of gap-bridging water recovery has been directly purchased by the Australian Government — either through open tender (1016.9 GL) or through the direct negotiation of strategic purchases (207.1 GL) (DAWR 2018h). The remainder (713.1 GL) has been recovered through investment in modernised irrigation infrastructure and 15.0 GL was gifted from the Queensland Government.

At 10 July 2018, the Australian Government reported it has recovered 2.7 GL against the groundwater target of 40.4 GL (7 per cent) (DAWR 2018h).[22]

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20 Registered water refers to entitlements delivered to environmental water holders. Some entitlements are contracted and not yet delivered, but are considered as 'recovered' by the Australian Government.

21 Including 2.9 GL purchased from the South Australian Government that is not subject to the legislative cap on surface water purchases.

22 This does not include offers accepted under the recently concluded tender in the Condamine Alluvium groundwater resource.

Table 3.1 **Progress towards bridging the gap[a]**

Contracted water recovery at 10 July 2018

SDL shared zone		*Basin Plan target[b]*	*SDL Adjustment[c]*	*July 2019 target[d]*	*Recovery to date*	*Recovery remaining[e]*	
		GL LTAAY	GL LTAAY	GL LTAAY	GL	GL	%
Surface water							
Nth Basin (Qld)	*Local*	123.0	..	123.0	127.8	12.7	9
	Shared	17.0		17.0		0.0	0
Nth Basin (NSW)	*Local*	156.0	..	156.0	172.9	16.4	9
	Shared	24.0		24.0		0.0	0
Sth Basin (NSW)	*Local*	590.0	286.8	590.0	808.8	0.0	0
	Shared	458.0		171.2		0.0	0
Sth Basin (ACT)	*Local*	0.0	0.0	0.0	4.9	0.0	0
	Shared	4.9		4.9		0.0	0
Sth Basin (Vic)	*Local*	627.0	266.2	627.0	787.1	0.0	0
	Shared	425.3		159.1		0.0	0
Sth Basin (SA)	*Local*	101.0	52.0	101.0	143.9	0.0	0
	Shared	82.8		30.8		0.0	0
Disconnected (NSW)	*Local*	48.0	..	48.0	49.6	0.0	0
Disconnected (Vic)	*Local*	23.0	..	23.0	22.6	0.4	2
TOTAL (surface water)	***Local***	**1 668.0**	**605.0**	**1 668.0**	**2 117.5**	**29.5**	**1**
	Shared	**1 012.0**		**407.0**		**0.0**	**0**
Groundwater							
Upper Condamine Alluvium	*Central Condamine Alluvium*	35.4	..	35.4	2.7	32.7	92
	Tributaries	5	..	5.0	0.0	5.0	100
TOTAL (groundwater)		**40.4**	**..**	**40.4**	**2.7**	**37.7**	**93**

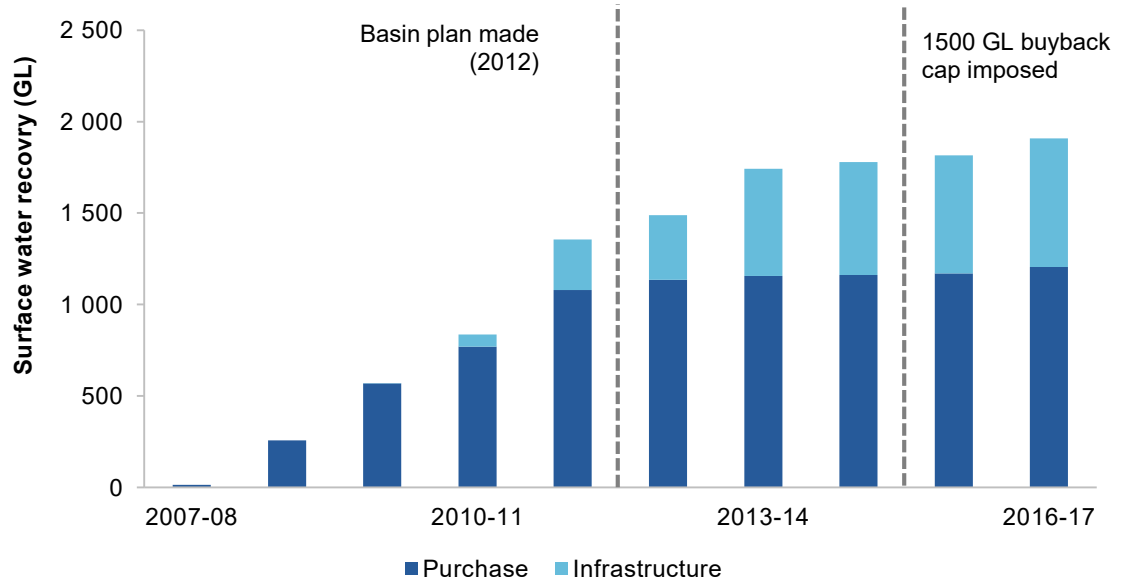
a All values are in long-term average yield (LTAAY) terms. **b** As amended following the *Northern Basin Review* **c** SDL adjustments are the apportioned supply measure offsets under the SDL adjustment mechanism. **d** Targets reflect SDL adjustments from the SDL adjustment mechanism and the *Northern Basin Review* amendments. It does not include the 62 GL of efficiency measures required to limit the change in the SDL to below 5 per cent by July 2019; this water can be recovered anywhere in the Basin. **e** As a proportion of the sum of local and shared targets, not including any potential over-recovery, not including offers accepted under the recent tender in the Condamine Alluvium groundwater resource. **..** Not applicable.

Data source: DAWR (2018h).

Progress has slowed, but the finish line is in sight

Water recovery occurred rapidly between 2008 and 2012, on the back of large open-market tenders to purchase water (figure 3.1). Community opposition soon emerged to the open tenders. The impacts of these programs, coupled with ongoing drought conditions and the legacy of pre-Basin Plan water recovery, were seen to create considerable hardship in communities and undermine the viability of some irrigation districts.[23]

Figure 3.1 **A decade of Australian Government water recovery**
2007-08 to 2016-17



Data source: DAWR (2017), attachment A.

Concerns over the impacts of water purchases — and a change of government — led to a revised water recovery strategy in 2014. The MDB Ministerial Council agreed to slow the rate of water recovery to mitigate the risk of over-recovery (MDBA 2016j). The Australian Government imposed a legislative cap of 1500 GL on surface water purchases, and stated a preference for infrastructure projects to recover the remaining water (DOE 2014).

Remaining gaps are small and mostly in the northern Basin

The Australian Government has met almost all shared targets across the Basin (following the operation of the SDL adjustment mechanism and the passage of the *Northern Basin Review* amendments). Almost all local targets in the southern Basin have been achieved.

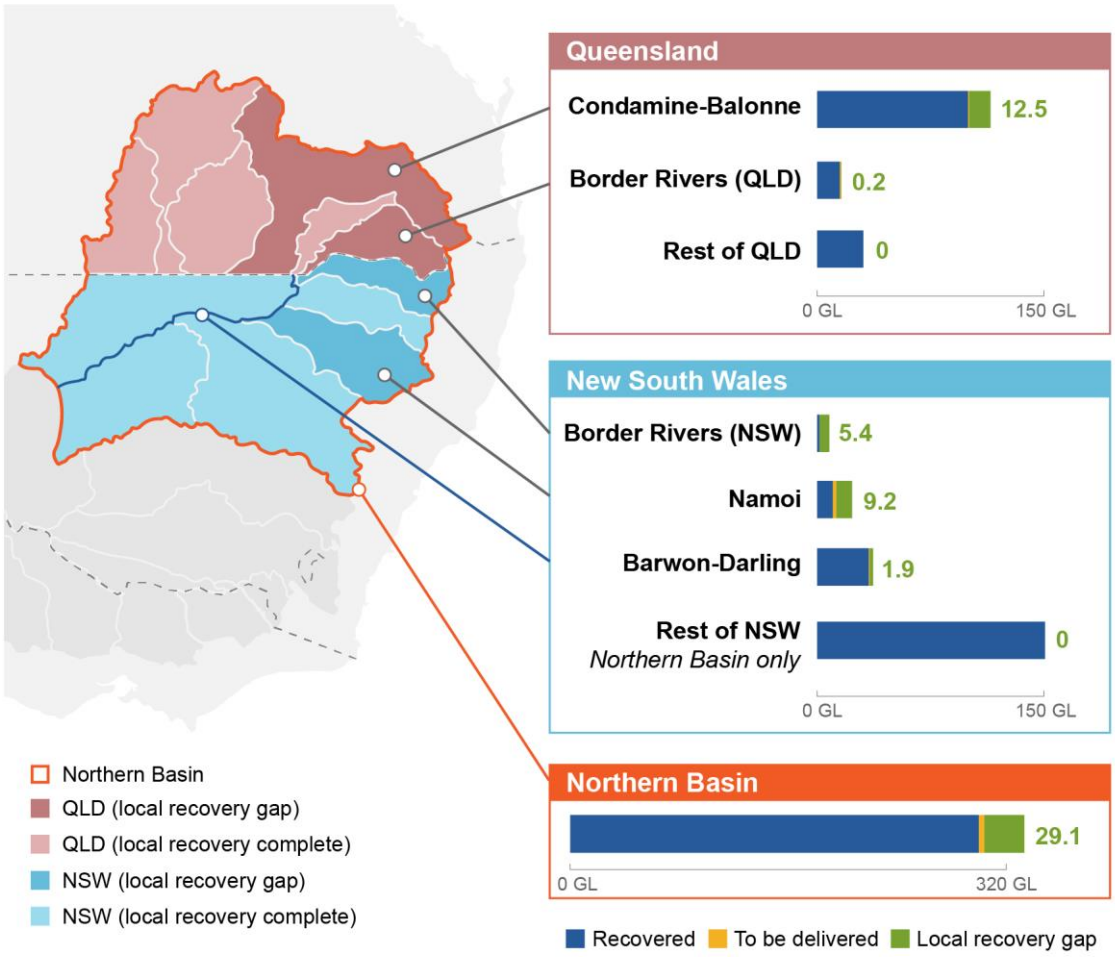
[23] Murray River Group of Councils (sub. 36), Lachlan Valley Water Inc. (sub. 49), Murray Darling Association (sub. 52), NSW Farmers' Association (sub. 60) and GMID Water Leadership (sub. 62).

The remaining gaps are primarily local targets in the northern Basin, and are small relative to the overall water recovery task (figure 3.2). Assuming delivery of contracted recoveries, the outstanding gaps to bridge (at 10 July 2018) are:

- local surface water in Queensland: 12.5 GL in the Condamine-Balonne and 0.2 GL in the Queensland Border Rivers
- local surface water in New South Wales: 9.2 GL in the Namoi, 5.4 GL in the New South Wales Border Rivers and 1.9 GL in the Barwon-Darling
- local surface water in the disconnected Wimmera-Mallee system in Victoria: 0.4 GL
- groundwater in the Upper Condamine Alluvium resource: 37.7 GL.

Figure 3.2 **The remaining surface water task in the northern Basin**

Local targets outstanding as of 10 July 2018



Source: DAWR (2018h).

How will the Australian Government bridge the gap by mid-2019?

In July 2018, the Australian Government announced the Murray-Darling Basin Water Infrastructure Program (DAWR 2018e). This program is designed to finalise gap-bridging surface water recovery and commence additional water recovery through efficiency measures towards 2024 (chapter 5). The program is Basin-wide, with individual water users submitting proposals (to DAWR, or its delivery partners) for water saving projects.[24]

The Commission is not aware of any specific strategy to finalise water recovery in the Wimmera-Mallee, which has a recovery gap of 0.4 GL against the target of 23.0 GL. There are no clear sources for the water, given the entire irrigation system was decommissioned in 2013.

To finalise groundwater recovery, DAWR recently operated an open tender process (which closed 31 July 2018). Following the first two tranches, DAWR has accepted tenders providing 21.8 GL (DAWR 2018k). If the third and final tranche of the tender is undersubscribed, the draft water resource plan for the Condamine-Balonne area includes a fall back option to reduce the nominal entitlement of some groundwater licences in order to meet the SDL.[25]

Will the 2019 target be met?

There are still a few outstanding matters to finalise in order to meet water recovery targets before July 2019. These are:

- completing surface water recovery in the northern Basin (29.1 GL to be recovered)
- ensuring delivery of contracted water (121.7 GL is yet to be delivered)
- managing the risk presented by revised planning assumptions in Water Resource Plans (while unclear, this could be about 10 GL)
- recovering an additional 62 GL through efficiency measures by July 2019.

Finalising water recovery

Of the remaining recovery gaps in the northern Basin, most material are:

- surface water targets in the Condamine-Balonne, the Namoi and the New South Wales Border Rivers
- the two targets for the Condamine Alluvium groundwater resources.

[24] Consistent with the June 2018 MDB Ministerial Council meeting, this program allows for off-farm, industrial, urban and metering projects that save water, as well as on-farm projects in Queensland, South Australia and the ACT (but not New South Wales or Victoria) (MDB Ministerial Council 2018a).

[25] Condamine-Balonne Draft Water Plan 2019 (Qld), referred to by the Queensland Farmers' Federation (sub. 61).

While surface water gaps are relatively small in the context of the overall recovery effort (table 3.1), existing programs may not be enough to finalise water recovery. There are some specific barriers to recovering water in the northern Basin, as highlighted by DAWR (Northern Basin Programs Taskforce 2018).

- Many landholders have already participated in on-farm programs and are unlikely to do so again, citing administrative burden, and there is no industry group to facilitate engagement in parts of the region.
- Some are only willing to give up unregulated entitlements to a government program, and these types of entitlements may not be able to be protected in-stream.

The Australian Government announced a new infrastructure program in July 2018 to finalise gap-bridging water recovery and commence additional water recovery through efficiency measures (chapter 5). It is not yet clear how the new program addresses these barriers.

The other significant recovery gap is in the Condamine Alluvium groundwater resource. The approach to finalising groundwater recovery in the region appears credible, with an agreed fall back if the current tender is undersubscribed. This should ensure that gap-bridging water recovery is completed in those resources.

Ensuring delivery of contracted (but not yet delivered) water

The Australian Government contracts the delivery of infrastructure projects to delivery partners, which include Basin States and irrigation infrastructure operators.[26] Project partners are contracted to deliver all outstanding water prior to July 2019.

As of 10 July 2018, 121.7 GL under contract had not yet been delivered. These outstanding deliveries are primarily in New South Wales (45.3 GL) and Victoria (72.0 GL). In its 2016-17 assessment of the relevant National Partnership Agreement,[27] DAWR (2018f) expressed concern over whether the New South Wales Government will deliver on water contracted under the Basin Pipes program, and whether Victoria will deliver all contracted water under the Victorian Farm Modernisation Program by 1 July 2019.

DAWR is managing the risk of any failures to deliver on contracted water through bilateral arrangements with the Basin States (DAWR, sub. 81). Active risk management is required, to ensure there are no material changes to recovery progress. It is unclear who is responsible for 'make good' arrangements to resolve any shortfall.

[26] Water is counted as recovered once the contract is signed, but water entitlements may not be transferred to the CEWH until works commence, or (for major off-farm projects) water may be transferred progressively in line with agreed milestones.

[27] The *National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin*.

Revisions to planning assumptions in Water Resource Plans

Changes to the planning assumptions as part of finalising Water Resource Plans (WRPs) (chapter 6) affect how water recovery is accounted. This may affect the size of water recovery gaps. Long-term diversion limit equivalent factors (also known as cap factors) are estimated to convert different entitlement types into a common unit for water planning purposes. Cap factors are complex to calculate as they include assumptions about the future utilisation of entitlements (DOI (NSW) 2018f; MDBA 2018m).

Cap factors are applied to all entitlements in a system, and therefore affect the contribution of the CEWH's portfolio towards gap-bridging targets (box 3.2). In the MDBA's 2017 *Basin Plan Evaluation*, the need to have up-to-date cap factors was identified as critical in finalising water recovery (MDBA 2017b).

Box 3.2 How do cap factors affect water recovery?

Cap factors convert the face value of water entitlements into a long-term average, with each type of entitlement having an associated cap factor. The Commonwealth Environmental Water Holder's (CEWH's) portfolio is made up of different types of entitlements, and any change in cap factors will affect the expected average annual yield of each entitlement accordingly.

This may change the overall contribution of the portfolio to meeting the water recovery targets. Changes to cap factors may create (or increase the size of) a water recovery gap, reduce the size of a gap, or lead to over-recovery (see table below).

Effect of draft cap factors on CEWH holdings in the Gwydir

Entitlement type	*Face value (GL)* **a,b**	*Cap factor (2011)*	*Long-term average (current)*	*Cap factor (2018 draft)*	*Long-term average (draft)*	*Difference*
	GL		GL (LTAAY)		GL (LTAAY)	GL (LTAAY)
	A	***B***	***A* x *B***	***C***	***A* x *C***	***(A* x *B)* – *(A* x *C)***
High	4 508	1.000	4 508	0.886	3 994	- 514
General	89 525	0.360	32 229	0.380	34 020	+ 1 791
Supplementary	20 451	0.190	3 886	0.485	9 919	+ 6 033
Total **c**	**..**	**..**	**40 623**	**..**	**47 932**	**+ 7 309**

a CEWH holdings as of 30 April 2018. **b** Values do not align with those reported by New South Wales as they do not include entitlements held by the New South Wales Government. **c** Totals may not add due to rounding. **..** Not applicable

Sources: CEWO (2018); MDBA (2017v); DOI (NSW) (2018f).

The process of developing (by Basin States) and accrediting (by the MDBA) cap factors has not been transparent, and delays in finalising cap factors have created additional uncertainty for both water recovery programs and water users.[28] Basin States are at different stages of the process of finalising cap factors.

- The New South Wales Government released draft cap factors for consultation in June 2018 (DOI (NSW) 2018f). Those draft cap factors decrease the contribution of the CEWH's holdings overall, but may contribute to over-recovery in some parts of the northern Basin.
- The Victorian Government has yet to publish revised cap factors, and it is unclear whether these will materially affect the contribution of the CEWH's entitlements.
- The South Australian Government has yet to publish revised cap factors. The CEWH only holds one type of entitlement in South Australia — unless the cap factor for high reliability entitlements is revised down significantly, more water recovery is unlikely to be needed.
- The Queensland Government (sub. 87) anticipates only minor changes to cap factors in remaining Water Resource Plans. This is because Queensland's water accounting system assumes full utilisation; cap factors only change to reflect improved information.

Recovering 62 GL through efficiency measures by July 2019

The Basin Plan provides a supply measure offset of 605 GL. For this to be recognised in full, the Australian Government must recover 62 GL through efficiency measures prior to 1 July 2019.[29]

In June 2018, the MDB Ministerial Council announced a number of state-proposed projects that were expected to contribute to the 62 GL (MDB Ministerial Council 2018a). There is little information provided concerning these projects, and they account for less than half of the gap (this risk is discussed in chapter 5).

Water recovery should be largely complete by mid-2019

Bridging the gap in the Basin has been a major undertaking, but is now mostly complete. Outstanding barriers to meeting the target on time are minor relative to overall task.

Finalising surface water recovery relies on recovering the remaining 29.5 GL of surface water (mostly in the northern Basin) and recovering 62 GL through efficiency measures by

[28] National Irrigators' Council (sub. 15), Coleambally Irrigation Co-Operative Limited (sub. 38), Namoi Water (sub. 82) and Gwydir Valley Irrigators Association Inc. (sub. 83).

[29] The Basin Plan (s. 7.19) limits the total change in the SDLs from the SDL adjustment mechanism to 5 per cent of the Basin-wide SDL. If the offset from supply measures exceeds 5 per cent of the SDL, water must be recovered through efficiency measures to keep the net change to within that limit when the SDLs enter into force on 1 July 2019.

July 2019. DAWR must ensure contracted recoveries are delivered as expected (or alternative arrangements are in place) and monitor and address changes to cap factors.

DRAFT FINDING 3.1

A total of 1995.8 GL of the 2075 GL needed to meet the adjusted Sustainable Diversion Limits has been delivered.

Finalising water recovery by 1 July 2019 is contingent on:

- recovering a further 29.1 GL from the northern Basin, 37.7 GL from two Queensland groundwater resources and 0.4 GL in one surface water resource in Victoria
- the delivery of 121.7 GL that is contracted, but has not yet been delivered
- recovering 62 GL through efficiency measures
- any changes to planning assumptions that affect the contribution of those water entitlements already recovered towards water recovery targets.

Although a small gap remains, the risk of not meeting the water recovery target is low.

There is no clear process to address over-recovery

As a result of uncertainties that DAWR has faced over the exact water recovery targets, the legacy of early 'no regrets' purchases, and ongoing shortcomings in recovery processes (as discussed above), it is also possible that parts of the Basin will be found to be over-recovered against the SDL.

Some participants to this inquiry contend that the Gwydir and Macquarie catchments in New South Wales have had too much water recovered relative to the targets (Macquarie River Food and Fibre, sub. 56; Gwydir Valley Irrigators Association Inc., sub. 83). Stakeholders attribute over-recovery to the early 'no regrets' purchases by the Australian Government, made before the regional distribution of SDLs was determined (for example, Lachlan Valley Water Inc., sub. 49; Gwydir Valley Irrigators Association Inc., sub. 83).

Holding excess environmental water represents an opportunity cost in lost agricultural production. If environmental benefits are marginal or negligible for some held water (for example, because of delivery constraints or limited connectivity to contribute to downstream needs) it is reasonable to suggest that some water held by the CEWH may not represent an efficient allocation of resources. The CEWH has no incentive to (and in fact, cannot) take this opportunity cost into account — it must trade solely for environmental purposes (CEWH, sub. 75).

A clear process for declaring and dealing with over-recovery has not been published, but one is needed. This process should have two steps.

- Finalising the amount and location of over-recovered water.

  - This requires finalising planning assumptions for Water Resource Plans, as these affect the extent and location of potential over-recovery.
- Determining how that water is returned by the CEWH to the consumptive pool.
  - Responsibility for determining over-recovery has not been clearly established. Any decision to sell Australian Government water holdings lies with the CEWH.

Basin Governments should agree on a timeframe and process for these steps. The MDBA, through the SDL accounting framework should identify whether too much water has been recovered in an SDL resource unit.

Only the CEWH can dispose of Australian Government water holdings, and the Water Act restricts the capacity of the Australian Government to direct its trading operations.[30] The CEWH's own internal operating rules are the logical vehicle to consider options for returning over-recovered water. The CEWH has signalled that rules will be reviewed in 2019 (DEE 2016).

This review should consider how over-recovered water could be returned (subject to the CEWH's obligation to ensure the proceeds are used to otherwise enhance environmental outcomes). These options should be canvassed with water users in the affected valley before any decision is made.

DRAFT RECOMMENDATION 3.1

Once Water Resource Plans are finalised in July 2019, the Murray-Darling Basin Authority should assess and determine the extent of over-recovery.

Basin Governments should then agree to a policy and timeframe to address any over-recovery where it has occurred.

3.3 Environmental effectiveness of recovered water

While water recovery is largely on track to bridge the gap by 2019, this alone is not sufficient to reset the balance. Water should be recovered in a way that builds a portfolio of environmental water that is best able to contribute to environmental outcomes in the Basin.

The SDLs (and associated water recovery targets) are expressed as long-term averages, allowing entitlements of different reliabilities to be compared on a common basis and meaningfully added together.

30 *Water Act 2007* (Cwlth), s. 107 prevents the Department or Water Minister from directing the CEWH with regards to specific trades. While s. 109 of the Act allows the Water Minister to set operating rules around the CEWH's trading activities, this power has not yet been used.

The mix of different entitlement types held by the CEWH determines the allocations available for use each year, and thus affects the CEWH's ability to effectively provide environmental water under different seasonal conditions. As observed by the EDOs of Australia (2017, p. 6):

> [w]hile it is often argued that 'cap protects the environment', such an approach fails to take into account the fact that species and ecosystems do not function on the basis of long-term annual averages.

While the Australian Government could meet water recovery targets by focusing on a small number of entitlement types, recovering an 'unbalanced' portfolio may compromise the ability of the CEWH to meet the environmental watering objectives of the Basin Plan across a range of seasonal conditions.

But determining an ideal environmental water portfolio for the Basin is a highly technical question. As more information on the effective use of environmental water has become available, the CEWH's specialist knowledge makes it best-placed to assess the makeup of an ideal portfolio. It therefore should have a key role in identifying the entitlement types that are the priority for water recovery programs.

This section considers whether the portfolio recovered is likely to achieve the outcomes sought by assessing how DAWR:

- selects which water to recover to align to environmental outcomes
- ensures the integrity of water recovered (that is, entitlements have the expected characteristics).

DAWR's processes for assessing environmental benefits are opaque

Submissions have raised concerns with the environmental utility of some entitlements recovered through recent purchases (Inland Rivers Network, sub. 23; Sarah Moles, sub. 67) and the roles and responsibilities of DAWR and the CEWH in identifying purchasing priorities (WWF-Australia, sub. 31; Sarah Moles, sub. 67).

The Commonwealth Environmental Water Holder's input into purchasing decisions

Prior to the Basin Plan, water was recovered primarily through open tenders, with no official protocol between DAWR and the CEWH to ensure maximum benefit for the environment (ANAO 2011). This accounts for almost one-third of the water recovered to date.

The updated water recovery strategy in 2014 also did not include an explicit role for CEWH providing advice — an essential criteria for achieving the best environmental outcomes. DAWR (sub. 81, p. 7) has indicated that its current processes consider:

> … the contribution towards the Basin SDL gap-bridging target, value for money and the environmental utility of the entitlement based on the CEWH's priorities. The Department, when

undertaking strategic water purchases, will also consider additional factors such as the possible socio-economic impact of removing water from a catchment on local communities.

The CEWH's priorities include both general principles for water recovery and advice for specific catchments. The CEWH (sub. 75, p. 4) indicated its general principles for water recovery include that:

- A portfolio of entitlements that maximises environmental utility should be acquired.
- Except where specific advice has been provided to indicate otherwise, a balanced portfolio is preferred without excessive reliance on a particular class of entitlement in any particular jurisdiction or catchment.

While CEWH does have some input into the process through those priorities, there is a lack of transparency on how DAWR has considered this advice. The CEWH's specific advice (outlining which entitlement types and locations are priorities in a particular catchment) is not generally publicly available.[31]

DRAFT FINDING 3.2

The Department of Agriculture and Water Resources does not have a systematic and transparent process to demonstrate that water recovered has environmental value.

Improvements are needed to demonstrate environmental utility and improve confidence

Contributions to this inquiry have raised concerns that a recent strategic purchase in the Warrego will not achieve environmental outcomes because DAWR purchased low reliability ('unsupplemented') water, which will not be available for the environment in drier years.

The Commission views the Warrego purchase as being consistent with the CEWH's published advice. The CEWH indicated a preference for lower-reliability water, stating:

> … on the basis of the risk of extraction and lack of in-stream protection measures, supplemented (regulated) water allocations in the water supply scheme based at Cunnamulla weir … are not recommended for recovery.[32]

The DAWR could address the stakeholder concerns about the environmental value of particular purchases if it was more transparent in how it takes into account the CEWH's advice. The complexity of determining which entitlements to recover clearly requires the CEWH's specialist input, and this role should be made clear to improve accountability.

31 In response to Senate orders to produce documents on particular strategic purchases (*Senate Motion No 579 for production of documents*), DAWR has published the CEWH's specific advice in some catchments (Warrego) but has withheld it in others (Condamine-Balonne).

32 *Senate Motion No 579 for production of documents*, p. 101 (p. 2 of CEWH advice for the Warrego catchment).

While commercial sensitivities remain in areas where gap-bridging water is not yet complete, there is no valid reason for not releasing this advice once gap-bridging recovery is complete or under contract.

DRAFT RECOMMENDATION 3.2

The Department of Agriculture and Water Resources should ensure that water recovery aligns with environmental requirements and its processes for doing this are transparent.

To ensure accountability, it should publish all advice provided by the Commonwealth Environmental Water Holder (including advice on strategic purchases) once transactions are complete.

Processes to ensure the integrity of recovered entitlements

Purchases of overland flow entitlements require ongoing compliance

Part of the Australian Government's approach to bridging the gap in the northern Basin has included the purchase of overland flow entitlements. The amount of water available under one of these entitlements is determined by the characteristics of the approved on-farm infrastructure that captures and stores these flows. For these entitlements to be available to the CEWH, that infrastructure must be decommissioned to allow surface flows to reach the river.

During regional consultations, inquiry participants raised concerns that works have not always been decommissioned as agreed, or are later reinstalled. The integrity of these entitlement types therefore depends on ongoing compliance by the relevant Basin State.

Return flows — are water savings real?

An ongoing debate in parts of the academic community considers that water recovered through investment in water use efficiency may not represent 'real' water if projects do not account for changes to return flows (water lost from irrigation systems that flows back to the river). Submissions to this inquiry have raised similar arguments.[33]

A return flow occurs where water applied by an irrigator is not used by crops and instead drains and returns to the river system or an environmental site through either surface flow or groundwater (van Dijk et al. 2006). These flows can be considered inflows in water accounting frameworks — although they are not directly measured in many cases

[33] Matthew Colloff, John Williams and R. Quentin Grafton (sub. 12), Inland Rivers Network (sub. 23), Professors Sarah Wheeler, Jeff Connor, Quentin Grafton, Lin Crase and John Quiggin (sub. 40), Wentworth Group of Concerned Scientists (sub. 42), Sarah Moles (sub. 67), Environment Victoria (sub. 73) and Murray Darling Association Region 6 (sub. 74).

(BOM 2010). Flows can also be considered system losses if they flow to non-recoverable sources (such as saline aquifers). The proportion of return flows that become inflows (rather than losses) varies by location and over time.

Improved water use efficiency can affect return flows and reduce the amount of water returning to the system (for example, lining channels can reduce seepage to an aquifer). If not measured, changes in return flows may represent an unaccounted loss to system inflows and the realised savings from an infrastructure project (on a system scale) may be less than expected.

However, improvements in water use efficiency are just one factor that affects return flows. Return flows are also affected by inter-regional water trade, the crop choice and land management decisions of individual landholders, and broader changes in land use (van Dijk et al. 2006). The net effect may be positive or negative for river inflows, and the net benefit to the environment of these flows depends on the water quality of the returns (which can be poor) and how the river system is regulated.

To account for this complexity, water accounting frameworks make assumptions to estimate the contribution of return flows, and these assumptions affect how water is allocated to entitlements. If actual return flows fall significantly below assumed levels, it can impact on allocations for all entitlement holders — including both irrigators and environmental water holders. In regulated systems, 'planned' environmental water (or base flows) are supplied with higher priority than entitlements and would still be provided for.

Changing patterns of return flows from irrigation can represent a risk to *all* water users — much like climate change, land use change (such as increased forestry) and bushfires (van Dijk et al. 2006). As return flows are often not directly measured, determining the magnitude of the risk requires:

- understanding existing return flows (which will vary significantly across the Basin depending on the irrigation delivery system, soil type and underlying aquifer), monitoring changes on a system scale, and reflecting improved understanding in water accounting frameworks
- assessing the impacts on return flows of Australian Government investments in modernised irrigation systems.

The Australian Government's water recovery programs may accelerate changes in return flows by subsidising (and thus increasing) uptake of modernised irrigation infrastructure. These programs should account for these impacts.

Some projects funded by the Australian Government have been subject to additional environmental approvals.[34] The Northern Victoria Irrigation Renewal Project (NVIRP) was required to have a robust water savings protocol to identify and provide 'mitigation water' to wetlands to compensate for losses in return flows (DSE (Vic) 2012). In this case,

[34] Under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).

entitlements recovered do represent 'genuine' water savings net of beneficial return flows. Other pre-Basin Plan water recovery programs (including The Living Murray) had similar requirements to assess the environmental impact of the specific project (MDBC 2008).

There is no evidence DAWR undertakes systematic assessments of return flows in its current programs. While this is a shortcoming for gap-bridging recovery, DAWR should also address this in programs to recover additional water through efficiency measures (chapter 5).

Because these assessments have not been done by DAWR systematically, some participants have argued that the reduction in recoverable return flows may exceed the amount of water saved — no 'real' water has been recovered for the environment through infrastructure programs.[35] This appears to be an overestimate. While the assumptions underlying this claim are not provided, they do not appear to account for NVIRP (and later programs), which had robust savings protocols, and the Nimmie-Caira project, which (while counted as an infrastructure project by DAWR) was a strategic purchase of land and water (DOI (NSW) 2018e). These two examples provide at least 235 GL of verified water savings towards the gap-bridging target (DOE 2014). While the Commission accepts there is a risk from failing to account for return flows, there is no evidence it is in the range suggested.

The legacy of past infrastructure investments may emerge over time on a system scale. The MDBA (sub. 86, p. 18) has proposed building 'a consensus on the science behind the Plan', including the measurement of return flows. The MDBA (as Basin Plan regulator) should assess and clarify the scale of the cumulative impact of changes in return flows (from all causes) as part of its improvements to the water accounting framework. This will allow the MDBA to monitor the risk to SDL compliance of any significant changes to return flows.

DRAFT FINDING 3.3

The Department of Agriculture and Water Resources has accounted for the impacts of improving irrigation efficiency on return flows in some major water recovery projects, but has not systematically accounted for these impacts in all water recovery programs.

The overall impact of improved irrigation efficiency on water resources is not precisely known. The Murray-Darling Basin Authority (as Basin Plan Regulator) is responsible for determining this risk to Sustainable Diversion Limits.

35 For example: Matthew Colloff, John Williams and R. Quentin Grafton (sub. 12).

3.4 Cost-effectiveness of water recovery

The Commission's assessment of Basin Plan implementation also has regard for the efficiency of actions to implement the Basin Plan (chapter 1). The cost-effectiveness of water recovery is therefore an important consideration.[36]

Under the National Water Initiative, all Australian Governments agreed to select measures to recover water for the environment primarily on the basis of cost-effectiveness, but with a view to managing the socioeconomic impacts of reduced water availability (paragraph 79(ii)(c)) (COAG 2004).

Basin Plan impacts on industries and communities were to be addressed primarily through the approach to water recovery

The original Australian Government commitment to rebalance water use in the Basin accepted that structural adjustment would be necessary to ensure the viability of irrigation districts, and that the Australian Government would 'work with communities in managing the necessary transition' (Howard 2007, p. 4).

Basin Governments agreed to recover water through projects that modernise irrigation infrastructure, in addition to the direct purchase of water from willing sellers (COAG 2008). The Australian Government provided funding for the initial state-led projects on the basis of those projects:

1. securing long-term futures for irrigation communities in the context of climate change and reduced water availability
2. delivering substantial and lasting returns of water for the environment
3. representing value for money in the context of the first two principles.[37]

In 2013, the Australian Government noted that adjustment pressures were primarily to be addressed through the approach to water recovery and the operation of the SDL adjustment mechanism.[38]

The agreed approach has resulted in higher costs (to the taxpayer and to the economy) of recovering a set amount of water for the environment.

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36 Defined as minimising the budgetary cost of achieving an objective (PC 2010b). In this case, the objective is to meet water recovery targets and to recover a held water portfolio likely to be effective in pursuing environmental outcomes in the Basin.

37 Paragraph 4.10 of the *2008 Agreement on Murray-Darling Basin Reform*.

38 Specific assistance programs have also been provided to help manage structural adjustment for communities. These are discussed in section 3.5.

The cost of recovering water in the Basin has been substantial

Water recovery has been the most expensive part of Basin Plan implementation to date. As of 30 June 2018, the Australian Government has committed $8 billion to programs to bridge the gap, with $6.4 billion spent (table 3.2). Of this, $6.5 billion has been committed to directly recover water, with $5.5 billion spent to date.

Table 3.2 **Expenditure on implementing the Basin Plan**
Expenditure as at 30 June 2018

Australian Government program	*Committed funding*	*Expenditure*	*Share of total expenditure*	*Gap-bridging water recovered*[a]
	$ million	$ million	%	GL (LTAAY)
Bridging the gap programs	**8 017**	**6 385**	**79**	**1 940.0**
Direct purchase	3 094	2 650	33	1 226.9
Infrastructure modernisation:[b]	4 803	3 636	45	..
- Gap Bridging Water recovery projects	*3 100*	*2 788*	*34*	*677.1*
- MDB Water Infrastructure program (gap bridging component)	*150*	*0*	*0*	*0.0*
- Other projects/activities	*1 553*	*848*	*10*	..
SARMS (water recovery)	120	99	1	36.0
Other implementation programs[c]	**4 985**	**1 737**	**21**	**..**
Total	**13 002**	**8 122**	**100**	**1 940.0**

[a] Contracted recoveries as of 10 July 2018, excludes state recoveries and water gifted to the Australian Government. [b] Infrastructure modernisation funding includes non-water recovery projects, including environmental works such as the South Australian Coorong, Lower Lakes and Murray Mouth project and other activities [c] Including the SDL adjustment mechanism, structural adjustment assistance, the Water for the Environment Special Account, implementation payments to Basin States, and other programs. Does not include ongoing funding secured for Australian Government statutory authorities (MDBA, CEWH, BOM and MDB Joint Programs) for essential Australian Government water functions in the 2016 Mid-Year Economic Fiscal Outlook. Includes funding provided to other agencies to deliver certain programs and reports as per original funding and as fully expended when funds were transferred to the relevant agency. Includes funding for South Australia Riverland Floodplains Integrated Infrastructure project ($155 million), the industry assistance component of South Australia River Murray Sustainability (SARMS) program ($120 million) and other Basin programs. .. Not applicable; LTAAY = Long-term average annual yield.

Source: DAWR, pers. comm., 16 August 2018.

Recovering water through infrastructure modernisation has substantially increased the budgetary cost of water recovery. On average, infrastructure modernisation has cost taxpayers about twice as much (per ML) as purchasing the same water. These premiums (market multiples) are explicit in the design of programs. The additional cost has been aimed at attempting to maintain irrigated agricultural production while recovering water for the environment.

The additional cost can be large. For example, round three of the New South Wales Private Irrigation Infrastructure Operators Program recovered 13.7 GL (LTAAY) from Murrumbidgee Irrigation Limited at a cost of $122 million (DAWR 2018g). The average

price paid was about $8905/ML (LTAAY). As of June 2018, market prices for high reliability entitlements in the Murrumbidgee have increased substantially to almost $4200/ML ($4420/ML LTAAY) — but are still less than half the price paid under the program (MJA 2018).[39]

Based on the premiums paid for previous infrastructure modernisation projects, the total premium paid (in excess of market prices) for recovering water in this way is about $1.9 billion (DOE 2014) (appendix B).

There is some evidence that this approach has lessened socioeconomic impacts

Purchases have facilitated adjustment, but have had flow-on impacts

Directly purchasing water has generally had positive outcomes for participating irrigators, particularly for those who transitioned out of irrigated agriculture (Schirmer 2016; TC&A and Frontier Economics 2017). Selling water compensates the irrigator, facilitating adjustment by providing them with financial resources to pay down debt, invest on-farm, or exit the industry.

The flow-on impacts of water purchases on Basin communities are less clear cut. Purchasing water leads to a permanent reduction in water availability and limits potential irrigated agricultural production. How irrigators (cumulatively) adjust will affect service providers, employment opportunities, and the viability of regional communities. There can be significant distributional impacts as some areas benefit, while others do not.

Some water purchases have had adverse impacts at the local scale, such as where significant irrigation businesses sold large parcels of water. This has created rapid and significant adjustment pressures on some small irrigation-dependent communities. In the northern Basin, the MDBA has identified towns that were adversely affected by early, relatively large water purchases (MDBA 2016c). For example, the largest employer in the Collarenebri area sold its entire water holdings in 2009 and converted to dryland farming — this has been one driver of falling agricultural employment in that community (MDBA 2016f).

Infrastructure modernisation can (in part) maintain irrigated agricultural production

Recovering water through infrastructure modernisation mitigates the impact of water recovery by helping maintain irrigated agricultural production. This is intended to improve the productivity of irrigated agriculture and support the sustainability of regional communities dependant on irrigation (DAWR, sub. 81). Effectively, this attempts to mitigate structural change and minimise adjustment pressure on communities.

[39] Converted to LTAAY using an long-term diversion limit equivalent factor of 0.95.

DAWR's evaluations, along with other reports into the impacts of water recovery, have highlighted a number of outcomes from recovering water through infrastructure modernisation. Research commissioned by DAWR has found that irrigators who participated in infrastructure modernisation programs reported benefits from on-farm infrastructure projects, including: improved water use efficiency, improved water delivery timing, reduced on-farm workload, farm productivity, and improved profitability (DAWR 2018i).

Some irrigators reported higher farm costs, while others reported that they were more exposed to higher water allocation prices and delivery costs (DAWR 2018i; TC&A and Frontier Economics 2017).

Investment in on- and off-farm infrastructure was likely to increase long-term employment and regional economic activity in the Murrumbidgee Irrigation Area, compared with a relatively minor benefit from water purchases (MJA 2017). The construction of improved infrastructure also provided a short-term stimulus to local economic activity.

At a broader scale, the MDBA concluded that the productivity benefits of infrastructure modernisation programs, along with water trade, have offset some of the impacts of water recovery on regional employment across the southern Basin (MDBA 2018d).

But infrastructure modernisation cannot preclude structural change

Structural change is ongoing. Although the Basin is growing at an aggregate level, populations are declining in a number of small regional communities (MDBA 2018d). In many cases, this is driven by a range of factors, including water recovery, changing water prices, water trade opportunities, changing agricultural labour requirements and commodity price movements (MDBA 2016e, 2018c).

Changing water prices and water trade, in particular, are driving change in a number of Basin communities (in part accelerated by Basin Plan reforms, chapter 10). After participating in water recovery programs, some irrigators purchase water on the market to replace water provided to the Australian Government. This contributes to higher market prices and spreads the impact of water recovery well beyond that irrigator's region. High market prices also spur innovation by water users, who have a strong incentive to reduce their water consumption and become more water-use efficient.

Price changes impact on how water is used; generally moving water from lower-value uses (per unit of water, such as dairy) to higher-value uses (such as horticulture). These developments can affect whether infrastructure modernisation has the mooted flow-on benefits for particular regional communities, as the water 'saved' may not remain in an irrigation district (PC 2017b). A recent trend in the southern Basin has been net trade in water entitlements from the upper Goulburn districts to the lower Murray (TC&A and Frontier Economics 2017). This has created concerns of trade out of some districts and higher costs for remaining irrigators (Murray River Group of Councils, sub. 36; GMID Water Leadership, sub. 62).

Reduced delivery volume may require irrigation infrastructure operators to spread a fixed cost over a smaller number of remaining irrigators, increasing charges for those users. While infrastructure operators can charge termination fees to irrigators that disconnect from the network, they have waived these fees in many cases to reduce costs for exiting landholders.[40]

DRAFT FINDING 3.4

The size and speed of water purchases has had negative impacts on some regional communities.

Recovering water through infrastructure modernisation has partially offset pressure for structural adjustment in some communities, but at a significant cost to taxpayers.

However, higher water prices, water trade, and other ongoing pressures for change in the agriculture sector mean that some structural change is inevitable.

Water recovery processes have not always demonstrated value for money

In addition to recovering water for the environment, governments have chosen to pursue an additional objective of reducing socioeconomic impacts through water recovery programs. This has increased the cost of meeting water recovery targets. It is important that water recovery programs remain cost-effective in light of this decision.

Purchasing water through direct negotiation requires transparency

Since 2015, DAWR has only purchased surface water through direct negotiation with entitlement holders (referred to as strategic purchasing).[41] There have been six recent purchases (table 3.3).

Participants have raised concerns that some recent purchases have not represented value for money (WWF-Australia, sub. 31; MLDRIN, sub. 72; Robert and Katharine McBride, sub. 78) and lack transparency (Inland Rivers Network, sub. 23; Wentworth Shire Council, sub. 48; Environment Victoria, sub. 73).

40 For example, Goulburn-Murray Water waived more than 70 per cent of exit (termination) fees between 2012-13 and 2014-15 (although charged a fee in all cases during 2015-16) (ACCC 2017a, p. 141).

41 These purchases differ from 'strategic purchases' agreed to through bilateral arrangements with Basin States (such as GMW connections in Victoria or the Nimmie-Caira project in New South Wales), although purchases through direct negotiation must still be approved by the relevant Basin State.

Table 3.3 **Water purchased through direct negotiation**
From January 2016

Date	*SDL resource unit*	*Entitlement type*	*Cost*	*Volume*	*Average unit cost*
			$m	ML LTAAY	$/ML LTAAY
May 2016	Border Rivers (NSW)		0.4	256	1 500
June 2016	Murray (SA)[a]	High reliability	8.0	2 880	2 778
January 2017	Murrumbidgee (NSW)	Supplementary	4.5	4 100	1 098
June 2017	Warrego (Qld)	Unsupplemented	16.9	10 130	1 668
June 2017	Lower Darling (NSW)	High security General security	78.0[b]	2 129 15 682	3 881 1 896
August 2017	Condamine-Balonne (Qld)	Overland flow	78.9	26 400	2 989

[a] Purchased from the South Australian Government, not subject to the water purchase cap. [b] Includes $40 million to decommission irrigation infrastructure. This is not included in the calculation of average unit cost.

Sources: Commission estimates, DAWR (2018a; sub. 81), *Senate Motion No 420 for production of documents, Senate Motion No 579 for production of documents*.

DAWR considers value for money as one of the criteria in assessing purchases, along with contribution to water recovery targets, environmental utility of the entitlement, and possible socioeconomic impacts (DAWR, sub. 81). The integrity of DAWR's processes becomes essential for both ensuring and communicating that these purchases do represent value for money. As purchases involve direct negotiation with potential sellers, transparency becomes essential (ANAO 2011).

Transparency has not been systematic. The Tandou purchase is an example of this — a payment of $40 million was made to decommission irrigation infrastructure (in addition to $38 million paid for water entitlements in the Lower Darling). This additional payment may be justified in light of the planned Menindee Lakes supply measure project (chapter 4) as it avoids the expected cost of connecting the property when the lakes are reconfigured. But this was not justified until well after the purchase, and only at the behest of the Australian Parliament (as with other purchases).[42]

The Australian National Audit Office's work program for 2018-19 includes a potential performance audit to consider 'value for money and the application of the Commonwealth Procurement Rules' in DAWR's recent purchases (ANAO 2018a). The Commission views this as an appropriate process to provide independent assurance over whether DAWR has achieved value for money in its previous strategic purchases, and so has not made its own detailed assessment.

42 *Senate Motion No 420 for production of documents*.

DAWR has indicated that it now publishes information about contracts awarded through limited tender on its website (sub. 81). If done systematically, this should aid transparency for future direct purchases.

Some premiums for infrastructure projects are high, and the basis for this is not clear

A premium is explicit in the design of infrastructure programs, but the reasons why different premiums are paid is not always apparent. For projects commencing prior to 2014, this premium has varied from 1.9 to 7.1 times the prevailing market price (DOE 2014). High premiums provide opportunities for arbitrage, and may not represent a good use of public money unless they are justified through additional public benefits.

Submissions have also provided specific examples of high premiums for some infrastructure modernisation projects, with Namoi Water (sub. 82) noting that water recovered through on-farm projects in the Peel Valley cost the Australian Government almost four times the prevailing market price at the time.

For future programs, DAWR should ensure the basis of different premiums is clear — noting that funding under the current Water Infrastructure Program allows for a maximum market multiple of 1.75 (well below that of previous programs) (DAWR 2018e).

The net benefits of the chosen approach have not been comprehensively assessed

The Australian Government's choice to invest in infrastructure modernisation to recover water has substantially increased the cost of meeting water recovery targets. This was a deliberate decision by Basin Governments, in part, to address major pressures for structural change on communities and the socioeconomic impacts these changes can have.

However this investment should still be considered against principles for public funding of water infrastructure — that is, that the public benefits of the investment exceed the costs to taxpayers (PC 2017b).

What benefits are genuinely additional?

Evidence provided so far indicates a number of private benefits for irrigators, but does not substantiate that infrastructure projects have helped sustain regional communities. If the benefits of infrastructure modernisation are primarily private (and those benefits exceed the costs of works), it raises the question of why those investments were funded by Governments and not undertaken by irrigators or infrastructure operators (PC 2010).

The analysis commissioned by DAWR (MJA 2017) does not estimate how much investment is likely to have occurred in the absence of Australian government programs — particularly,

if water were purchased, and some proportion of the proceeds were used by irrigators to invest on-farm to realise those same private benefits.

Has it mitigated structural adjustment?

The MJA (2017, p. iii) analysis of infrastructure modernisation in the Murrumbidgee Irrigation Area states it is not a benefit-cost assessment, and does not consider economy-wide impacts or the opportunity cost of investment (that is, alternative uses of public money). A number of benefits and costs have therefore not been considered in the analysis released so far.

- Improved water use efficiency may not provide economic benefits where modernised irrigation infrastructure has higher operating costs.
- Expenditure on 'gold-plating' farms or shared water infrastructure that later becomes underutilised represents an economic cost in inefficient use of resources (and government expenditure).
- Private net benefits from on-farm infrastructure modernisation require improved productivity to increase irrigated production and offset lower future production (because some water has been transferred to the Government) (EY 2018).

The additional cost has not been clearly justified

The available evidence indicates that infrastructure modernisation is likely to have provided some benefits for irrigators, and had some positive flow-on impacts for regional communities. But the size of these benefits are not apparent, and no comprehensive benefit-cost analysis has been undertaken to confirm that the public benefits of these measures have exceeded the costs to taxpayers. This public evaluation is needed to ensure public confidence in the implementation of the Plan and to demonstrate the program is achieving its intended outcomes (chapter 13).

DRAFT FINDING 3.5

The Department of Agriculture and Water Resources has not always demonstrated that water recovery has been cost-effective in meeting its goal of mitigating adjustment pressures while sourcing water entitlements. It has:

- not systematically released information for strategic water purchases acquired by direct negotiation
- paid a substantial premium above market prices to recover water through infrastructure modernisation
- not undertaken a comprehensive assessment of benefits and costs of these approaches.

3.5 Structural adjustment assistance

While most of the socioeconomic impacts of the Basin Plan were to be managed through the approach to water recovery, governments have also committed to specific assistance programs to help communities transition to a future with less water. Spending on specific assistance programs as part of the Basin Plan reforms has totalled about $189 million, including:

- the Strengthening Basin Communities program between 2009 and 2011 ($200 million committed, with $64 million spent)
- the Murray-Darling Basin Regional Economic Diversification Fund, commencing in 2013 and concluding in June 2019 ($100 million)[43] — this program is being administered by the Australian Department of Infrastructure, Regional Development and Cities to fund projects selected by Basin States
- the economic development component of the South Australia River Murray Sustainability (SARMS) program, which has since concluded ($25 million).

It is unlikely that specific assistance has been effective

The effects of specific assistance programs are difficult to disentangle from the other factors affecting communities, industries and individuals in the Basin (discussed above). Evaluation is important to assessing effectiveness of the funding provided — but because specific structural adjustment assistance is not part of the Basin Plan, there is no direct requirement to evaluate these programs.

There is little information available on how these programs were implemented, and what the outcomes of spending were.

- The Strengthening Basin Communities program provided grants to local governments for urban water saving initiatives and to help communities plan for reduced water availability.
  - DAWR has published which local governments received grants under the programs, and what types of projects were funded (DAWR 2016b). While projects worth $80 million were committed to, only $64 million of funding was spent (DAWR pers. comm. 10 August 2018).
- The MDB Regional Economic Diversification fund provided competitive grants to assist Basin communities diversify their economies and adjust to a water constrained environment.

[43] Refers to funding transferred to the Australian Department of Infrastructure, Regional Development and Cities; however, only $73 million has been committed through the program (DAWR, pers. comm., 10 August 2018).

  - This program was implemented by Basin States. There is some information on what project were funded in some states, but the criteria used to assess these grants is not apparent (DOI (NSW) 2016; DSD (Qld) 2017; RDV 2017).
  - RAMROC (sub. 27) highlighted $32.6 million was spent in New South Wales on a number of projects, but could not provide evidence those projects had contributed to the outcomes of the Basin Plan.
- A further $25 million was provided for regional development under the SARMS program (PIRSA 2017).

Prior to the Basin Plan, a number of analyses assessed which Basin communities were likely to be most vulnerable to the impacts of the plan (MDBA 2012c). But it is not clear if structural adjustment programs targeted these vulnerable communities. Multiple submissions have criticised where grants under the MDB Regional Economic Diversification program were provided.[44]

A competitive grant program limits the scope to target projects to areas of need. Grants may congregate in areas where individuals are more capable of engaging in such a program. Some projects were funded in communities identified as being most vulnerable prior to the Basin Plan (such as Warren). However, a number of grants were provided to areas that, while located in the Basin, did not rely on irrigated agriculture — for example, regional centres Armidale, Orange and Wagga Wagga (DOI (NSW) 2016).

DAWR (sub. 81) considers a number of other projects have helped communities adjust to the Basin Plan.[45] Some of these projects were implemented well prior to the Basin Plan, do not align to where impacts were expected at the time, or relate to helping communities adjust to the Basin Plan. The SARMS program also included $7.5 million to redevelop the Loxton Research Centre (PIRSA 2017). There is no clear basis as to why these initiatives are considered by DAWR to have assisted communities adjust to the Basin Plan.

DRAFT FINDING 3.6

Grants-based structural adjustment programs are unlikely to have been effective at supporting communities.

- Assistance was not provided to those areas considered most vulnerable prior to the Basin Plan.
- Some projects considered to provide community assistance have not done so.

[44] Southern Riverina Irrigators (sub. 29), Coleambally Irrigation Co-operative Limited (sub. 38), Cotton Australia (sub. 47), Lachlan Valley Water Inc. (sub. 49), Lower Edward River Pumpers & Landholders (sub. 63) and Gwydir Valley Irrigators Association Inc. (sub. 83).

[45] These include the Integrated Pipelines project in South Australia ($117 million), the Wimmera-Mallee Pipeline ($98 million) and the Orange City Pipeline ($20 million).

Recent commitments should avoid similar mistakes

In May 2018, the Australian Government agreed to provide $20 million for economic development grants to Indigenous, remote, rural and regional communities most affected by the Basin Plan (DAWR 2018c). Some northern Basin communities (St George, Dirranbandi, Collarenebri and Warren) have been identified as having highest priority in this program.

Details on how this program will be implemented are not yet available, and its objectives are not apparent. While a relatively small program, it risks being ineffective. The Australian Government should target funding to areas where there is clear evidence of Basin Plan impacts — reflecting communities with the least capacity to adjust, not necessarily where water was recovered.

The Commission has previously provided principles for effective regional economic development programs in its *Transitioning Regional Economies* study, and for addressing structural adjustment issues linked to water reform (PC 2017c). In line with these principles, DAWR should also ensure that the grants program:

- funds projects that align with state-based regional planning processes, and avoids industry assistance or subsidies
- applies rigorous and transparent processes for choosing, implementing, and evaluating individual projects
- monitors and reports on whether the program achieved its outcomes.

DRAFT RECOMMENDATION 3.3

If provided, the Australian Government should target any further assistance to communities where substantial adverse impacts from water recovery have been identified. This should:

- have clear objectives and selection criteria
- be subject to monitoring and evaluation.

Any support for regional development should align with the Productivity Commission's strategies for transition and development, set out in its report on *Transitioning Regional Economies*.

4 Supply measures and Toolkit

Key points

- Supply measures are a Sustainable Diversion Limit (SDL) adjustment mechanism that was included in the Basin Plan to ensure water is used efficiently. The measures include environmental infrastructure works, rule changes and constraint easing that can achieve the equivalent or better environmental outcomes, reducing the level of water recovery. They were included in the Basin Plan with the aim of reducing the socioeconomic impacts on Basin communities.
  - Basin States are responsible for developing and implementing approved supply projects by 2024; failure to implement projects by this date may mean further water recovery.
  - The Australian Government has made up to $1.0 billion available for funding supply measures.
- Basin States face significant challenges implementing all supply measures by 2024.
  - A supply measures package to offset 605 GL in water recovery has been approved, but there are substantial issues still to be resolved before implementation can commence.
  - There have been delays in the development and approval of the package and community dissatisfaction with the level of transparency and consultation to date.
  - The supply package relies heavily on six highly complex and interdependent projects. Past experience with similar projects suggests the 2024 deadline is highly ambitious, if not unrealistic.
  - There is currently no mechanism to ensure individual measures deliver value for money.
- The Commission's draft recommendations include:
  - Basin Governments should develop an integrated plan for delivering supply projects to enable consistency of approach, manage interdependencies within the package of projects and ensure their efficient operation.
  - Basin Governments should extend the deadline for supply measures to be operational where it would allow projects to be retained and deliver their full benefits. This would enable adequate planning, proper approval processes, consultation and implementation.
  - The Australian Government should establish a review process to ensure individual supply measures offer value for money.
- These proposed changes would allow supply measures to succeed in meeting their objectives and potentially reduce the cost to taxpayers of meeting SDLs by hundreds of millions of dollars.
- Following the review of SDLs in the northern Basin, Governments have agreed to reduce the water recovery target by 70 GL and implement Toolkit measures.
  - Toolkit measures are similar to supply measures but without the same checks and balances.
  - Northern Basin Governments must now develop transparent and accountable governance arrangements for implementing the Toolkit measures within reasonable timeframes.

This chapter discusses supply measures in the southern Murray-Darling Basin (MDB). It first provides background on the purpose and operation of supply measures (section 4.1). It then presents the Commission's assessment of implementation of supply measures (section 4.2) and options for improving implementation in the future (section 4.3). It concludes with discussion of the northern Basin Toolkit (section 4.4).

4.1 Background

Supply measures are a way to achieve environmental outcomes with less water recovery

Sustainable Diversion Limits (SDLs) are the limits on the average amount of surface water that can be taken from the Basin's rivers, while providing enough water to meet agreed environmental outcomes. To ensure extractions are within new SDLs, the Australian Government agreed to recover 2750 GL of surface water for the environment (chapter 3).

The Basin Plan provides the opportunity to adjust SDLs and the consequential water recovery targets prior to SDLs commencing on 1 July 2019. In the southern Basin, adjustments to surface water SDLs may occur through the SDL adjustment mechanism. Under the SDL adjustment mechanism, the surface water SDL can be *increased* where works and measures can be shown to achieve equivalent environmental outcomes with a lower volume of environmental water.[46] These are known as supply measures and can include both physical environmental works as well as operation rule changes. The maximum increase in the SDL from supply measures anticipated under the Basin Plan was 650 GL.

Under the SDL adjustment mechanism, surface water SDLs can also be *reduced* to enable a suite of enhanced environmental outcomes (box 4.1). This reduction can occur where an additional 450 GL of water[47] can be recovered for the environment while maintaining or improving socioeconomic outcomes. These are known as efficiency measures and can include projects to improve the efficiency of on- and off-farm irrigation.

Supply and efficiency measures are linked in several ways.

- The overall net change in SDLs from these adjustment measures must be within 5 per cent of the original surface water SDL.
- They are also both reliant (to different extents) on easing or removing constraints to the delivery of environmental water in river systems.
- In May 2018, the Australian Government agreed to link payments for supply measures with full cooperation with the delivery of efficiency measures under the National Partnership Agreement.

46 Basin Plan s. 7.09(b).

47 Beyond the Basin Plan's water recovery target of 2750 GL to meet benchmark environmental outcomes.

Nevertheless, the purposes and intended outcomes of supply and efficiency measures are quite distinct (box 4.1).

The inclusion of both supply and efficiency measures in the SDL adjustment mechanism reflects a compromise that was struck between the Australian and Basin State Government in finalising the Basin Plan (MDBA, sub. 86). On the one hand, a primary motivation for including supply measures was to test whether environmental outcomes could be achieved with less water, thereby reducing the socioeconomic impacts on communities in the Basin. On the other, the inclusion of efficiency measures in the southern Basin reflects the opportunity to improve environmental outcomes (particularly in the Lower Murray) by recovering additional water for the environment. The requirement that additional water is recovered with neutral or improved socioeconomic outcomes was to address concerns about detrimental socioeconomic impacts of additional water recovery (chapter 5).

Approved supply projects must be implemented by 2024

The *Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin* (IGA) set out the requirements for the development, approval and implementation of the supply measures package (COAG 2013). Under the IGA, Basin States were responsible for identifying and preparing business cases for potential supply and efficiency measures (figure 4.1). The Basin Officials Committee (BOC)[48] then assessed the notified measures and recommended a package of adjustment measures for consideration by the Murray-Darling Basin Authority (MDBA).

The MDBA was responsible for assessing the package of adjustment proposals and providing a recommendation to the Australian Government Minister for Water on how much to adjust the SDL for surface water. The scope of the assessment was to determine the environmental equivalence from the final package of State projects and recommend an adjustment volume for the SDLs (box 4.2).

When the Minister approved the final adjustment to the SDLs, they tabled an amendment to the Basin Plan in the Parliament (as a disallowable instrument). Basin States have until 2024 to implement approved SDL adjustment projects. The Basin Plan requires Basin States to withdraw a measure from the package if it will not be operational by 30 June 2024 (however, it is unclear how strictly this will be applied in practice).[49]

[48] BOC comprises representatives from the Australian, New South Wales, Victoria, South Australia, Queensland and the ACT Governments. It is chaired by the Australian Government representative. The MDBA's Chair and Chief Executive are non-voting members.

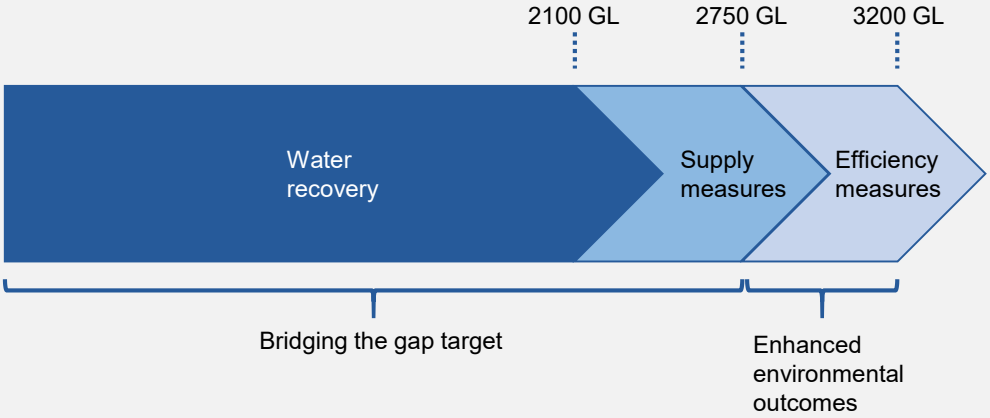
[49] Basin Plan, s. 7.12(6).

Box 4.1 Adjustments to Sustainable Diversion Limits

In the southern Basin, the Plan allows for adjustments to surface water SDLs.

- **Supply measures** allow the surface water SDL to increase (and the water recovery target to decrease) where works and measures can be shown to achieve equivalent environmental outcomes with a lesser volume of environmental water. The Basin Plan allows for a water recovery offset of up to 650 GL from supply measures (figure below). (If supply measures achieve less than 650 GL of water offset, then water recovery to bridge the gap must be more than 2100 GL.)
  - **Constraints projects** aim to overcome some of the barriers that constrain the delivery of water down the system. They can include changes to physical features such as crossings and bridges, as well as negotiating easements where private land is flooded. Constraints projects were originally included in the Basin Plan because they facilitate the delivery of enhanced environmental outcomes (outlined in Schedule 5 of the Plan) by enabling the delivery of water, particularly to larger areas of floodplains. However, they also assist in delivering equivalent environmental outcomes and are largely being progressed as a subset of supply measures.
- **Efficiency measures** aim to achieve enhanced environmental outcomes above those achievable with 2750 GL by recovering an additional 450 GL for the environment. Additional water is to be recovered through projects that improve the efficiency of the consumptive use of water, while securing neutral or improved socioeconomic outcomes. The enhanced environmental outcomes are in the southern Basin and are achieved by watering larger areas of floodplains, higher stream flows, and meeting specific objectives for the Coorong, Lower Lakes and Murray Mouth in South Australia. Delivering these enhanced environmental outcomes is also dependent on easing constraints.

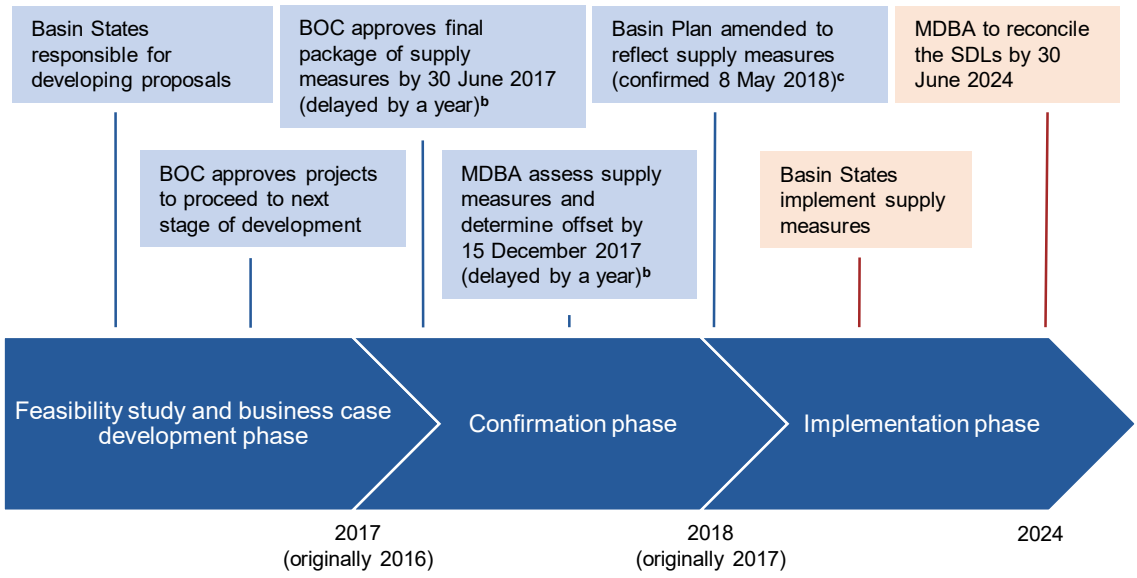
The Basin Plan limits the amount that SDLs can be adjusted in total. The Basin-wide long term average SDL is 10 873 GL and can be adjusted up or down by a maximum of 5 per cent (approx. 543 GL).



If the MDBA judges that there has been material changes to the package of supply measures during implementation, it may conduct a reconciliation by 30 June 2024. This would involve re-estimating the size of the SDL adjustment. A downward revision in the adjustment may mean Governments are required to undertake further water recovery to meet the SDLs. Governments are yet to finalise arrangements about whether Basin States or the Australian Government would be responsible for recovering water should this be required. Make good arrangements are expected to be outlined in the funding agreements for supply measures.

The Australian Government has allocated up to $1.0 billion for supply projects (DAWR, pers. comm., 10 August 2018).[50] The quantum of funding reflects the estimated cost of recovering the equivalent amount of water through purchase in the absence of the supply projects at the time — as per the IGA. That is, a reference water entitlement price of $1660/ML and an offset of 605 GL (as discussed below). Approximately $35 million was given to Basin States to develop business cases (DAWR, pers. comm., 10 August 2018).

Figure 4.1 **Timeline for developing, assessing and implementing supply measures[a]**



a Light blue boxes indicate actions that have occurred, orange boxes indicate actions to occur. **b** An amendment to the Basin Plan (s. 7.10(1)) in 2016 allowed Basin States an extra 12 months to nominate supply measures. The initial dates for approving and assessing supply measures were for 2016. The extra time allowed for the Enhanced Environmental Water Delivery (Hydro-cues) project to be added. **c** The Basin Plan was amended in December 2017, but was subject to a disallowance that was resolved in May 2018.

Sources: MDB Ministerial Council (2017b); MDBA (2017s).

50 Constraints projects will also be able to seek funding from the Water for the Environment Special Account. A total of $200 million is available for funding constraints projects — including the New Goulburn Constraints measure, which was included in the SDL adjustment mechanism but was not nominated as a supply measure.

Box 4.2 **Determining equivalent environmental outcomes**

To calculate the supply contribution (water recovery offset) for supply measures that achieves equivalent environmental outcomes, the MDBA followed the method set out in Schedule 6 of the Basin Plan. The method involved the MDBA using hydrologic models to compare the environmental outcomes under the benchmark scenario (with 2750 GL water recovery) and a scenario which includes the supply measures and a reduced amount of water recovery (MDBA 2017s). It assumed that Basin States would implement 'pre-requisite policy measures' by 30 June 2019 (chapter 10). The MDBA compared environmental outcomes using a scoring method of ecological elements, that was developed by the CSIRO and agreed by Basin States, to determine that the supply measures achieve equivalent environmental outcomes across key environmental sites in the Basin (Overton et al. 2015). In applying the method, the MDBA had to ensure that there was no reduction in the benchmark environmental outcome scores for each region, but there was scope for some limited reductions in the score or outcome of individual elements if they are offset by increases in other elements (limits of change).

The MDBA's modelling approach was subject to independent review in 2017, with the review finding the approach was consistent with the requirements of the Basin Plan (Bewsher Consulting Pty Ltd 2017). The SDL adjustment mechanism process was more broadly reviewed in 2018 and found to be consistent with the IGA and Basin Plan obligations (Tucker, Davies and Turner 2018).

4.2 Assessment of implementation risks

To assess the effectiveness of the implementation of supply measures, the Commission considered whether Basin States are on track to implement supply measures by 2024, and hence, achieve their goal of equivalent environmental outcomes with less water recovery. It also considered broader issues such as whether the process for implementing supply measures ensures value for money. To inform this analysis, the Commission examined several lines of evidence including experiences with similar projects in the past (such as The Living Murray (TLM)) and the extent that decisions have been underpinned by good processes that include transparency, management of key risks and governance arrangements that promote accountability and clarity of roles.

A supply package has been approved, but there is a range of issues to be resolved during the implementation phase

In May 2018, the Australian Government Minister for Water confirmed plans to proceed with an approved package of 36 supply measures with an estimated water recovery offset of 605 GL (Minister for Agriculture and Water Resources 2018a). The Minister approved the package in December 2017 on the advice of the MDBA; however, there were delays in finalising required amendments to the Basin Plan owing to the need to debate a disallowance motion. The uncertainty associated with the disallowance meant there was limited progress on implementation for nearly six months. This delay was on top of the one year extension to the original deadline for Basin States to notify the MDBA of the supply measures and for

the MDBA to assess the package (figure 4.1). As a consequence, there is effectively 18 month less to implement the supply projects than parties originally envisioned.

The package includes a variety of projects such as rule changes, environmental infrastructure works and constraint easing (MDBA 2018s). For example:

- New South Wales and Victoria have a joint project that involves changing operating rules to allow the river operator to release flows from the Hume Dam at a higher rate and reduce operational losses and unseasonal flooding in the Barmah-Millewa Forest
- the TLM environmental works[51] project at Hattah Lakes uses a pumping station, regulators and levees to deliver water to the lakes and floodplain more frequently and with less water in the River Murray.

Effectively, the supply package has the potential to provide additional benefits to improve the long-term health of the Basin, such as the ability to provide additional delivery capacity, greater flexibility for river operations and capacity to water new areas of the floodplain. It will provide a new suite of tools and operating rules that will need to be integrated into river management in the future — this will require community support.

Projects are at varying stages of implementation (table 4.1). For example, six works projects funded under TLM are already operational, while most other supply projects are still in the concept design phase. Those projects yet to be implemented have a number of issues that Governments will need to resolve during project refinement for successful implementation, such as further consultation with local communities, establishing environmental targets, addressing potential water quality issues and monitoring third party impacts.

Key details about governance and funding of the supply measures package are also yet to be finalised, and is further delaying implementation of projects. Basin States and the Australian Government have not yet finalised project implementation agreements — which set out the funding for supply projects, roles and responsibilities for ongoing operation and maintenance and risk sharing, including 'making good' where supply projects do not meet their intended outcomes (DAWR, pers. comm., 10 August 2018). The MDBA has not yet finalised and published how it will assess projects as part of reconciliation in 2024, which will in turn have implications for project risks. That Governments have not substantially addressed these fundamental issues by this stage appears to be symptomatic of both a broader lack of trust and effective coordination across parties in implementing the Plan (chapter 14). Until these issues are resolved, the timeframe for implementing supply projects will be further compressed.

[51] TLM environmental works have been included as supply measures as they were not operational in 2009 and were not included in the benchmark model.

Table 4.1 **Supply projects at August 2018**

Project	*Proponent(s)*	*Status*
Operational rule changes and system enhancements[a]		
2011 Snowy Water Licence Schedule 4 Amendments (RMIF)	NSW, Victoria	Draft rules
Operating rule change to the use of the Barmah-Millewa Forest Environmental Water Allocation	NSW, Victoria	Being trialled
Computer Aided River Management system for the Murrumbidgee River	NSW	Being trialled
Enhanced Environmental Water Delivery (Hydro-cues)	NSW, Vic, SA	Scoping
Flexible rates of fall in river levels downstream of Hume Dam	NSW, Victoria	In operation
Operating rule change to Hume Dam airspace management and pre-releases	NSW, Victoria	In operation
Menindee Lakes Water Savings project (including the Lower Darling constraints key focus area)	NSW	Scoping
SDL Offsets in the Lower Murray, New South Wales (Locks 8 and 9 Weir Pool Manipulation)	NSW	Scoping
Improved Regulation of the River Murray	NSW, Victoria	**na[b]**
Environmental works[c]		
Belsar-Yungera floodplain management project	Victoria	Concept design
Burra Creek floodplain management project	Victoria	Concept design
Gunbower National Park environmental works project	Victoria	Concept design
Guttrum and Benwell Forests environmental works project	Victoria	Concept design
Hattah Lakes North floodplain management project	NSW	Concept design
Lindsay Island (stage 2) floodplain management project	Victoria	Concept design
Nyah floodplain management project	Victoria	Concept design
Vinifera floodplain management project	Victoria	Concept design
Wallpolla Island floodplain management project	Victoria	Concept design
Riverine Recovery Project	SA	In operation
South East Flows Restoration Project	SA	Under construction
TLM Environmental Works and Measures: Koondrook-Perricoota Forest Flood Enhancement Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Mulcra Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Lindsay Island (Stage 1) Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Hattah Lakes Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Gunbower Forest Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Chowilla Floodplain Works	NSW, Vic, SA	In operation
Improved flow management works at the Murrumbidgee River – Yanco Creek offtake	NSW	Concept design

(continued)

Table 4.1 (continued)

Project	*Proponent(s)*	*Status*
Nimmie-Caira Infrastructure Modification Proposal	NSW	Under construction
Eastern Mount Lofty Ranges Flows for the Future Project	SA	Detailed design
Murray and Murrumbidgee National Parks	NSW	Concept design
Modernising supply systems for effluent creeks – Murrumbidgee River	NSW	Concept design
South Australian Riverland Floodplains Integrated Infrastructure Program (SARFIIP): Pike and Katarapko Floodplain project elements	SA	Under construction
Constraints[d]		
Yarrawonga to Wakool junction reach constraints measure	NSW	Concept design
Murrumbidgee constraints measure	NSW	Concept design
Hume to Yarrawonga constraints measure	NSW, Vic	Concept design
River Murray in South Australia constraints measure	SA	Concept design

[a] Status categories for rule changes: Scoping, Draft rules, Being trialled, In operation. [b] Project not modelled as part of SDL adjustment determination. [c] Status categories for environmental works: Concept design, Detailed Design, Under Construction, In operation. [d] Status categories for constraints: Concept design, Community consultation, Being trialled, In operation.

Source: MDBA (2018s).

There is community dissatisfaction with the level of transparency and consultation to date

Regional visits and submissions to this inquiry revealed a high degree of dissatisfaction and mistrust in parts of community, including Traditional Owners, arising from a perceived lack of transparency and consultation in the development of the agreed package of supply projects.[52] Specific concerns included a lack of detailed information on the benefits, costs and impacts of some projects (including not publishing the business cases) and tokenistic community consultation. This lack of trust has increased community divisions over a number of projects and reduced broader community confidence and support for the Basin Plan in general. It has also reduced the willingness of a number of individuals to participate in the implementation of projects (such as constraints)[53] and enhanced the concerns of Traditional Owners:

> MLDRIN is concerned that the SDLAM [SDL adjustment mechanism] fails to account for impacts on First Nations values and uses, due to the uneven distribution of 'benefits' and 'dis-benefits' arising from the use of supply measures as an offset for real water recovery. (MLDRIN, sub. 72, p. 3)

[52] For example, EDO's of Australia (sub. 14), Leeton Shire Council (sub. 17), Inland Rivers Network (sub. 23), WWF-Australia (sub. 31), Murray Darling Association (sub. 52), Lower Edward River Pumpers & Landholders (sub. 63), Murray Valley Private Diverters Inc. (sub. 69) and MLDRIN (sub. 72).

[53] Lower Edward River Pumpers & Landholders, sub. 63.

As the MDBA and Basin States further develop supply projects, addressing this trust deficit will be a major challenge.

Basin Governments and the MDBA have recently taken steps to address these concerns. In June 2018 for example, Basin States released the business cases for each supply measure. The MDBA has also committed to regularly reporting on progress in implementing the supply projects; whether projects will achieve their intended outcomes and any potential adjustment to the SDLs where projects are not on track on achieve their intended outcomes (MDBA 2017s). The MDBA has also made a commitment to fund Murray Lower-Darling River Indigenous Nations to host some workshops with Traditional Owners about the SDL adjustment mechanism process and projects (MLDRIN, pers. comm., 25 June 2018).

The package relies heavily on six highly complex projects

Although all the projects to be implemented have a number of outstanding issues to be resolved for successful implementation, there are six key projects (Menindee Lakes, Hydro-cues and four constraints projects) that are particularly noteworthy. These projects could account for between one-third and half of the expected water recovery offset of the approved supply package (box 4.3). They are highly complex and are in relatively early stages of development. As discussed below, past experience suggests the 2024 deadline for all these projects to be fully operational is highly ambitious, if not unrealistic.

If these projects fail, the Australian Government or Basin States may then have to 'make good', for example by purchasing water entitlements. Such water purchases are limited by a legislative cap (chapter 3).

Constraints

Constraints projects aim to increase the size of flows that can be delivered down the river system to water additional areas of the floodplain. This involves removing physical barriers (such as increasing the height of bridges), building levees to protect land from inundation and, negotiating and signing agreements with landholders whose land is flooded by the higher flows.

The approved supply package includes five constraints projects along key river reaches in the southern Basin (Hume to Yarrawonga, Yarrawonga to Wakool Junction, Murrumbidgee, SA Murray and Lower Darling (as part of the Menindee Lakes project)) (figure 4.2). These projects are still concept proposals and there are a number of issues that will need to be resolved during the project implementation phase to better understand the benefits, costs and third party impacts of the projects (MDBA 2018s).

Box 4.3 Importance of constraints, Hydro-cues and Menindee Lakes to the supply measures offset

In assessing the supply measures offset, the MDBA worked out the proposed adjustment to the SDLs based on the full package of supply projects. It did not calculate adjustment values for each project individually due to 'the interlinked and interdependent nature of river management' (MDBA 2017s, p. 28). For example, the environmental benefits of the Hydro-cues project is heavily dependent on easing constraints.

Although it is not possible to precisely define the marginal contribution that individual projects make to the overall 605 GL offset, past estimates provide some insight into the contribution of the constraints, Hydro-cues and Menindee Lakes projects.

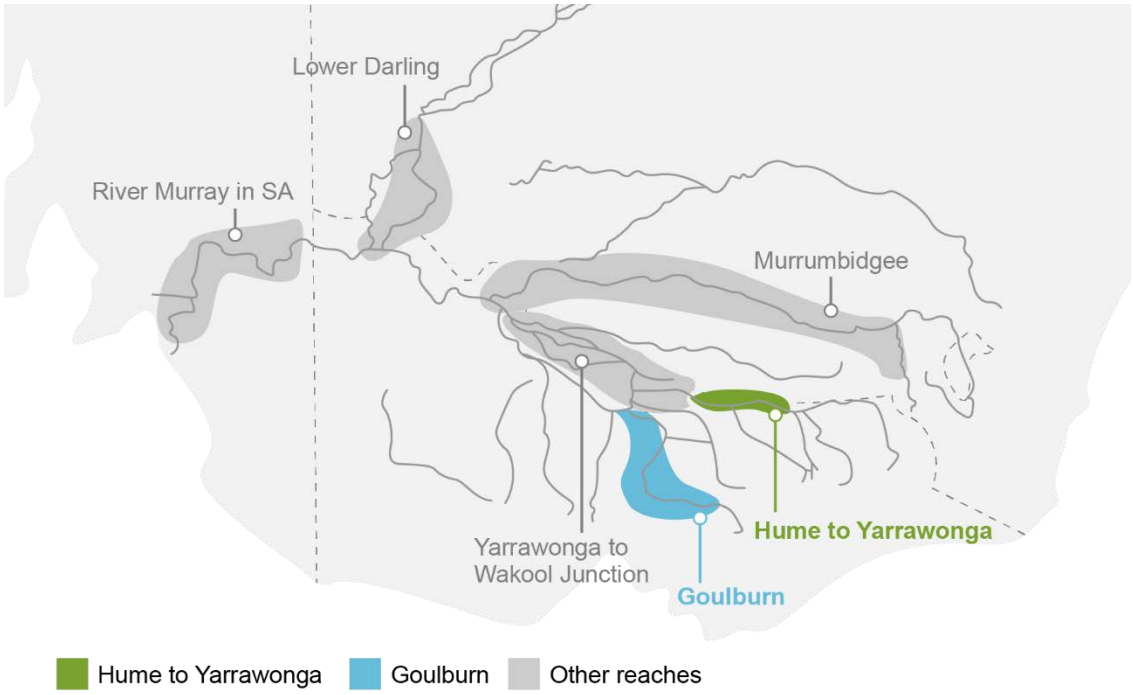
- A 2015 stocktake of supply measures estimated a package without the constraints, Hydro-cues and Menindee Lakes projects could offset over 400 GL (Martin and Turner 2015).
- The 19-project package of supply measures which did not include the Hydro-cues project — but did include an earlier version of the Menindee Lakes project — was able to offset up to 400 GL (Blackmore et al. 2017).
- MDBA modelling showed that adding Hydro-cues to the 19-project package could achieve a better environmental outcome score with an offset of 200 GL (MDBA 2017k).
- MDBA modelling of the Menindee Lakes project estimated it offset 106 GL (DPI (NSW) 2017b).

There are varying views on the size of the offset from the key projects because of the reported challenges in ascribing the marginal contribution. Various estimates place the offset contribution of these projects between 200 and 300 GL — or between one-third and half of the total offset. Despite the high level of uncertainty, it is clear that these projects are integral to the package of supply measures achieving the 605 GL offset.

Implementation of constraints projects will be highly complex. It will involve Governments assessing the impacts of higher flows for every affected landholder. Governments and landholders will need to agree on mitigation measures and compensation to landholders through event-based payments, infrastructure or legal easements recognised on the property title (DPI (NSW) 2016b; MDBA 2018s). On the River Murray where these negotiations will involve landholders in both New South Wales and Victoria, Governments will need to work together to develop and deliver an equitable and consistent approach to undertaking these negotiations and share risk. Governments have not yet clearly articulated how constraints will be eased where landowners refuse to participate in negotiations.[54]

[54] The Victorian Government ruled out compulsory acquisition of land or easements. The Constraints Management Strategy also includes principles to recognise and respect the property rights of landholders and water entitlements holders (MDBA 2013a).

Figure 4.2 **Constraints in the southern Basin**



Note: Previous constraint easing has occurred in the Hume to Yarrawonga reach. Constraint easing in all reaches must be completed by 2024. The Goulburn constraint measure (in blue) is not nominated as a supply measure but nominated as a constraint measure as part of the SDL adjustment mechanism to achieve enhanced environmental outcomes (chapter 5).

Based on past experience with similar projects, the 2024 deadline for all constraints to be fully operational appears highly ambitious, if not unrealistic. For example, negotiations in the 2000s to secure the right to release 25 000 ML/day from Hume Dam involved negotiating legal easements with 103 landholders from Hume to Yarrawonga (MDBA 2015c) and took almost eight years to complete (MDBA, pers. comm. 9 August 2018; MDBA 2009). In comparison, easing constraints for the five supply measures will require negotiations with over 3000 landholders and must take place over six years to 2024, assuming Basin States start immediately (figure 4.2, table 4.2). These negotiations will also be hampered, at least initially, by the legacy of community mistrust and concern resulting from poor consultation done to date. Murray Irrigation (sub. 26, p. 3) noted that government agencies have acknowledged that 'the scale and complexity of stakeholder engagement on constraints projects has been significantly underestimated'.

Further, the estimated costs of the constraints proposals have increased over time. At the prefeasibility stage in 2014, the MDBA estimated the total cost of the four nominated constraints-as-supply projects at $192 million (MDBA 2014b). The more recent and detailed cost estimates in the business cases put the total of these projects at over $430 million (table 4.2).

Table 4.2 **Characteristics of the constraint-as-supply measures**

Constraint measure	*Estimated cost ($ million)*	*Estimated agricultural area affected (ha)*	*Estimated number of affected properties*
Hume to Yarrawonga	26-34	1 201	207
Murrumbidgee	113-164	53 103	1 056
South Australian Murray	38-55[a]	9 374	**ne**[b]
Yarrawonga to Wakool Junction	262-306	22 879	1 513
Lower Darling (part of Menindee Lakes Water Savings Project)	**np**[c]	**ne**[b]	260[d]
Total	**439-559**	**86 557**	**3 036**

[a] Cost estimate released as part of *Senate Motion No 685 for production of documents*. [b] Not estimated in business case. [c] Not published. [d] Number of licence holders in Lower Darling.

Sources: DELWP (Vic) (2016); DEWNR (SA) (2016); DPI (NSW) (2016a, 2016b, 2017b); MDBA (nd(b)).

Hydro-cues

Hydro-cues is a supply project that involves operational rules changes. It aims to achieve environmental outcomes (namely, in-channel, floodplain and wetland condition) by increasing the ability of environmental water holders to coordinate environmental water delivery with increases in natural flows caused by rainfall (MDBA 2017k).

Hydro-cues is early in the scoping and development phase and while small trials have been coordinated in the southern Basin by river operators, the MDBA and other stakeholders since 2010-11, considerable further work is required to understand the benefits, costs and impacts of the program (MDBA 2017k).

It is also a complex project, requiring coordination across three States and input from a range of stakeholders including environmental water holders, environmental water managers, catchment management organisations and water authorities.

There are a number of issues that must be resolved through the implementation phase. This includes developing a detailed implementation plan that will give river operators confidence and capacity to actually deliver higher flows with no adverse consequences and align objectives with Water Resource Plans (MDBA 2017k, 2018s). Realising the full benefits of Hydro-cues is 'critically dependent' on implementing constraints projects (MDBA 2017k, p. 17) which are highly unlikely to be completed by 2024, as outlined above. The project must also develop a strategy to engage stakeholders and communities and a detailed monitoring and evaluation plan. Given the issues to be resolved, the likelihood of Hydro-cues being fully operational by 2024 appears to be low.

Menindee Lakes Water Savings Project

The Menindee Lakes project aims to improve the operation of the Lakes to reduce evaporative losses. It involves changes to infrastructure and operational arrangements to improve the ability of water managers to achieve ecological outcomes in the Menindee Lakes, Lower Darling, the Anabranch and the Lower Murray and return more water to the system for environmental use.

There is currently a considerable list of issues to resolve prior to implementing the Menindee Lakes project (MDBA 2018s). These include:

- the need for greater consultation and engagement with communities on project development and refinement
- the need for a detailed Environmental Impact Statement to assess potential impacts to the ecology of the Menindee Lakes and the Lower Darling and an Aboriginal Heritage Impact permit to assess and mitigate potential impacts to Aboriginal cultural values
- the need to develop a detailed new proposed operating regime to provide for the needs of the Lower Darling and assess and mitigate impacts on the wider River Murray System operation, acknowledging that implementation of the project needs to maintain reliability of water entitlements
- a mechanism for recognition and treatment of additional protected environmental inflows from the northern Basin
- a mechanism for recognition and treatment of water savings as a result of the project
- the need for more detailed design of infrastructure, refurbishment and enhanced flood protection works.

Inquiry participants have voiced a number of concerns about the Menindee Lakes project, with several arguing that governments have not adequately acknowledged the potential adverse impacts on communities and the environment.[55] These concerns relate to the reliability of Lower Darling water entitlements, environmental and cultural degradation of Menindee Lakes and increased costs for Broken Hill water users. An effective consultation strategy will be essential to addressing these concerns during project development.

The timelines for project delivery by 2024 appear to have little margin for contingencies and rely on a number of highly optimistic assumptions for the project to be operational. For example, the business case assumed dry conditions during the brief (18 month) period allocated to construction, with no contingency plan if this is not the case (DPI (NSW) 2017b). Similarly, it relies on changes to the project as a result of the Environmental Impact Statement and Aboriginal Heritage Impact Permit being easily addressed. These issues mean there is a significant risk that the project will not be fully operational in 2024 as required by the Basin Plan.

[55] For example, Jensen (sub. 28), MacKenzie (sub. 35), Lower Edward River Pumpers & Landholders (sub. 63), Moles (sub. 67), MLDRIN (sub. 72), McBride (sub. 78) and Mills (sub. 84).

DRAFT FINDING 4.1

It is likely that some key projects in the approved supply package will not be fully operational in 2024.

- They are behind schedule and the timeframe for implementation has been compressed due to delays in developing the projects.
- They are still in an early stage of development.
- History has shown that these types of projects are complex, interdependent and require extensive consultation to implement.
- A range of issues still need to be resolved between Governments before these projects can proceed. These include project risk sharing, monitoring, governance and funding.

There is no mechanism to ensure individual supply measures deliver value for money

Australian government funding for supply measures assumes the average cost of offsets is less than the benchmark price for recovering the equivalent volume of water (that is, $1660/ML). However, there is no requirement for the offset attributable to individual supply measures to be less than the cost of recovering the equivalent volume of water. This means that the package of supply measures could potentially include some projects that are above the benchmark cost, increasing the cost to the Australian Government (taxpayers) of meeting its SDL and water recovery obligations.

Also, there is currently no scheduled step in the approval process whereby the Australian Government or BOC reviews the current package of supply measures to assess whether there has been any significant changes to the anticipated benefits, costs and timelines of individual projects and to confirm that the project continues to offer value for money.

Past experience in building environmental works projects through TLM has shown that the costs and benefits of projects can diverge substantially from original estimates. For example, the final cost of the Koondrook-Perricoota Forest works project ($80 million) was several times higher than the initial budget ($11 million) (box 4.4). The absence of a specific process that accounts for material changes to the net benefits of supply projects creates a risk that individual projects that were initially promising but later found to have questionable net benefits, still receive funding.

Box 4.4 **Koondrook-Perricoota Forest works**

The Koondrook-Perricoota Forest works project was undertaken by the New South Wales Government as part of the Living Murray program and involved constructing a series of channels and flow management structures designed to flood the forest in order to improve the condition of wetlands, river red gum forests and fish and bird outcomes. The projects initially had an expected completion date of 2011 and expected budget of $11 million (MDBC 2004).

The project was eventually completed in 2013 at a final cost of $80 million. The increase in timelines and budget were due to flooding in the forest during construction, and unforeseen changes to the project to avoid Indigenous cultural heritage sites and to address community concerns about flooding (MDBA 2012d).

In addition to higher than expected cost and timelines for completion, the project has not been able to operate at capacity because landholder consent for flooding private land has not been secured.

4.3 Improving implementation

Governments urgently need to change the current approach to implementing supply measures. To date, Governments have focused on how to design a package of supply measures that achieves the maximum water recovery offset, while achieving equivalent environmental outcomes. Having decided to progress with a package of supply projects, Governments must now commit to delivering them lest persistent delay, deferral of community agreement and subsequent potential for abandonment undermine the credibility of the Plan itself. Successful implementation of the supply measures package will require:

- recognition that the supply projects are an integrated package of projects with clear interdependencies between projects in the planning, building and operation stages and which will ultimately need to be integrated into operation of the River Murray and shared resources
- clear roles and responsibilities for project implementation and oversight
- realistic timeframes which enable consultation, approvals processes, planning and implementation to be undertaken properly
- commitment to meaningful engagement where communities are consulted, local knowledge is incorporated and local issues are recognised and resolved. Stakeholders should be provided with information to understand the possible impacts on them and how these will be mitigated
- commitment to engagement with Traditional Owners not only at the local scale (as required by current legislation) but also at the program scale on the design, sequencing and operation of the package.

Stakeholders are fully aware of the magnitude of issues to be resolved to implement supply measures and are concerned about likely impacts on cultural assets, the reliability of water

entitlements, and impacts on land use. The apparent reluctance of Governments to recognise the reality of these issues and to plan to undertake the projects properly with full consultation and appropriate issue resolution is further eroding community confidence. Basin Governments must change course and properly implement supply measures to avoid unnecessary further water recovery costs.

The Basin Officials Committee should develop an integrated plan for delivering the package of supply projects

BOC should develop and publish an integrated plan for delivering the package of supply projects that seeks to manage interdependencies both within the package of supply projects and into the larger operation of the River Murray and shared resources. Examples of issues the plan should address include:

- ensuring consistent approaches to implementation where projects span multiple States (such as negotiating with landholders on opposite sides of State borders)
- the logical sequencing of individual projects, given known risks and interdependencies (such as Hydro-cues and constraints)
- linkages to other key areas of work, for example Menindee Lakes and Water Resource Plans for the Barwon-Darling, Murray and Lower Darling
- identifying opportunities to reduce costs by exploiting economies of scale across projects
- clear mechanisms for consultation on the package and individual projects with Traditional Owners and local communities
- the role of the MDBA as an 'agent of governments' in assisting with the development, delivery and oversight of the plan.

An integrated plan would assist in maximising the success rates of projects and gaining the maximum value of project investments. The MDBA, as an agent of government, has a key role in facilitating and leading the implementation of the supply measures package, particularly for complex projects that cross State borders. Governments urgently need to agree on governance and funding arrangements and then establish the approach to implementing supply measures. Implementation agreements between the Australian and Basin State Governments will need to take into account their interdependencies, and bilateral agreements will not likely facilitate the flexibility required to manage the interdependencies within the integrated package.

Utilising the MDBA, as an agent of governments, to facilitate the implementation of projects should improve the likelihood of success. However, the MDBA is also a regulator and assessor of the Plan. It will track the progress of Basin Governments in implementing projects and will be responsible for any reconciliation of the success or otherwise of supply projects in 2024. It is important that the MDBA's dual roles are managed well (discussed in chapter 14).

DRAFT RECOMMENDATION 4.1

Basin Governments must resolve governance and funding issues for supply measures. They should develop an integrated plan for delivering supply projects to improve understanding and management of interdependencies within the package of supply projects within 12 months.

Governments should plan for an extension of project delivery timelines

If the MDBA and Basin States continue to work to the 2024 deadline it is likely some significant projects will need to be removed from the package. This would potentially increase the costs of meeting the SDL obligations, as Governments may need to recover water through purchases or infrastructure works. For example, failure to implement the constraints, Hydro-cues and Menindee Lakes projects could increase costs to Governments in the order of $480 million (appendix B.2).[56] It would also reduce the other river management benefits of supply measures, including additional delivery capacity and flexibility in river operations.

To avoid such an outcome, Governments should extend the 30 June 2024 deadline for supply measures to be operational. This should only be allowed for projects that offer value for money to be retained and delivered effectively to meet outcomes with adequate consultation.

Extending timeframes could be interpreted as a lack of commitment to the Basin Plan, thereby reducing public trust and confidence. Further, delaying projects could also mean associated environmental benefits are delayed.

Governments could address these concerns case-by-case. For example, Governments could agree to only allow extensions where independent assurance shows that an extension would facilitate desired benefits and there is a clear delivery pathway and the proposed new timeline is credible. Governments should make these decisions after detailed designs are completed. The MDBA could also use annual reporting on supply measure implementation by Basin States to monitor progress against new milestones, identify emerging risks to delivery and strategies to mitigate them. Governments should still be subject to make good if projects fail to meet revised timelines.

Further, not extending timeframes also carries risks to public confidence and trust. The status quo could lead to an unwinding of a significant portion of the supply package or a political compromise at the eleventh hour to save the package in 2024. Such outcomes would likely compound public frustration with the lack of transparency in the process for delivering the

56 This estimate compares the average cost of implementing the six key projects (based on their business cases) and the potential cost of recovering 250 GL through infrastructure works (the middle estimate of their water offset). The range for this estimate (based on an offset range of 200-300 GL and uncertainty in the costs of supply projects) is a saving of between $161 million and $805 million. Details of this estimate are in appendix B.2.

projects and forgo the opportunity to carefully revise the strategy to meet the objectives of the Basin Plan at least cost.

Providing flexibility in project delivery would likely necessitate changes to the Basin Plan and the current reconciliation process. For example, conducting a reconciliation in 2024 where some projects are not fully operational would require assumptions about projects' final outcomes. Where the anticipated outcomes from unfinished projects are uncertain, reconciliation may not accurately determine the offset from the package. Reconciling in 2024 would need to be done on the assumption that unfinished projects continue to be implemented as outlined, with checks and balances to ensure accountability to this process. One way to do this would be to establish a second reconciliation after 2024 to ensure projects not operational by 2024 still meet their intended outcomes.

Alternatively, the reconciliation process could be deferred until all projects are implemented. In some sense, this would simplify the reconciliation process as fewer assumptions about the supply measures would be required. However, delaying the reconciliation risks compromising environmental outcomes in the short-term if supply measures have not achieved the full 605 GL offset. Any changes to the reconciliation as a result of extending delivery timeframes should be agreed by the MDB Ministerial Council.

DRAFT RECOMMENDATION 4.2

Basin Governments should extend the 30 June 2024 deadline for supply measures to be operational where it would allow projects that offer value for money to be retained and their full benefits to be delivered within credible timeframes.

DRAFT RECOMMENDATION 4.3

The Murray-Darling Basin Authority (as Basin Plan Regulator) must devise a strategy for undertaking the reconciliation of supply measures against environmental equivalence. This strategy should include an adaptive management approach to assessing reasonable progress to enable projects to be delivered in realistic timeframes.

The Australian Government should establish a process to ensure individual supply measures offer value for money

To ensure individual supply projects offer value for money, the Department of Agriculture and Water Resources (DAWR) should establish process that reviews projects before final approval of funding. As projects reach detailed design, the process should consider whether they still offer value for money in light of any revisions to the expected costs and benefits. If they have changed significantly enough that they no longer offer value for money, there should be scope to remove the projects from the package. As mentioned above, revisions to

timelines should also be considered and this process should be used to set realistic timeframes.

In recognition of the interrelated nature of supply projects, the MDBA as the agent of governments could provide technical support in estimating the benefits (in environmental equivalents) of individual supply projects once Basin States have completed detailed design. For example, the MDBA could use the modelling methodology used for determining the SDL offset to consider what offset is achieved when individual projects are excluded from the package. To the extent there are uncertainties around these estimates because projects are in an early stage of development or their benefits are dependent on other projects, the MDBA could provide ranges for the offset as well sensitivity analysis.

DAWR has advised that it intends to fund projects through a two-phase process whereby initial funding is provided to allow States to prepare detailed design, cost refinement and stakeholder consultation. Projects would then be subject to a gateway review process to determine whether they should proceed to the implementation phase (DAWR, pers. comm., 10 August 2018). These arrangements are yet to be finalised.

DRAFT RECOMMENDATION 4.4

The Department of Agriculture and Water Resources should establish a review process to determine if projects offer value for money and to determine credible timelines before final funding is approved.

4.4 Northern Basin Toolkit

During the development of the Basin Plan it was recognised that additional knowledge of certain systems would be beneficial for ensuring the SDLs met their goal of providing a sustainable level of take while balancing social and economic outcomes. As a result, Governments agreed that the MDBA would undertake a review of SDLs in the northern Basin.

The Northern Basin Review has been completed

The MDBA completed the Northern Basin Review (NBR) in 2016. The NBR involved research into the economic and social impacts of the Basin Plan on local communities, the workings of the river systems and their flora and fauna, and the importance of water to Indigenous communities. The MDBA also took advice from community and industry groups. Two stakeholder groups — the Northern Basin Advisory Committee and the Northern Basin Aboriginal Nations (NBAN) — were given a central role in informing the Review.

The key recommendation arising from the review was to reduce the water recovery target in the northern Basin from 390 GL to 320 GL on the provision that the Australian, Queensland and New South Wales Governments implement a Toolkit of measures that enhance the use

of environmental water (MDBA 2016c). These Toolkit measures are similar to supply measures in that they aim to change how rivers in the region are managed to more effectively achieve Basin Plan environmental outcomes. The six projects in the MDBA's recommended package of toolkit measures are listed in table 4.3.

Table 4.3 **The Toolkit measures**

Toolkit measure	*Nature of benefits*
Protection of environmental flows	Enhancement of low flows and fresh flows, particularly in the unregulated river systems of the Condamine–Balonne and Barwon–Darling.
Better targeting of water recovery	Improved environmental watering into Narran Lakes, Lower Balonne and Culgoa floodplains and the Barwon–Darling River.
Event-based mechanisms including: one-off temporary trade by event, options over pumping (enduring agreements) and store and release	Benefits in the Narran Lakes, some areas of the Lower Balonne, the Border Rivers and Namoi regions, and limited benefits in the Barwon–Darling.
Improved coordination and delivery of environmental water	Improved outcomes from environmental water moving from upper catchments to downstream rivers – such as the Barwon–Darling and the Lower Balonne Rivers, improved habitats for many aquatic organisms during dry times.
Removal of constraints in the Gwydir	Higher river flows associated with significant environmental benefits in the Gwydir.
Constructing fishways and control of cold water pollution	Improved fish passage, mitigated effects of cold water pollution on fish.

Source: MDBA (2016c).

In June 2017, the MDB Ministerial Council provided an in-principle commitment to implementing the Toolkit subject to funding being available (MDB Ministerial Council 2017a).

Stakeholders have raised a range of concerns over the NBR since its release. Inquiry participants have criticised the MDBA's environmental modelling, both in terms of its assumptions and data inputs, and how the MDBA interpreted the outputs to produce its final recommendation.[57] Some have also questioned whether all of the Toolkit measures would ultimately be put in place[58], as while the lowering of the water recovery target would be locked into the Basin Plan through an amendment, the States had only agreed in principle to implement the Toolkit at the time of its tabling. NBAN was dismayed by the review's outcomes, and felt that its views were not given enough weight when decisions were made (MDBA 2017b).

[57] For example, Bycroft (sub. 4), the Goulburn Valley Environment Group Inc. (sub. 13), Inland Rivers Network (sub. 23), Jensen (sub. 28), Brown (sub. 66), Murray Darling Association Region 6 (sub. 74).

[58] For example, Inland Rivers Network (sub. 23), Murray Darling Association Region 6 (sub. 74), National Parks Association of NSW (sub. 76).

Reflecting these and other concerns with implementation of the Basin Plan, the Australian Greens Party introduced a disallowance motion for the amendment to the Basin Plan to enable changes from the NBR in November 2017, which Parliament initially upheld in February 2018.

The Australian Government and Opposition subsequently reached an agreement in May 2018 whereby they would pass amendments to enable changes from the NBR subject to a range of conditions. These conditions include that measures and funding would be put in place to improve outcomes for Indigenous Australians, the government publicly release the MDBA's NBR modelling, and a 'Northern Basin Commissioner' responsible for reporting on progress in the roll-out the Toolkit measures would be established.

Details for implementing the Toolkit are still emerging

Northern Basin Governments are currently finalising arrangements for implementing the Toolkit, which will account for commitments made in the Government and Opposition's agreement such as the roles of the Northern Basin Commissioner. DAWR has advised that the Australian Government will provide up to $180 million of funding for the Toolkit out of money saved by reducing the water recovery target (DAWR, pers. comm., 10 August 2018).

A key difference between these arrangements and those for the SDL adjustment mechanism in the southern Basin is that unlike the reconciliation process associated with the latter, there is no vehicle for reviewing the northern Basin SDLs in the event that the Toolkit measures are not implemented as originally intended.

Transparent and accountable governance arrangements for implementing the Toolkit are necessary to ensure the included measures achieve their intended purpose. These should feature a mechanism for keeping the implementation in line with specified timelines, as well as independent reporting on their implementation and resultant effectiveness.

The MDBA, in its role as Basin Plan regulator, is well placed to formally play this oversight role for the Toolkit, given it is undertaking an equivalent role for the supply measures in the southern Basin. That is, it will have relevant experience, resources and skills for the task. In contrast, the non-statutory short term nature of the Northern Basin Commissioner means it would not have the same level of status as the MDBA (particularly under the proposed institutional arrangements outlined in chapter 14). Moreover, the Commissioner's other proposed function of advising the MDB Ministerial Council on scientific and other contextual information relevant to the northern Basin (such as planning assumptions, floodplain harvesting and water trade) may conflict with the above regulatory functions, and there is still little information about what resources it will have at its disposal. Given that the Toolkit measures lack the cross-border issues associated with the supply measures, there is less of a need for the MDBA to additionally operate as the agent of governments in this setting.

In the absence of improved governance arrangements, there is a risk that the timeframes for implementing the measures will blow out, or that some may never be put in place to the degree

originally intended. The premise of the recommendation package was that the northern Basin would suffer only a slight overall decrease in environmental health as a consequence, but if the Toolkit is mismanaged and not subject to review, this may not be the outcome.

DRAFT RECOMMENDATION 4.5

Northern Basin Governments should put in place transparent and accountable governance arrangements for implementing the Northern Basin Toolkit. These arrangements should include:

- a mechanism to establish clear milestones to ensure the Toolkit measures are implemented within reasonable timeframes
- an independent assessment by the Murray-Darling Basin Authority, as Basin Plan Regulator, of progress and effectiveness in implementing the measures.

5 Efficiency measures

Key points

- Through the Sustainable Diversion Limit adjustment mechanism, the Basin Plan allows for additional water recovery to further improve environmental outcomes. This water can only be recovered through efficiency measures (water-saving projects that provide a share of saved water to the environment), and must result in neutral or improved socioeconomic outcomes.
- The Australian Government has committed to recover an additional 450 GL through efficiency measures to pursue the enhanced environmental outcomes outlined in Schedule 5 of the Plan.
  - These outcomes go beyond those achievable through recovery of 2750 GL proposed under the Basin Plan, and are targeted at sites in the southern Basin, including larger areas of floodplains and the Murray Mouth.
  - Basin States must also ease or remove constraints along key rivers in the southern Basin to allow river operators to meet increased demands from environmental water holders. Basin Plan modelling suggested that the extra water would have few additional benefits if this does not occur.
- Current progress in implementing efficiency measures provides little confidence that the enhanced environmental outcomes of the Basin Plan will be achieved by 2024 or on budget.
  - There has been no update to the modelling to estimate what environmental benefits can be realistically achieved, given proposed projects to ease or remove constraints are unlikely to achieve the anticipated flow rates at key sites or be fully operational by 2024.
  - Basin Governments have not yet agreed on an efficiency measures work plan to recover 450 GL by 2024, including how major socioeconomic impacts will be mitigated.
  - Despite this, the Australian Government is rolling out a water recovery program Basin-wide, which risks recovering water in the northern Basin that may not be useful to achieving the enhanced environmental outcomes in the southern Basin.
  - There is a material risk that recovering the additional 450 GL through efficiency measures could be significantly more expensive than anticipated. The benefits and costs of the program as a whole have not been assessed.
- With almost $1.8 billion available for pursuing the enhanced environmental outcomes, there is a critical need to rethink the implementation of efficiency measures prior to spending large sums of money. The Australian Government (in agreement with Basin States) should:
  - undertake further modelling to establish the benefits of additional water recovery with the current suite of constraint proposals
  - ensure additional water recovery in pursuit of the Schedule 5 outcomes is effective, efficient and genuinely ‘no regrets’ — additional water recovery should be sequenced with progress in easing or removing constraints and socioeconomic impacts should be identified and mitigated through the design of the program
  - assess the benefits and costs as a whole through the independent statutory review in 2021, and adjust the program to ensure further water recovery maximises net benefits to the community.

This chapter discusses the program to pursue enhanced environmental outcomes in the Murray-Darling Basin (MDB) by recovering additional water through efficiency measures and easing or removing capacity constraints on the delivery of water. It first describes the purpose of efficiency measures and their operation (section 5.1). It then presents the Commission's assessment of progress and implementation effectiveness (section 5.2) and options to improve implementation in the future (section 5.3).

5.1 Background

Efficiency measures seek to achieve enhanced environmental outcomes through additional water recovery

Efficiency measures are projects that increase the technical efficiency of water use, with an agreed share of proposed water savings provided to the Australian Government for environmental use (chapter 4, box 4.1). Under the Basin Plan, additional water recovered through efficiency measures reduces the Sustainable Diversion Limit (SDL) in each area where additional water is acquired.[59]

Additional efficiency measures are intended to improve environmental outcomes in the Basin, but must also achieve neutral or improved socioeconomic outcomes.[60] The Plan states that neutral or improved socioeconomic outcomes are evidenced by voluntary participation in efficiency measures programs, but also allows Basin States to propose their own approach to assessing socioeconomic neutrality.

In addition to recovering water for the environment under *bridging the gap* (chapter 3), the Australian Government has committed to recover an additional 450 GL for the environment through efficiency measures. The purpose of recovering the additional 450 GL is to pursue the enhanced environmental outcomes outlined in Schedule 5 of the Basin Plan. These outcomes go beyond the environmental outcomes achieved by recovering (the equivalent of) 2750 GL to implement the SDLs.

Schedule 5 includes environmental outcomes for larger areas of floodplains in South Australia, New South Wales and Victoria; in-stream flow targets; and improved connections with low and middle level floodplains in the southern Basin. It also includes specific targets in the Coorong, Lower Lakes and Murray Mouth at the end of the system (box 5.1). The Schedule 5 outcomes reflect the results of hydrologic modelling undertaken by the Murray-Darling Basin Authority (MDBA) in 2012 (box 5.2).

The inclusion both of supply and efficiency measures in the SDL adjustment mechanism reflects a compromise struck between the Australian Government and Basin States in finalising the Basin Plan. The inclusion of efficiency measures reflects the opportunity to

59 This adjustment is made each year following the method described in Schedule 6A of the Basin Plan.

60 Basin Plan, s. 7.17(2)(b).

improve environmental outcomes in the southern Basin (particularly in the Lower Murray) by recovering additional water for the environment. The requirement that additional water is recovered with neutral or improved socioeconomic outcomes was to address concerns about detrimental socioeconomic impacts of additional water recovery.

Reflecting this compromise, the Australian Government also amended the *Water Act 2007* (Cwlth) in 2013 to provide funding for recovering an additional 450 GL, and to pursue the environmental outcomes modelled by the MDBA.[61]

Box 5.1 Enhanced environmental outcomes in Schedule 5 of the Basin Plan

Schedule 5 of the Basin Plan outlines the enhanced environmental outcomes pursued through efficiency measures and easing or removing constraints. The outcomes are:

- further reducing salinity in the Coorong and Lower Lakes
- keeping water levels in the Lower Lakes high enough to maintain flows into the Coorong, prevent acidification, acid drainage and riverbank collapse below Lock 1 at all times
- ensuring the mouth of the River Murray is open without the need for dredging in at least 95 per cent of years
- exporting two million tonnes of salt from the Basin annually as a long-term average
- increasing flows through the barrages to the Coorong and supporting more years where critical fish migrations can occur
- in conjunction with easing constraints, providing opportunities for watering an additional 35 000 hectares of floodplain in South Australia, New South Wales and Victoria
- achieving enhanced in-stream outcomes and improved connections with low to middle level floodplains and habitats adjacent to rivers in the southern Murray-Darling Basin.

Governments will need to ease constraints in the river system to achieve enhanced environmental outcomes

The Basin Plan identifies that Governments will need to address constraints[62] in reaches of the southern Basin that limit the ability of river operators to deliver additional environmental water. Drawing on its 2012 modelling, the MDBA (2013a) prepared a *Constraints Management Strategy* that identifies six areas in the southern Basin where Basin States need to ease constraints. As discussed in chapter 4, easing constraints will involve changes to physical features (such as raising bridges) as well as negotiating easements where private land is flooded.

61 Water Act, Part 2AA.

62 Constraints are barriers that constrain the delivery of water down the system. They limit the amount of water that river operators can release from storages (such as dams) and deliver downstream. They are represented as maximum allowed flow rates (usually in ML/day).

The MDBA's modelling showed that without easing constraints, recovering 3200 GL had 'few additional benefits' compared to the benchmark (MDBA 2012b, p. viii). Constraint easing is particularly important for achieving the Schedule 5 outcome of watering larger areas of floodplains in the southern Basin, which modelling suggests requires flow rates of 80 000 ML/day in the River Murray at the South Australian border (box 5.2).

Box 5.2 Modelling that informed the Basin Plan

The Murray-Darling Basin Authority's (MDBA's) modelling that informed the development of the Basin Plan examined three water recovery scenarios (2400, 2800 and 3200 GL by varying recovery in the southern Basin), assuming no changes to infrastructure, river rules or river operations (benchmark conditions). The MDBA's judgment based on the modelling was that:

- water recovery of 2400 GL was insufficient to achieve key environmental objectives
- 2800 GL would achieve sufficient environmental objectives for in-stream processes and low-level wetlands and floodplains
  - As a result of sensitivity testing of alternative water recovery strategies in the Condamine-Balonne (Queensland) the benchmark water recovery target (to bridge the gap to the SDLs) was reduced from 2800 GL to 2750 GL.
- 3200 GL showed marginal improvements in some outcomes in the Coorong, Lower Lakes and Murray Mouth, but improvement for higher level floodplains was limited by river operating constraints.

At the request of the Murray-Darling Basin Ministerial Council, the MDBA completed further modelling which examined water recovery of 2800 GL and 3200 GL with eased constraints in the river system. The results showed that eased constraints would improve the ability to deliver high-flow events to inundate floodplains in the Lower Murray. Relative to the 2800 GL water recovery with benchmark constraints scenario:

- easing constraints with recovery of 2800 GL had some small improvements in environmental outcomes
- easing constraints with recovery of 3200 GL achieved significantly more environmental targets (table below).
  - In particular, this scenario met high flow targets along the River Murray, including the target at the Riverland-Chowilla floodplain of achieving 80 000 ML/day for 30 days (also discussed in box 5.3).
  - The enhanced environmental outcomes in Schedule 5 reflect the results of this modelling scenario.

Thus, achieving significant environmental benefits above the benchmark scenario was considered to require both the recovery of the additional water **and** the removal of constraints.

Number of flow indicators achieved under the tested scenarios

	Baseline	*2800 GL*	*2800 GL, relaxed constraints*	*3200 GL*	*3200 GL, relaxed constraints*
Flow indicators achieved – River Murray	0 / 18	11 / 18	11 / 18	13 / 18	17 / 18

Sources: MDBA (2012a, 2012b).

Efficiency measures must provide a portion of the 450 GL for the environment by 2019 and the full volume by 2024

As part of the SDL adjustment mechanism (chapter 4, box 4.1), Basin Governments are required to notify the MDBA of adjustments to SDLs associated with efficiency projects by the end of 2023, with recovered water transferred to the Commonwealth Environmental Water Holder (CEWH) by 30 June 2024. The exception is the need to recover the first 62 GL before the SDLs come into effect on 1 July 2019 to meet the 5 per cent adjustment limit required in the Plan.[63]

In 2012, the Australian Government allocated $1.575 billion to recover water through efficiency measures and $200 million to ease constraints through the Water for the Environment Special Account (WESA). The Water Act requires independent reviews of the WESA (in 2019 and 2021) to ensure funding is sufficient and the design of projects is appropriate to recover 450 GL and ease or remove constraints by 2024.[64]

Basin States have nominated six constraint projects as part of the SDL adjustment mechanism (chapter 4). The location of these projects aligns with the key focus areas in the *Constraints Management Strategy*. With the exception of the Goulburn constraint project, all southern Basin constraint projects are in the approved supply measures package and are therefore eligible for funding as supply measures in addition to that available from the WESA (DAWR, pers. comm., 10 August 2018).[65]

To address the requirement for neutral or improved socioeconomic outcomes, Basin Governments commissioned independent analysis on how to design, target, and resource efficiency measure programs to recover the additional 450 GL by 30 June 2024 in ways that will ensure such outcomes. This analysis was undertaken by EY (2018). Basin Governments have since agreed to develop additional program criteria to ensure neutral or beneficial socioeconomic outcomes from on-farm infrastructure projects by the end of 2018, and to define a pathway for recovering the extra 450 GL by 2024 through development of a separate work plan (MDB Ministerial Council 2018a).

The Department of Agriculture and Water Resources (DAWR) is responsible for implementing the efficiency measures program and administering funding from the WESA. The CEWH is responsible for managing environmental water recovered by the Australian Government in pursuit of the Schedule 5 outcomes.

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63 The Basin Plan (s. 7.19) limits the net SDL adjustment from supply and efficiency measures to 5 per cent of the SDL (about 543 GL) at any point in time. The 605 GL offset determination from the supply measure package means at least 62 GL must be recovered through efficiency measures by 30 June 2019 to give full effect to the supply measure offset and complete gap-bridging water recovery in the southern Basin.

64 Water Act, s. 86AJ.

65 This includes four constraints projects (Hume to Yarrawonga, Yarrawonga to Wakool Junction, Murrumbidgee and South Australian Murray) and the Menindee Lakes Water Savings project, which includes easing constraints in the Lower Darling.

In July 2018, DAWR announced the Murray-Darling Basin Water Infrastructure Program to commence recovering an additional 450 GL through efficiency measures (DAWR 2018e).[66] The Australian Government has agreed to consult closely with Basin States in developing the efficiency measures program (including the regional distribution of water recovery targets) to secure farm-level participation and to ensure neutral or improved socioeconomic outcomes.[67]

5.2 Assessment of implementation effectiveness

To assess implementation effectiveness, the Commission considered whether the Australian Government and Basin States are on track to recover 450 GL through efficiency measures by 2024, and whether the program to recover water through efficiency measures is likely to achieve the enhanced environmental outcomes set out in Schedule 5 of the Basin Plan. The assessment also considered the potential total cost of easing or removing constraints and recovering 450 GL through efficiency measures.

Specifically, the Commission has considered whether:

- projects to ease or remove constraints in river systems and enable the delivery of the additional environmental water to key sites will be operational by 2024
- additional water recovery and constraint projects will achieve the Schedule 5 outcomes, given developments since the 2012 Basin Plan modelling
- the water recovery program is well-designed; in particular whether it aligns with the Schedule 5 outcomes and complies with the Basin Plan requirement for neutral or improved socioeconomic outcomes
- the water recovery program is likely to recover the additional 450 GL within budget.

Proposed constraint projects are unlikely to be fully operational by 2024

As discussed in chapter 4, there are a number of complex issues to work through to implement constraint projects and, as such, the 2024 deadline for these projects to be operational appears highly ambitious, if not unrealistic. The Commission is therefore recommending that Governments extend the deadline for supply measures — including constraints projects — where appropriate and establish a credible pathway for delivery (section 4.3).

66 This program is also designed to complete gap-bridging water recovery by July 2019 (chapter 3).

67 Paragraph 4.7 of the *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin 2013*.

There has been no modelling to clarify the environmental benefits of additional water recovery under constraint proposals

There are further doubts over whether current proposals will ease constraints enough to facilitate water delivery to achieve enhanced environmental outcomes (Jan Beer, sub. 9; Wentworth Group of Concerned Scientists, sub. 42). As part of the SDL adjustment mechanism assessment, Basin States did not need to demonstrate that constraint proposals were capable of achieving the Schedule 5 outcomes, nor did the MDBA choose to assess this (MDBA, pers. comm., 3 August 2018). Some of the current constraint proposals under the SDL adjustment mechanism provide lower flow rates than those modelled by the MDBA in 2012 (table 5.1). The MDBA (sub. 86) indicated that States could not develop constraint proposals that feasibly achieved the flow rates assumed in the modelling.

The extent to which the lower flow rates in current constraints proposals will affect the ability of river operators to deliver additional water to key sites (and achieve the Schedule 5 outcomes) is unknown, because the MDBA has not updated its modelling to account for these and other developments since 2012 (MDBA, pers. comm., 3 August 2018). The South Australian Government (sub. 85, p. 14) said that 'even without relaxing constraints, the additional 450 GL is expected to deliver significant additional benefits including flows during dry years and additional flows for sites that are primarily volume dependent, such as the Coorong, Lower Lakes and Murray Mouth'. However, it is not clear if the full suite of environmental benefits as outlined in Schedule 5 — particularly those for higher-level floodplains — can be achieved (box 5.3). For example, the lower flow rates in the Goulburn, Lower Darling and Murrumbidgee key focus areas may affect the ability to call sufficient water to deliver high flows in the absence of an unregulated flow event. It is not clear how the proposed buffer in the Yarrawonga to Wakool constraint proposal will operate or how it will be used to deliver high flow events.

Table 5.1 **Flow rates in the MDBA's eased constraints modelling scenario (2012) and the SDL adjustment measures**

Key focus area	*Location*	*Benchmark constraint (ML/day)*	*Eased constraint in modelling scenario (ML/day)*	*Target flow rate in agreed SDLAM package (ML/day)*
Hume to Yarrawonga	Doctor's Point	25 000	40 000	40 000
Yarrawonga to Wakool	Yarrawonga Weir	22 000[a]	40 000	**30 000**[b]
Lower Darling	Weir 32	9 300	18 000	**14 000**
Murrumbidgee	Gundagai	30 000	50 000	**38 000**
	Balranald	9 000	13 000	**12 000**
Goulburn	Seymour	12 000	15 000	**na**
	McCoy's Bridge	20 000	40 000	**20 000**
River Murray in SA	SA border	80 000	80 000	80 000

[a] Constraint was eased to 40 000 ML/day in original Basin Plan modelling, but effectively limited by the Hume to Yarrawonga Constraint. [b] With a buffer for 50 000 ML/day under certain circumstances.

Sources: MDBA (2012a, 2018s).

Box 5.3 Achieving enhanced floodplain outcomes

Achieving the enhanced environmental outcomes for floodplains is reliant on easing constraints. The MDBA's modelling scenario with 3200 GL of water recovery and eased constraints showed that improved outcomes to floodplains could be achieved by meeting high flow targets at the key indicator sites along the River Murray (Basin Plan, s. 7.09(e), box 5.2). It was the only scenario tested where the environmental flow target of 80 000 ML/day for 30 days at the Riverland-Chowilla floodplain (on the South Australian border) was met (table below). The MDBA's modelling indicated that this flow will water an additional 35 000 ha of floodplain in the southern Basin.

Building a flow event that achieves 80 000 ML/day for 30 days at the South Australian border represents a significant challenge for river operators and doing so requires sizable upstream flows from the four major river reaches in the southern Basin (Upper Murray, Goulburn, Murrumbidgee and Darling). Previous floods indicate that the sum of these four flows (measured at Yarrawonga, McCoy's Bridge, Balranald and Weir 32 respectively) must add to about 150 000 ML/day to produce a flow of up to 80 000 ML/day at the South Australian border (MDBA 2014e). A regulated flow under the proposed constraint projects could only add up to 96 000 ML/day. Thus, meeting the target, even under the assumption of eased constraints is reliant on sizable, unregulated flooding in at least one river reach, with water released in other reaches to 'piggyback' off the unregulated flow (MDBA 2014e). This represents a significant challenge for river operators.

The lower flow rates in some constraint proposals may lower the number of opportunities to achieve a flow of 80 000 ML/day at the South Australian border as it reduces flexibility in how flows from different tributaries could be combined (MDBA, pers. comm., 3 August 2018). The 80 000 ML/day flow may still be achieved under unregulated conditions (as occurred before the Basin Plan was introduced). However, reduced opportunities to meet the high flow target potentially mean that under current arrangements, the flow frequency target will not be met.

Percentage of years where Riverland-Chowilla flow indicator of 80 000 ML/day for 30 days target modelled to be achieved under various scenarios

Target: (high to low uncertainty)	*Without development*	*Baseline (2009 conditions)*	*2800 GL*	*2800 GL, eased constraints*	*3200 GL*	*3200 GL, eased constraints*
17 – 25 %	34%	10%	14%	13%	14%	18%

Data source: MDBA (2012a).

In addition to uncertainty about whether the proposed flow rates are sufficient, environmental water holders and river operators will face challenges in delivering high flow events. Doing so will require environmental water holders and river operators to coordinate the release of environmental water in multiple river reaches to piggyback off unregulated flow events in other river reaches (box 5.3). Operationally, building high environmental flow events — such as an event to deliver 80 000 ML/day at the South Australian border — is a significant change from historical river management, and river operators will likely be cautious as they are legally liable for any flooding or third party impacts from the release of environmental water (James 2017). Improving the understanding of river reach hydrology and the timing of environmental flow releases will be important to ensuring environmental events can be delivered within the realms of new operational constraints (MDBA 2013d).

Given the above, it is uncertain if the current constraint projects are capable of facilitating the full suite of modelled environmental benefits listed under Schedule 5 of the Basin Plan, or whether those environmental benefits can be achieved in practice.

Shortcomings in the design of water recovery programs may put the outcomes at risk

Additional water recovery is underway

Basin Governments have commenced recovering additional water through efficiency measures, with their short-term priority being recovering the first 62 GL by 30 June 2019. As of 10 July 2018, 1.2 GL had been contracted (with 0.5 GL delivered to the CEWH) through a three-year pilot program in South Australia — the Commonwealth On-Farm Further Irrigation Efficiency program (COFFIE) (DAWR 2018h).

In June 2018, the MDB Ministerial Council outlined a number of projects proposed by Basin States to help reach the 62 GL target on schedule (MDB Ministerial Council 2018a).[68] The announcement identifies up to 29 GL that could be recovered through these projects (leaving a gap of about 32 GL to meet the 62 GL target). There is currently little information available about any of the proposals.

The MDB Ministerial Council also agreed that Basin officials would develop a work plan to provide a pathway to recovering the 450 GL by 2024 (MDB Ministerial Council 2018a).

The Australian Government has since announced the MDB Water Infrastructure Program to progress recovering the 450 GL by 2024 (DAWR 2018e). The MDB Water Infrastructure Program will:

- operate Basin-wide (that is, projects in any water resource area in the Basin will be eligible for funding)
- recover permanent water rights (entitlements) through rolling tender rounds
- include on-farm, off-farm, urban, industrial and metering projects[69]
- fund projects to a maximum of 1.75 times the market price of recovered entitlements.

[68] The largest contributions are 15 GL through an ACT urban water initiative and 9 GL from various projects in Victoria. Projects in Queensland and New South Wales are not yet defined, while those proposed by South Australia have committed to delivering up to 5 GL.

[69] Reflecting the outcomes of the June 2018 MDB Ministerial Council, the program will only allow for on-farm projects in Queensland, South Australia and the ACT until additional criteria to ensure socioeconomic neutrality are agreed to (MDB Ministerial Council 2018a).

No water recovery strategy has been released to articulate how projects will contribute to Schedule 5 outcomes

The Australian Government has not yet published a water recovery strategy to complement the commencement of the MDB Water Infrastructure Program. No regional water recovery targets have been set, and the Australian Government has also not yet articulated how it will take into account the potential contribution of proposed water savings towards the Schedule 5 outcomes. There is also no detail on how DAWR will assess whether and when additional water recovered through proposed efficiency projects will be able to be delivered to key sites, given some (but not all) of the Schedule 5 outcomes are reliant on easing or removing constraints.

In the absence of a strategy for additional water recovery, there is a risk that the program will recover water that does not meaningfully contribute to the enhanced environmental outcomes in Schedule 5. For example, recovering water in the northern Basin (particularly Queensland) and in disconnected systems does not align with the MDBA's modelling, as this assumed all additional water was recovered in the southern connected Basin (box 5.2).

The approach to socioeconomic neutrality is yet to be finalised

Recovering an additional 450 GL for the environment has been highly contentious, largely owing to concerns about the impacts on Basin communities. Contributions to this inquiry raised concerns that the cumulative impact of additional water recovery (on top of previous recovery) will lead to negative impacts through reduced agricultural production and lower employment in regional communities (Speak Up Campaign Inc., sub. 18; GMID Water Leadership, sub. 62; Greater Shepparton City Council, sub. 71). There is concern that water trade will concentrate the impacts of further water recovery in some regions, with the Murray River Group of Councils (sub. 36, p. 2) noting:

> … the connected nature of the Southern Basin means that wherever in the Southern Basin that water is recovered from, it is inevitable that further Victorian … entitlements will be lost from the Goulburn Murray Irrigation District (GMID) with further economic and social impact.

In 2017, the MDB Ministerial Council (2017b, p. 35) recognised that:

> [c]ritical to the success of this initiative is finding a way to provide Basin governments and communities with the necessary confidence that enhanced environmental outcomes nominated in the Basin Plan can be achieved in ways that have a neutral or positive socio-economic impact on Basin communities.

There is not yet an agreed position on how Governments will meet the requirement for neutral or improved socioeconomic outcomes from additional efficiency measures. The voluntary participation test in the Basin Plan is currently the default requirement for an efficiency project to be considered as socioeconomically neutral (as it has been under the COFFIE pilot).

However, by the end of 2018, the MDB Ministerial Council will consider additional program criteria to ensure socioeconomic neutrality for on-farm programs, taking into account regional and cumulative impacts (MDB Ministerial Council 2018a). The MDB Water Infrastructure Program will not recover water through on-farm projects in New South Wales and Victoria until these additional program criteria are in place (DAWR 2018b).

The voluntary participation test (alone) will not address stakeholder concerns about impacts on regional communities

The lack of an agreed approach reflects a major disconnect between (and within) Governments and Basin communities over how any test of 'neutral or improved socioeconomic outcomes' should be applied for further water recovery.

- The Government of South Australia (sub. 85) argued the legal requirement of voluntary participation should be retained, as it does not inhibit projects being delivered on time and in budget to deliver the 450 GL.
- The Victorian Government (sub. 89, p. 4) described the voluntary participation test as 'inadequate' and unable to 'reflect the real impact that water already taken from the system has had'.
- Similarly, the Murray River Group of Councils (sub. 36, p. 2) is concerned that adherence to the current test could lead to water recovery with 'significant social and economic impact on northern Victorian communities while still meeting the definition of "neutral"'.

Many community groups, local governments and irrigators (particularly in upstream States) consider the requirement for neutral or improved socioeconomic outcomes implies a genuine commitment to ensuring no adverse impacts (at a community scale) from additional water recovery.[70]

Stakeholder concerns about further water recovery clearly extend to potential adverse impacts on communities and other non-participants, not just direct impacts on individual water users. Experience from previous infrastructure modernisation projects indicates that recovering water through infrastructure modernisation can have adverse socioeconomic impacts on non-participants, particularly through the water market (chapter 3).

Governments recovering additional water solely in accordance with the legal requirement of the Basin Plan will not address these concerns.

[70] For example: National Irrigators' Council (sub. 15), Leeton Shire Council (sub. 17), Speak Up Campaign Inc. (sub. 18), Coleambally Irrigation Co-operative Limited (sub. 38), NSW Farmers' Association (sub. 60), GMID Water Leadership (sub. 62) and Greater Shepparton City Council (sub. 71).

… but a strict 'no impacts' test is unworkable

A definition of socioeconomic neutrality that requires Governments to demonstrate that an efficiency measure would have *no* negative impacts is simply unworkable.

Transferring water to the Australian Government affects the future decisions of individual irrigators. In some cases, those irrigators may purchase water to replace that provided to the Australian Government, leading to (or accelerating) trade of water out of other regions. If trade is allocating water to higher value uses, it may reduce economic activity in some regions and lead to a negative impact — but this may be offset through higher economic activity in other regions. These impacts cannot be directly observed in the context of wider drivers of regional socioeconomic change until well after the fact (if at all).

A strict interpretation would therefore lead to a situation whereby any potential adverse impacts could prevent a project from being implemented. This could block projects that would have acquired water for the environment in a cost-effective fashion, and with relatively limited impacts (particularly where measures are put in place upfront to mitigate those impacts).

In the Commission's view, any potentially significant adverse impacts of further water recovery are better addressed through program design. This would involve Governments or delivery partners clearly identifying upfront the likely magnitude and nature of impacts from water recovery (which will likely vary by region). Then (if warranted), Governments should devise options for mitigating those impacts, in consultation with local communities and industry (water users and irrigation infrastructure operators).

As discussed in chapter 3, attempting to mitigate the negative socioeconomic impacts of water recovery by prescribing a program level approach to water recovery comes at a cost to taxpayers (via a higher price for recovering water). Moreover, experience to date has shown that specific programs aimed at facilitating adjustment to water recovery have often been ineffective in meeting that objective and have lacked transparent monitoring and evaluation. Consequently, it is vital that where Governments seek to mitigate impacts of efficiency measures, they:

- articulate the magnitude and nature of the impacts that warrant a policy response
- consider a range of options for mitigating those impacts
- select the option that is likely to be the most cost-effective way of mitigating impacts
- review the effectiveness of these measures over time.

The threshold for what size (and likelihood) of an impact would warrant action will always be contentious, and setting too low a bar could substantially increase the cost of recovering the 450 GL. There must be accountability and transparency around any such decisions that could substantially increase the cost of recovering water.

DRAFT FINDING 5.1

The current test of neutral or improved socioeconomic outcomes (based on voluntary participation in infrastructure projects) does not fully address stakeholder concerns about impacts of additional water recovery on regional communities.

However, addressing these concerns by requiring efficiency projects to have no adverse impacts is impractical, and risks ruling out projects that achieve the outcomes at least cost.

Potential adverse impacts of further water recovery would be better addressed through program design, including close consultation with water users and irrigation infrastructure operators.

Additional water recovery may cost more than the current budget

The Australian Government's program aims to recover 450 GL within the budget set by the WESA ($1.575 billion). To achieve this, projects must deliver water entitlements to the Australian Government at an average cost of $3500/ML (LTAAY).[71] This benchmark:

- exceeds the cost of some recent on-farm infrastructure modernisation programs — for example, EY reported prices paid under the On-Farm Irrigation Efficiency Program (over five rounds, with the latest in March 2015) varied between $2399 and $3162/ML LTAAY (EY 2018, p. 188).
- is well below the cost of recent off-farm programs, including round 3 of the Private Irrigation Infrastructure Operators Program in New South Wales.[72]

The MDB Water Infrastructure Program involves project proponents submitting tenders that outline the cost to them of designing and constructing a water efficiency measure, the proposed volume of savings to be transferred to the Australian Government and the payment they require to undertake the project. The Australian Government has indicated it will pay proponents up to a maximum 75 per cent premium over the market price of the water entitlement for the proposed share of the water savings (DAWR 2018e).[73]

There are some inherent risks with this somewhat arbitrary approach. First, there will be incentives for proponents to inflate estimated cost to extract the full premium. Under the

71 Long term average annual yield.

72 The five projects in round three recovered 39 228 ML at a cost of $249.8 million (DAWR 2018g). This implies an average cost of $6368/ML (LTAAY).

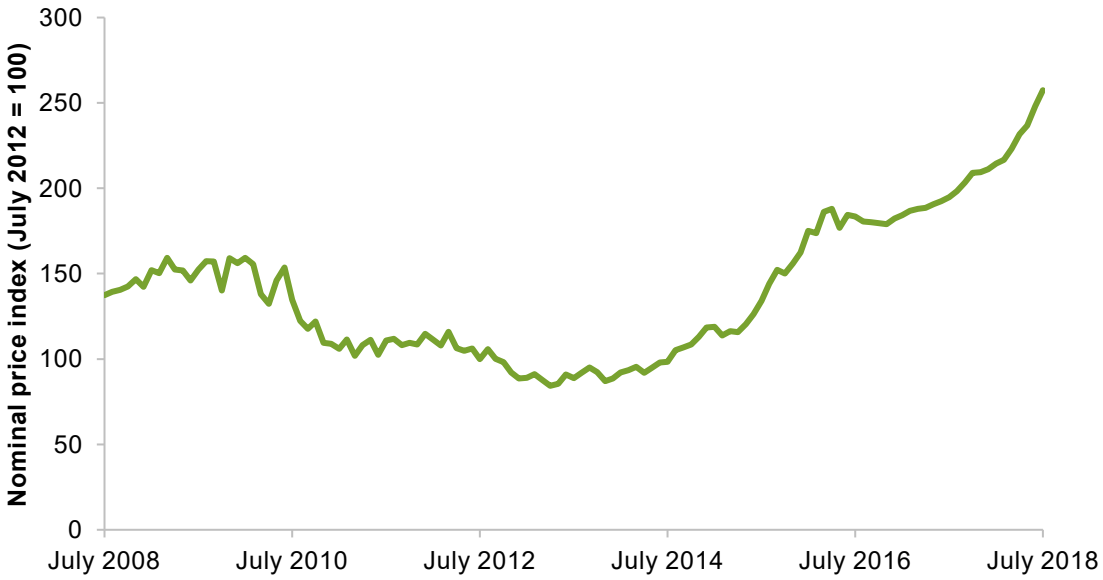
73 This premium is known as the market multiple, and refers to the cost of water recovered through an infrastructure project compared with the prevailing market price for the same entitlement at the time of the project approval (DOE 2014). DAWR has indicated that the MDB Water Infrastructure Program is to recover water with a maximum market multiple of 1.75 (DAWR 2018j).

COFFIE pilot, for example, the average premium paid so far has been close to the maximum (1.75), with average funding exceeding $5000/ML (LTAAY).[74]

If the program ends up paying close to the maximum premium for water, current market prices suggest there is risk the current budget will be insufficient to acquire 450 GL. Between July 2012 and July 2018, the nominal prices for water entitlements in the southern Basin have increased by more than 150 per cent (figure 5.1). If the price on which DAWR bases its offer increased by a similar amount (and prices remain at similar levels), costs for on-farm works would exceed the average cost of $3500/ML (LTAAY). The Commission's estimates suggest that (at current market prices) recovering 450 GL at a market multiple of 1.75 would cost about $2.1 billion — exceeding the funding available in the WESA for water recovery by about $500 million (appendix B.3).

Figure 5.1 **Southern Basin entitlement prices**

Nominal price index, July 2008 to July 2018[a]



[a] The index measures changes in the weighted capital value for a group of major water entitlement types in the southern Murray-Darling Basin. The index is based on nominal historical entitlement prices (not adjusted for inflation).

Sources: Aither (pers. comm. 13 August 2018; (2017)).

[74] Commission estimates based on the costs and volumes contracted under approved COFFIE projects (DAWR, pers. comm., 10 August 2018; *Senate Motion No 420 for production of documents*). All entitlements recovered are for the South Australian River Murray and have been converted to LTAAY using a factor of 0.90.

This, of course, assumes the maximum current market multiple provides enough of an incentive to encourage participation to acquire the 450 GL, and that efficiency measure projects are delivered. It is also possible that other streams of the program (such as urban or industrial measures) may provide more cost-effective projects which could bring down the average cost.

The estimated costs of constraint projects have also risen

The estimated cost of constraint easing has risen substantially since the making of the Basin Plan. In 2013, the Australian Government allocated $200 million (through the WESA) to easing or removing constraints. In 2014, the MDBA (2014b) suggested that this funding would be inadequate and estimated that the cost of easing constraints in the six key focus areas in the southern Basin would be closer to $220 million. Based on cost estimates from business cases prepared by Basin States for the SDL adjustment mechanism, the total cost estimate now lies between $509-$629 million[75] — even with flow rates that are lower than those assumed in the MDBA's preliminary cost estimates.

To fund the full suite of constraint projects, Basin States have sought Australian Government funding for constraints as supply measures, as well as through the WESA (DAWR, pers. comm., 10 August 2018).[76]

A risk moving forward is that Governments treat the two funding streams for constraints as interchangeable, when the two programs have very different objectives — supply projects must achieve equivalent environmental outcomes to 2750 GL, but to deliver outcomes for the WESA, constraints must facilitate the enhanced environmental outcomes.

There is no opportunity to assess the value for money of further water recovery

When the Australian Government amended the Water Act in 2012 to include the WESA, it acknowledged the risk of higher than expected costs to recover water. The Act provides for two independent reviews of the account (in 2019 and 2021) to assess:

- the adequacy of funding to recover an additional 450 GL for the environment
- the design of water recovery programs to recover the full amount of water.

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75 This cost estimate excludes the Lower Darling constraint (which is part of the Menindee Lakes water savings supply measure and is not publicly available). It does include an estimated cost for the New Goulburn Constraints measure of $70 million. The cost of an older version of this constraint project was estimated at $140 million (DELWP (Vic) 2016a). Victoria is still waiting for feedback from New South Wales before completing the revised business case (which now focusses on in-channel constraints) and making it public. Given the scope is considerably less, the costs of implementation are likely to be in the order of half. However final costs would depend on addressing comments from other States (DELWP, pers. comm., 9 August 2018).

76 Other than the Goulburn constraints measure, all constraint projects are also supply measures.

These reviews were intended to enable parliamentary scrutiny of the account and provide an opportunity for the Australian Parliament to increase funding for the WESA. These reviews are not required to assess the benefits and costs of doing so.[77]

Given potential increases in the costs of both additional water recovery and for projects to ease or remove constraints, there is a risk that the costs of achieving the Schedule 5 outcomes could be higher than the current funding available in the WESA. Any shortfall in funding leaves three options:

1. increasing the budget, and continuing to pursue 450 GL following reviews of the WESA
2. widening the scope of the program to allow for more cost-effective projects
3. discontinuing further efficiency measures, or adjusting the outcomes being pursued.

DRAFT FINDING 5.2

Current progress in implementing efficiency measures provides little confidence that the enhanced environmental outcomes of the Basin Plan will be achieved by 2024 or on budget.

- There has been no update to the modelling to estimate what environmental benefits can be realistically achieved, given proposed projects to ease or remove constraints are unlikely to achieve the anticipated flow rates at key sites or be fully operational by 2024.
- Basin Governments have not yet agreed on an efficiency measures work plan to recover 450 GL by 2024, including how major socioeconomic impacts will be addressed.
- Despite this, the Australian Government is rolling out a water recovery program Basin-wide, which risks recovering water in the northern Basin that may not be useful to achieving the enhanced environmental outcomes in the southern Basin.
- There is a material risk that recovering 450 GL could be significantly more expensive than anticipated. The benefits and costs of the program as a whole have not been assessed (and there is no requirement to do so).

5.3 Improving implementation

Basin Governments are working towards a target of recovering an additional 450 GL for the environment by 2024, despite evidence the deadline is becoming increasingly unrealistic. Further, there is a lack of a clear strategy for recovering the additional water that ensures the program has the maximum chance of successfully achieving its environmental objectives, while being responsible with taxpayer money. In particular:

[77] The benefits and costs of the SDL adjustment mechanism were not considered in the Basin Plan's *Regulation Impact Statement* (MDBA 2012c).

- The enhanced environmental outcomes are dependent on progress in easing or removing constraints. However, these constraint projects are unlikely to be fully operational by 2024 and may not deliver the full range of anticipated constraint easing. If constraints are not eased, rushing to recover the full 450 GL by 2024 would risk the Australian Government spending hundreds of millions of dollars for an asset that potentially cannot be used for some time — if at all. Aligning water recovery to progress in lifting constraints could potentially save the Australian Government up to $184 million.[78]
- There is no coherent water recovery strategy that aligns water recovery with progress on constraint projects, ensures that recovered water will contribute to achieving the enhanced environmental outcomes in the southern Basin, and demonstrates how socioeconomic impacts will be mitigated.

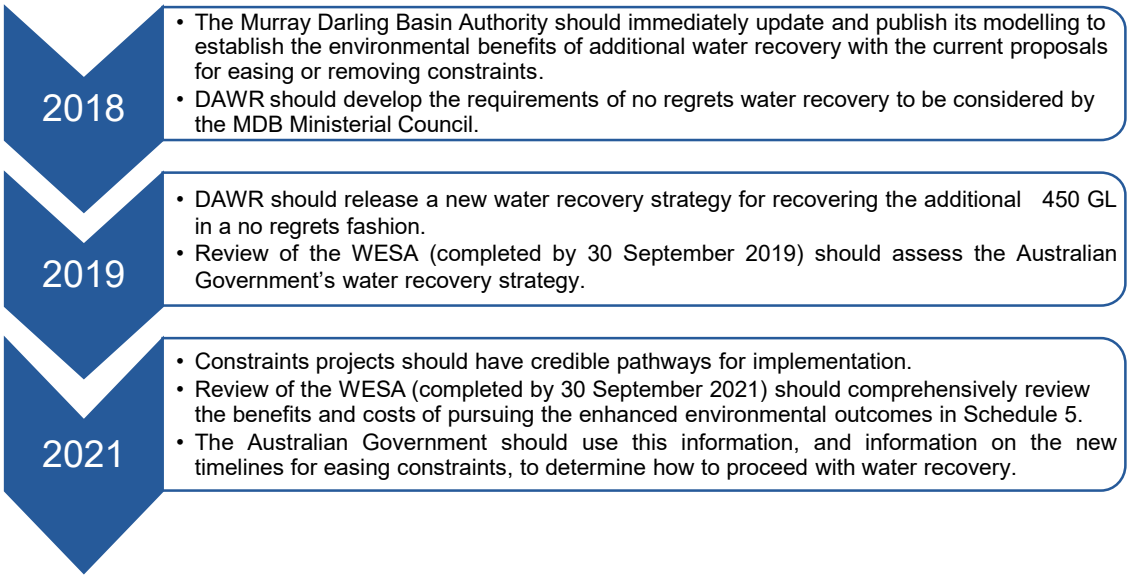
With almost $1.8 billion available in the WESA, there is a critical need to rethink the implementation of the efficiency measures program prior to the Australian Government spending large sums of money. In particular, the Australian Government (in agreement with Basin States) should:

- undertake further modelling to establish the benefits of additional water recovery with the current suite of constraint proposals
- develop a strategy for the recovery of the additional 450 GL to ensure water recovery is effective, efficient and genuinely 'no regrets'
  - this should including sequencing additional water recovery with progress in easing or removing constraints (so that environmental water can be delivered at the flow rates required to achieve the enhanced environmental outcomes) and designing the program to identify and minimise adverse socioeconomic impacts
- assess the benefits and costs as a whole through the independent statutory review of the WESA in 2021, which should examine the updated modelling results; the progress and realistic timelines for constraint easing and the likely costs of water recovery.

The Commission's proposed approach will help pursue the enhanced environmental outcomes at considerably lower cost than the current approach. It would also help address adverse socioeconomic impacts and provide opportunities to refine the implementation of the program in response to new information. This pathway is summarised in figure 5.2.

78 The estimate compares the net present cost of recovering water through efficiency measures by 2024 and increasing the time over which water is recovered to 2030. Future costs are discounted at a rate of 5 per cent a year for this estimate (appendix B.4).

Figure 5.2 **The way forward with efficiency measures**



The relationship between constraint easing and achieving the Schedule 5 outcomes needs to be understood

Basin Governments need to develop a shared understanding of what enhanced environmental outcomes can be realistically achieved from additional environmental water within the current suite of constraint proposals. This understanding also needs to include what environmental benefits can be achieved during the period that constraints easing is actually being implemented.

The MDBA, as an agent of joint governments, should update its 2012 modelling to confirm:

- the likely environmental benefits of additional water recovery within the suite of proposed constraint projects and other substantial changes to the Basin (such as the inclusion of supply measures to offset water recovery)
  - modelling should consider what benefits are possible if constraints are fully, partially or not eased or removed, and at full and partial levels of water recovery (such as 200 GL or 300 GL above the benchmark, as well as 450 GL)
- the location of environmental water entitlements (the portfolio) needed to achieve those benefits

This work should be undertaken as soon as possible and completed by July 2019.

The MDBA should update this modelling in the event of substantial changes to operations in the Basin, such as modifications to constraint projects or to other supply measures.

DRAFT RECOMMENDATION 5.1

The Murray-Darling Basin Authority should immediately update and publish its modelling to establish the environmental benefits of additional water recovery with the current proposals for easing or removing constraints.

Prudent design of the efficiency measures program is needed

Recovering the full 450 GL by 2024 prior to easing or removing constraints carries the risk of the CEWH holding water that river operators cannot deliver, or that provides no benefit to the enhanced environmental outcomes. But some water could likely be recovered in a 'no regrets' fashion to deliver some of the enhanced environmental outcomes in the meantime. Updated modelling by the MDBA should help clarify the extent of these interim benefits; this will then inform the priorities of the water recovery program.

Any water recovered (including the 62 GL needed by July 2019) must be no regrets. The Australian Government should release a new water recovery strategy to guide how additional water recovery will give effect to this principle.

Water recovery should better align with easing constraints (beyond 2024 if necessary)

In pursuit of the enhanced environmental outcomes, DAWR should align additional water recovery in different parts of the Basin with the timelines for easing relevant constraints. If constraints are not eased or removed by 2024, recovering the full 450 GL by 2024 would risk the Australian Government spending hundreds of millions of dollars for an asset that potentially cannot be used for some time — if at all (delaying water recovery to align with updated timelines for relaxing constraints could potentially save the Australian Government up to $184 million; appendix B.4).

The exact timeframes for easing or removing constraints are likely to change over time to reflect improved understanding. DAWR should plan in advance for different constraint-easing scenarios (including that some constraints may not be able to be eased or removed) and be clear on how it will adjust its water recovery priorities in response to those changes.

The Commission acknowledges that the CEWH could use this water to improve environmental outcomes in the Basin in the meantime. And, as noted by the South Australian Government (sub. 85), not all Schedule 5 outcomes are dependent on easing or removing constraints. These benefits, and their environmental watering requirements, will be better understood following updated modelling by the MDBA (discussed above) to inform the interim targets for water recovery.

If the timeframe for easing or removing constraints extends beyond 2024 (as appears likely), recovering the additional 450 GL should be slowed over a similarly extended timeframe. Once credible timeframes for easing or removing constraints have been established, the Basin Plan should be amended to ensure efficiency measures can continue to be implemented beyond 2024 (as it was in 2016 to provide more time for supply measure proposals). While it is not the primary motivation for the proposed changes, slowing additional water recovery beyond 2024 could also:

- help Basin communities adjust to having less water available for consumptive uses (structural adjustment is generally less costly if industries and communities have more time to adjust to changes)
- provide opportunity for more meaningful engagement with industry and irrigation infrastructure operators to identify potential efficiency measures
- reduce the impact of Australian Government intervention on water market prices (in reducing the supply of water entitlements) by diluting it over time.

Designing a 'no regrets' water recovery program

The Basin Plan requirement for neutral or improved socioeconomic outcomes from additional water recovery is not adequate to address concerns about significant negative impacts; additional program criteria are needed. However, this should not extend to a test that requires all projects to demonstrate that there are no negative impacts — this is unworkable and will block otherwise cost-effective water recovery projects.

As discussed above, socioeconomic impacts can be addressed through an approach to program design that identifies and mitigates any significant adverse impacts of recovering more water. This approach would be in addition to the Basin Plan requirement. The independent analysis of efficiency measures (EY 2018) highlighted some elements of an effective program design, including:

- two-way engagement with community and industry at a regional scale
- adaptive management through a monitoring and evaluation framework and scope to adjust program design in response to data collected
- phased implementation of the program over time.

In the Commission's view, the following are also required to ensure effective and efficient water recovery that complies with Basin Plan requirements.

- The volume, type and location of water being recovered should clearly contribute to the enhanced environmental outcomes.
  - This should be based on transparent advice from the CEWH, and take into account both progress in easing and removing constraints and any risks associated with the feasibility of those measures.

- Program design should explicitly consider potential socioeconomic impacts and include mitigation strategies.
  - This requires close engagement with affected communities and industries (such as shared irrigation infrastructure operators) to identify the likely impacts of different options.
- Value for money should be ensured by requiring prices paid (per ML and in total) for water to be within predetermined benchmarks. More expensive projects may be warranted, but should be subject to independent scrutiny to ensure cost-effectiveness.
  - As part of ensuring value for money, alternative or innovative water products (such as leases and options) should be considered where capable of securely contributing to enhanced environmental outcomes at a lower cost than entitlements.
- Other shortcomings in DAWR's approach towards gap-bridging water recovery (highlighted in chapter 3) should be addressed. These findings include the need for greater transparency concerning advice from the CEWH, and clearer consideration of impacts on return flows in future infrastructure modernisation programs.

DAWR should ensure that the new strategy for recovering the additional 450 GL is based on these requirements for no regrets water recovery. These should be included in the broader efficiency measures work plan to be considered by the MDB Ministerial Council.

DRAFT RECOMMENDATION 5.2

The Department of Agriculture and Water Resources should release a new strategy for recovering the additional 450 GL in a no regrets fashion in early 2019. No regrets water recovery requires that:

- the strategy should plan for a range of scenarios for constraint easing or removing and costs, and evolve as new information becomes available
- water recovery should align with progress in easing or removing constraints
- the volume, type and location of water recovered should clearly contribute to achieving the enhanced environmental outcomes in Schedule 5 of the Basin Plan
- alternative water products (such as leases and options) should be considered where capable of meeting enhanced environmental outcomes at a lower cost than the permanent recovery of entitlements
- program design and implementation should explicitly consider potential socioeconomic impacts and include mitigation strategies. This should include close engagement with affected communities and industries
- prices paid for water (per ML and total expenditure) should be within predetermined benchmarks. Where they exceed this benchmark, projects should be subject to independent scrutiny and the reasons made publicly available.

Reviews of the Water for the Environment Special Account should be broadened

The Commission has highlighted a material risk that the cost of recovering additional water may be higher than anticipated — potentially exceeding the current budget by more than $500 million. To recover the 450 GL, there may be a need to increase the funding in the WESA — but there is currently no requirement to assess the benefits and costs of additional funding, or whether the current approach to efficiency measures is the best way to achieve the Schedule 5 outcomes.

There are specific issues relating to the design of the programs that need to be explored. For example, in the event that funding is sufficient to achieve most (but not all) of the Schedule 5 outcomes, how much more is the Australian Government willing to spend to meet the remaining outcomes, given that funding could be directed towards achieving other environmental outcomes in the Basin? Given a limited budget, are other approaches (such as additional constraint easing) more cost-effective in meeting environmental outcomes than additional water recovery?

The terms of reference for the two independent reviews of the WESA (in 2019 and 2021) should be broadened to consider these issues. Currently, the reviews must consider whether both funding and the design of water recovery programs are adequate to recover an additional 450 GL for the environment, but the Water Act also permits the Water Minister to direct the reviewers to consider other matters.[79]

This provides an opportunity for the Australian Government to ensure the program represents value for money, as well as improving accountability and helping to secure wider consensus on further water recovery. The 2019 review should be broadened to assess the Australian Government's new water recovery strategy, while the 2021 review should comprehensively assess the benefits, costs and timelines for achieving enhanced environmental outcomes, given credible timeframes for easing or removing constraints.

With the expanded scope, the processes for both reviews should be subject to greater public involvement and scrutiny. Both reviews should accept public submissions and undertake regional consultation.

Assess the approach to 'no regrets' water recovery in 2019

The Water Act requires the review of the WESA to consider the likely effectiveness of the design of water recovery projects in recovering 450 GL; the sole focus of recovering a volume of entitlements (irrespective of what benefits are achievable) may cost millions with (potentially) limited benefits.

79 Water Act, s. 86AJ(3).

Drawing on updated modelling from the MDBA, the 2019 review should assess whether the Australian Government's new water recovery strategy establishes a sound basis for effective and efficient water recovery, in alignment with the Commission's 'no regrets' requirements (above) and any criteria agreed to by the MDB Ministerial Council.

Ensuring an open review process at this stage will provide wider confidence that the approach to program design will identify and address adverse socioeconomic impacts, and that the water recovered will meaningfully contribute to the intended environmental outcomes.

Review the benefits and costs of the program as a whole in 2021

The terms of reference for the 2021 review of the WESA should also be expanded to assess the benefits and costs of pursuing the enhanced environmental outcomes in Schedule 5 of the Basin Plan.

At that time, the timeframes and feasibility of easing or removing constraints should be understood as the projects pass the Australian Government's funding process (chapter 4). The 2021 review can then assess how the enhanced environmental outcomes can be achieved within those delivery constraints.

The objective of this review should be to identify how the remaining WESA funding can be used to maximise the net benefits of pursuing those environmental outcomes, drawing on:

- progress to date on additional water recovery
- progress towards (and feasibility of) easing or removing constraints
- the environmental benefits achievable through water recovery within expected constraint flow rates
- the budgetary costs of recovering additional water through efficiency measures.

The review should also consider the benefits and costs of other approaches to achieving the Schedule 5 outcomes. If constraints cannot be removed, or if achieving the enhanced environmental outcomes will require considerably more water than originally modelled, the Australian Government should consider re-scoping the program to ensure the water recovery proceeds in a way that maximises net benefits to the community.

This review should not increase funding for the WESA unless the benefits of doing so can be shown to exceed the costs.

DRAFT RECOMMENDATION 5.3

The Water Minister should direct the independent review of the Water for the Environment Special Account scheduled for 2021 to review the benefits and costs of pursuing the enhanced environmental outcomes in Schedule 5. This should include:

- identifying what enhanced environmental outcomes can be achieved, given progress in easing or removing constraints, and how much environmental water would be required to do so
- the benefits and costs of other approaches to achieving those environmental outcomes.

The Australian Government should use this information to determine how to proceed with water recovery in a way that maximises net benefits to the community, or whether to pursue the enhanced environmental outcomes through other means.

6 Water resource planning

Key points

- Basin State water planning arrangements continue to be the primary instruments for water management at the local level while Water Resource Plans (WRPs) are the mechanism for demonstrating compliance with Basin Plan requirements.
- WRPs are the vehicle for establishing Sustainable Diversion Limits in Basin State water sharing arrangements. They also require Basin States to implement provisions to meet critical human water needs, plan for environmental water management, and manage water quality.
  - Basin States are required to develop WRPs to be accredited by the Minister for Agriculture and Water Resources by 30 June 2019.
  - From 1 July 2019 the Murray-Darling Basin Authority (MDBA) will be responsible for enforcing compliance with WRPs. Enforcement of Sustainable Diversion Limits is treated separately to WRPs and has its own compliance framework.
- The development and accreditation of WRPs is well behind schedule.
  - Of the 33 WRPs that must undergo accreditation, 20 are in the early stages, 11 are in draft form, one is in the accreditation process and one has accreditation.
  - There is still technical work to be completed on ensuring compliance with SDLs.
- Given the remaining workload, there is a risk that attempting to accredit all WRPs by the 30 June 2019 deadline will compromise the quality of some WRPs by not allowing sufficient time to consider and consult on key issues with affected stakeholders. This may reduce the effectiveness of WRPs in implementing the SDLs and key elements of the Basin Plan such as extreme events.
- There are concerns that the implementation of WRPs has been poorly executed, with the accreditation process resulting in unnecessary costs in developing plans and potentially making adaptive management more difficult.
- In response to these issues the Commission recommends that:
  - Basin Governments should immediately negotiate a pathway for granting extensions to the timelines for accrediting WRPs where there are significant outstanding issues to give sufficient time for adequate community engagement
  - in the next 12 months, the MDBA as Basin Plan Regulator, should: clarify what Basin States are required to self-report annually to show compliance with WRP obligations; articulate the compliance assessment regime relevant to WRP obligations; and develop guidance and consult on how it proposes to assess future amendments to WRPs by Basin States
  - the MDBA and Basin Governments should develop a detailed terms of reference to assess the utility of WRPs as water planning instruments in preparation for the five-yearly evaluation in 2020.

This chapter discusses Water Resource Plans (WRPs). It first provides background on the purpose and operation of WRPs (section 6.1). It then presents the Commission's assessment of WRP implementation to date (section 6.2) and options for improving implementation in the future (section 6.3).

6.1 Background

Water Resource Plans are a key instrument in implementing the Basin Plan and Sustainable Diversion Limits

WRPs are a key instrument in implementing the Sustainable Diversion Limit (SDL) in WRP Areas (box 6.1) and ensuring Basin States consistently address key elements of the Basin Plan. The *Water Act 2007* (Cwlth) sets out 12 parts that a WRP must address which the Murray Darling Basin Authority (MDBA) developed into 54 requirements under the Basin Plan.[80] The following key elements are dealt with in greater detail in subsequent chapters of this report: Indigenous water values and uses (chapter 7); water quality (chapter 8); critical human water needs (chapter 9); water trading rules (chapter 10); environmental water planning and management (chapter 11); compliance (chapter 12) and reporting, monitoring and evaluation (chapter 13).

Basin State water planning arrangements continue to be the primary instruments for water management at the local level while WRPs are the mechanism for demonstrating compliance with Basin Plan requirements. WRPs are designed to 'bring together existing state rules and instruments, along with other supplementary material, to provide a plan for managing water resources in a way that is consistent with the Basin Plan' (MDBA 2017f, p. 2). To the extent a Basin State's entitlement and planning arrangements do not address specific matters set out for WRPs, they would need to amend their arrangements or supplement them with new ones to be compliant with the Basin Plan. For example, Basin States will need to develop accounting methods that demonstrate how they incorporate and apply SDLs for their WRP Area.

80 The Water Act, s.22(3).

Box 6.1 Implementing Sustainable Diversion Limits through Water Resource Plans

The Basin Plan introduces a new water accounting and compliance framework based on Sustainable Diversion Limits (SDLs) that is due to replace the Murray–Darling Basin Cap on Surface Water Diversions (the Cap) on 1 July 2019.

How will WRPs implement SDLs?

Water Resource Plans (WRPs) are the mechanism that bring SDLs into effect by requiring Basin States to set out how they will calculate the maximum quantity of water that the Basin Plan permits to be taken for consumptive use (permitted take) in a water accounting period and any associated rules for take for each WRP Area. The determination of permitted take for a WRP, and subsequently how the water take in a WRP Area meets its SDL over the long-term, is underpinned by a number of 'planning assumptions' such as historical climate conditions, expected utilisation of entitlement classes, trading patterns and the impact of water sharing rules for a particular WRP Area (for example, carry over, trading and water access rules).

How will SDLs differ to the Cap?

The Cap was introduced in 1995 by the Murray–Darling Basin Ministerial Council to 'protect and enhance the riverine environment and protect the rights of water users' (MDBA 2017v, p. 7). The Cap introduced long-term limits on the volume of water consumptive users could take from rivers in 24 designated river valleys. Under the Cap, Basin States' had to provide data to the Murray–Darling Basin Authority (MDBA) and its predecessor the Murray-Darling Basin Commission, about how much water consumptive users actually took each year compared with the annual Cap targets.

The SDL framework expands on the Cap by explicitly including water take from groundwater, run-off dams, floodplain harvesting, commercial plantations (net take) and basic water rights and applies to 29 surface water and 81 groundwater SDL resource units (that sit within WRP Areas). Between the introduction of the Basin Plan in 2012 and when SDLs become enforceable in 2019, Basin States have been required to report on Transitional Diversion Limits, which are SDLs adjusted for water recovery progress in WRP Areas (MDBA 2017v). The Basin Plan also places limits on growth for take under basic rights, by runoff dams and net take of commercial plantations. Take can increase above the limit set out provided another form of take with limits in the same SDL resource unit decreases at the same time so there is no net change in the long-term average annual quantity of water taken (MDBA 2018l).

How will SDLs be monitored and enforced?

The MDBA will collate the volumes of permitted and actual take in an annual register of take against which compliance with the SDLs is assessed. Annual permitted take and actual take, the difference between them (either a debit or a credit) and the cumulative balance of take are recorded in the register of take. Like the Cap, non-compliance occurs when the cumulative balance exceeds 20 per cent of the long-term annual diversion limit for the SDL and Basin States do not provide a reasonable excuse (MDBA 2018l).

Compliance with SDLs sits outside of and is separate to compliance with WRPs (MDBA 2018g). The SDL reporting and compliance framework at the time of writing was in the process of being finalised. The most recent SDL compliance report found that all SDL resource units were compliant (MDBA 2018v).

Sources:(MDBA 2017v, 2018g, 2018v).

The actual form of WRPs can vary depending on Basin States' existing water planning arrangements and how they choose to demonstrate compliance with the WRP requirements. They can be a single document which references various states instruments, or made up of a number of documents (MDBA 2017x). For example, the main document submitted for accreditation for the Queensland Warrego-Paroo-Nebine WRP used an index giving line by line detail of how each requirement was met, referring to instruments and supporting text that constituted the WRP (DNRM (Qld) 2016, p. 5).[81] In contrast, the Victorian draft Wimmera-Mallee WRP is provided in the form of a report which 'largely explain our current water legislation and management tools … acknowledging work done in implementing the Basin Plan'(DELWP (Vic) 2017, p. 15).

All Water Resource Plans must be accredited by 2019

Basin States are responsible for developing WRPs for 33 WRP Areas, all of which must be accredited by 30 June 2019.[82] There are 54 requirements that WRPs must address to gain accreditation.[83] Some of them relate to the inclusion of specific content (for example, requirements to incorporate and apply SDLs, including rules necessary for sustainable use and management, and to set out circumstances under which trade is permitted) while others are about process (for example, the form the WRP must take, a description of consultation undertaken, and how best available information was used).

Once Basin States have developed their WRPs (with input from the MDBA) they submit them to the MDBA which is responsible for assessing the WRPs and making a recommendation to the Australian Government Minister for Agriculture and Water Resources (the Minister) on whether each should be accredited. There must be an accredited WRP for each WRP Area.[84] Once accredited, WRPs become operational and take on the status of Commonwealth legislative instruments. The accreditation period lasts for as long as the WRP is in effect.[85] The Minister can request the MDBA to prepare part or all of a WRP, also known as 'step-in provisions', in place of a Basin State in limited circumstances (for example, when a WRP is not submitted for accreditation in time or the submitted WRP is not accredited by the Minister).[86]

81 Draft versions of WRPs being compiled by South Australia and New South Wales also appear to be following the index with supporting text approach.

82 New South Wales has 20 to complete, Victoria has five, Queensland and South Australia have three each and the ACT has two.

83 There are 55 requirements in Chapter 10 but requirement 10.01 is a simplified outline.

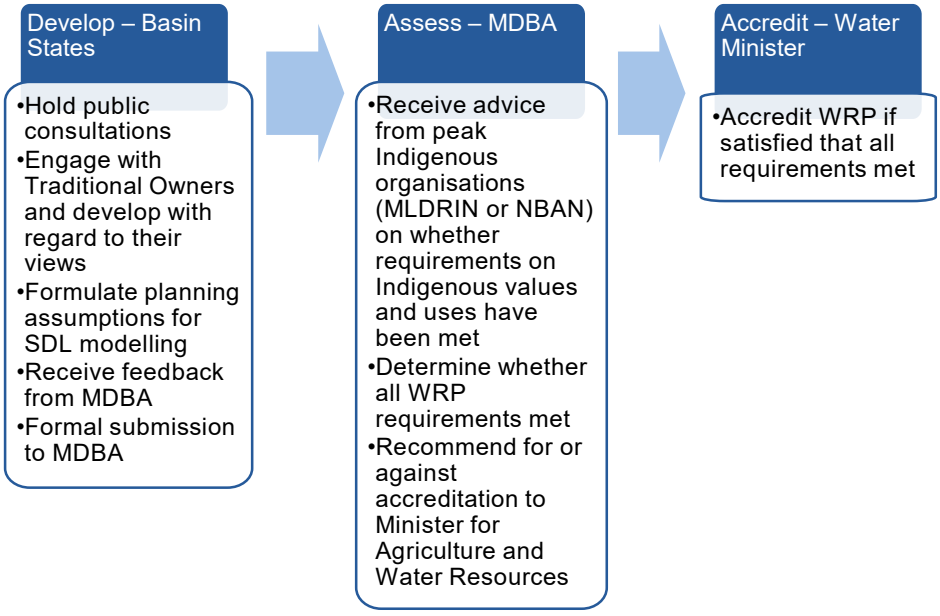
84 The Water Act, s.54.

85 The Water Act, s.64 sets out the provisions about the duration of accreditation, with the WRP in effect usually for the duration of the state instruments that underpin it, for example New South Wales water sharing plans have a duration of ten years.

86 The Water Act, ss.68–69.

Figure 6.1 illustrates the development, assessment and accreditation process. Table 6.1 sets out the roles of Basin States, the MDBA and the Minister in the development, assessment and accreditation phases for WRPs. The MDBA, as set out in the Basin Plan, also consults with relevant peak Indigenous organisations to confirm that the requirements relating to Indigenous values and uses have been met as part of the assessment process (chapter 7).

Figure 6.1 **Process for accrediting Water Resource Plans**



Once WRPs are in place, Basin States are able to review and amend their accredited WRPs at any time; however, any changes will need to be assessed by the MDBA and reaccredited by the Minister.[87] As at August 2018 the MDBA had not developed guidelines on the amendment process but the Department of Agriculture and Water Resources had started the process of preparing regulations for minor amendments (MDBA, pers. comm., 9 August 2018).

87 The Water Act, ss.65–66 and the Basin Plan ss.10.47–10.48.

Table 6.1 **Roles across Water Resource Plan development and implementation phases**

Role	*Responsible party*
Development phase – before July 2019	
Develop WRPs	Basin States
Issue assessment guidelines and provide feedback on draft WRPs	MDBA
Consult with stakeholders on WRP content	Basin States
Engage with Traditional Owners and have regard to their objectives and desired outcomes throughout WRP development	Basin States
Peak Indigenous organisations (Murray and Lower-Darling River Indigenous Nations and Northern Basin Aboriginal Nations) provide advice to the MDBA on whether requirements on Indigenous values and uses have been met	MDBA and peak Indigenous organisations
Recommend for or against accreditation to the Minister	MDBA
Decision on accreditation	Minister
Implementation phase – from July 2019	
Manage water resources consistent with policies set out in WRPs	Basin States
Carry out compliance activities where WRP policies place obligations on individuals	Basin States
Enforce compliance with WRPs by States or individuals if States fail to do so	MDBA
Maintain register of take for SDLs	MDBA
Carry out compliance actions if SDLs breached	MDBA
Annual reporting on compliance with WRPs	Basin States
Five-yearly reporting on the efficiency and effectiveness of WRPs	Basin States and MDBA
Propose amendments to WRP and provide reasoning	Basin States
Recommend for or against accreditation of amendments to the Minister	MDBA
Decision to accredit amendments	Minister

The MDBA is responsible for ensuring compliance with accredited Water Resource Plans once they are operational

Both Basin States and the MDBA have responsibilities relating to monitoring, reporting and reviewing the implementation of accredited WRPs. In particular, Basin States must self-report annually on compliance with any ongoing obligations in their WRPs to the MDBA.[88] The MDBA has identified 22 possible types of obligations from WRP requirements that may affect State agencies, operating authorities, infrastructure operators or holders of water access rights (MDBA 2017h). Whether these obligations are imposed will 'depend on the nature of the particular WRP Area, the content of the particular Basin Plan requirement and how that requirement is satisfied in the WRP' (MDBA 2017f, p. 4).

88 The Basin Plan, Schedule 12 Matter 19.

Examining these obligations, the Commission suggests that they can be categorised by the type of function they impose. These include:

- **Restrictive obligations**, such as water access rights holders complying with associated conditions or restrictions on activities, States ensuring that the actual quantity of water taken is kept below the permitted take quantity each year, and States seeing that there is no net reduction in planned environmental water
- **Operational obligations**, such as States maintaining a register of held environmental water, ensuring consistency with long-term environmental watering plans, and implementing water quality management plans
- **Triggered management obligations**, such as measures to preserve critical human water needs in the case of extreme events, actions that must be taken if interception activities such as floodplain harvesting are found to be impacting on the area's water resources, and reasoning being needed if a State wishes to amend a WRP.

The MDBA plans to adopt a risk-based approach to WRP compliance, where although all obligations in WRPs must be complied with, there will be a focus on those obligations that:

> have the greatest implications for outcomes … [including] compliance with sustainable diversion limits, protection of planned environmental water and compliance with Basin Plan water trading rules.

The MDBA has indicated that they will work with Basin States on what is appropriate content for them to report against once WRPs are accredited (given the content of the WRP will define what the precise ongoing obligations are in a WRP Area) and may issue guidelines as more WRPs come into effect. As Basin States have responsibility for compliance with their existing water management frameworks, the MDBA 'expects the Basin state to take appropriate compliance action' if there is non-compliance with obligations that exist under states law (MDBA 2017f, p. 3) (chapter 12).

Basin States are required to set out monitoring in their WRPs that will be undertaken to fulfil all reporting obligations set out under Schedule 12 of the Basin Plan and reporting agreements on all reporting obligations were to be in place by 2015 (chapter 13).[89]

Basin States and the MDBA must both report on the 'efficiency and effectiveness' of the operation of WRPs every five years.[90] These five-yearly reports under Schedule 12 of the Basin Plan are due in 2020.

89 The Basin Plan, s.10.46 and s.13.15.

90 The five yearly evaluation is required under the Basin Plan, Schedule 12 Matter 18 and must also include an assessment on whether they provide a robust framework for a changing climate.

Sustainable Diversion Limit monitoring and compliance has its own framework

As part of the WRP accreditation process, Basin States are required to show how they will meet SDLs by defining how permitted water take will be measured (box 6.1). However, once WRPs are accredited SDL monitoring and compliance will occur via a register of take which the MDBA administers separately to WRP monitoring and compliance (MDBA 2018g). As of August 2018, the MDBA was consulting with key stakeholders on its draft SDL reporting and compliance framework, with a view to finalising it by 30 September 2018.[91] This draft compliance framework outlines that SDL accounting results will be published in an annual report in March each year and will include 'all compliance assessment outcomes, including reasonable excuse claims, steps states will take to reduce the excess and non-compliance actions' (MDBA 2018l, p. 11).

In the MDBA's (2018v) *Transition Period Water Take Report 2016-17*, all cap valleys were compliant and take in all surface and groundwater SDL resource units was compliant with the Transitional Diversion Limits (TDL).[92] It is noted under the SDL framework non-compliance is defined over a number of years, so a headline result does not provide particular insight to the future operations of the SDL.

Of the 29 surface water SDL resource units in 2016-17, actual take exceeded the TDL in three (Barwon-Darling, Murrumbidgee, South Australian Murray) and was between 90 and 100 per cent of the TDL in another eight. In the past five years of TDL compliance reporting, actual take exceeded the TDL in 12 surface water SDL resource units.[93] In contrast, of the 81 groundwater SDL resource units, six had an actual take over 70 per cent or greater of the TDL in the past five years of reporting.

Within the *Transition Period Water Take Report 2016-17* (MDBA 2018v) the MDBA reaffirmed the recommendations to improve methods for estimating volumes of take (permitted and actual), increasing the proportion of actual take that is measured to an agreed standard and using automated reporting where possible. It also acknowledged the work being undertaken by New South Wales and Queensland in the area of measuring flows in unregulated systems and their commitment to policy reform and further consultation (DOI (NSW) 2018c; Queensland Government 2018a, 2018b).[94]

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91 Action 1.1 for the MDBA in the *Murray-Darling Basin Compliance Compact* (MDB Ministerial Council 2018b)

92 During the transitional SDL accounting period there will be no actual consequences of non-compliance. The transitional accounting period finishes with the 2018-19 water accounting year, such that in 2019-20 non-compliance will result in enforcement actions being undertaken.

93 Appendix 2 of the *Transition period water take report 2016-17* (MDBA 2018v).

94 The Basin Plan, s.10.45 states that (to be accredited) a WRP must specify measures for maintaining and, if practicable, improving: the proportion of take measured and the standard to which take is measured and a timeframe for doing so. In its *Compliance and enforcement policy 2018-21,* the MDBA (2018g, p. 15) states it will 'work to develop and implement methods to improve accuracy of water measurement and increase transparency of water take'.

6.2 Assessment of implementation

The Commission assessed the effectiveness of WRP implementation by considering whether WRPs are likely to be accredited by the 30 June 2019 deadline so that SDLs can take effect on 1 July 2019; as well as whether they are likely to effectively implement SDLs and other key elements of the Basin Plan.[95] As the vast majority of WRPs are under development at the time of writing, the Commission based its assessment on whether WRPs are likely to effectively implement SDLs and other key elements of the Basin Plan based on principles of good water planning such as transparency, stakeholder engagement and flexibility (adaptive management). The Commission also had regard to whether WRPs impose minimum necessary compliance costs (such as adopting a risk-based approach to compliance).

Water Resource Plan development is behind schedule

The development and accreditation of WRPs is well behind schedule. The MDBA initially projected that 14 plans would be accredited by 2017 and 26 by 2018 (MDBA 2017b); however, as at May 2018 only Queensland's Warrego-Paroo-Nebine WRP has accreditation, 20 of the remaining 32 WRPs were in the early stages, 11 were in draft form and only one had been submitted to the MDBA for final assessment (figure 6.2).

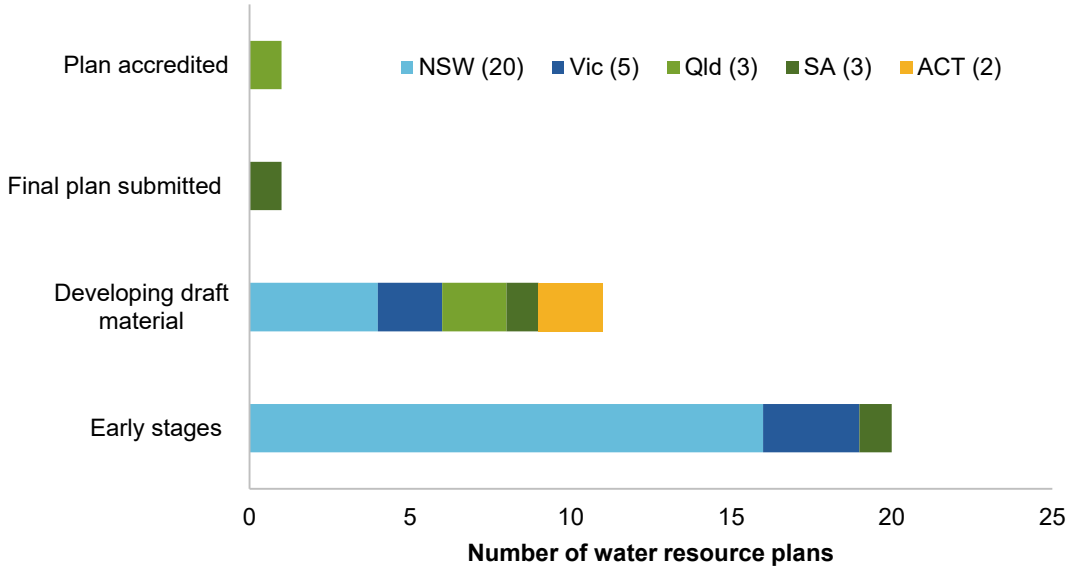
Slow progress in developing and accrediting WRPs has been attributed to a number factors. The MDBA (sub. 86, p. 34) suggested progress had been slower than expected due to a number of factors including:

- Development and communication of policy positions and accreditation requirements took time … [and] was a learning process for both Basin states and the MDBA on what was adequate.
- Too few resources were allocated to the task in both the Basin states and the MDBA.
- Some states have had significant and ongoing internal changes through restructuring and staff turnover, resulting in a loss of corporate knowledge and delays in undertaking work.
- There has been a reluctance by some states to engage fully in the WRP process and its requirements.
- New knowledge and skills have been required to address some aspects of the requirements … This has generally needed a specific engagement and longer timeframes.

The MDBA (sub. 86, p. 15) also acknowledged that 'work on SDL Adjustment Mechanism and Northern Basin Review became almost all-consuming, absorbing the time and energy of government processes.'

[95] There is no explicit objective for WRPs set out in the Basin Plan.

Figure 6.2 **Progress of Water Resource Plans[a,b]**



Notes: [a] Early Stages category represented here combines the categories of 'preliminary planning begun', 'development of plan started' and 'some early draft material available to the MDBA for review' used in the May Quarterly Report. Categories 'development not yet begun', 'complete set of material available to the MDBA for review' and 'MDBA recommendation provided to the Minister' not included due to no WRPs in these categories. Remaining headings abbreviated from 'final plan submitted to the MDBA for assessment' and 'Further progress in developing draft material'. [b] 33 WRPs represented here as per January 2018 Quarterly report although 36 reported in the May Quarterly report due to the *Basin Plan Amendment Instrument (No.1) 2018* adopted 2 July 2018 accepting changes to WRP Areas from 36 to 33.

Source: (MDBA 2018w).

Some Basin States attributed delays to the MDBAs approach to accreditation. Queensland (sub. 87, p. 6) observed the MDBA's 'interpretation of what is required to meet the Basin Plan requirements is often too legalistic and not fit-for-purpose'. Victoria (sub. 89, p. 3) noted the 'timeliness and consistency of feedback from the MDBA remains an issue that is impacting on WRP timelines' (these issues are discussed further below).

The MDBA (sub. 86, p. 34) acknowledged some of these concerns noting it 'should have provided earlier and clearer guidance about how to address Plan requirements'. It has also made efforts to speed up the accreditation process by developing an assessment template to help streamline the development of WRPs and publishing position statements on how they interpret requirements and what they expect from Basin States to meet them. The Queensland (sub 87, p. 6) and South Australian (sub 85, p. 19) Governments both acknowledged these changes had improved the timeliness of the accreditation process. However, concerns remain this will not be enough to get all WRPs accredited for the 30 June 2019 deadline.

In the past 12 months the MDBA has taken a number of actions to improve engagement with Basin States to assist with WRP development (MDBA, pers. comm., 3 August 2018). Examples include fortnightly teleconferences and regular face to face meetings between

MDBA and Basin State staff and establishing a WRP project management office with a focus on improving responsiveness given tight timeframes and working closely with Basin States to resolve issues.[96]

There is still work to be completed by some Basin States to finalise the methodologies of permitted water take to meet the SDL, also referred to as planning assumptions.[97] An update of this work is provided below in table 6.2.

Table 6.2 **Status of Basin States planning assumptions[a]**

Basin State	*Status*	*Update*
New South Wales	Incomplete	Consultation on draft planning assumption closed 17 July 2018. This work will be finalised, in consultation with the MDBA, as part of WRPs.
Victoria	Incomplete	Discussing early draft planning material with MDBA and will be finalised as part of WRPs.
Queensland	Incomplete	Expected to be finalised by the end of 2018.
South Australia	Incomplete	Submitted some work to the MDBA in 2017. Some details still to be finalised as part of the SA River Murray WRP.
ACT	Not applicable	Not a relevant matter for the ACT as ACT shared reduction amount will be recovered from within New South Wales.

Notes: [a] The MDBA plans to commission independent reviews of methodologies used by Basin States in developing their planning assumptions and publish these reviews.

Sources: MDBA (pers. comm., 3 August 2018); Queensland Government (sub. 87).

Attempting to accredit all Water Resource Plans by 30 June 2019 risks compromising quality

Given the remaining workload, there is a risk that the quality of some WRPs will be compromised to meet the 30 June 2019 accreditation deadline, and subsequently the ability of those WRPs to effectively meet the objectives of the Basin Plan in the longer-term.

Consultation with key stakeholders and communities is a critical component of good quality water management. It facilitates transparency about positions being put forward and evidence supporting them, allows for local knowledge to be incorporated and facilitates understanding of complex issues which may have serious consequences, such as changes to property rights of water entitlements and cultural values of Traditional Owners.

96 The terms of reference also requires the Commission to report on progress towards milestones agreed in the *MDB Ministerial Council Implementing the Basin Plan* (MDB Ministerial Council 2017b) including whether the MDBA has appropriately engaged with the States on their plan development.

97 Planning assumptions were to be submitted to the MDBA by the end of 2016 for assessment (MDBA 2017b).

A number of participants to this inquiry raised concerns that the 30 June 2019 deadline for accrediting WRPs does not allow sufficient time to transparently consider and consult on key issues (particularly in New South Wales, which has the largest number of WRPs to accredit). Specific concerns raised by participants included:

- Failure to properly consider and consult on significant rule changes to protect environmental flow (chapters 11), water quality (chapter 8) and critical human water needs (chapter 9) with entitlement holders and third parties.[98]
- Lack of consultation on measurement of water take in New South Wales — particular areas of concern were the level of consultation with the Stakeholder Advisory Panels on the modelling assumptions underlying SDLs and the limited timeframes to carefully consider and provide input on issues.[99]
- Inadequate consultation timeframes by some States with Indigenous groups in the Basin — the Murray Lower Darling River Indigenous Nations (sub. 72, p. 7) noted 'the stalled progress of WRP development has created compressed timelines that impose unreasonable and culturally inappropriate pressures on First Nations' (chapter 7).

An example of where significant rule changes are under consideration and consultation remains outstanding is in the Barwon-Darling WRP Area (box 6.2). The timelines for implementing the Barwon-Darling WRP assumes that consultation with the stakeholder advisory panel and public exhibition (including on water sharing plan rule changes for active management to share flows and detailed options on amendments to access rules) will occur over the second half of 2018 (DOI (NSW) 2018c). The MDBA has this WRP scheduled for assessment in the last quarter of 2018 (MDBA 2018w). This implies a maximum period of six months for consultation before the WRP is assessed for accreditation.

It is unlikely that six months will be sufficient to consult on significant rule changes (such as active management to share flows and detailed options on amendments to access rules) that are yet to be finalised. For perspective, consultation (involving targeting key stakeholders, and public exhibition) on the 2012 Barwon-Darling water sharing plan took place over a period of more than 12 months and the subsequent changes put through then still remain a concern for some stakeholders (DPI (NSW) 2012, pp. 70–73).

Inadequate consultation may result in poorer water management outcomes than if key stakeholders had been engaged in a timely manner to work through issues of contention and help develop solutions. This is particularly important where rule changes potentially impact on the reliability and use of water entitlements or planned environmental flows. Failure to adequately consider and address the above concerns (and be seen to do so) risks undermining community trust in the both the usefulness and legitimacy of WRPs and acceptance of the rules they impose. This may in turn reduce the likelihood of meeting the broader objectives and outcomes of the Basin Plan.

98 Cotton Australia (sub. 47).

99 Lower Edward River Pumpers and Landholders (sub. 63); Ricegrowers Association of Australia (sub. 70); NSWIC (Sub 80); GVIA (sub. 83).

Box 6.2 Barwon-Darling Water Resource Plan

The *Murray-Darling Basin Water Compliance Review* (MDBA 2017u, p. 15) found the Barwon-Darling water sharing plan failed to 'provide adequate protection for environmental water, particularly during low flows' potentially inhibiting achievement of the environmental and social outcomes of the Basin Plan. A range of submissions to this inquiry and participants attending public forums have raised concerns about the Barwon-Darling water sharing plan (2012), which commenced just before the Basin Plan was finalised, including:

1. Rules that permit the take of water during low flows, which are important to share with downstream systems
2. Rules that permit the take of water when flows reach certain thresholds without accounting for contributions from environmental flows — allowing consumptive users to extract water intended for environmental flows within the rules of the water sharing plan
3. Illegal take of water (including when there is a section 324 embargo to protect water flows)
4. The current water sharing plans are unlikely to meet the requirements of the Basin Plan during extreme events.

Submissions to this inquiry expressed concern that unless these issues were addressed in the Water Resource Plan then the Basin Plan would 'lock in' the existing Barwon-Darling water sharing plan at the expense of communities and the environment:

> The Basin Plan locks in the Barwon Darling water sharing plan made in 2012, which changed the access to low flows. Low flows are legally extracted by a small number of very large scale irrigation businesses. This has been at the expense of the Brewarrina Community (Brewarrina Shire Council, sub. 2, p. 1).
>
> … dismayed by some of the goal shifting changes that have occurred in the unregulated Barwon-Darling that severely compromise downstream river and wetland health, to the detriment of communities and environment. At this stage, with the requirement to accredit WRPs by mid-2019, NPA emphasises the importance of not locking in inappropriate commitments within existing NSW WSPs (National Parks NSW, sub 76, p. 4).

The New South Wales Government has committed to undertaking substantial actions to address identified issues in the Barwon-Darling system in the last 12 months through its Water Reform Action Plan, including developing enduring solutions for the better protection and management of environmental water to be implemented through amendments to water sharing plans. These actions have been incorporated into the *Murray-Darling Basin Compliance Compact* (MDB Ministerial Council 2018b).

In June 2018, the New South Wales Parliament passed amendments to the *Water Management Act (2000)* (NSW) to address issues raised with respect to the Barwon-Darling water sharing plan. Among other things, these legislative changes will enable:

- changes to the Barwon-Darling water sharing plan including allowing Individual Daily Extraction Limits and Total Daily Extraction Limits to be established to better protect environmental water
- temporary water restrictions (section 324 notices) to protect environmental water and a framework for the application of these restrictions to be developed.

The Department of Industry note these amendment provisions aim to 'allow sufficient time to develop the rules and tools for active management' using Individual Daily Extraction Limits with further work and consultation with relevant stakeholders in the Barwon-Darling required to implement these changes (DOI (NSW) 2018a).

Sources: (DOI (NSW) 2018a, 2018b; DPI (NSW) 2017a; MDB Ministerial Council 2018b; MDBA 2017u).

Given the timeframe remaining and the issues that need to be resolved in some WRP Areas, it is unlikely there will be time for adequate consultation. There is a choice here to either:

- attempt to accredit all WRPs by 30 June 2019 and risk compromising the quality of those plans by rolling over existing inadequate rules or rushing in new rules which are ill-specified and lacking wider stakeholder understanding and commitment, resulting in WRPs being ineffective, or
- provide an extension where warranted to enable adequate consultation, particularly where rule changes to state water management plans are required to be consistent with the Basin Plan.

The *Murray-Darling Basin Water Compliance Review* (MDBA 2017u, p. 64) highlighted that where there are unaccredited WRPs post July 2019, the MDBA may 'take compliance action where there are inconsistencies' between state water plans and the Basin Plan or 'develop its own enforceable plan' using step-in provisions of the Water Act. Currently there is no clear public strategy about managing key elements of the Basin Plan — such as those around SDL compliance — in unaccredited WRPs post July 2019.

DRAFT FINDING 6.1

The development and accreditation of Water Resource Plans is well behind schedule and there are key issues still to be finalised in some Water Resource Plan Areas.

There is a risk that attempting to accredit all Water Resource Plans by the 30 June 2019 deadline will:

- compromise the quality of some plans
- not allow sufficient time to consider and consult on key issues with affected stakeholders
- inadvertently impact the entitlements of water users or the environment
- reduce the effectiveness of Water Resource Plans in implementing key elements of the Plan including Sustainable Diversion Limits, the protection of environmental water and providing water for critical human needs.

This risk is highest for New South Wales, given the number of outstanding plans and the magnitude of proposed rule changes in some Water Resource Plan Areas. There is currently limited public information on how the Murray-Darling Basin Authority will address the risk of some plans not having accreditation by 30 June 2019.

There are concerns that Water Resource Plan implementation has been poorly executed

While acknowledging the accreditation process has provided some consistency in approaches (for example the incorporation of Indigenous use and values and accounting for

more types of water take), participants to this inquiry have raised concerns that the implementation of WRPs has been poorly executed.

There are concerns the Water Resource Plan accreditation process has been overly burdensome

Participants to this inquiry argued that the WRP accreditation process has been overly burdensome and had resulted in unnecessary administrative costs and delays. They attributed this to both the nature and number of accreditation requirements as well as the MDBA's interpretation of what is required to meet those requirements. For example, the Queensland Government noted that the MDBA's interpretation of requirements was not focused on outcomes:

> This results in a significant amount of time spent preparing and explaining details that are of no material benefit to the management of the basin's water resources and are low risk to achieving the Basin Plan objectives. (Queensland Government, sub. 87, p. 6)

These concerns have been exacerbated by the absence of a clear process for how WRP development would be managed from the beginning, covering how conflict would be resolved and response timeframes between the MDBA and Basin States. This lack of clarity on WRP development is an example of the ineffective processes for intergovernmental collaboration discussed further in chapter 14. The MDBA's (2017x) *Water resource plan assessment framework* addressed some of the ambiguity of the assessment process, but still lacks detail on resolving areas of difference between the MDBA and Basin States in a timely matter or requiring the publication of WRP work programs.[100]

Concerns remain about ongoing reporting

Another concern about WRPs is that the ongoing reporting obligations of Basin States may lack a clear purpose and focus, which will in turn reduce their effectiveness as an accountability tool for ensuring Basin States continue to abide by requirements set out in WRPs and add an unnecessary burden on Basin States. There is currently limited information about what Basin States will need to self-report on annually to demonstrate WRP compliance. MDBA guidance issued in 2017 simply states that there will be 'a focus on compliance with ongoing obligations', that the MDBA 'will work with Basin states to agree appropriate content' and 'may issue further guidelines'(MDBA 2017f, p. 4). Until more information on annual WRP compliance reporting becomes available, the Commission is unable to assess whether this will be an effective and efficient approach.

100 The MDBA now publishes a quarterly report on the progress of each WRP based on Basin State work programs.

Uncertainty about amendment processes risks inhibiting adaptive management

In addition to the upfront costs of the initial WRP accreditation process, some participants suggested WRPs could inhibit adaptive management by adding another layer of administration (and costs) to those associated with changing state instruments. In particular, changes to any of the water management instruments defined by WRP requirements may trigger the need for reaccreditation of the WRP by the Minister. Having to change water management tools at both a state level and in the WRP adds to the complexity of water management, legal confusion and could stymie the capacity of Basin States to respond in a timely manner to new information.

The Queensland Government highlighted a need to streamline this process to maximise efficiency where state instruments are part of the accredited WRP:

> As the WRPs comprise many instruments and texts, there is a need to streamline the process to maintain accreditation of the WRPs when, in the future, non-material changes are made to any of the WRP components … Re-accreditation requirements need to be configured to maximise efficiency of process and minimise effort taken from managing the WRPs, given the number of jurisdictions and instruments from each that comprise Commonwealth WRPs. (Queensland Government, sub. 87, p. 6)

There is a lack of clarity on what the MDBA's process will be for assessing amendments, such as what exactly Basin States would need to submit for reaccreditation or how long the approval process might take. Without regulations for minor amendments, any changes to an accredited WRP would require reaccreditation (MDBA, pers. comm., 9 August 2018) with a risk that WRPs may inhibit adaptive water resource management.[101]

DRAFT FINDING 6.2

There are concerns that the process of developing Water Resource Plans has been onerous and unnecessarily costly because of inadequate guidance on the requirements of plans and little clarity of the Murray-Darling Basin Authority's expectations for accreditation.

Key details for the implementation of Water Resource Plans have not yet been agreed including the:

- requirements for annual compliance reporting, risking unnecessary compliance costs
- process for updating plans, risking an amendment process that inhibits adaptive management.

101 The Water Act, s.65 enables these regulations to be developed.

6.3 Improving implementation

There should be a pathway for granting extensions to the 30 June 2019 accreditation deadline

Pushing through key elements of WRP development such as stakeholder consultation to meet the 30 June 2019 deadline for accreditation may result in implementation issues, lack of community acceptance and failure to meet Basin Plan objectives. There is a concern that the time available in some WRP Areas is insufficient for adequate consultation and that as a result, either existing inadequate rules will be rolled over or new rules will be passed into law with little or no commitment from stakeholders.

Having States simply direct more resources into plan development is unlikely to be an easy fix as genuine consultation requires time. Furthermore the MDBA has already moved to simplify the drafting task for the States by streamlining its assessment criteria, so there may be limited room for further moves of this nature without risking a lowering of standards.

Invoking the 'step-in' provisions of the MDBA to prepare a WRP would be a poor outcome for many reasons including: the conflict that it would create with Basin States in compliance; State agencies are best placed to draft local level policy and have established relationships with stakeholders; and not least, that stepping in would not guarantee that WRPs would meet the accreditation deadline. Accordingly, the MDBA should seek to avoid using this power to deal with late plans.

Proper consideration and consultation over significant rule changes takes time to allow for appropriate community engagement and understanding, and an extension would allow for this in cases where the process began too late and provide certainty for stakeholders. While an extension would bring some of its own costs, applying it carefully could keep these in check. While the present situation could have been avoided, what matters now is that the quality of outcome.

A potential disadvantage to extensions would be locking in a further period after the 30 June 2019 deadline where WRPs — along with SDL arrangements and other associated improvements to State instruments — do not apply. This risk could be limited by restricting extensions to those WRPs where there have been substantive changes to state-based water management rules with material impacts for entitlement holders or third parties and require community engagement. Any extension should be kept to the shortest necessary period of time. The annual SDL water accounting reporting period is an incentive not to extend the accreditation timeframe beyond twelve months. Acknowledging possible delays and providing a pathway to accreditation beyond the deadline before it arrives would allow greater certainty for Basin Governments and the MDBA in implementing SDLs.

While extending the accreditation deadline would require a shift from the current commitment to implement the Basin Plan 'on time and in full,' the potential long-term benefits of the type of extensions described are likely to be worth the short-term costs.

DRAFT RECOMMENDATION 6.1

Basin Governments should immediately negotiate a pathway for granting extensions to the timelines for accrediting Water Resource Plans where there are outstanding issues to give sufficient time for adequate community engagement.

Extensions should only be given in limited circumstances, particularly where there are material impacts that require negotiation of substantive changes to state-based water management rules.

The MDBA should finalise outstanding work critical to the effective implementation of Water Resource Plans from July 2019

A number of key elements to WRP implementation remain incomplete and should be finalised as a priority. The MDBA should undertake this work with direct consideration of how they will impact compliance costs and adaptive management, seeking to minimise any unnecessary costs and administrative burdens while maximising the potential for positive water management outcomes.

In the next 12 months, the MDBA should provide detailed guidance that clarifies what Basin States will be required to self-report annually to show compliance with WRP obligations. This guidance should describe how the MDBA will ensure annual WRP compliance reporting does not duplicate other reporting required under the Basin Plan and focuses on WRP compliance issues that are most material to achieving Basin Plan outcomes, such as through reporting by exception.

The MDBA should also develop guidance that sets out how it will assess whether changes made by Basin States to water management instruments covered in WRPs require reaccreditation, and the process for reaccreditation. The guidance should set out 'the why, who and how' of the amendment process including response timeframes and clearly articulate what type of changes would require reaccreditation (currently all changes to accredited WRPs require reaccreditation in the absence of regulations defining minor amendments).

The MDBA should consult with Basin States in developing such guidance to minimise the potential legal complexity, administrative and regulatory burden while maximising Basin States' ability to responsively manage water resources.

Waiting to complete this work until after all WRPs are accredited creates uncertainty about consequences for non-compliance and how restrictive they may be for responsive water management during development.

DRAFT RECOMMENDATION 6.2

In the next 12 months, the Murray-Darling Basin Authority (as Basin Plan Regulator) should:

- clarify what Basin States are required to self-report annually to show compliance with Water Resource Plan obligations
- articulate the compliance assessment regime relevant to Water Resource Plan obligations
- develop guidance and consult on how it proposes to assess future amendments to Water Resource Plans by Basin States.

The five-yearly evaluation of Water Resource Plans provides an opportunity to examine their utility

The five-yearly evaluation of the efficiency and effectiveness of WRPs provides an opportunity for the Basin States and the MDBA to assess the utility of WRPs in implementing the Basin Plan.[102] The MDBA should, in consultation with Basin Governments, develop a detailed terms of reference to assess the effectiveness and efficiency of WRPs in the five-yearly evaluation in 2020. These terms of reference should consider opportunities to improve the utility of WRPs in a robust and impartial way including: scope to reduce compliance costs by examining whether content currently included in them are better addressed in other Basin Plan instruments or could be streamlined; ensuring WRP obligations align with Basin Plan objectives and that adaptive management is not constrained.

The Commission recognises that the 2020 evaluation would provide limited time to fully gauge how WRPs are operating in practice, and that a more comprehensive evaluation and consideration of some matters might have to wait until 2025 to gather further information. That said, this should not preclude common sense changes occurring following the 2020 evaluation. Addressing areas above in 2020 and 2025 would reduce the risk that WRPs will be rolled over as is and used as a catch all for changing elements of the Basin Plan in 2026 when they may not be the best instrument to do this.

The terms of reference for the five-yearly evaluation of WRPs should be finalised and published as a priority in preparation for the evaluation in 2020. This would enable Basin Governments and the MDBA to collect the information required to facilitate the assessment, provide scope for consultation as well allow time to identify gaps and make improvements before it is undertaken.

102 The Basin Plan, Schedule 12 Matter 18.

DRAFT RECOMMENDATION 6.3

The Murray-Darling Basin Authority (as Basin Plan Regulator) in consultation with Basin Governments should develop a detailed terms of reference to assess the effectiveness and efficiency of Water Resource Plans in preparation for the five-yearly evaluation in 2020.

This evaluation should enable an assessment of the utility of Water Resource Plans for delivering on the objectives and outcomes of the Basin Plan.

7 Indigenous values and uses

Key points

- Indigenous Australians value water for cultural, social, spiritual, customary, economic, and environmental purposes.
- The Basin Plan states that there should be sufficient and reliable water supplies that are fit for a range of purposes including cultural use.
- Basin States have introduced policies to meet 2004 National Water Initiative commitments regarding Indigenous values and uses and these are contributing to their Basin Plan obligations.
- The Basin Plan requires Basin States to consult on and identify cultural water values and uses, and to have regard to these and other matters (such as native title and cultural heritage) in Water Resource Plans (WRPs).
  - Basin States have improved their formal processes for engaging Traditional Owners, particularly by taking a nation-by-nation approach to consultation.
  - There is a risk that New South Wales will not meet its Basin Plan requirements by the July 2019 deadline. Where there are major outstanding issues, the Commission is proposing that individual WRPs should be extended to provide for adequate community engagement.
- The Basin Plan contains provisions for Traditional Owners to be involved in the planning and management of environmental watering. Basin Governments have been pursuing opportunities to support cultural values through environmental watering.
  - This approach benefits from long-term relationships between Traditional Owners and environmental managers at the local level, combined with investments in knowledge about cultural values and uses.
- The Murray-Darling Basin Authority's work program includes developing tools to improve knowledge of cultural values and uses, and the monitoring and evaluation of outcomes. It is important that evaluation can enable continuous improvement and review of programs and policies, and hold governments to account.
- In May 2018, the Australian Government committed $40 million for direct investment in cultural and economic water entitlements in the Basin. It is unclear why this funding is limited to Indigenous communities in the Basin, rather than being available to all Indigenous communities in Australia.

7.1 Background

Indigenous values and uses of water

There are more than 40 Indigenous Nations across the Basin that value and use water for cultural, social, spiritual and customary purposes (collectively referred to as cultural values and uses in this report). As a result of consultation with Indigenous Australians, the Queensland Government found that water is an important part 'of many aspects of Aboriginal life, such as fishing, hunting, swimming, storytelling, family gatherings, ceremonies and other sacred activities' (DNRME (Qld) 2018, p. 6). Indigenous cultural values and uses are often supported by a healthy environment so there will often be occasions where environmental and cultural objectives align (PC 2017b).

Indigenous Australians also value water for economic uses, such as employment for Indigenous Australians in water management, and income gained through the selling of fish, other animals and plants (DNRME (Qld) 2018). Although, the boundaries between water uses for cultural and economic purposes can sometimes be blurred, it is useful for water planners to consider water for economic purposes as a distinct issue.

The National Water Initiative and State water policies

Under section 52 of the National Water Initiative (NWI), COAG agreed in 2004 to incorporate Indigenous objectives and the strategies to achieve them into water plans, wherever they can be developed. Basin States have implemented state policies to meet these NWI commitments as part of their water resource planning responsibilities. The Basin Plan is consistent with national policy.

The Commission assessed progress of all States and Territories in meeting the NWI commitments in 2017, including those related to Indigenous values and uses (table 7.1). It found that some good progress against the NWI requirements had been made. However, there was considerable scope for jurisdictions to better recognise and accommodate Indigenous Australians' water needs by:

- identifying and providing for cultural objectives in water plans
- using existing water entitlement frameworks and market mechanisms to provide water for economic purposes (along with supporting arrangements), where governments seek to do so
- providing for cultural water values as part of environmental water management, where this can be done without compromising environmental outcomes
- monitoring and reporting on strategies that provide water for Indigenous Australians (PC 2017b).

Basin States have started to address the deficiencies in their policies on a statewide basis. Momentum on state policies has increased — in some cases, as a result of the Basin Plan requirements. In other cases, state policies are contributing to the implementation of the Basin Plan. In addition, the Australian Government has partnered with Basin States and Traditional Owners to support cultural objectives in the Basin, such as through the National Cultural Flows Research Project (section 7.4).

Table 7.1 **State policies have been developed**

As reported in the National Water Reform inquiry report

Basin State	*State policies and projects that contribute to Indigenous objectives in relation to water*
New South Wales	The New South Wales Government has made cultural access licences (capped at 10 ML per year per application and unable to be traded) available to support Indigenous cultural requirements. Indigenous communities can also apply for community development licences to support commercial enterprises owned by Indigenous Australians in coastal unregulated surface water or groundwater areas. The New South Wales Government ceased its Aboriginal Water Initiative (AWI) in 2016. The work of the AWI included collecting and maintaining a database of Indigenous water values in a culturally-appropriate manner, and helping to build the capacity of the staff and communities to recognise cultural values and to develop appropriate rules for water sharing plans.
Victoria	Victoria launched its Aboriginal water policy in 2016 as part of its state policy *Water for Victoria*. The Government is investing $4.7 million over four years to improve understanding of Aboriginal water values, uses, aims and requirements, including cultural heritage. The policy also seeks to: build capacity and increase Aboriginal participation in water planning and management; provide shared benefits from environmental watering to both the environment and Indigenous communities; and is investing $5 million to provide water for economic development (DELWP (Vic) 2017).
Queensland	In 2017, the Queensland Government introduced a bill into Parliament to amend the *Water Act 2000* (Qld) to require cultural outcomes for Indigenous Australians to be stated within state water plans. The amendments require cultural outcomes to be specified separately from economic, social and environmental outcomes, and expands the definition of environmental flow objectives to include protecting cultural outcomes.
South Australia	In South Australia, the Aboriginal Partnerships Program has worked with Indigenous Australians to increase participation in managing natural resources, including water since 2013. The program aims to improve awareness and understanding of Aboriginal culture, and protect Aboriginal heritage. The Ngarrindjeri Partnerships Project seeks to protect and manage the cultural values of sites with regard to the revegetation, native animal, water flow and infrastructure activities taking place in the Coorong, Lower Lakes and Murray Mouth (DEWNR (SA) 2015).
ACT	The ACT has statutory requirements to consult all stakeholders, including Indigenous groups, in the development of water plans.

Source: PC (2017b).

The Basin Plan provisions specific to Indigenous Australians

One of the stated Basin Plan objectives is 'to optimise social, economic and environmental outcomes arising from the use of Basin water resources in the national interest' (s. 5.02(1)(c)). Cultural water uses are specifically included within the outcomes and objectives of the Plan (ss. 5.02(2)(a) and 5.04(1)). The Basin Plan also contains provisions for Indigenous Australians to be involved in and advise on water resource management in relation to water planning, environmental management, knowledge building and monitoring and evaluation.

Part 14 of chapter 10 of the Basin Plan specifies that Basin States must identify the objectives and outcomes of Indigenous Australians in relation to water resource management for each Water Resource Plan (WRP) Area. Basin States must have regard to the views of Indigenous Australians across matters such as cultural values and uses, native title rights and claims, Indigenous Land Use Agreements, Aboriginal heritage, risks, and cultural flows.

The Environmental Management Framework in chapter 8 of the Plan includes several provisions that aim to incorporate Indigenous values and uses into environmental water planning and management. The MDBA is to have regard to Indigenous values and uses when preparing the Basin-wide environmental watering strategy and the Basin annual environmental watering priorities (ss. 8.15 and 8.29). The Basin Plan also contains principles to be applied by environmental water managers, one of which is to have regard to Indigenous values as a way to maximise the benefits of environmental watering (s. 8.35).

The MDBA is required to evaluate the extent that the objectives and outcomes of the Basin Plan have been achieved (ss. 13.05–13.06) and must have regard to strategies to improve knowledge of water requirements relating to cultural water uses by Indigenous Australians (s. 4.03).

The Murray Lower Darling Rivers Indigenous Nations (sub. 72, p. 2) argued that 'actions and targets included within the Plan do not go far enough to support the outcome of Aboriginal communities with "sufficient and reliable water supplies" [as per s. 5.02] fit for cultural purposes' and that the Basin Plan's objectives and outcomes give 'only passing mention' of Traditional Owners' rights, interests and cultural obligations. In this inquiry, the Commission has primarily assessed the effectiveness of implementation to date for the current provisions in the Basin Plan (chapter 1).

The rest of this chapter describes the Commission's assessment of the effectiveness of implementation of the provisions of the Basin Plan related to Indigenous values and uses, and how implementation can be improved. Section 7.2 looks at the quality of the consultation undertaken for the development of WRPs. Section 7.3 describes how cultural values are increasingly being considered in environmental water planning and management. Section 7.4 discusses efforts to improve knowledge about cultural values and uses, and how good monitoring and evaluation can improve strategies that provide for cultural values now and into the next phase of Basin Plan implementation.

7.2 Progress in considering Indigenous values in Water Resource Plans

The MDBA's guidelines for Water Resource Plans

The MDBA works in partnership with two peak Indigenous organisations to provide culturally authoritative advice on the management of the Basin. The organisations are the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) in the southern Basin and the Northern Basin Aboriginal Nations (NBAN) in the northern Basin. MLDRIN and NBAN are independent and represent Traditional Owners in the Basin on natural resource management.

The MDBA has published guidelines to assist Basin States in meeting the WRP requirements in relation to Indigenous Australians' objectives and outcomes for water (MDBA nd(d)). The Part 14 guidelines were developed in consultation with MLDRIN and NBAN and informed by the Akwé: Kon Guidelines (box 7.1). The MDBA expects engagement in the development of WRPs to occur with Traditional Owners at the local level and to involve:

- a planned approach, such as adequate time and resources
- identification and involvement of appropriate Traditional Owners
- proper notification of the opportunity to be involved
- the provision of clear information about water planning processes
- the use of appropriate tools for recording objectives and outcomes (MDBA nd(d)).

Box 7.1 **Akwé: Kon Guidelines**

The Akwé: Kon are voluntary guidelines designed to facilitate the full involvement of indigenous and local communities in the assessment of the cultural, environmental and social impact of proposed developments on sacred sites and on lands and waters they have traditionally occupied.

The guidelines were developed by the Secretariat of the Convention on Biological Diversity in cooperation with indigenous and local communities, as part of the work program agreed by the Parties to the Convention on Biological Diversity, which Australia signed on as a party to in 1992. The guidelines, which represent best practice, were endorsed by the Parties to the Convention in 2004.

The guidelines aim to:

- support effective participation of indigenous communities in screening, scoping and development planning exercises
- properly take into account the concerns and interests of indigenous communities
- have regard to the protection and ownership of traditional knowledge, innovations and practices.

Source: Secretariat of the Convention on Biological Diversity (2004).

Once each WRP is submitted for accreditation, the MDBA seeks advice from MLDRIN or NBAN in relation to whether the requirements in Part 14 have been met. The elements of good engagement with Traditional Owners described in the MDBA's guidelines form part of the criteria used by MLDRIN and NBAN in their framework for assessing WRPs (MLDRIN, pers. comm., 9 August 2018; NBAN, pers. comm., 2 August 2018).

Efforts to support effective local-level consultation processes are likely to generate ongoing benefits where this consultation leads to longstanding relationships and partnerships between Traditional Owners and local water managers.

The Akwé: Kon Guidelines could be applied to consultation on supply projects

MLDRIN (sub. 72) has raised concerns about the effect of the Sustainable Diversion Limit (SDL) adjustment mechanism supply projects on cultural values and cultural heritage. Chapter 4 of this report stated that successful implementation of the supply measures package will require a commitment to engagement with Traditional Owners at the local scale and at the program scale on the design, sequencing and operation of the measures. The Akwé: Kon Guidelines could be used to plan engagement mechanisms with Traditional Owners about the effects that projects could have on cultural values and uses.

Basin States have improved consultation arrangements …

The only WRP accredited to date is the Warrego Paroo Nebine WRP in Queensland. NBAN's (2016, p. 1) view on the development of this WRP was that the first two rounds of consultation were not effective but that the third round was 'much more targeted at Traditional Owners which lead to a much better outcome'. As a result of advice from NBAN, Queensland has changed from town-based meetings to nation-based meetings for the consultation processes for its other WRPs.

Following the consultation process, the Queensland Government committed to new water planning measures to provide for Indigenous outcomes. For example, a report on the flow requirements to support cultural values and uses, informed by engagement with Indigenous Australians, is to be published within five years of the Condamine–Balonne and Moonie and Border Rivers water plans commencing (DNRME (Qld) 2018).

As there is only one WRP accredited, it is too early to tell how well the WRP provisions related to Indigenous values and uses are being met by all Basin States and how well the process for accreditation is working. However, remaining timeframes to complete implementation are short, particularly for New South Wales.

The New South Wales, Victorian, and South Australian Governments are also taking a nation-by-nation approach to consultation (NSW Department of Industry, pers. comm., 19 June 2018; South Australian Government 2017; Victorian Department of Environment, Land, Water and Planning, pers. comm., 2 July 2018).

The WRP requirements have raised the standard for identifying the water related objectives, outcomes, values and uses of Indigenous Australians in the Basin. The South Australian Government (sub. 85, p. 20) stated that the Basin Plan requirements have provided 'an important catalyst to enhance engagement' on water management and that this has provided a foundation for improved engagement across the State. The Victorian Government stated that engagement with Traditional Owners is a major focus of the development of their WRPs as the identification of Traditional Owner water objectives and outcomes is a significant gap in Victoria's water management arrangements (Victorian Department of Environment, Land, Water and Planning, pers. comm., 2 July 2018).

… but delays in New South Wales are concerning

Basin States have had since 2012 to consult with Traditional Owners on the WRP requirements. As of 2017, the MDBA (2017b) reported that engagement with Indigenous Australians about their values and uses of water had commenced in all Basin States other than New South Wales.

Specific engagement processes with Traditional Owners in New South Wales are now in place. New South Wales completed consultation with the Gomeroi Nation in April 2018 and a final report has been completed that will inform a number of WRPs, including the Gwydir Surface Water WRP (NSW Department of Industry, pers. comm., 19 June 2018). The Government has hired consultants to undertake consultations with other Indigenous Nations in the next three to six months (NSW Department of Industry, pers. comm., 19 June 2018).

Following consultation, New South Wales will be required to have regard to the views of Indigenous Australians in preparing its WRPs, including on matters such as native title. In 2015, native title rights were recognised for the Barkandji people over a large section of the Darling River and some adjacent land (Hartwig and Jackson 2017). In 2017, the New South Wales Government signalled its intention to account for the Barkandji determination in the relevant state water plan when it is updated as part of WRP development (PC 2017b). The status of this commitment is unclear because the draft WRP is not publicly available.

Despite recent commitments to accelerate progress, there may not be enough time for New South Wales to meet the Part 14 obligations and for MLDRIN, NBAN and the MDBA to complete their assessment of all 20 New South Wales WRPs by July 2019. MLDRIN (sub. 72) expressed grave concern about the ability of New South Wales to complete consultation in a culturally appropriate manner. MLDRIN (sub. 72, p. 9) also noted that developing advice on whether the WRP obligations have been met requires 'considerable engagement, research and technical review of Plans' and that this should not be streamlined to meet the deadline.

The Commission is proposing (draft recommendation 6.1) that extensions for accrediting WRPs should be granted where there are outstanding issues to give sufficient time for adequate community engagement. The Commission proposes extensions should only be

given in limited circumstances, particularly where there are major impacts that require negotiation of substantive changes to state-based water management rules.

DRAFT FINDING 7.1

Basin States have improved their formal processes for engaging Traditional Owners as part of Water Resource Plan (WRP) development.

Given that so few WRPs have been submitted for accreditation to date, there is a risk that Basin States have left too little time before July 2019:

- to complete effective engagement with Traditional Owners
- to have regard to the views of Traditional Owners in preparing their WRPs
- for MLDRIN and NBAN to develop their advice about whether the WRP requirements for Indigenous values and uses have been met.

This concern is greatest for New South Wales.

7.3 Progress in implementing environmental water management provisions

The MDBA

There is scope for the MDBA to improve how it has regard to cultural values and uses when undertaking environmental water planning. At a Stakeholder Working Group meeting (chapter 1), NBAN and MLDRIN described limitations in the MDBA's consultation processes for its Environmental Management Framework, in particular that consultation with Indigenous organisations can be last minute.

The Commission is proposing (draft recommendation 11.1) that the MDBA strengthen the next iteration of the Basin-wide environmental watering strategy (BWEWS) in 2019 by including a secondary objective that environmental watering should seek to achieve social or cultural outcomes (to the extent that environmental outcomes are not compromised).

The MDBA (2018b) has committed to partnering with NBAN and MLDRIN to develop guidance on the outcomes Indigenous Nations would like environmental watering to achieve. It intends to incorporate this information into the Basin-wide environmental watering priorities from 2019-20. This work should also feed into the 2019 BWEWS.

Basin States, the CEWH and the Living Murray program

Basin States and environmental water holders have taken opportunities to consider and provide for cultural values as part of environmental watering. The effectiveness of this approach relies on quality, long-term relationships and meaningful engagement at the local

level. It is also supported by investments in documenting knowledge about cultural values and uses, and capability building.

The New South Wales Government includes Indigenous representation on its Environmental Watering Advisory Groups (MDBA 2017l). The Victorian Environmental Water Holder's (VEWH's) seasonal watering plan is informed by proposals by Catchment Management Authorities who undertake consultation with Traditional Owners (DAWR 2018f; VEWH 2018). In South Australia, the *2016-17 Annual Environmental Watering Plan for the South Australian River Murray* was informed by Indigenous engagement initiated by the State's environmental managers when developing their watering proposals, including with the Ngarrindjeri Regional Authority and the First People of the River Murray and Mallee Region (DEWNR (SA) 2016a).

Victoria has taken other measures to integrate cultural values and uses into its regulatory framework governing environmental water management. It appointed an Aboriginal Commissioner to the VEWH in 2017 and has introduced legislation that will require the VEWH to consider opportunities to provide for Indigenous water-related environmental outcomes (PC 2017b).

In 2016-17, environmental watering (using jointly held water) under The Living Murray program was informed by proposals developed with the support of a range of stakeholders including Traditional Owners (MDBA 2017a). The Living Murray program also includes an Indigenous Partnerships Program (IPP). In 2016-17, activities under the IPP included consultation on site-based environmental water planning, cultural heritage management, pest management and ecological monitoring, and building the capacity of Indigenous communities to identify and share cultural knowledge and values (MDBA 2017a).

The Commonwealth Environmental Water Holder (CEWH) works with NBAN, MLDRIN and other Indigenous groups to improve collective understanding about cultural values and investigate ways to deliver shared benefits from environmental water (CEWH 2017b, 2017a). The CEWH is also involved in the local engagement processes of Basin States that enable a range of stakeholders, including Traditional Owners, to share views on environmental watering (CEWH 2017a).

In May 2018, the Australian Government announced that it will require the CEWH to enhance engagement with Indigenous communities on decisions underpinning the beneficial use of environmental water to meet Indigenous values (DAWR 2018c). The CEWH should not necessarily undertake all consultation processes themselves but should ensure that environmental watering priorities and proposals are based on meaningful consultation between local water managers and Traditional Owners or Indigenous organisations.

The Commission is proposing (draft recommendation 11.6) that Basin States and environmental asset managers should have processes for engaging with Traditional Owners about opportunities to achieve cultural outcomes with environmental water. Basin States should put these arrangements in place before the first revision of long-term watering plans,

where they have not already done so. It is important that these processes incorporate new knowledge about cultural values and uses into environmental priorities as it becomes available.

7.4 Improving knowledge and evaluating outcomes

The MDBA's work program

The MDBA Aboriginal Partnerships team undertakes a range of projects to improve Indigenous outcomes in partnership with Traditional Owners. The MDBA has developed processes and research tools to assist Traditional Owners with engaging in water research, planning and management, and to build the skills and knowledge of all people involved in water planning (MDBA 2017c). Projects include Use-and-Occupancy Mapping, the Aboriginal Waterways Assessment tool, developing the sociocultural research methodology used in the Northern Basin Review, the Strengthening Connections Plan, the Aboriginal Weather Watchers Project and the Aboriginal Submissions Database (MDBA 2017c).

The Aboriginal Waterways Assessment methodology was developed by MDBA, MLDRIN and NBAN to enable Traditional Owners to measure and prioritise the spiritual, cultural and environmental value of chosen wetland and river sites and measure the health of these sites (MDBA 2015a). As of 2017, the Victorian, Queensland, South Australian and ACT Governments have funded or committed to fund Traditional Owners to carry out waterways assessments on their traditional lands, with findings to be incorporated into water planning and environmental management (DNRM (Qld) 2017; DNRME (Qld) 2018; MDBA 2017e).

Australian government funded programs and projects

On 29 June 2018, the Australian Government and MLDRIN announced the release of the findings from the National Cultural Flows Research Project (box 7.2). This project aimed to support Indigenous Australians and water planners to provide for cultural flows, through both the development of a cultural flows assessment methodology and a review of relevant legal and policy mechanisms.

Tools like the Aboriginal Waterways Assessment methodology and cultural flows assessment framework are likely to provide future benefits as they are applied across various elements of water resource management. Basin States have not yet articulated how they plan to use the findings from the National Cultural Flows Research Project but they should utilise the frameworks and knowledge in state water policies, environmental management and planning, and the preparation of the next iteration of state water plans.

Box 7.2 The National Cultural Flows Research Project

The National Cultural Flows Research Committee released several reports in June 2018 as part of the concluding stage of the National Cultural Flows Research Project (the Project). The committee formed in 2011 was originally made up of representatives from MLDRIN, NBAN and the North Australian Indigenous Land and Sea Management Alliance. The MDBA provided support throughout the project. The committee was expanded in 2015 to include Australian and state government representatives. The Project was funded by several Australian government agencies.

The aim of the Project was to "secure a future where First Nations' water allocations are embedded within Australia's water planning and management regimes, to deliver cultural, spiritual and social benefits as well as environmental and economic benefits" (p. 4). The Project centred on two case studies in New South Wales: the first within in a regulated system at the Toogimbie Wetlands on Nari Nari Country on the Murrumbidgee River near Hay. The second in an unregulated system near the Queensland border, at the Gooraman Swamp on Murrawarri Country.

The Project had three broad phases:

1. a literature review of known Indigenous uses and values of water in Australia
2. two field studies used to develop and test methodologies for quantifying cultural flows and monitoring and evaluating their effects. The results were generalised into a new cultural flows framework with guidelines and technical reports developed for the community and water managers.
3. a review of the policy and legal options available to Indigenous Nations and governments to give effect to cultural flows.

Source: Cultural Flows Planning and Research Committee (2018).

In May 2018, the Australian Government announced a range of measures to improve outcomes for Indigenous Australians in the Basin. Several of the commitments are likely to support the provision of cultural flows,[103] such as:

- funding of two full time staff positions and $1.5 million to support NBAN and MLDRIN to work with Indigenous Nations and government agencies to translate the findings of the National Cultural Flows Research Project into practical and effective ways forward, and to continue the development of Aboriginal Waterway Assessments
- committing $40 million to administer a program to support Indigenous investment in cultural and economic water entitlements
- presenting bills to Parliament in 2018 to increase the flexibility of the Indigenous Land Corporation to use their funds to access water entitlements

103 Other measures include: a commitment of $20 million over four years to provide grants for economic development projects for Indigenous, remote, rural and regional communities most affected by the Basin Plan; giving priority to Aboriginal and local suppliers in the delivery of environmental works under the 'toolkit' measures in the northern Basin; and supporting works for cultural gatherings and low impact water recreation, such as options to refurbish weirs at Wilcannia and Cunnamulla (DAWR 2018c).

- working with New South Wales and Queensland to identify water entitlements in the northern Basin that could be allocated to Indigenous communities to support both cultural and economic activity (DAWR 2018c).

In the Commission's inquiry into National Water Reform, it recommended that the National Water Initiative should be revised to include provisions about how to provide access to water for Indigenous communities for economic development. It recommended that State and Territory Governments should source water within existing water entitlement frameworks, ensure adequate supporting arrangements, involve Indigenous communities in program design, specify governance arrangements, and regularly monitor and report on the program and its outcomes (PC 2017b).

DRAFT FINDING 7.2

In addition to the development of Water Resource Plans, Basin Governments have developed a range of tools and processes to support the recognition of cultural values and uses in state water planning and environmental management and planning.

The Australian Government has committed $40 million to administer a program to support Indigenous investment in cultural and economic water entitlements in the Basin. The objectives and principles guiding the implementation of this program have not yet been articulated. It is unclear why this funding is limited to Indigenous communities in the Basin, rather than being available to all Indigenous communities in Australia.

Progress in monitoring and evaluating outcomes

Evaluation methodology for cultural and Indigenous outcomes

The MDBA will be assessing cultural and Indigenous outcomes in its 2020 evaluation of the Basin Plan. To support this work, the MDBA have developed and trialled 'a participatory and cross-cultural evaluation methodology that will be re-used between now and 2020 to track how the implementation of the Basin Plan is taking Aboriginal interests into account' (MDBA 2017e, p. 37). The methodology will be applied to program evaluations on a case by case basis, subject to budget (MDBA, pers. comm., 9 August 2018). The MDBA will work with MLDRIN and NBAN to identify and collect the relevant information and to interpret the research results (MDBA 2017c).

The evaluation strategy was trialled in the Barkandji Nation's Country along the Darling River (the Baarka) (MDBA 2017b). The trial included surveys, which explored the relationship between water management and determinants of Aboriginal health and wellbeing. This approach was based on that used for the socioeconomic analysis for the Northern Basin Review. For the Northern Basin Review, the MDBA sought information about Aboriginal values and priorities through NBAN and conducted a sociocultural survey that looked at the importance of environmental water to Traditional Owners in three towns (MDBA 2017b).

Monitoring the effect of environmental watering on cultural values

In the 2017-18 Basin environmental watering priorities, the MDBA referred to two case studies by MLDRIN and NBAN that demonstrate how past environmental watering has contributed to Aboriginal outcomes. The case study by MLDRIN (2017) described how a watering event 2014 in the Barapa Barapa portion of the Gunbower Forest improved the condition of understorey vegetation, which supported cultural values. The case study by NBAN (2017) described how environmental watering in the Macquarie Marshes has supported cultural outcomes for the Wayilwan Nation since they became involved in environmental water management in 2007.

In June 2018, the Minister for Agriculture and Water Resources (2018b) gave a Direction under the Water Act that the MDBA must report annually on how environmental water holders have considered Indigenous values and uses and involved Indigenous Australians, when planning for environmental watering.

The importance of monitoring and evaluation

The Commission is proposing (draft recommendations 13.2 and 13.3) the development of a revised Basin Plan evaluation framework and a monitoring and evaluation strategy. If this proposal is accepted, these policy documents should consider:

- what is needed to hold governments to account for the commitments within the Plan related to Indigenous values and uses
- the role of the MDBA's cross-cultural evaluation methodology in evaluating Indigenous outcomes from the Basin Plan and programs that protect cultural values
- the wide range of projects being undertaken to ensure that there is an evidence-base to enable continuous improvement of programs and review of policies over time.

With the benefit of greater knowledge about cultural values and how to effectively provide for them, the 2026 review of the Basin Plan may provide an opportunity to re-examine the provisions set in the Basin Plan related to Indigenous values and uses. Evidence on outcomes may also inform the development of any strategies that provide for Indigenous values and uses in the future.

8 Water quality

Key points

- The Basin Plan builds on decades of collaborative work by Basin States to manage water quality, particularly salinity. It sets out objectives and targets for water quality to be suitable for drinking, agricultural, recreational, cultural and environmental purposes. These include:
  - an objective for salt export of two million tonnes per year from the Basin into the Southern Ocean
  - specific river targets for managing water flows that relate to salinity (at five reporting sites), dissolved oxygen and blue-green algae
  - Water Quality Management (WQM) Plan targets for fresh water dependent ecosystems, irrigation water and recreational water (based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality)
  - end-of-valley targets for the purposes of long-term salinity planning and management.
- Basin water quality management can, to some extent, be assessed by whether targets and objectives are being met.
- Site-specific salinity targets indicate when salinity concentrations are likely to affect water users. They have been met at four of the five reporting sites.
  - The specific salinity target at Burtundy is not being met during periods of low flow. The MDBA will review salinity and water quality targets in 2020. The Burtundy target will need to be reviewed in the context of changes to the management of the Darling River upstream of Menindee and proposed changes to the operation of Menindee Lakes.
- The salt export objective is not being met. In periods of low flows, there can be an inherent conflict between meeting the site-specific salinity targets and meeting the salt export objective. The MDBA 2020 review of salinity and water quality targets should consider whether the objective should be respecified or abolished.
- The main Basin Plan mechanism by which water quality will be managed in tributaries and catchments are WQM Plans which are part of Water Resource Plans (WRPs). All WRPs are to be accredited by 30 June 2019. After this date the MDBA's compliance responsibility will commence.
  - It is important that WQM Plans adequately assess water quality risks, set out appropriate mechanisms to address water quality events when they occur and follow principles of effective water management planning.
  - It is equally important that the MDBA, through its WRP assessment process, is clear and transparent in how assessment should play a role in ensuring the adequacy of water quality.
- Communities are concerned about salinity and blue-green algae problems occurring in the Lower Darling.
  - The development of the WQM Plan for the New South Wales Murray and Lower Darling WRP is the process to resolve these concerns.

Maintaining the water quality of the Basin is crucial for a healthy environment, farming, industries, human consumption, recreation and cultural needs.

This chapter discusses how the Basin Plan builds on decades of collaborative work to manage water quality and provides a snapshot of water quality provisions under the Plan. The chapter then investigates whether targets and objectives under the Basin Plan are being met and the development of Water Quality Management Plans.

8.1 The Basin Plan is an evolution in water quality management

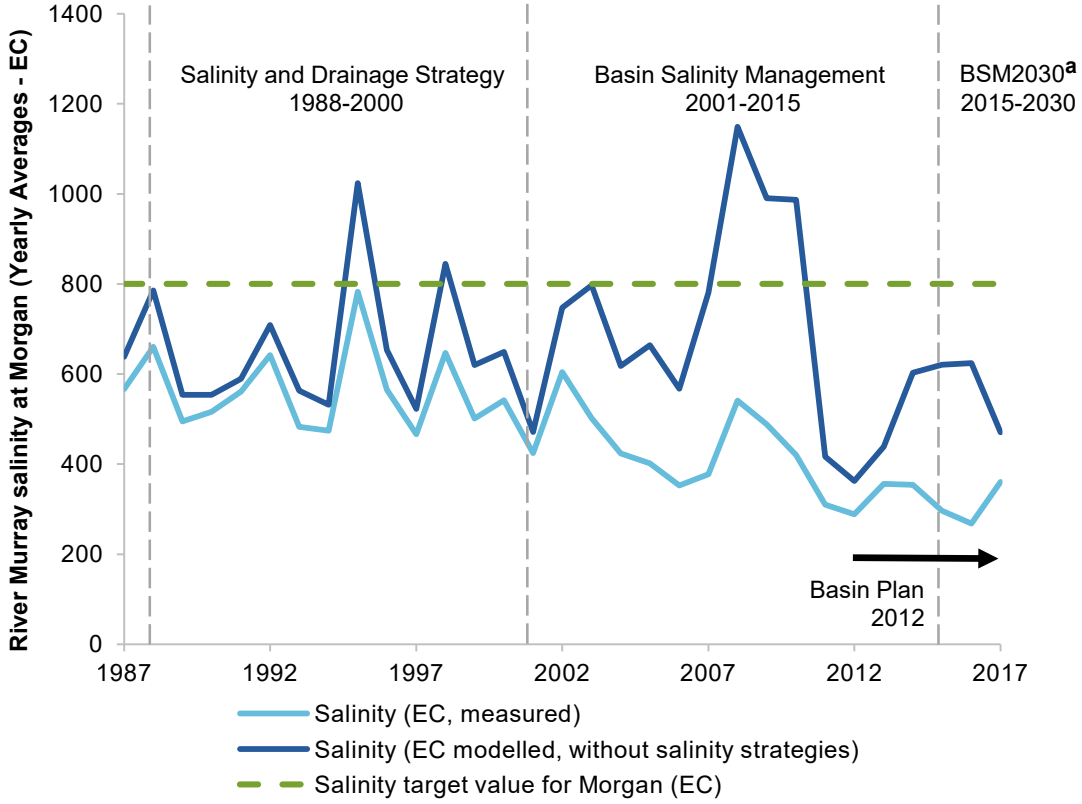
Water quality issues in the Basin have been a focus of public concern, government policy and water management for decades. Poor water quality can put stress on a range of aquatic organisms, impact on Aboriginal cultural and spiritual uses of water, increase the cost of drinking water treatment, contribute to public health risks and decrease the suitability of water for irrigation (DPI (NSW) 2017c).

Impacts of poor water quality can be local and can also intensify as water flows down through the system. Threats to water quality include high salinity, blue-green algae blooms, low dissolved oxygen (including blackwater), suspended matter, nutrient deposits and toxicants.

The Basin Plan builds on decades of collaborative work by Basin Governments to manage water quality, particularly salinity. The inter-jurisdictional approach began with the Salinity and Drainage Strategy (1988–2000) followed by the Basin Salinity Management Strategy (2001–2015) which managed salinity by placing limits on salt entering the river, investing in salt interception schemes and improved land and water management (MDB Ministerial Council 2015). These strategies have led to a 30 year trend of decreasing salinity levels in the River Murray (figure 8.1).

While the Basin Plan includes specific provisions to protect water quality in the River Murray and catchments (discussed below), it is also having a direct and positive effect on water quality, particularly on salinity in the River Murray through resetting the balance of consumptive and environmental water use. This is because water for irrigation is reduced to meet Sustainable Diversion Limits and irrigation efficiency is being improved as a result of water recovery investments, both of which reduce offsite salinity impacts. In addition, the provision of additional water for the environment provides significant dilution benefits (MDB Ministerial Council 2015).

Figure 8.1 **Decreasing salinity in the River Murray**



[a] Basin Salinity Management 2030.

Data source: MDBA pers. comm., 20 July 2018.

The Basin Plan contains specific objectives and targets for water quality that aim to ensure that water quality is suitable for drinking, agricultural, recreational, cultural and environmental purposes. These include:

- an aspirational objective for salt export of two million tonnes per year from the Basin into the Southern Ocean
- specific targets that relate to salinity levels (at five reporting sites), dissolved oxygen (blackwater events) and blue-green algae.
- Water Quality Management (WQM) Plan targets for each water resource area for freshwater ecosystems, irrigation water and recreational use for fresh water dependent ecosystems, irrigation water and recreational water (based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC guidelines)).
- end-of-valley targets for the purposes of long-term salinity planning and management (box 8.1).

Box 8.1 Water quality commitments under the Basin Plan

The Basin Plan sets out a range of objectives and targets for water quality.

- Chapter 5 sets out a general objective to maintain appropriate water quality for environmental, social, cultural and economic activity in the Basin, and the related outcome that Basin water resources remain 'fit for purpose'.
- Chapter 9 sets out a series of water quality targets to help ensure the Basin's water is suitable for drinking, agricultural, recreational and environmental purposes. These include:
  - specific river targets for managing water flows – salinity (at five salinity reporting sites), dissolved oxygen, and blue-green algae.
  - Water Resource Plan (WRP) targets for fresh water-dependent ecosystems, irrigation water and recreational water (based on the ANZECC Guidelines).
  - surface water salinity targets for the purposes of long-term salinity planning and management by establishing a link to end-of valley targets set out in the Murray–Darling Basin Agreement.
- Chapter 9 puts obligations on Basin States, river operators, environmental water holders and the managers of planned environmental water to have regard to water quality targets when making flow decisions.
- An objective for salt export for the River Murray system is included in Chapter 9. This is more aspirational than a target and aims for the discharge of an average of two million tonnes of salt from the River Murray System into the Southern Ocean each water accounting period (July to June).
- Chapter 10 (Part 7) states the need for WRPs to include a Water Quality Management (WQM) Plan. The provisions link the development of WQM Plans to the objectives and targets in Chapter 9 of the Basin Plan.

Source: MDBA (2017w).

The Basin Plan puts obligations on Basin States, river operators, environmental water holders and the managers of planned environmental water to have regard to targets when making flow decisions. It also recognises that external influences such as land management practices and pollution can affect water quality (MDBA 2017b, p. 37).

The MDBA provides assurance that Basin States and the Commonwealth Environmental Water Holder are having regard to water quality when managing flows and using environmental water (MDBA 2018g, p. 18).

The Basin Plan has no instrument for joint State action in the day-to-day management of the shared water resources of the Basin. Basin Salinity Management 2015–2030 (BSM2030), agreed by the Murray-Darling Basin Ministerial Council in 2015, integrates the requirements of the Basin Plan into the joint arrangements for salinity management and river operations under the new balance. It is the mechanism by which governments collaborate on salinity management to implement individual, collective and coordinated actions in the shared water resources and, where necessary, in their catchments. BSM2030 and the Basin Plan are consistent and inter-linked. They link State catchment-based arrangements for salinity

management with Basin Plan Water Resource Plan (WRP) obligations, their obligations to have regard to the Basin Plan salinity targets for managing water flows and their mutual commitment to salinity management (MDB Ministerial Council 2015, p. 8).

Key changes in water quality management under the Basin Plan include:

- site-specific salinity targets that inform river operations in real time
- the development of WRPs (which will include WQM Plans)
- the use of ANZECC guidelines to provide a framework for developing water quality targets. The guidelines form the central technical reference of the National Water Quality Management Strategy, which all Australian, State and Territory Governments have adopted for managing water quality.

8.2 The effectiveness of water quality management under the Basin Plan

Basin water quality management can be assessed by whether targets and objectives under the Basin Plan are being met and, to some extent, the effectiveness of WRPs (once accredited) to deliver water quality that is fit-for-purpose for drinking, agricultural, recreational, cultural and environmental purposes.

Salinity targets and the salt export objective

Salinity management across the Basin is an ongoing challenge. If not managed well, salinity poses an ongoing risk to the Basin's land and water resources. Salt occurs naturally in the Basin's landscape, but activities such as irrigation development and land clearing can increase the accumulation of salt in particular locations. Water flowing through the River Murray system and out to the Southern Ocean through the Murray Mouth is the only natural means by which salt can leave the Basin (MDBA 2017g, p. 3).

Together, salinity targets and the salt export objective are intended to provide indicators of salinity management outcomes in the Basin.

- The salt export objective is based on an adequate flushing of salt from the river system but is aspirational in nature.
- The site-specific river salinity targets for flow management provide an indication of the salinity concentrations at key points in the River Murray system, and whether water quality is fit-for-purpose.
- The end-of-valley-targets under BSM2030 'provide a valley scale context to the identification and management of salinity risks to the shared water resources' (MDB Ministerial Council 2015, p. 17). These are incorporated into WQM Plans.

Ongoing monitoring and evaluation of salinity targets and the salt export objective tracks the implementation of salinity provisions and outcomes systematically and forms the basis of adaptive salinity management (chapter 13).

The salinity target at Burtundy is not being met

The Basin Plan requires daily monitoring of salinity levels at five reporting sites, namely Lock 6, Morgan, Murray Bridge, Milang and Burtundy. The targets are deemed to have been met if salinity has been below the Basin Plan targets for 95 per cent of the time.

Between July 2012 and June 2017, salinity targets for flow management (under Chapter 9 of the Basin Plan) were met at four of the five reporting sites (table 8.1).

The unmet target was at Burtundy in the Lower Darling where salinity exceeded the target value for 36 per cent of days between July 2012 and June 2017. High levels of salinity have been a persistent problem during periods of low flows in the Lower Darling. The drivers of flows in the Lower Darling include:

- total inflows (both up and downstream of Menindee)
- how much water is extracted by upstream users (upstream of Menindee) in low flows
- how Menindee Lakes is and will be managed (downstream of Menindee) (MDBA 2018o).

Given that the salinity target at Burtundy cannot be consistently met during periods of low flow in the Lower Darling, there is concern that this target has not been set appropriately, particularly as a real-time management tool.

Table 8.1 **Salinity levels compared to target values in the Basin Plan**
Five-year reporting period (July 2012 to June 2017)

Reporting site	*Target value (EC in µS/cm)*	*Non-exceedance salinity (µS/cm)*	*Percentage of days above the target value*
River Murray at Murray Bridge	830	563	0
River Murray at Morgan	800	520	0
River Murray at Lock 6	580	363	0
Darling River downstream of Menindee Lakes at Burtundy	830	1 620	36
Lower Lakes at Milang	1 000	877	0

Source: MDBA (2017g).

Salinity targets will be reviewed by the MDBA in its 2020 review of salinity and water quality targets. Particular consideration needs to be given to the role, value and utility of the salinity target at Burtundy, with a view to whether the target should be respecified or

abolished given that it is persistently not being met during periods of low flows in the Lower Darling. The target will also need to be reviewed in the context of the changes to the management of the Darling River upstream of Menindee and proposed changes to the operation of Menindee Lakes.

The value of the salt export objective is questionable

The MDBA assesses the effectiveness of the salt export objective by comparing the two million tonnes per year export objective with an estimate of the number of tonnes of salt exported per year into the Southern Ocean from the River Murray system (averaged over the preceding three years).

The salt export objective is not being met

During the most recent three year assessment period (July 2014 to June 2017) the estimated annualised rate of salt export over the barrages was 870 000 tonnes (table 8.2). This was significantly less than the Basin Plan's objective.

Table 8.2 **Salt export and salt interception schemes(SISs)**

Reporting year	*2014-15 (tonnes/year)*	*2015-16 (tonnes/year)*	*2016-17 (tonnes/year)*
Estimated salt export over the lower lake barrages — annual average over three preceding years	900 000	560 000	870 000
Salt diverted away from the river and adjacent landscapes through SISs	432 000	525 000	395 000

Source: MDBA (2017g).

A number of factors influence whether the salt export objective can be met

The salt export objective is influenced by a number of factors including the operation of salt interception schemes (SISs), river regulation, changed land management practices, complex groundwater systems and the highly variable hydrological conditions in the Basin.

In particular, SISs play an important role in salinity management, during periods of low flows diverting salt from the river. For example:

- in the relatively dry 2015-16 reporting year, SISs diverted over 500 000 tonnes of salt away from the River Murray system and an average of 560 000 tonnes of salt was exported through the river mouth
- in comparison, in the relatively wet 2016-17 reporting year, SISs played a less significant role in salinity management. In that year, 395 000 tonnes of salt was diverted under SISs

and an estimated average of 870 000 tonnes of salt was exported to the Southern Ocean (table 8.2).

There can be conflict between the salt export objective and salinity targets

In periods of low flows, there is an inherent conflict between meeting salinity targets and meeting the salt export objective. The MDBA stated that:

> It may not be possible to flush 2 million tonnes of salt consistently while maintaining salt concentration or the salinity levels in the river at acceptable levels. During periods of low flows, preventing salt entering the river is more important than exporting salt to the ocean. (MDBA 2017g, p. 4)

Maintaining water quality that is fit-for-purpose by meeting salinity targets should be prioritised over meeting the salt export objective. Moreover, there is no specific environmental outcome dependent on specifically achieving the salt export objective.

Given this conflict, the value of the salt export objective is questionable and should be reviewed in the MDBA's 2020 review of salinity and water quality targets.

DRAFT FINDING 8.1

Salinity targets for flow management have been met at four of the five reporting sites.

The salt export objective has not been met. In periods of low flows, there can be an inherent conflict between meeting site-specific salinity targets and meeting the salt export objective.

DRAFT RECOMMENDATION 8.1

The Murray-Darling Basin Authority should review the Basin Plan salt export objective in its 2020 review of salinity and water quality targets. This review should consider:

- the relationship between the salt export objective and site-specific salinity targets that require a higher prioritisation to meet water quality objectives
- whether the objective should be respecified or abolished.

Water quality management plans

The main Basin Plan mechanism by which water quality will be managed at the local scale is through Water Quality Management (WQM) Plans.

WQM Plans (which are part of WRPs) are being developed to take into account any potential and emerging risks to water quality for each WRP Area and to establish rules to meet water quality objectives. WQM Plans are to identify key causes of water quality degradation and

risks to water quality, incorporate water quality and salinity targets, and seek to provide the same or better levels of protection as those set out in the Basin Plan (MDBA 2013c).

The MDBA is responsible for assessing WRPs and advising the Minister on whether to accredit a WRP and any amendments to a WRP. Currently, only Queensland's Warrego-Paroo-Nebine WRP had been accredited (chapter 6).

Generally, existing State water quality legislation and policies already provide for water quality management in a manner that would fulfil many of the requirements under WQM Plans. Relevant material can form part of the WRP in accordance with s. 10.04 of the Basin Plan. The WRP accredited to date (Warrego–Paroo–Nebine) draws principally on the Healthy Water Management Plan prepared under the Queensland Environmental Protection (Water) Policy (DNRM (Qld) 2016, p. 16).

In the development of WQM Plans, and through the WRP assessment process, the MDBA and Basin States must ensure that WQM Plans are consistent with national water quality guidelines. The relevant guidelines are:

- The ANZECC guidelines.
- Guidelines for Managing Risks in Recreational Water.
- Australian Drinking Water Guidelines (MDBA, sub. 86, p. 42).

The Basin Plan sets high level water quality targets but enables Basin States (through WQM Plans) to develop alternative water quality target values (equivalent to water quality guidelines/objectives) — as long as they are determined in accordance with the ANZECC guidelines. States must also state why an alternative target will be more effective in achieving the objective or why the target in the Basin Plan is inappropriate for that WRP Area (MDBA, sub. 86, p. 41).

The Warrego–Paroo–Nebine WRP includes a number of alternative, more locally relevant water quality target values than the default values included in the Basin Plan (DNRM (Qld) 2016, pp. 16–17).

The Basin Plan requires that all 33 WRPs be accredited by 30 June 2019. After this date the MDBA's compliance responsibility for WRPs will commence (including the Warrego–Paroo–Nebine WRP).

The *Water Act 2007* (Cwlth) requires that an agency of a Basin State, an operating authority, an infrastructure operator or a holder of a water access right must not act inconsistently with a WRP or fail to act as required by a WRP. The MDBA's compliance role will be to monitor and enforce compliance of all regulated entities with accredited WRPs and ensure that State water management processes do not diverge from the accredited arrangements (chapter 12).

Arrangements for the NSW Murray and Lower Darling WRP

The Commission has repeatedly heard concern for water quality in one WRP Area — the Lower Darling — where current arrangements do not appear to be delivering adequate water quality for much of the time. The 'Lower Darling' is the portion of the Darling River regulated by releases from the Menindee Lakes Scheme. Inflows to the Menindee Lakes are sourced from the Barwon-Darling River and its tributaries.

Participants in this inquiry expressed significant concern about persistent blue-green algae and salinity problems in the Lower Darling. A number of inquiry participants suggested that these problems were exacerbated by current management arrangements and advised that without change these problems will be perpetuated under WRP processes (box 8.2). Concerns about meeting critical human water needs in the Lower Darling are discussed in chapter 9.

Box 8.2 **Water quality in the Lower Darling: participants' views**

Murray Valley Private Diverters (sub. 69, p. 37):

> Water Quality issues in the Lower Darling are of major public and local concern – they are not being resolved under the Basin Plan. This question should be posed to the MDBA.

The Wentworth Shire Council (sub. 48, p. 1):

> The supply for communities reliant on the Menindee Lakes and Lower Darling River System, including the townships of Menindee, Pooncarie, Ellerslie, and Pomona is subject to ongoing water quality issues due to a decrease in flows in the Barwon Darling System which has led to higher salinity levels being experienced and longer lasting blue-green algae blooms. The expected outcome looks bleak and our farmers are reporting an inability to plan long term, or even get information or be consulted about their particular issues.

The Murray Lower Darling Rivers Indigenous Nations (sub. 72, pp. 10–11):

> In many cases, water quality across the Basin is not adequate to support cultural activities. In particular, the condition of water resources in the Baarka or Darling River, have been identified as a threat to the ability of Aboriginal communities to sustain cultural practices, share knowledge and use the river.

Robert McBride (sub. 78, pp. 11–13):

> Since 2015, there have been clear issues with the quality of water in the Lower Darling. This has had a significant impact on communities and the environment … there has been a clear failure of water managers to achieve appropriate water quality, and a failure to recognise and address these issues going forward, as we have seen a repeat of the same issues, and a failure of water managers to acknowledge and accept responsibility for the poor water quality … several users extract water for stock and domestic use directly from the river, and that there are limited filtration systems available. This makes high quality safe water in the river an important matter.

Water quality events (including salinity build up and blue-green algae blooms) in the Lower Darling are associated with periods of low flow. As discussed earlier, the drivers of flows in the Lower Darling include: total inflows (both up and downstream of Menindee); how much water is extracted by upstream users (upstream of Menindee) in low flows; and how Menindee Lakes is and will be managed (downstream of Menindee) (MDBA 2018o).

Stakeholders are particularly concerned with the use of Menindee Lakes as a storage that is used as a first preference to supply water to South Australia. Robert McBride commented:

> The Menindee Lakes were at full capacity in December 2016. The community again called for the NSW Government and MDBA to improve management of the Menindee Lakes storage to prevent the lakes and Lower Darling going dry. We argued that draining the Menindee Lakes as first preference of supply is not sustainable, and that the justification on the basis of high evaporation rates was not valid over having a connected river system and water in the Lower Darling. (sub. 78, p. 4)

New South Wales is responsible for operating Menindee Lakes, in dry conditions, to meet local needs, including water quality. WaterNSW publishes the Lower Darling Annual Operations Plan outlining how the Menindee Lakes System will be managed during each water year. The MDBA reported:

> The NSW Government is responsible when it comes to implementing private or on farm water supply measures to address water quality. WaterNSW will consider whether an increased flushing flow could improve water quality in the Lower Darling and the potential impact this would have on security of supply if dry conditions continue. WaterNSW provides regular updates to Lower Darling water users about operation of the system. (2018o)

The development of the WQM Plan for the New South Wales Murray and Lower Darling WRP is the process to resolve concerns regarding water quality in the Lower Darling.

It is important that WQM Plans adequately assess water quality risks, set out appropriate mechanisms to address water quality events when they occur and follow principles of effective water management planning. Key principles include evidence based analysis drawing on different response options, sound documentation, transparency, and ongoing and meaningful community engagement. It is equally important that the MDBA, through its WRP assessment process, is clear and transparent in how assessment should play a role in ensuring the adequacy of water quality (in the New South Wales Murray and Lower Darling WRP, in particular).

Once WRPs, enter into force, compliance, monitoring and adaptive management (flexibility) will be critical to the effectiveness of WQM Plans to achieve good outcomes in water quality management. Chapter 6 examines WRP processes including assessment, accreditation and compliance and chapter 13 discusses monitoring and evaluation.

DRAFT FINDING 8.2

In the Lower Darling, the management of water quality during periods of low flow is of concern. The development of the Water Quality Management Plan for the New South Wales Murray and Lower Darling Water Resource Plan is the process to resolve this concern.

9 Critical human water needs

Key points

- Critical human water needs (CHWN) are the minimum volumes of water that can reasonably be provided from Basin resources to meet core human consumption requirements that, if not met, would cause prohibitively high social, economic or national security costs.
- In communities that are dependent on the River Murray system, the Basin Plan and the Murray-Darling Basin Agreement set water volumes for CHWN based on experience during the Millennium Drought, and establish a three-tiered approach to water sharing.
  - Since the Basin Plan entered into force, the Murray-Darling Basin Authority (MDBA) has not declared either Tier 2 or Tier 3 water sharing arrangements — that is, the effectiveness of CHWN provisions for River Murray communities have not been tested under a significant dry period.
  - Participants to this inquiry reported confidence in the provisions for meeting CHWN in extreme dry conditions in River Murray communities.
  - The MDBA is undertaking a proactive approach to preparing to meet CHWN in periods of extreme dry through continual risk assessment, scenario testing and education.
  - The Basin Plan provisions for supplying CHWN in the River Murray system in periods of low water availability are robust — no changes to the provisions are warranted.
- The management of CHWN during periods of low flow and water quality events in the Lower Darling is of concern to many participants to this inquiry and there appears to be little clarity on how this concern is resolved.
- For Basin communities outside the River Murray system, the Basin Plan requires that Water Resource Plans (WRPs) describe how CHWN will be met during extreme events. The Basin Plan requires that all 33 WRPs be accredited by 30 June 2019 — after this date the MDBA's compliance responsibility for WRP's will commence.
  - The development of the extreme event provisions in the New South Wales Murray and Lower Darling WRP is the process to resolve CHWN concern in the Lower Darling.
  - In WRP areas where Basin States are developing provisions for CHWN during extreme events there is an immediate need for transparency and good process.
  - It is equally important that the MDBA, through its WRP assessment process, is clear and transparent in how assessment should play a role in ensuring the adequacy of provisions for meeting CHWN during extreme events.

The Basin provides water to over three million people for critical human water needs (CHWN) such as drinking, food preparation and sanitation. CHWN is defined under the *Water Act 2007* (Cwlth) as the minimum amount of water that can reasonably be provided from Basin resources to meet:

- core human consumption requirements in urban and rural areas that are dependent on Basin water resources
- non-human consumption requirements that, if not met, would cause prohibitively high social, economic or national security costs (s. 86A(2)).

Under the Basin Plan, CHWN is managed through two planning mechanisms.

- In communities that are dependent on the River Murray system, the Basin Plan (chapter 11 of the Plan) and the Murray-Darling Basin Agreement set specific water volumes required to meet CHWN, and establish a tiered approach to water sharing. These provisions were forged during the Millennium Drought. They reflect the lessons of that extreme dry period, the worst ever recorded (MDBA, sub. 86, p. 49).
- In other Basin communities (those that are not dependent on water from the River Murray System), the Basin Plan (chapter 10, Part 13) requires that Water Resource Plans (WRPs) describe how CHWN will be met (for each Water Resource Plan Area) during extreme events.

This chapter discusses these two mechanisms for planning to meet CHWN during periods of extreme dry. Section 9.1 discusses the tiered approach to water sharing in the River Murray System and the MDBA's approach to dry scenario preparedness. Section 9.2 examines planning for CHWN through extreme event provisions in WRPs.

9.1 Water sharing for critical human water needs in the River Murray system

During the Millennium Drought, when inflows were at a record low, Basin States faced the prospect of being unable to meet water for CHWN in the River Murray system (MDBA 2016g, p. 2).

In response, jurisdictions agreed that in the River Murray system, CHWN should be prioritised above all and developed specific water sharing rules for periods of extreme water scarcity. In 2008, the concept of CHWN for the River Murray system was added to the Water Act. At this time, additional CHWN provisions were included in the MDB Agreement and were then reflected in the Basin Plan (box 9.1).

The highest priority water in the River Murray system is conveyance water for the river system, which is the volume of water required to ensure that the CHWN volume can be delivered to where it is needed, taking into account evaporation and seepage. Chapter 11 of the Basin Plan sets out the agreed volumes for CHWN for New South Wales, Victoria and

South Australia, and the conveyance water needed to deliver those CHWN volumes (MDBA nd(a)). The MDBA reported:

> The Plan focuses on critical human water needs for communities dependent on the River Murray system, setting out a process to identify risks, while providing the flexibility to respond to circumstances. The MDBA and states have fully incorporated these Plan requirements into their water management practices. For example, processes are in place to ensure states set aside the required critical human water needs volumes and report these to the MDBA, by the start of the water year. (sub. 86, p. 49)

Box 9.1 CHWN provisions in the River Murray system

CHWN are met in accordance with the arrangements in the Water Act, the Basin Plan, and the Murray-Darling Basin Agreement.

The Water Act (Part 2A)

The Water Act establishes CHWN as the highest priority water use for communities that are dependent on the Basin's water resources. To give effect to this in the River Murray system, the Water Act provides conveyance water (required to deliver CHWN) as the first priority of available water. The Water Act sets out a range of requirements (such as volumes of CHWN) for the Basin Plan to address CHWN. The Water Act also requires an emergency response by the MDBA and the Basin Officials Committee if a water quality trigger is reached.

The Basin Plan reflects the requirement of this Act

Chapter 11 of the Basin Plan sets out a three-tiered system for water sharing, including :

- volumes of water for CHWN
- conveyance water and the conveyance reserve
- salinity and water quality triggers at which water becomes unsuitable for meeting CHWN
- processes to assess and manage risks associated with inflow prediction
- triggers for changing water sharing tiers.

The Murray-Darling Basin Agreement

The Murray–Darling Basin Agreement was amended in 2011 to allow for CHWN provisions in the Water Act, and the provisions required by the Water Act to be included in the Basin Plan. The Agreement gives effect to these provisions by changing water sharing arrangements — for example giving priority to conveyance water. Changes to the Agreement included Schedule G (accounting for the South Australian storage right) and Schedule H (water sharing during Tiers 2 and 3 events).

Source: MDBA (2016g).

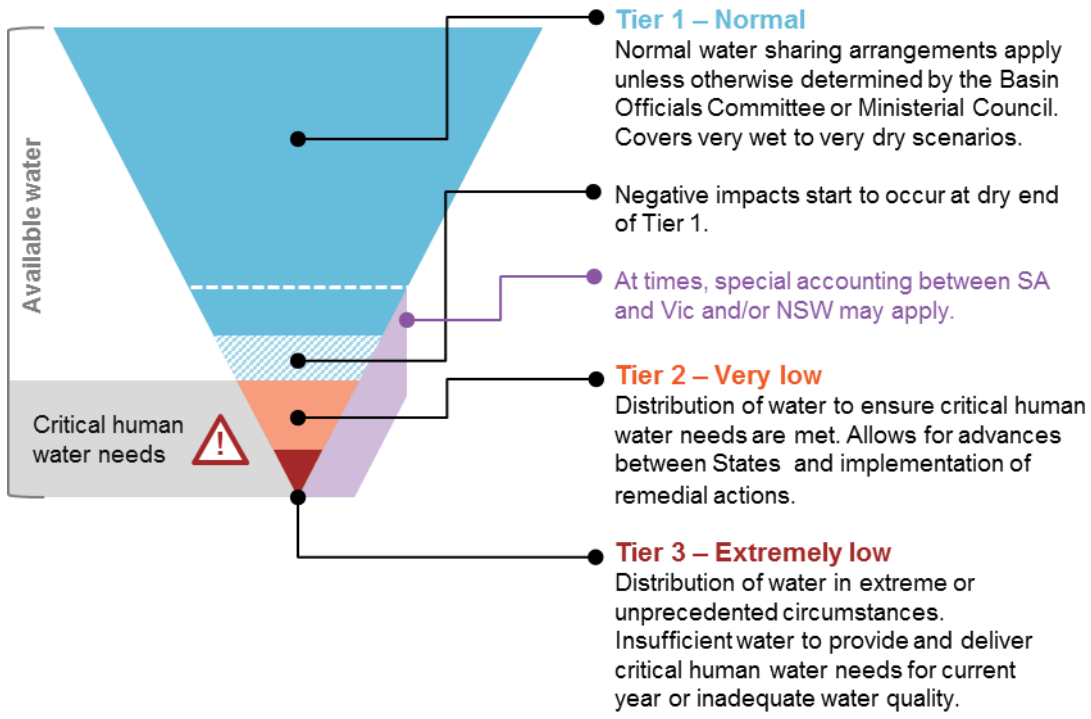
Water sharing is based on a three-tiered approach whereby Tier 1 represents normal water availability, Tier 2 is very low water availability and Tier 3 is extremely low water availability (figure 9.1).

Tier 2 and 3 water sharing arrangements occur in extreme conditions, similar to, or worse than the millennium drought.

The Basin Plan sets triggers for moving between tiers. Triggers are based on the amount of water available, or the quality of water, in the system. Water availability triggers are based on forecasts of the water available to meet conveyance water, conveyance reserve or CHWN requirements. Water quality triggers are activated if water cannot be treated for human consumption, or if salinity is greater than 1400 EC (µS/cm) upstream of Wellington. Activating the water quality trigger establishes Tier 3 water sharing arrangements (MDBA nd(a)).

The MDBA is responsible for declaring Tier 2 or Tier 3 water sharing arrangements, and the MDBA, the Basin States and the Department of Agriculture and Water Resources are jointly responsible for reporting on the implementation of the emergency response process for meeting CHWN (when necessary). If the MDBA has declared Tier 3 water sharing arrangements the Ministerial Council must meet at least once every four months to consider recommendations or reports by the Basin Officials Committee and take appropriate action (box 9.2).

Figure 9.1 **Tiered water sharing in the River Murray system**



Source: MDBA (nd(a)).

Box 9.2 Roles in providing for CHWN in the River Murray

The role of the MDBA

The MDBA is responsible for declaring Tier 2 or 3 water sharing arrangements. In particular, it may declare (on its website) which tier is to cease and which is to enter into effect, under what conditions the declaration has been made and the date the change is to take place.

- Tier 1 water sharing arrangements occur when there is sufficient water available to meet conveyance, CHWN (NSW 61 GL, Victoria 77 GL and South Australia 204 GL) and support starting seasonal allocations.
- Tier 2 will be declared if:
  - from 1 June to 31 August there is insufficient water to provide conveyance water in the current water accounting period and/or
  - from 1 September to 31 May there is insufficient water to set aside a conveyance reserve for the next water accounting period.
- Tier 3 will be declared if:
  - there is insufficient water to provide all of the CHWN in the current year or
  - there is insufficient water to provide the conveyance water in the current water year
  - the specified water quality or salinity trigger is reached.

The MDBA is required to advise the Basin Officials Committee (BOC) if there is unlikely to be sufficient water available to a State in the current water year to: meet any required contribution to the conveyance reserve; meet its contribution to current conveyance; or allocate at least the volume set aside by it for CHWN in the previous water year. If insufficient water is available, the MDBA is required to advise BOC whether an advance of water from another State could prevent a shortfall, including which State should make the advance and the volume required.

The role of the Basin States

It is the responsibility of the Governments of New South Wales, Victoria and South Australia to set aside the water volumes to meet CHWN, prescribed under Chapter 11 of the Basin Plan.

The Basin Plan also requires a State, via its BOC member, to advise the MDBA if a water quality trigger point has been reached, and of the need to enact Tier 3 water sharing arrangements.

The role of the Basin Officials' Committee (BOC)

- If the MDBA has declared Tier 2 water sharing arrangements, BOC is required to determine if any remedial action is required — in the form of advances or otherwise.
- If the MDBA notifies BOC that there is insufficient water to meet the current conveyance requirements BOC must consider the MDBA's view. If BOC, agrees that there is insufficient water it must make a declaration to that effect and take remedial action. If BOC disagrees, the MDBA may decide to review its declaration of Tier 2 water sharing arrangements.
- If the MDBA has declared Tier 3 water sharing arrangements, BOC must meet at least once every two months to consider and recommend actions.

The role of the Ministerial Council

If the MDBA has declared Tier 3 water sharing arrangements, the Ministerial Council must meet at least once every four months to consider recommendations or reports by BOC and take appropriate action.

Source: MDBA (2013b).

Effectiveness of the River Murray system CHWN provisions

The MDBA reports annually on whether CHWN have been met. The system is currently under Tier 1 arrangements. The MDBA (2018r, p. 12) reported:

> Tier 1 water sharing arrangements are expected to continue for 2018-19. If inflows over 2018-19 are extremely low, and do not recover in 2019-20, there may not be sufficient water to sustain Tier 1 next year and delivery of critical human water needs may be a challenge. The probability of this occurring is low but nonetheless a possibility. The MDBA will liaise with partner governments to closely monitor risks and adjust plans accordingly in the knowledge that drought security is reliant on forward planning and the management of reserves.

Since the Basin Plan entered into force, the MDBA has not declared either Tier 2 or Tier 3 water sharing arrangements. As such, the effectiveness of CHWN provisions for River Murray communities have not been tested under a significant dry period.

Participants to this inquiry reported confidence and satisfaction with provisions for meeting CHWN in River Murray communities. For example, the South Australian Government (sub. 85, p. 4) commented that 'no changes to the provisions for critical human water needs are needed at this time'. Similarly, the Department of Agriculture and Water Resources stated:

> The Department considers the current triggers and measures within the Basin Plan adequate to meet any risks to CHWN which may arise. (sub. 81, p. 23)

And, the Murray Valley Private Diverters said:

> Critical Human water needs provisions are already well protected in NSW Murray water sharing and resource planning, Victorian Planning — all provisions for both states and South Australian needs are well protected and there is no need for change (sub. 69, p. 40).

Periods of extreme dry are inevitable in the River Murray system. The CHWN provisions under the Basin Plan establish a solid framework for managing CHWN under dry climate scenarios.

Effective planning to meet CHWN also relates to preparedness — for example, through continual risk assessment, scenario testing and education. The MDBA have demonstrated a proactive approach in this area (box 9.3).

Box 9.3 Preparedness to meet CHWN in the River Murray system

The MDBA employs a range of strategies to prepare for meeting CHWN in periods of extreme dry in the River Murray system.

Scenario testing

Ongoing scenario testing is important in water resource management because there are many dynamic variables (such as rainfall, soil moisture and water user demands) that influence water availability and these are difficult to forecast.

The MDBA reports on water sharing scenarios in the *River Murray System Annual Operating Plan*. The scenarios are prepared by the MDBA with input from the Australian Government and the States of New South Wales, Victoria and South Australia through the MDBA's Water Liaison Working Group.

River Murray system scenarios for 2018-19 include six scenarios ranging from extreme dry to wet scenarios (MDBA 2018r, p. 14).

Education

In 2015-16, in response to increasingly dry conditions the MDBA conducted a drought preparedness project. Its aim was to educate and prepare River Murray water resource managers and CHWN decision makers for the implementation of CHWN provisions in the Plan.

The project also included a comprehensive review of the actions taken to respond to the Millennium Drought (MDBA 2016a, p. 62). The 2016 report *Since the Millennium Drought* concluded that the changes made to managing extreme dry conditions in the River Murray System in response to the Millennium Drought provide a 'robust but flexible framework' to plan for and manage extreme dry conditions (MDBA 2016g, p. 7).

Monitoring and evaluation

The MDBA undertakes ongoing risk assessment for CHWN and has stressed the importance of future evaluation. The MDBA commented:

> Looking to the future, the MDBA will continue to closely monitor risks to critical human water needs and the management of extreme droughts, and will factor any relevant new information into future reviews of the Plan. After any triggering of Tier 2 or 3 water sharing arrangements, the MDBA would review the effectiveness of its response, including the requirements of the Plan and the Murray–Darling Basin Agreement and would seek amendments if required. (sub. 86, p. 50)

DRAFT FINDING 9.1

The Basin Plan provisions for supplying critical human water needs in the River Murray system in periods of low water availability are robust and no changes to the provisions are warranted.

9.2 Managing CHWN through Water Resource Plans

A common misconception amongst Basin communities is that CHWN provisions under Chapter 11 of the Basin Plan apply to all Murray-Darling Basin communities. This is not the case. In other Basin communities the provision of water for CHWN are managed through extreme event provisions in Water Resource Plans (WRPs).

The Basin Plan (Part 13) requires that WRPs describe how water resources (including CHWN) are to be managed during an extreme event. Extreme events include extreme dry periods (such as a dry period that is outside the range of experience contained in the 114-year historical climate baseline), water quality events and infrastructure failure that could put at risk the supply of water for CHWN (box 9.4).

Box 9.4 Providing for CHWN in extreme events through WRPs

Similar to CHWN provisions in the River Murray system it is expected that Water Resource Plans (WRPs) demonstrate that arrangements are in place to provide for CHWN during extreme events. Information that could be used to satisfy this includes:

- roles and responsibilities relating to the management of water resources during the identified extreme events (for example, the powers of the Minister to declare an extreme event)
- the water management actions that will be implemented to respond to extreme events (for example restrictions on water take, the policies for determining the level and timing of those restrictions, and how water will be provided to the point of use)
- a demonstration of how the WRP will perform under extreme circumstances
- alternative water management rules to manage water resources during extreme events (for example, changes in the way that water allocation rules are applied)
- estimates of the volume of water required to meet CHWN
- the indicators that will be used to assess whether an event (such as a dry period or water quality event) is classified as 'extreme' and determine the type or level of action to be taken (for example, specifying the duration or severity of an extreme event)
- circumstances in which a WRP can be suspended and the extent of temporary rules that could be put in place (MDBA 2013c, pp. 102–103).

The intention is for flexibility in arrangements. The MDBA reported:

> In some cases, new scientific information will emerge that will change our understanding of the nature of extreme events — for instance, events that were once considered extreme and unusual are recognised as occurring more regularly. The WRP needs to contain structures that allow these changes in information to be taken into account, including considering the need to manage water resources differently. This may then lead to a review of the existing WRP and amendments to manage water differently, which would need to be accredited according to the requirements in the Act to have standing under the Basin Plan. (MDBA 2013c, p. 103)

The MDBA is responsible for assessing WRPs and advising the Minister on whether to accredit a WRP and any amendments to a WRP. Currently, only Queensland's Warrego-Paroo-Nebine WRP has been accredited. In this WRP Area, water for CHWN is not sourced from the Basin. The Warrego-Paroo-Nebine WRP states:

> In the WRP plan area all town water supplies for critical human water needs are sourced from the Great Artesian Basin which is a higher quality and higher reliability of supply in general and during an extreme dry period. Water from the Great Artesian Basin is not a Basin water resource. … It is therefore unlikely that a Basin water resource will be subject to regulation for a water supply emergency for an extreme dry period. (DNRM (Qld) 2016, pp. 101–102, 160)

The Basin Plan requires that all 33 WRPs be accredited by 30 June 2019. After this date the MDBA's compliance responsibility for WRP's will commence (including the Warrego–Paroo–Nebine WRP).

The Water Act requires that an agency of a Basin State, an operating authority, an infrastructure operator or a holder of a water access right must not act inconsistently with a WRP or fail to act as required by a WRP. The MDBA's compliance role will be to monitor and enforce compliance of all regulated entities with accredited WRPs and ensure that State water management processes do not diverge from the accredited arrangements (chapter 12).

There is some confusion why CHWN in parts of the Edward-Wakool system are managed through WRPs rather than chapter 11 provisions in the Basin Plan given the Edward-Wakool is managed as part of the River Murray system.

Murray Valley Private Diverters commented:

> In times of extreme drought critical human water needs are not protected in the Edward-Wakool System. The Basin Plan 86B highlights communities dependent on the waters of the Edward-Wakool systems downstream of Stevens Weir are excluded from the mandatory content of the Basin Plan (arrangements for critical human needs). This is a major oversight of the Basin Plan. (sub. 69, p. 40)

The Water Act and Basin Plan explicitly exclude, from CHWN provisions, communities dependent on the waters of the Edward–Wakool System downstream of Stevens Weir. This decision was made on the advice of representatives of the New South Wales Government, based on lessons from the Millennium Drought. In extreme circumstances, the CHWN of communities downstream of Stevens Weir can potentially be delivered more efficiently by overland transport rather than through running the river system (MDBA pers. comm., 20 July 2018). This should be set out in the New South Wales Murray and Lower Darling WRP.

Arrangements for the NSW Murray and Lower Darling WRP

The Commission has repeatedly heard concern for CHWN in one WRP Area — the Lower Darling. The 'Lower Darling' is the portion of the Darling River regulated by releases from the Menindee Lakes Scheme. Inflows to the Menindee Lakes are sourced from the Barwon-Darling River and its tributaries. Robert McBride commented:

> There are significant concerns in meeting CHWN on the Lower Darling, which have increased since the introduction of the Plan and the 2012 Barwon-Darling WSP … It is critical that CHWN of downstream users are prioritised in WRPs going forward … Failure to prioritise connectivity (particularly in the Lower Darling) over efficiency of delivery of water by the MDBA (their primary priority as stated to us on many occasions) has led to serious risk of CHWN. The Menindee Lakes SDL adjustment mechanism project will significantly increase risk to CHWN on the Lower Darling. (sub. 78, p. 13)

This concern is interlinked with water quality concerns in the Lower Darling. Chapter 8 discusses how water quality events — including salinity build up and blue green algae blooms — in the Lower Darling are associated with periods of low flows. Low flows and water quality events can put at risk the supply of water to meet CHWN.

The development of the extreme event provisions in the New South Wales Murray and Lower Darling WRP is the process to resolve concerns regarding CHWN in the Lower Darling. In WRP areas where Basin States are developing provisions for CHWN during extreme events there is an immediate need for transparency and good process.

In planning for extreme events (through WRPs) it is important that risks are assessed, appropriate mechanisms are in place to provide for CHWN when extreme events occur and that principles of effective water management planning are followed. Key principles include evidence based analysis drawing on different response options, sound documentation, transparency, and ongoing and meaningful community engagement. It is equally important that the MDBA through its WRP assessment process is clear and transparent in how assessment should play a role in ensuring the adequacy of provisions for meeting CHWN during extreme events (in the New South Wales Murray and Lower Darling WRP, in particular).

DRAFT FINDING 9.2

The management of critical human water needs during periods of low flow in the Lower Darling is of concern. The development of the extreme event provisions in the New South Wales Murray and Lower Darling Water Resource Plan is the process to resolve this concern.

10 The water trading rules

Key points

- Trade in the Basin has increased significantly in the last 30 years, supported by reforms that have reduced barriers to trade and improved market information.
- The Basin Plan trading rules have contributed to more efficient water markets by introducing new requirements to improve market information and promote confidence in the market, and by providing a mechanism to validate or remove restrictions on trade.
- However, more should have been done since 2014 by the Murray–Darling Basin Authority (MDBA) and Basin States to review restrictions on trade and resolve compliance matters raised to date.
- The establishment of the Office of Compliance in late 2017 and release of a compliance policy by the MDBA in June 2018 may help speed up progress but there are additional improvements to its compliance processes that could be made. In particular, the MDBA should:
  - develop an assessment framework for reviewing trade restrictions
  - be more transparent about its compliance role, processes and the outcomes of its work.
- Basin States should not let their collective responsibility for market oversight fall by the wayside. Basin Governments should monitor and respond to risks associated with changes in trade patterns, water use and pressures on delivery capacity.
  - A current priority should be a timely and transparent response to concerns about effects on the environment and third parties resulting from increased pressures on delivery capacity and constraints in some parts of the Basin.

10.1 Background

History of trading in the Basin

Trade of water allocations and entitlements in the Basin has increased significantly since each of the southern Basin State Governments first allowed trade in the 1980s (Hughes, Gupta and Rathakumar 2016; NWC 2011). The development of the water market in the Basin was further enabled by the major water reforms through the 1990s and 2000s. These included the Murray–Darling Basin Agreement (MDB Agreement) in 1992 and COAG commitments in 1994 and 2004, which introduced measures to reduce barriers to trade (including interstate trade) and to support trade through improved market information (NWC 2011).

These trade reforms have enabled water to move to higher value uses and given water users greater flexibility to respond to changes in commodity prices and water availability (PC 2017b). Between 2008-09 and 2016-17, the volume of surface water allocations traded in the Basin increased by 139 per cent to over 4000 GL (ABARES 2018).[104]

Trading under the Basin Plan

The Basin Plan contains objectives for water trading such as facilitating the operation of efficient water markets, protecting the needs of the environment, providing appropriate protection to third parties[105] and minimising transaction costs on water trades through good information flows (s. 5.07(1)).

The Basin Plan also includes a chapter on water trading rules (chapter 12), which augment previous water trade-related reforms. The inclusion of the trading rules in the Basin Plan provides a common framework for the trading of water rights[106] in the Basin.

The trading rules can be split into two main categories, discussed below.

First, the trading rules define the types of trade restrictions that are permissible in the Basin. These rules largely apply to Basin States, which are responsible for the setting of trading rules and restrictions as part of their water resource management arrangements. An example of this type of rule is that a person may trade a water access right free of any restriction on the trade that relates to the person being a member of a particular class of persons or the purpose for which the water will be used (ss. 12.07–12.08).

The second category includes provisions aimed at improving market information and market confidence. There are about 16 different notification, disclosure and reporting requirements that apply to Basin States, the Murray–Darling Basin Authority (MDBA), irrigation infrastructure operators (IIOs) and water traders. Examples of this type of rule are that persons aware of a market announcement must not enter into trades informed by that information until it is generally available (s. 12.51) and that Basin States must give the MDBA information about the characteristics of different types of water entitlements in their jurisdiction (s. 12.43).

Most of the Basin Plan trading rules became effective in July 2014. However, under the Basin Plan Implementation Agreement, Basin States were given until Water Resource Plans (WRPs) commence in July 2019 to 'review and exercise their best endeavours' to ensure that their trade restrictions are consistent with the Plan (MDBA, CEWH & Basin State

104 Transfers of environmental allocations have been excluded from this calculation.

105 An example of a third party effect is transmission loss through evaporation or seepage that may be incurred by other water holders as a result of trade. An example of an effect on the environment from trade is channel erosion due to changes in patterns or volumes of water delivered.

106 Water rights applicable include water access entitlements, water allocations, irrigation rights and some water delivery rights.

Governments 2013, p. 24). Only trade restrictions related to the Basin Plan trading rules on groundwater (ss. 12.24–12.26) need to be included and accredited as part of WRPs[107] — restrictions on surface water trade do not need to be accredited through WRPs.

The main consequence of insufficient progress in implementing the Basin Plan trading rules would be a slower rate of improvements to the efficiency of the water market. This can impose costs on those who would like to trade water, third parties and the environment, and prevent productivity gains that benefit the broader community. It is important that there is ongoing momentum to improve the efficiency of the water market over time.

The roles and responsibilities of the MDBA with respect to water trade

The MDBA has various roles and responsibilities with respect to water trade.

- Under the Basin Plan Implementation Agreement, the MDBA agreed to publish guidelines to assist Basin States in understanding the requirements of the trading rules (MDBA, CEWH & Basin State Governments 2013).
- The MDBA also provides advice to Basin Governments on the implementation of Schedule D of the MDB Agreement, which sets principles and administrative arrangements for trade between valleys and States in the southern connected system. The MDBA's functions under the MDB Agreement are funded by Basin Governments under a joint venture.
- However, the MDBA also has a regulatory role under the Basin Plan, which includes enforcing compliance with the Basin Plan trading rules by Basin States and other parties obligated by the rules.

The MDBA's regulatory role broadly entails two kinds of compliance.

1. It has a typical compliance role, which involves identifying, investigating and responding to breaches of the trading rules. For example, if a person selling a water access right does not notify the approval authority of the price agreed for the trade as per section 12.48, this would be a relatively straightforward breach of the water trading rules.
2. In contrast, compliance matters related to trade restrictions may not be so black and white. The clearest example of this are sections 12.16 to 12.18 of the Basin Plan, which state that surface water trade should be free of any restriction[108] except where it is necessary: due to the existence of a physical constraint, to address hydrologic connections and water supply considerations, to protect the environment or due to the level of groundwater hydraulic connectivity. Determining whether a trade restriction is consistent with this trading rule can involve detailed analysis and judgement.

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107 If a trade restriction is used as supporting information in a WRP, then changes to that trade restriction may require an amendment of the WRP. The MDBA's process for considering minor amendments of WRPs is discussed in chapter 6 of this report.

108 This rule applies to trades within a regulated system, between regulated systems, or within an unregulated system.

The MDBA is taking a risk-based approach to compliance with the trading rules. The MDBA's priorities for compliance were set out in the *Strategic Priorities: Basin Plan Water Trading Rules* (MDBA 2016h). The priorities were based on an assessment of the relative importance that each requirement set under the trading rules has on the achievement of water trading objectives. This document identified trade restrictions and the disclosure and management of water announcements as high priority areas for the MDBA's compliance work program (MDBA 2016h).

The MDBA has raised about 16 potential compliance issues with Basin States since the commencement of the trading rules in 2014 (MDBA, pers. comm., 15 June 2018). Some of these issues were identified during the extensive consultation processes undertaken by the MDBA and the Australian Competition and Consumer Commission (ACCC) during the development of the Basin Plan trading rules (MDBA, pers. comm., 3 May 2018). There have also been 8 issues reported to the MDBA by members of the public as of July 2018, and the MDBA has noted these complaints on its register of non-compliance allegations (MDBA 2017d, 2018j, 2018k).

The rest of this chapter discusses the effectiveness of the implementation of the trading rules and recommends a way forward to improve outcomes for the water market and trading. The Commission's assessment of the effectiveness of implementation has included consideration of:

- progress made in implementing the Basin Plan trading rule requirements
- whether arrangements and processes in place for implementation and compliance are sufficiently transparent, evidence-based, consultative and cost-effective
- risks to achieving the objectives for water trading.

The outcomes of this analysis are discussed under three different themes. Section 10.2 is about implementation and compliance with the trading rules related to removing trade restrictions. Section 10.3 describes new arrangements put in place by Basin Governments as a result of the trading rules to improve market information and market confidence.

Section 10.4 recognises that Basin Governments also need to be forward-looking in their market oversight role. They need to be able to identify and manage potential issues associated with growth in trade and the constraints that might affect the delivery of trades.

10.2 Restrictions on water trading

Some progress has been made in removing inconsistent trade restrictions …

Section 12.19 of the Basin Plan requires Basin States to notify the MDBA of all restrictions on the trade of surface water and the allowable reasons for the restrictions. Basin States sent initial lists of restrictions to the MDBA in 2014 (MDBA 2017b). The total number of restrictions exceeded 1500 (MDBA, sub. 86, p. 45).

Basin States have reviewed and changed some of their trade rules as a result of the Basin Plan trading rules and consultation with the MDBA. For example, Victoria removed its four per cent annual limit on trade out of irrigation districts in 2014, South Australia has allowed water traded from interstate to be carried over (MDBA, sub. 86) and Queensland's draft water plans for the Condamine–Balonne and Border Rivers–Moonie no longer require landholder consent when moving water allocations[109] on to a waterhole (Queensland Government, sub. 87).

… but there is scope to do more

The changes to trade restrictions and efforts to consult on and identify compliance issues signify early progress but it appears that there has been little progress since. Of the 16 matters that the MDBA has raised with Basin States, 10 issues remain unresolved (MDBA, pers. comm., 15 June 2018). Most of these issues are about potential inconsistencies with the trading rules specified in part 2 of chapter 12, which relates to restrictions on trade.

Some of the issues that the MDBA has raised as potential areas of non-compliance have been reported publicly, including about:

- some inter-valley trade limits in the southern Basin (DAWR 2016a, 2018f)
- interstate trade between the ACT and New South Wales. Although these Basin States reached an in-principle agreement to establish interstate trade in 2017, the New South Wales Government has since stated that it is not required to establish interstate trade because it considers the ACT Murrumbidgee to be an unregulated surface water system (DAWR 2018f)
- interstate trade between New South Wales and Queensland on the intersecting streams. Both States have expressed the view that there is little if any demand for interstate trade on the intersecting streams (DAWR 2016a). The Queensland Government has agreed to monitor demand and has outlined a process to establish an interstate market if and when there is net benefit in doing so (DNRM (Qld) 2017)
- a possible breach of section 12.23 (a rule about how restrictions apply to delivery of water under a tagged entitlement) in Victoria (MDBA 2017d). The MDBA has been in discussions with Victoria about the management of tagged entitlements in that State (DAWR 2018f).

109 Water access entitlements are called water allocations in Queensland.

Participants to the inquiry have raised concerns about trade rule issues in addition to the 16 matters that the MDBA has investigated to date. These issues mostly relate to the northern Basin.

> The current unregulated trade rules prevent trade in the northern unregulated systems, it is not fit for purpose and it is at risk due to the tight timeframes for the Water Resource Plan development. (Namoi Water, sub. 82, p. 19)

In its advice on the development of Basin Plan trading rules, the ACCC noted that trade rules 'within unregulated systems are generally not as clearly stipulated as rules for regulated systems, or in some cases are not in place at all' (ACCC 2010, p. 180). As of 2017, the ACCC (2017b) stated that only limited progress in implementing its recommendations to develop opportunities for trade in unregulated systems had been made since 2010.

Deficiencies in the MDBA's compliance function have contributed to slow progress in implementing the trading rules and a log of unresolved compliance issues. The MDBA (sub. 86, p. 46) itself stated that:

> Work is progressing too slowly under the current approach of assessing existing state trade rules against the Trading Rules.

The MDBA can investigate trade restrictions as it becomes aware of potential inconsistencies with the trading rules, such as through its audit program or complaints made by others. (This assumes that Basin States have not already requested that the MDBA declare that a surface water trade restriction is consistent with the Basin Plan, as is allowed by section 12.20 of the Plan.)

The MDBA's compliance tools for the trading rules include audits of high-risk water trading rules and using its power to request compellable information for its investigations (MDBA 2018g). If Basin States (or other parties obligated by the rules) are not cooperative in changing inconsistent rules or there is a dispute, the MDBA's enforcement options include enforceable undertakings to make good on an area of non-compliance and applying to a court for an injunction to prevent non-compliant behaviour.

Despite having a range of compliance options, the MDBA has mainly addressed trade issues to date by communicating bilaterally with Basin States through both informal discussions and formal letters. Letters have been used to communicate the MDBA's preliminary view of an issue following an initial investigation, and Basin States have been asked to provide further information.

This approach has not been particularly effective. Negotiation is a suitable and low cost option to initiate a compliance action but if no resolution is reached, then there is a need to escalate matters through a formal process. In discussions with some Basin States, the Commission has heard that the MDBA has been reluctant to provide them with a formal resolution on some matters and that there is a tendency for the MDBA to continue to seek further information rather than make a determination on compliance.

However, the MDBA has increased its resources and focus on compliance, which may support more decisive compliance action in the future (MDBA, sub. 86). In late 2017, the MDBA established a new Office of Compliance, and moved the Water Trade Team to this division. Although the MDBA received complaints from the public about the trading rules from 2015, it only published a register of these complaints in 2017 as part of the Murray-Darling Basin Water Compliance Review (MDBA 2017u). In June 2018, the MDBA (2018g) published its compliance and enforcement policy for 2018–21, which outlined many of its compliance and enforcement options for the Basin Plan trading rules publicly for the first time.

The Commission has identified scope for further improvements to the compliance process for the Basin Plan trading rules.

DRAFT FINDING 10.1

Some trade restrictions that were inconsistent with the Basin Plan trading rules have been removed.

The Murray-Darling Basin Authority (MDBA) has raised 16 instances of potential non-compliance with the trading rules with Basin States. Ten of these matters remain unresolved and the MDBA has not been clear with Basin States about the steps to resolve these in a timely way.

Improving compliance processes

Develop an assessment framework for trade restrictions

Trade restrictions used to manage delivery and physical constraints and third party effects of trade vary in type and can be highly complex. For example, assessing and validating the need for a volumetric limit on inter-valley trade is not a black and white case of compliance — it requires an understanding of delivery capacity, demand at different times of the year and the extent of third party effects that are considered acceptable. Current limits may be based on historic patterns of water use which, as trade increases and there is more active environmental water management, may no longer hold true over time.

The MDBA's guideline on managing surface water trade restrictions provided limited advice on what constitutes an allowable restriction to manage third party effects. It stated that both costs and benefits should be considered and they will vary on a case-by-case basis (MDBA 2014c). This is a gap in the MDBA's compliance strategy.

The MDBA should develop an assessment framework for evaluating the consistency of trade restrictions against the Basin Plan trading rules. Specifically, the framework should provide additional information about how to assess and compare the benefits and costs of removing restrictions and how to determine a threshold above which a restriction is justified. An assessment framework would assist with compliance progress, improving market efficiency,

and support the MDBA to defend its judgements about specific rules. The MDBA (sub. 86, p. 47) flagged this as an option for strengthening arrangements:

> The Plan presents high level principles about allowable restrictions. It would help the process if these principles were developed in more detail, so that they provide an assessment framework.

The framework should be developed by the MDBA with advice from Basin States. If the MDBA and Basin States are not working within a consistent framework, this could lead to avoidable disputes. The assessment framework should be comprehensive enough to assess compliance of existing restrictions and be useful to Basin States in evaluating the potential need for new trade restrictions (discussed in section 10.4). The framework should require all costs and benefits of removing restrictions to be considered.

A documented assessment framework would make the compliance process more transparent, improve community understanding and better identify uncertainties and data limitations.

Clarify roles and responsibilities for assessing restrictions

Currently, the MDBA appears to be taking a lead role in conducting the analysis required to assess the compliance of state trade rules.

Given that Basin States implement trade restrictions in their jurisdictions based on local knowledge and consultation with interested parties, they should have the responsibility for assessing whether restrictions are consistent with the Basin Plan trading rules. When the MDBA initiates investigations of state-based trading rules, it should ask Basin States to undertake the analysis required to substantiate the need for the rule. The MDBA would then review the assessment, ask for further information if necessary and determine whether the restriction is compliant with the Basin Plan.

Set timeframes for resolving matters

The MDBA has published a protocol for handing allegations of non-compliance generally (MDBA 2017t). Credible allegations will be referred to the relevant referral agency, which in the case of the Basin Plan trading rules is the MDBA itself. The protocol sets timeframes for state agencies to address matters referred to it and an escalation pathway if the Basin State does not resolve matters in a timely manner. However, these timeframes were not set for the MDBA itself when acting as the regulator.

The MDBA should establish realistic timeframes that it will endeavour to meet for investigating and addressing trading rules compliance matters. Greater discipline on timeframes could be set for steps in the process, such as following the receipt of information from a Basin State and after the MDBA has made a determination on a compliance matter.

Transparency and reporting by the regulator

Although there is some public information about the compliance status of Basin States, the MDBA has not published information about the compliance status of irrigation infrastructure operators, despite these rules taking effect four years ago.

The National Farmers' Federation (sub. 77, p. 9) called for more transparent processes when considering changes to trading rules:

> Full examination about the potential impacts of any rule changes must be transparently conducted, in consultation with stakeholders. In many instances, there are fundamentally sound reasons for trade rules, such as to ensure deliverability, to protect the environment or to ensure that the entitlements of others are not eroded. These reasons should not be arbitrarily discarded in the pursuit of unfettered trade.

Transparent processes go some way in minimising the risk that third-party or environmental effects are given either too little or too much weight when changes to trade restrictions are considered.

Better public reporting and transparency by the MDBA would make it more accountable for its compliance work program and the time it takes to resolve compliance matters. The MDBA should report publicly on the outcomes of its compliance work, such as the numbers of audits and investigations initiated and closed annually, the outcome of all determinations, and the trading rules that the investigations applied to.

The MDBA has not made its assessments and determinations of compliance with the Basin Plan trading rules public in order to avoid generating market uncertainty. Given the value of the water market and the investments that depend on it, efforts to manage this risk may be justified.

However, consultation with interested parties may be required to obtain information about the costs and benefits of keeping or removing a trade restriction. When Basin States and the MDBA do consult, they should take care to make this information generally available.

The MDBA could provide greater opportunity for public scrutiny by publishing the Basin States' reasoning that each surface water restriction is in place, sent to the MDBA under section 12.19. Further, by publishing the assessments of the consistency of trade restrictions against the trading rules and the MDBA's decisions regarding compliance, this may assist others with understanding how to apply the assessment framework.

The MDBA should do more to communicate to members of the public about the processes for getting potential trading rule issues investigated. A first step in this effort would be to provide a link to the MDBA's *Report a breach of the Basin Plan* webpage from the main Basin Plan trading rules webpage.[110]

110 https://www.mdba.gov.au/managing-water/water-markets-trade/basin-plan-water-trading-rules

It is unlikely that all restrictions on trade will be consistent with the Basin Plan trading rules by July 2019. However, the Commission is less concerned with States meeting this commitment set in the Basin Plan Implementation Agreement and more concerned about an ongoing commitment by Basin States and the MDBA to improve compliance with the trading rules over time. The Commission expects that the new compliance policy and the additional improvements to its processes will lead to a more proactive approach and greater discipline by the MDBA in closing unresolved matters with Basin States. These changes should also enable any remaining compliance issues to be uncovered over time and resolved.

DRAFT RECOMMENDATION 10.1

The Murray-Darling Basin Authority (as Basin Plan Regulator) should:

- develop and publish an assessment framework for evaluating the consistency of trade restrictions against the Basin Plan trading rules, which gives guidance about how to estimate the costs and benefits of removing trade restrictions
- specify the timeframes that it will endeavour to meet in resolving trading rule compliance matters
- notify Basin States whether the ten unresolved matters raised with them amount to non-compliance and what action is required by Basin States to resolve them
- publish the reasons given by Basin States for restrictions on surface water trade
- publish its compliance determinations and the assessments that support each determination.

10.3 Market information and transaction costs

Market information and market confidence have improved as a result of the Plan

Basin States and the MDBA have made good progress in implementing the Basin Plan requirements aimed at improving market information and market confidence. The MDBA has published the characteristics of the 70 most traded types of entitlements for regulated surface water systems in the Basin, using a consistent template (MDBA, sub. 86).

> … the Commonwealth Environmental Water Holder, and South Australian and Victorian water organisations have put protocols in place to ensure that staff, who are aware of an upcoming water announcement, do not trade until the information is public. (MDBA. sub. 86, p. 46)

> NSW does not currently provide information on the disclosure of relevant interests where the approval authority is a party to the trade. … It is anticipated that this issue will be addressed through a negotiated workplan with the MDBA. In addition, a Market Sensitive Information Policy is being finalised along with guidelines on the 'Communication of Market Sensitive Information' and 'Breach Management'. (DOI (NSW) 2017, p. 13)

Basin Governments have implemented or committed to implementing new arrangements to improve price reporting (Queensland Government, sub. 87; DOI (NSW) 2017; South Australian Government, sub. 85). The MDBA has announced that the accurate reporting of water trade prices will be one of its compliance priorities in 2018-19 (MDBA 2018h).

There is still room to reduce transaction costs

Implementation of the Basin Plan requirements related to improving market information and market confidence contribute to the Basin Plan objective to minimise transaction costs on water trades (s. 5.07(1)(b)).

Participants have identified a range of ways to improve market information and reduce transaction costs. For example, the National Irrigators' Council (sub. 15) reported that the market is often not easy to use or access and that trade rules can be complex and any work to explain or make processes more transparent would be worthwhile. Coleambally Irrigation Co-operative Limited (sub. 38) commented on the variability of the accessibility and usability between different state water registers and the need to improve them. The Lower Edward River Pumpers & Landholders (sub. 63), Ricegrowers Association of Australia (sub. 70) and Cotton Australia (sub. 47) would like real-time processing of water trades.

Many of the concerns raised echo those raised with the Commission as part of its inquiry into National Water Reform in 2017. In that inquiry, the Commission found that market information provided by governments and the private sector has improved but that there was room for States and Territories to improve the quality and accessibility of trade data in their water registers (PC 2017b). The Commission also recommended that the Australian Government commission an independent review of the effectiveness and efficiency of service standards for trade approvals, which considers whether the standards should require shorter approval times. The Commission will review progress on this issue and opportunities for further reform in its 2020 review of National Water Reform.

DRAFT FINDING 10.2

New information and reporting requirements specified under the Basin Plan trading rules are largely in place.

10.4 Responding to emerging risks from greater trade

Risks emerging from more open trade

Although the Basin Plan requirements are about *removing* inconsistent trade restrictions, participants to the inquiry have raised concerns about a separate but related matter — the potential need for *new* trade restrictions to manage emerging risks.

Trading might push up against delivery constraints

The ACCC (2018, p. xi) noted that 'some regions are experiencing significant changes in land use and crop types, which influence water use, trade and delivery patterns'. These changes have been made possible because of reforms such as the Basin Plan trading rules and those that preceded it, which have deregulated trade. For example, the expansion of the almond industry in the Victorian lower Murray has resulted in large volumes of water being traded into this region from other parts of the southern Basin (ABARES 2018).

Growth of trade has increased demands on delivery capacity and put pressure on delivery constraints (MDBA, sub. 86). Changes to delivery patterns — both changes in geographic location and the times of the year when water is ordered — can lead to a situation where the river channel capacity cannot meet demand at peak times.

Water users are seeking a policy response to this issue to protect property rights. The Lower Edward River Pumpers & Landholders (sub. 63), Murray Valley Private Diverters (sub. 69) and the Southern Riverina Irrigators (sub. 29) noted that increased water demand for new horticulture developments in the lower Murray could result in channel capacity sharing issues that could compromise prior rights to extract water.

Participants to the inquiry have also raised concerns about inadequate protection of the environment and other third party effects from trade. Damage to upstream rivers due to unseasonal high flows to meet water demand downstream can affect environmental values and cause erosion that reduces the delivery capacity of the system (GVEG, sub. 13; Murray Valley Private Diverters, sub. 69).

A strategic and collaborative approach to managing emerging risks

The consideration and implementation of new trade restrictions is a state responsibility, Basin Governments should ensure that understanding pressures on delivery constraints is a priority for water resource managers.

Where trade restrictions are in connected systems across Basin States, then there is a case for States collaborating to determine the best response to issues related to changes in trade patterns, water use and delivery capacity constraints. To reflect joint state decision-making, authority on these matters would sit with the Basin Officials Committee (BOC). Just as it does under the MDB Agreement, BOC may ask the MDBA (as an agent of the States) to provide advice or technical expertise on these issues.

The MDBA has been working with Basin States to understand the delivery capacity issues in the southern-connected system (sub. 86). This work is being undertaken as part of the MDB Agreement joint venture and is overseen by BOC (MDBA, pers. comm., 3 August 2018). Findings may inform part of the Trade Adjustments Project (described below) (MDBA 2017r).

It is unclear exactly what work is being done because little information has been made public. Given the growing public concern about delivery capacity issues, Basin States should be more transparent about their work plan. Part of the role of water resource managers is to oversee and communicate policy changes to the water market.

More generally, Basin States should take care that their responsibility to have oversight of market operations does not fall by the wayside. Effective water resource management requires Basin States to be proactive market managers that identify market risks, not just respond to them. The MDBA (sub. 86), DAWR (sub. 81) and ACCC (2017b) have suggested that there is a need for more integrated and agile responses to improve the management of the water market.

As water markets evolve, new opportunities may emerge to improve the efficiency of the market. For example, the MDBA (in its advisory role under the MDB Agreement) and Basin States have been working on the Trade Adjustments Project. The project is exploring how to improve the processes that adjust state water shares when water is traded between States, which could lead to improvements in the transparency and efficiency of some trade restrictions in the southern Basin (MDBA 2017r).

DRAFT FINDING 10.3

Growth of trade has increased demands on delivery capacity and put pressure on delivery constraints in some parts of the Basin. A range of community members are concerned about the effects on third parties and the environment.

Basin States and the Murray-Darling Basin Authority are aware of this strategic policy issue, but the process to resolve it is unclear.

DRAFT RECOMMENDATION 10.2

Basin Governments should set and publish a work plan within the next 12 months that describes how delivery capacity and constraint issues associated with changes in water use and trade will be investigated and managed. The work plan should specify responsibilities, timeframes and how this information will be communicated to the water market.

Basin Governments should assign the Murray-Darling Basin Authority (as an agent of governments) responsibility for identifying and managing risks related to changes in water use and trade in connected systems.

Trade restrictions may not be the best policy response

The lowest cost and most effective solution to delivery pressures may not be new trade restrictions. The Commission's inquiry into National Water Reform mentioned the potential for tradeable rights to the capacity of a congestion point on a river to replace some trade

restrictions (PC 2017b). Alternatively, engineering solutions could be used to ease some constraints (this sort of policy response is somewhat analogous to the projects aimed at easing constraints that restrict the delivery of environmental water (chapter 4)).

New trade restrictions may ultimately be an appropriate response to delivery constraint issues but in the first instance river operators should clarify delivery capacity at different times of the year and under different climatic scenarios, and consider whether river operations can be modified to meet changes in water demand.

Potential conflicts in the MDBA's role

Basin States would need to notify the MDBA, as regulator of the Basin Plan trading rules, of any new trade restrictions. The new restrictions may then be subject to investigation by the MDBA as part of compliance processes.

This highlights how the MDBA's multiple responsibilities, functions and relationships in relation to water trading could be a contributing factor to slow progress on compliance with the trading rules. The MDBA's Water Trade Team is part of the Office of Compliance division but is also involved in joint venture work for Basin States under the MDB Agreement. Chapter 14 of this report sets out how these conflicting roles can be effectively addressed.

11 Environmental water planning and management

Key points

- The Basin Plan builds on previous State and joint Basin Government reforms. It defines an increased share of water for the environment and sets out a new range of requirements to promote the effective planning and management of environmental water.
  - The Australian Government has recovered water entitlements to bridge the gap from historical levels of extraction to the new Sustainable Diversion Limits. These entitlements are actively managed by environmental water holders to achieve the environmental objectives and outcomes of the Basin Plan.
- Achieving the environmental outcomes of the Basin Plan is predicated on the implementation of an agreed set of pre-requisite policies by Basin States to support the efficient use of environmental water. There is some risk that these pre-requisite policy measures will not be fully implemented by all Basin States by 30 June 2019.
- The Basin Plan includes an Environmental Management Framework which sets out the guiding principles and processes to coordinate the planning, prioritisation and use of environmental water. The Framework facilitates co-operation between the Commonwealth and State environmental water holders and local environmental asset managers. Overall, this has operated well.
  - Over 750 environmental watering events have occurred over the past five years, targeted at specific environmental outcomes linked to the long-term objectives of the Plan.
  - There are signs that the environment is responding positively to environmental watering activities with some evidence of improved ecological outcomes at the local and system scale.
- Key planning processes, including the Basin-wide environmental watering strategy and long-term watering plans, are mostly in place. Improving these plans by providing clearer guidance on the relative priority of key environmental assets would enhance the accountability of environmental water managers to achieve the outcomes of the Basin Plan. Annual Basin-wide planning can be rationalised for efficiency.
- Informal intergovernmental arrangements for coordinated environmental watering have been established in the southern Basin. By 2020, Basin States should formalise these and establish equivalent arrangements in the northern Basin. The Commonwealth Environmental Water Holder should establish processes to enable event-based environmental watering decisions.
- Opportunities to achieve social or cultural outcomes with environmental water should be actively pursued by environmental water holders when doing so does not compromise environmental outcomes.
- Achieving the environmental objectives of the Basin Plan will require more than just environmental watering. Basin States should plan for and deliver complementary waterway and natural resource management measures.

Under the COAG water reform agenda, all States and Territories committed to providing a legally recognised share of water for the environment and addressing over-allocation of water resources (chapter 3). These commitments were implemented by:

- providing planned environmental water (through water sharing arrangements) — which involves imposing rules or obligations on water resource managers and/or consumptive water users to leave a residual flow in the river and associated wetlands
- supplementing this in a number of systems with held environmental water — which involves acquiring water entitlements (with the same conditions and legal properties as those held by consumptive users) that can be actively managed to achieve environmental outcomes.

Since the late 1990s, Basin Governments have worked to address over-allocation through their own water planning and water entitlement purchasing programs. For example, in 2004 in the River Murray, a joint Basin Government initiative — The Living Murray — was agreed, which recovered around 500 GL from the consumptive pool to be used for the environment.

During the Millennium Drought, Basin Governments agreed that, despite these efforts, Basin water resources were still over-allocated and further reform was needed to achieve environmental sustainability. They agreed to develop the Basin Plan to reset the balance between environmental and consumptive uses of water. The Plan represented a step change in the management of the Basin and established an increased share of water for the environment by reducing diversions to a new Sustainable Diversion Limit (SDL) and ensuring the protection of planned environmental water.

Water recovery programs were implemented to 'bridge the gap' between historic levels of use and the new SDLs (chapter 3). Of the water recovered to meet the new SDLs, a significant portion is held by the Australian Government as water entitlements, managed by an independent statutory body established under the *Water Act 2007* (Cwlth) — the Commonwealth Environmental Water Holder (CEWH).

The Plan also sets high-level outcomes and more specific environmental objectives that, if met, will improve the health of Basin ecosystems. Achieving these outcomes requires sustaining or improving the environmental condition of rivers, floodplains and wetlands across the Basin at the local asset, catchment, connected system and Basin-wide scale. To do this, the Commonwealth and State environmental water holders, local environmental asset managers and water resource managers need to work together to use environmental water effectively. The Basin Plan provides a framework for the planning and management of environmental water to facilitate co-operation between Basin Governments and assist in coordinating their planning and annual decision making. A key change arising from the Plan has been a more prominent and ongoing role for the Australian Government.

This chapter assesses the effectiveness of implementation of the Basin Plan's requirements for environmental water planning and management, and considers:

- requirements to establish an increased share of water for the environment and ensure its effective use
- the long-term planning frameworks for achieving environmental objectives through environmental watering
- the annual planning and management of environmental water.

Providing water for the environment is essential but not sufficient to achieve environmental outcomes. This chapter also identifies measures that sit outside the Basin Plan that will be necessary to achieve the Plan's environmental outcomes from environmental water management.

11.1 Background

Overview of Basin Plan requirements

The Basin Plan outlines a number of specific targets, outcomes and objectives that are relevant to environmental water planning and management. Monitoring and evaluation of environmental outcomes is covered in detail in chapter 13.

Chapter 5 of the Basin Plan outlines the management objectives and outcomes to be achieved in relation to the environment of the Basin. Objectives include to:

- protect and restore water-dependent ecosystems and ecosystem functions
- ensure water-dependent ecosystems are resilient to climate change
- ensure environmental watering is well coordinated between relevant parties.

Chapter 8 of the Basin Plan also outlines a number of specific environmental objectives for water-dependent ecosystems, while Schedule 7 sets out intermediate targets (to be met up to 30 June 2019) and longer term targets for maintaining flows, river condition, hydrological connectivity and water-dependent species such as vegetation, birds and fish.

To achieve these outcomes the Basin Plan requires:

- water recovery to bridge the gap and enable the SDLs to commence on 1 July 2019 (chapter 3)
- Basin States to implement pre-requisite policy measures (PPMs) by 30 June 2019 to enable more efficient use of environmental water
- Basin States to develop Water Resource Plans (WRPs) by 30 June 2019, which include provisions to enable environmental watering between connected water resources and to ensure that there is no net reduction in the protection of planned environmental water

- the implementation of the Basin Plan 'Environmental Management Framework'[111].

The inclusion of the Environmental Management Framework in the Basin Plan recognises that there are multiple parties involved in environmental watering, each with their own statutory responsibilities (box 11.1). The Environmental Management Framework aims to facilitate consultation, coordination and co-operative arrangements amongst all of these key players to ensure effective and efficient planning and management of all environmental water (i.e. both planned and held) to achieve the objectives of the Basin Plan.

Box 11.1 Major parties involved in environmental watering

There are a range of parties involved in environmental water planning and management.

- **The Commonwealth Environmental Water Holder (CEWH)** holds and manages environmental water on behalf of the Australian Government, guided by the Basin Plan and the Basin-wide environmental watering strategy.
- **Basin State environmental water holders**, such as the Victorian Environmental Water Holder and the New South Wales Office of Environment and Heritage, manage their own State water portfolios and allocate their water to achieve State priority objectives.
- **River operators and waterway managers** store, manage and deliver water (including environmental water) within particular areas of the Basin.
- **Local environmental asset managers** manage the actual delivery of water to environmental assets and aim to achieve on-ground outcomes at the local scale.

The Environmental Management Framework builds on the policies and arrangements that were previously in place within Basin States, and those underpinning the collaborative arrangements for delivering environmental water in The Living Murray. The Framework combines a top-down and bottom-up approach and operates over two time scales:

1. Long-term (5–10 year) environmental water planning to achieve environmental outcomes.
2. Annual environmental water planning to inform environmental watering decisions.

How the Commission has assessed effectiveness

The effectiveness of environmental planning and management has been assessed by gauging the extent to which the:

- supporting measures outlined in the Basin Plan (such as WRPs and PPMs) are, or will be, in place
- required planning documents are, or will be, delivered within the agreed timeframes set out in the Basin Plan

111 Contained within Part 4, Chapter 8 of the Basin Plan.

- content of those planning documents influences decision making and contributes to achieving the environmental outcomes and objectives of the Basin Plan
- actual planning and management of environmental water, including coordination between environmental water holders has, and will likely continue to have, facilitated meeting the environmental outcomes and objectives of the Basin Plan.

In making recommendations, the Commission has acknowledged that environmental water management at the Basin scale is relatively new and complex. Environmental water management will continue to evolve as a number of processes relevant to the Basin Plan are completed over the next five years and beyond. For example:

- finalisation of the held water portfolio from gap-bridging water recovery (chapter 3)
- the implementation of supply and constraint easing measures (chapter 4)
- additional water recovery (chapter 5), which is aimed at achieving the enhanced environmental outcomes outlined in Schedule 5 of the Plan.

The recommendations outlined in this chapter largely seek to improve current environmental watering planning frameworks and remove barriers to effective management. The Commission has aimed to maintain the flexibility of environmental water managers during this period to provide the capacity to learn through experience and adaptively improve management, while increasing their accountability to deliver the outcomes of the Plan. The Commission will further examine the arrangements for environmental watering in its 2023 review of Basin Plan implementation.

11.2 Establishing the share of water for the environment

The Basin Plan requires planned environmental water to be identified through Water Resource Plans (WRPs), to ensure that there is 'no net reduction' relative to past arrangements for planned environmental water (chapter 6). WRPs must also ensure that environmental watering events can be coordinated between connected WRP areas — enabling environmental water to be shepherded through the system.

Planned water is supplemented by environmental water entitlements held by Basin State environmental water managers (including those entitlements recovered by pre-Basin Plan programs) and the additional water recovered under the Basin Plan to bridge the gap which is mostly held by the CEWH (chapter 3).

In addition to setting rules for the protection of planned environmental water and recovering water for the environment, the Basin Plan contains other measures that facilitate its effective use. When the Basin Plan was made and SDLs were determined, it was assumed that the Basin's rivers would be managed in a way that maximised environmental outcomes. One way this was assumed to occur is through implementation of pre-requisite policy measures (PPMs).

Pre-requisite policy measures

PPMs, referred to as 'unimplemented policy measures' in the Basin Plan[112], are operating rules which enable more efficient use of held environmental water. PPMs provide the capacity to credit environmental return flows for downstream environmental use (rather than it being used to meet the demands of other users) and allow the call of held environmental water from a specific storage to top-up or 'piggy-back' on unregulated flow events.

Basin States are required to implement PPMs by 30 June 2019. Failure to fully implement the PPMs by the target date will influence the Murray-Darling Basin Authority's (MDBA's) assessment of potential adjustments to SDLs proposed as part of the supply measures under the SDL adjustment mechanism (chapter 4). PPMs were assumed in the original modelling to establish the SDLs as well as in the model used to determine the environmental equivalence of supply measures. If PPMs are not implemented, overall water recovery would need to rise considerably when reconciliation of the total water recovery target is completed in 2024 (chapter 4). According to the MDBA (2017n, p. 2):

> … if the PPMs are not addressed, it is estimated that the Basin Plan outcomes could only be achieved with a SDL reduction of more than 4000 GL. … unless PPMs are addressed, it will not be possible to achieve any significant offsets from the SDL adjustment mechanism.

If Basin States do not implement PPMs by 30 June 2019, the MDBA may recalculate SDLs. It was agreed by the SDL Adjustment Assessment Committee that New South Wales, Victoria, South Australia and the MDBA (for the River Murray) would develop PPM Implementation Plans by June 2016, setting out the steps needed to implement PPMs by June 2019. The MDBA will assess the effectiveness of Basin State policies in addressing the PPMs.

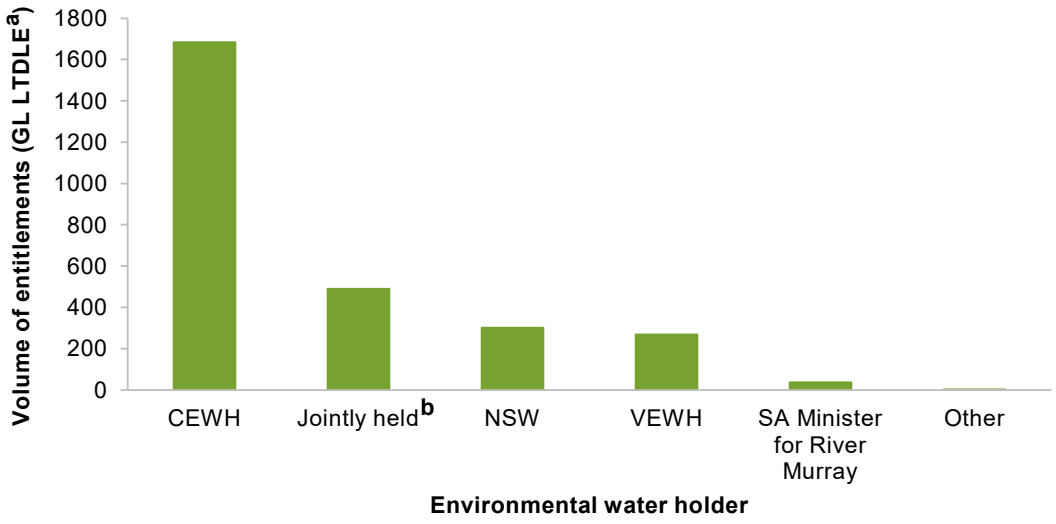
Assessment of implementation

Recovering water for the environment is mostly on track (chapter 3), with 1995.8 GL (LTAAY) provided to environmental water holders against the target of 2075 GL (DAWR 2018h). The vast majority of water recovered under the Basin Plan is held by the CEWH (figure 11.1). As at 30 June 2018, the CEWH managed around 2700 GL of entitlements with a long term average annual yield of approximately 1900 GL[113] (DEE 2018). Environmental water recovered under earlier State reforms such as NSW RiverBank and The Living Murray, and a small amount of gap-bridging water, is held by Basin States. As at May 2018, approximately 20 per cent of all water entitlements in the Basin are now managed for the environment (DEE 2018; MDBA 2016i).

112 Chapter 7, Part 2, Division 4.

113 The volume of the CEWH's holdings is lower than the volume of gap bridging water recovery because some gap bridging water is managed by Basin State environmental water holders, and some contracted water recoveries are yet to be delivered to the CEWH.

Figure 11.1 **Held environmental water entitlements in the Basin by owner**
As at 30 June 2016



[a] Long-term diversion limit equivalence factors estimate the actual long-term use associated with water entitlements, allowing them to be compared on 'equal terms' (DOI (NSW) 2018f). [b] Entitlements held by multiple governments, such as those acquired through The Living Murray program.

Source: MDBA (2017e).

The relative prominence of the CEWH's environmental water holdings varies between catchments. For example, in the Lower Darling the CEWH owns 40 per cent of all high security entitlements and 28 per cent of general security entitlements, while in Murrumbidgee the CEWH holds only 3 per cent of all high security entitlements and 15 per cent of general security entitlements (DEE 2018; MDBA 2016i).

The relative share of held and planned water also varies considerably with location — with the northern Basin consisting mainly of planned environmental water, and the majority of held environmental water presiding in the southern Basin. More than 80 per cent of the CEWH's gap-bridging water entitlements are held in the southern Basin (DAWR 2018h).

The development and accreditation of WRPs is behind schedule. Provisions to protect planned environmental water in WRPs are to be submitted by Basin States to the MDBA for accreditation by 30 June 2019. However, there are concerns in some WRP areas (such as in the Barwon-Darling) that there is insufficient time remaining to properly consult with stakeholders on the significant rules changes that are proposed to protect planned environmental water and to enable shepherding (chapter 6).

Pre-requisite policy measures

New South Wales, South Australia and Victoria have submitted their plans for implementing PPMs and these have all been approved by the MDBA. These States have all conducted PPM

pilot projects and trials in the southern Basin. However some of these arrangements are yet to be formalised, and a number of PPM implementation issues remain unresolved, primarily in New South Wales. A number of participants[114] raised concerns around the likelihood of PPMs being implemented on time. These related to:

- the apparent lack of progress in conducting the hydrological modelling required to understand the magnitude of potential third party impacts of PPMs and the drafting of new rules required to implement PPMs[115]
- the lack of public consultation[116] needed to gain local insights, test the complex proposed rule changes with those who will be affected, and promote community confidence that PPMs will result in no adverse impacts on third parties
- the lack of transparency[117] and independent public assessment of PPM implementation
- risks that PPMs will negatively impact existing water users[118] by restricting their ability to extract water, thereby reducing the value of water entitlements.

In New South Wales, there is a lack of publicly available information regarding the timeframe and process for implementing PPMs. The New South Wales Government indicated that PPMs would be implemented through provisions in state water sharing plans and procedure manuals (DPI (NSW) 2017d). The CEWH has flagged that the New South Wales PPM Implementation Plan does not adequately facilitate the use and protection of environmental water (as quoted in DAWR 2018f). It remains a risk that New South Wales will not have implemented PPMs within the legislated timeframe.

Victoria and South Australia appear to be largely on track to have in place the policy mechanisms required to implement PPMs by the target date. Both States have already implemented return flow provisions. However, DAWR (2018f) raised concerns that current arrangements in both States do not adequately facilitate the movement of environmental water across multiple locations.

Overall, there is a lack of clarity around the processes and timelines for implementing the PPMs before June 2019. It is unclear if there is a common understanding between Basin States and the MDBA of the MDBA's process for assessing the implementation of PPMs.

114 Including Environment Victoria (sub. 73), Goulburn Valley Environment Group Inc. (sub. 13), Namoi Water (sub. 82), National Irrigators' Council (sub. 15), New South Wales Irrigators' Council (NSWIC, sub. 80).

115 NSWIC (sub. 80).

116 Lower Edward River Pumpers & Landholders (sub. 63) and Murray Valley Private Diverters Inc. (sub. 69).

117 Wentworth Group of Concerned Scientists (sub. 42).

118 Coleambally Irrigation Co-operative Limited (sub. 38) and Southern Riverina Irrigators (sub. 29).

DRAFT FINDING 11.1

Although the Murray-Darling Basin Authority has approved the Pre-requisite Policy Measure (PPM) Implementation Plans for all relevant Basin States, there is some risk that PPMs will not be implemented by 30 June 2019.

Improving implementation

WRPs are to include rules for protecting planned environmental water and to enable connected system watering. The Commission recommends extending the timeframe for WRP development and accreditation in limited circumstances to allow for adequate community consultation and negotiation of substantive changes to water management rules in chapter 6. These issues, in some WRP areas, represent substantive changes to water management rules and would justify a delay in WRP accreditation, to ensure that the quality of WRPs is not compromised.

When implementing arrangements to facilitate PPMs, Basin States should ensure they are fully in place by June 2019, and that these arrangements are sufficiently flexible to allow for refinement over time.

11.3 Long-term planning for environmental water

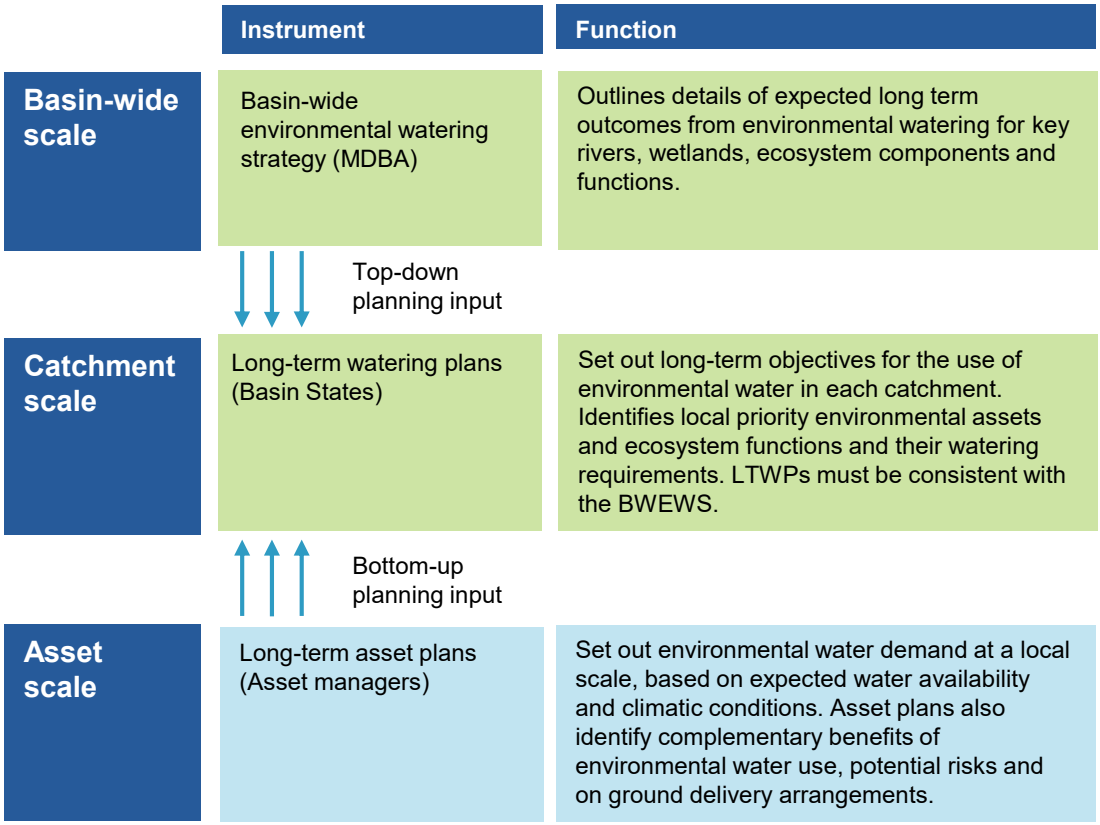
The Environmental Management Framework sets out requirements to guide the long-term planning of environmental water. These are summarised in figure 11.2.

Under the Basin Plan[119], the MDBA must prepare a Basin-wide environmental watering strategy (BWEWS). The BWEWS:

- outlines the expected detailed long-term outcomes from environmental watering for priority rivers, wetlands and key ecosystem components and functions
- explains the context within which annual environmental watering priorities will be developed
- helps to coordinate the management of environmental water at the Basin scale by setting policies and principles for prioritising use of environmental water under different climate scenarios.

119 Chapter 8, Part 4, Division 2.

Figure 11.2 **Long-term environmental water planning architecture[a]**



[a] Documents highlighted in green are formally required by Basin Plan. Documents highlighted in blue are not formally required by the Basin Plan.

Once the BWEWS is finalised, Basin States must prepare a long-term watering plan (LTWP) for each surface water WRP area. LTWPs must be consistent with the BWEWS and:

- set out the long-term objectives for the use of environmental water
- identify local priority environmental assets and ecosystem functions
- provide details of the watering requirements needed to meet the corresponding ecological targets outlined in the Plan.

LTWPs can be informed by long-term asset plans for individual assets. These asset plans are developed by managers of individual environmental assets, often as a requirement of State legislation or policy.

Monitoring and evaluation (chapter 13) will also be important for ensuring effective use of environmental water. The Basin Plan[120] sets out the program for monitoring and evaluating the effectiveness of the Basin Plan, including the effectiveness of environmental water

120 Chapter 13, Part 3, Division 2.

planning and management. The Basin Plan requires the MDBA to conduct a review of the Environmental Watering Plan every five years.

Assessment of implementation

Basin-wide environmental watering strategy

The first BWEWS was published in 2014, consistent with the legislated timeframe within the Basin Plan. This BWEWS outlined the expected outcomes for river flows and connectivity, native vegetation, waterbirds, and native fish over the next decade, given the new SDLs and current operating rules and procedures (MDBA 2014a). The 2014 BWEWS was informed by long-term asset plans (where these were in place) and MDBA modelling. The BWEWS must be reviewed every five years, with the next due for publication in 2019.

The BWEWS is being successfully utilised by managers of environmental water.

- The CEWH has used the BWEWS as a key input to inform its portfolio management planning approach (CEWO 2016). In its annual reporting to the MDBA, the CEWH has provided Statements of Assurance that it has performed its functions and exercised its powers in a way that is consistent with the BWEWS.
- Basin States have used the objectives outlined in the BWEWS as the basis for catchment-level objectives outlined in LTWPs (for example, in DELWP (Vic) 2015) and to inform the development of State annual environmental watering priorities.

The Commission considers the BWEWS to be a useful part of the Basin Plan's environmental planning framework. It provides the strategic direction on the expected outcomes of environmental watering and the policies and principles for making environmental watering decisions across the Basin. Its formal articulation of specific Plan environmental objectives and expected outcomes will become an increasingly useful yardstick against which the effectiveness of environmental water management can be measured.

However, the field of environmental water management is evolving rapidly. Environmental water managers are learning from experience, adapting to new knowledge, working more closely with river operators and experimenting with more complex multi-site and connected system watering events. They are also learning more about the water requirements of ecosystems under different climatic conditions.

If the BWEWS is to remain relevant as the overarching strategy guiding environmental watering in the Basin it will need to evolve, incorporating new knowledge and contemporary policy. The 2014 BWEWS was developed on the basis of government policy and the best available scientific knowledge at the time. Given the progress made, the 2014 BWEWS has limitations including the absence of clear guidance on:

- connected watering events in the Northern Basin

- the priority for achieving flow connectivity at the system scale relative to watering within an individual WRP area
- the relative importance of the criteria for determining priorities for environmental water use, particularly under different climatic scenarios
- the relative importance of a number of listed priority environmental assets and functions for maintaining the ecological health of the Basin as a whole
- how secondary, non-environmental outcomes should be considered.

DRAFT FINDING 11.2

The 2014 Basin-wide environmental watering strategy (BWEWS) has provided a strategic foundation for the environmental water planning of significant environmental water holders and has been used to inform their portfolio planning and watering decisions.

The 2014 BWEWS does not provide clear guidance on how to prioritise those assets or types of watering events that are most important for achieving the Basin Plan objectives and expected outcomes.

Long-term watering plans

At the catchment level of long-term planning, the majority of LTWPs (13 out of 20) — mainly those located within New South Wales (9) and Queensland (3) — are yet to be published (MDBA, pers. comm., 9 August 2018). Some Basin States have negotiated with the MDBA for an extension to the initial Basin Plan deadline for completing LTWPs, ranging from mid-2018 to 30 June 2019 (MDBA 2017l). Where they have been prepared, Basin States have taken different approaches to developing LTWPs. While some LTWPs contain predictions of expected environmental water demands for environmental assets in each catchment, others contain more aspirational targets.

LTWPs provide detail on the magnitude, nature and location of the demand for environmental water at the regional scale, and are a valuable resource for managers of environmental water. The CEWH (sub. 75) stated that LTWPs are highly useful in informing their decision making. However, participants[121] raised a number of concerns regarding the implementation of LTWPs:

- LTWPs may become codified, and Basin States should balance the need to provide certainty with the need to allow flexibility. The CEWH (sub. 75) advocated for flexible and adaptable management of environmental water and suggested that LTWPs should be 'living documents' — able to be improved as operational practices improve and as new information becomes available.

121 Including Namoi Water (sub. 82), NSWIC (sub. 80) and the Wentworth Group of Concerned Scientists (sub. 42).

- LTWPs may be too aspirational, and are seen as a 'shopping list' of environmental actions that give no consideration to matching demands with the likely supply of environmental water. The content of LTWPs varies significantly between Basin States, with some setting targets that are highly ambitious and only achievable under highly favourable circumstances, such as with the removal of all constraints and under favourable natural conditions. The Commission heard concerns regarding the feasibility of some targets within South Australia's LTWPs, and in particular flow-rate targets for the Murray Mouth. Unrealistic targets are not useful for environmental water managers and may prevent effective environmental watering and monitoring at the catchment level.
- LTWPs are not independently accredited. This creates a risk that targets specified in some LTWPs may not align with the BWEWS or be fully consistent with the objectives and outcomes sought by the Basin Plan as a whole. The Wentworth Group of Concerned Scientists (2017) suggested that LTWPs should be aligned with Basin Plan targets, the BWEWS and WRPs as part of an accreditation process.

DRAFT FINDING 11.3

Only seven out of 20 long-term watering plans (LTWPs) have been developed and published, with the remaining 13 due to be published by the ACT, New South Wales and Queensland Governments by 30 June 2019 or earlier.

LTWPs are likely to be an important component of the Environmental Management Framework as they are:

- undertaken at the catchment scale and facilitate top-down and bottom-up input
- a mechanism to facilitate local input into environmental water planning activities and the prioritisation of assets within a catchment.

Basin States have adopted different approaches to specifying priorities, objectives and targets in LTWPs.

Improving implementation

Basin-wide environmental watering strategy

The BWEWS is the overarching strategy that drives the planning framework for environmental watering under the Basin Plan. When developing the next iteration of the BWEWS in 2019, the MDBA should refine the strategy to build on the learnings of the past five years by:

- considering the LTWPs and contemporary local asset plans that have been developed by Basin States
- incorporating new knowledge, including that generated from the Northern Basin Review, relevant research, and the learnings of recent experiences of event-based management and multi-site watering

- reflecting recent changes to government policy, including the Australian Government's recent commitment of $40 million to support Indigenous investment in cultural and economic water entitlements in the Basin (chapter 7).

To address the shortcomings identified above, the 2019 BWEWS should:

- include explicit objectives to maximise environmental outcomes and to achieve additional cultural and social outcomes where these do not compromise environmental outcomes
- articulate the relative importance of the priorities for achieving Basin-wide outcomes
- provide clearer guidance on priorities for system connectivity.

Increasing the specification of the BWEWS will provide greater direction to, and accountability for, the CEWH. The CEWH is obligated under the Water Act to manage its portfolio in a manner that is consistent with the Basin Plan's Environmental Watering Plan and to report annually against the achievement of objectives under the Plan when deploying its water portfolio. By better articulating the relative priorities of assets in connected systems, the BWEWS will encourage the CEWH, as the largest water holder in the Basin, to shift its focus from smaller-scale environmental watering activities to undertaking larger-scale coordinated events.

In developing the 2019 BWEWS, it is critical that the MDBA consults widely and harnesses the experiences of environmental water holders, river managers, local asset managers and their local communities.

DRAFT RECOMMENDATION 11.1

The Murray-Darling Basin Authority, when developing the next five-year Basin-wide environmental watering strategy in 2019, should strengthen its value as the key strategic plan governing environmental watering across the Basin by:

- including a clear objective to 'maximise environmental outcomes through effective and efficient environmental water management'
- including a secondary objective that environmental watering should seek to achieve social or cultural outcomes, to the extent that environmental outcomes are not compromised
- providing clear guidance, under all water availability scenarios, on the relative priority of key Basin environmental assets (including instream assets) to achieving the overall environmental objectives of the Basin Plan and the expected outcomes set out in the strategy
- providing clear guidance, under all water availability scenarios, on the priority for achieving flow connectivity at the system scale relative to watering within an individual Water Resource Plan Area.

Long-term watering plans

While LTWPs are still in the implementation phase, the Commission has identified some areas for improvement to be considered as LTWPs are progressively reviewed. There may be scope for LTWPs to be made more consistent across jurisdictions (as outlined above), and in the longer term, LTWPs should articulate realistic long-term objectives for the use of environmental water. More consistent LTWPs will also facilitate improved coordination of environmental watering between Basin States by outlining the environmental watering requirements in different locations in a consistent manner.

LTWPs must be reviewed at least every five years. To drive greater consistency and ensure improvements in the BWEWS are incorporated into LTWPs, the MDBA should provide clear guidance material to Basin States on the expected content of LTWPs following the publication of the 2019 BWEWS. This guidance material should be utilised by Basin States when revising LTWPs (within five years of initial publication), and will improve consistency across LTWPs and accountability of Basin States in implementing them. The MDBA should consult widely when developing guidance material for LTWPs. Strategic input should be sought from those who utilise LTWPs, including asset managers and environmental water holders and managers, to ensure that their utility for decision making can be improved over time.

The Basin Plan does not outline any requirements regarding the publication of LTWPs. Transparency around the development of LTWPs would be improved if the MDBA maintained a register of LTWPs on its website, including relevant deadlines, progress towards completion and final documents when they are completed. Since LTWPs are reviewed at least every five years, this function would also be useful to publicly communicate the current status of LTWPs following their initial completion by 30 June 2019.

As LTWPs are still in the establishment phase, and most are still in the development phase, the Commission will revisit these issues around alignment and accountability in its next Basin Plan Implementation Inquiry scheduled for 2023.

DRAFT RECOMMENDATION 11.2

Following the publication of the 2019 Basin-wide environmental watering strategy (BWEWS), the Murray-Darling Basin Authority (MDBA) should provide clear guidance material to Basin States on the expected content of long-term watering plans (LTWPs) when they are revised. This guidance material should include the need for LTWPs to articulate:

- realistic long-term objectives to be achieved from the available environmental water portfolio through watering activities within current operational constraints
- environmental watering requirements in the catchment including the required magnitude, timing and frequency of watering for priority assets, ecosystem functions and system connectivity
- the relative priority of assets within the catchment for achieving the objectives of the Basin Plan and the expected outcomes of the BWEWS
- the risks to the achievement of the long-term watering objectives.

The MDBA should seek the strategic input of asset managers and environmental water holders and managers when preparing this guidance material to ensure that the utility of LTWPs for environmental water decision making can be improved over time.

To improve the accessibility of information, the MDBA should maintain a register of LTWPs on its website, including relevant deadlines, progress towards completion, final documents when they are completed, and the status of each plan as they are reviewed and adapted over time.

11.4 Annual planning and environmental water delivery

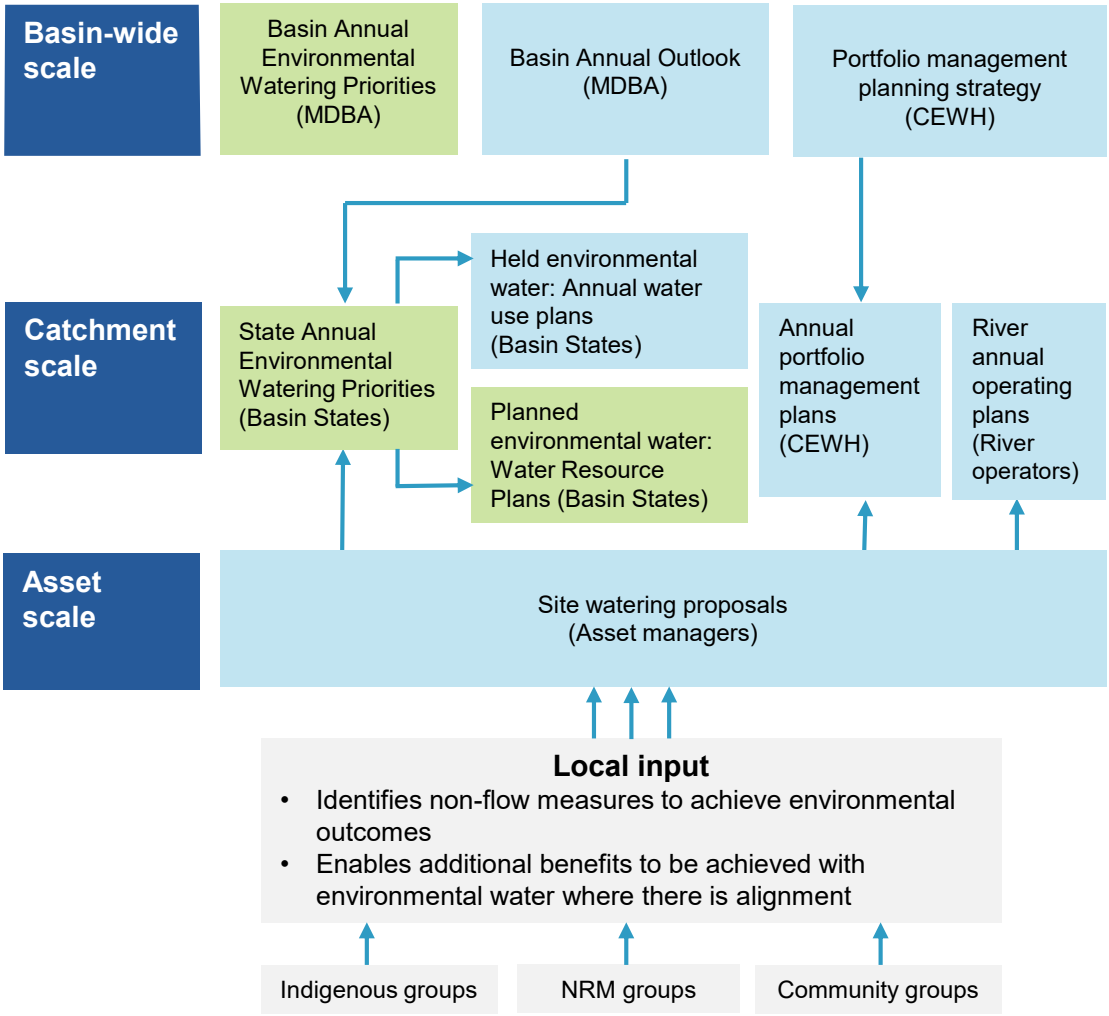
Annual planning documents

The Environmental Management Framework sets out the requirements to guide annual planning of environmental watering. These plans guide the water use decisions of environmental water holders (figure 11.3). The Basin Plan requires:

- the MDBA to identify Basin annual environmental watering priorities (Basin AEWPs) to guide the management of environmental water at the Basin-scale for a given water year. These may identify priority environmental assets and ecosystem functions that have Basin-scale significance or require complex arrangements and any potential synergies in environmental watering activities. Basin AEWPs must be consistent with the BWEWS and may be informed by State priorities. The Basin AEWPs must be published by 30 June each year.
- Basin States to identify annual environmental watering priorities (State AEWPs) in each WRP area that contains surface water, guiding the annual planning, prioritisation, and

use of environmental water at the catchment scale[122]. State AEWPs must have regard to the BWEWS and relevant LTWPs and outline priorities for the watering of priority environmental assets and ecosystem functions within each catchment. State AEWPs must be handed to the MDBA by 31 May each year unless otherwise agreed.

Figure 11.3 **Annual environmental water planning architecture**[a]



[a] Documents highlighted in green are formally required by Basin Plan. Documents highlighted in blue are not formally required by the Basin Plan.

The Basin Plan requires State AEWPs to be consistent with Basin AEWPs. However, recognising that State AEWPs are published prior to Basin AEWPs, the MDBA also publishes a Basin-wide annual environmental watering outlook in April each year. The outlook is not required by the Basin Plan, but provides a preliminary list of Basin-wide priorities to facilitate State planning (MDBA 2017l).

122 Chapter 8, Part 4, Division 4.

When developing State AEWPs, Basin States consider planned environmental water arrangements (as outlined in WRPs) and their own planning instruments for held environmental water that are not required under the Basin Plan. For example:

- State AEWPs are informed in a 'bottom-up' manner by **local asset plans** (developed by the owners of particular environmental assets).
- In many areas where they possess held water, Basin States develop **annual plans for water use** in collaboration with the CEWH and river operators (MDBA 2016b) such as Victoria's Seasonal Watering Plan, New South Wales' annual watering plans and the Annual Environmental Watering Plan for the South Australian River Murray.
- The CEWH develops **annual portfolio management plans** for all catchments where the Australian Government holds water, informed by local asset plans and Basin States' annual plans for water use.

These planning documents, while not formally required by the Basin Plan, are a crucial part of the Basin's 'bottom-up' environmental water planning architecture. They are useful tools for Basin States when developing State AEWPs and are therefore important for achieving the environmental outcomes of the Plan.

Coordination of environmental watering

The Basin Plan outlines a number of principles[123] to be applied in managing environmental water. For example, environmental watering must be coordinated and information on environmental watering must be transparently shared between the MDBA, DAWR, Basin States and environmental water managers to ensure it is used efficiently and effectively. Environmental watering must also be undertaken in a way that utilises local knowledge and experience, and considers wider impacts.

Assessment of implementation

Annual planning documents

While it is still relatively 'early days' for environmental water management, overall the arrangements set out in the Plan are working well. There are signs that the environment is responding positively to environmental watering activities, including a reduced decline in waterbird abundance, positive responses from native fish, and improved growth and diversity of native vegetation (chapter 2).

Environmental water holders have worked co-operatively with the MDBA and Basin States towards achieving the environmental objectives of the Plan (MDBA, sub. 86). The CEWH has incorporated input from local communities through various forums (Natural Capital Economics 2017). Environmental water holders have determined annual priorities in

123 Chapter 8, Part 4, Division 6.

consultation with each other and their local communities, and have developed individual portfolio management plans outlining their intended environmental watering actions. Using these processes throughout the previous five years, over 750 environmental watering events have occurred within the Basin, targeted at specific environmental outcomes linked to the long-term objectives of the Plan (MDBA, sub. 86).

Both Basin and State AEWPs have been completed within required timeframes each year. The Commission heard that State AEWPs have been fundamental for articulating what is needed at the local level on an annual timeframe. State AEWPs are used as a basis for priority-setting and coordination in the southern Basin, and also assist in informing the CEWH's environmental water portfolio plans (CEWH, sub. 75).

However, there were questions raised by participants[124] about the usefulness of Basin AEWPs for managers of environmental water. For example, participants argued that:

- Basin AEWPs are released too late in the year to be useful for planning. The MDBA's earlier seasonal forecast — the Basin environmental watering outlook — fulfils the role of a 'draft' set of Basin AEWPs and is seen as a more useful, high level document that helps to inform local priorities
- Basin AEWPs have been viewed merely as a check-list, rather than actually directing environmental watering decisions
- annual priority setting has shifted towards 2–3 year planning in some areas.

DRAFT FINDING 11.4

The Basin annual environmental watering priorities:

- do not add value to the decision making of environmental water managers as they are released too late for consideration in their planning processes
- are becoming increasingly redundant as significant environmental water holders are moving to rolling multi-year plans.

Coordination of environmental watering

To facilitate coordination for the delivery of environmental watering events, the Basin States, the CEWH and the MDBA established the Southern Connected Basin Environmental Watering Committee (SCBEWC) in 2015. SCBEWC is a collaborative, non-binding forum that brings together environmental water holders, asset managers and river operators to prioritise effort and resources to meet environmental needs in the southern connected Basin, and is valued by its members[125]. This enables the value of environmental watering to be

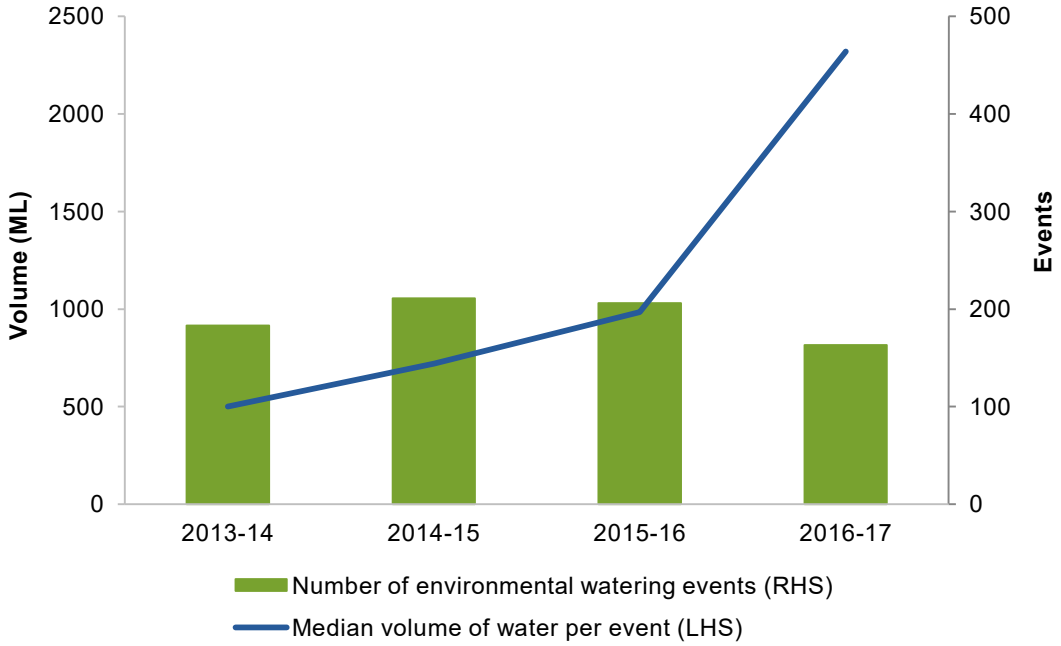
124 Including Cotton Australia (sub. 47) and the Gwydir Valley Irrigators Association Inc. (sub. 83).

125 Including the CEWH (sub. 75) and the MDBA (2017l).

maximised and can include both multi-site watering and coordinated releases from multiple storages along the connected system.

SCBEWC has been highly successful in increasing the coordination of environmental watering in the southern Basin. From 2014-15 to 2015-16, the share of environmental watering events that were coordinated across multiple water holders in the southern Basin increased from 18 per cent to 33 per cent (MDBA 2017l). The yearly number of environmental watering events occurring throughout the southern Basin has fallen, while the total volume of water used has risen (figure 11.4).

Figure 11.4 **Coordination of environmental watering**



Source: MDBA (2017b).

Participants[126] identified the lack of a coordinated environmental watering forum in the northern Basin as a significant issue. Despite the absence of a forum, the first connected northern Basin environmental watering event took place in April 2018 (MDBA 2018p). This was a coordinated release from the CEWH (24 GL) and the New South Wales Office of Environment and Heritage (7 GL) to help maintain connectivity between river systems, and was accompanied by a New South Wales Government Ministerial Order imposing a temporary embargo on extraction by consumptive users.

126 Including McBride (sub. 78), MDBA (sub. 86) and NSWIC (sub. 80).

Improving implementation

Annual planning documents

In practice, Basin AEWPs are redundant to the decision making of environmental water managers due to the following planning arrangements:

- The BWEWS sets the long-term priorities at the Basin scale.
- State AEWPs set the annual priorities at the local scale, and are developed to be consistent with the BWEWS. These are also moving towards rolling multi-year plans, are informed by local input and help to inform the CEWH's portfolio planning.
- Coordination of environmental water holders through SCBEWC allows for trade-offs to be made at the connected-system scale.
- The Basin AEWPs are released too late to be useful for environmental water managers.

To streamline the process and remove unnecessary administration, the Basin Plan should therefore be amended to remove the requirement for the MDBA to produce annual watering priorities.

DRAFT RECOMMENDATION 11.3

The Basin Plan should be amended to remove the requirement for the Murray-Darling Basin Authority to produce Basin annual environmental watering priorities.

Coordination of environmental watering

Notwithstanding the success of established forums for coordination of environmental watering to date, there is scope for improvement. To ensure collaboration between environmental water managers continues to occur successfully, and to provide certainty, the structure and terms of reference of SCBEWC should be formalised under the auspices of the joint governance arrangements of Basin Governments.

Formal arrangements for coordination are also required for the northern Basin. The benefits of improved coordination in the northern Basin were demonstrated through the recent environmental watering event. However, this was facilitated through an ad-hoc arrangement. In order to identify future opportunities for these types of events, Basin Governments should establish a forum to facilitate intergovernmental co-operation. Given the success of SCBEWC, a similar committee in the northern Basin is required.

DRAFT RECOMMENDATION 11.4

By 2020, Basin Governments should:

- agree to formalise the role of the Southern Connected Basin Environmental Watering Committee as the mechanism for intergovernmental coordination for environmental watering. Governance arrangements including terms of reference, membership and reporting responsibilities should be established
- establish a Northern Connected Basin Environmental Watering Committee as a mechanism for intergovernmental coordination for planning and coordinating connected environmental watering events in the northern Basin.

The dynamic nature of the operating environment of the Basin means that the CEWH's portfolio plans are not able to determine with certainty precisely what environmental decisions will occur throughout the year. In some systems, particularly in the northern Basin, unregulated flow events mean that the CEWH will be required to make real-time decisions about the use of its portfolio.

The need to make these event-based decisions means that processes to consult and coordinate with key stakeholders in real-time will be critical. These processes should also be transparent so that stakeholders are aware of how the CEWH makes decisions in real time. Where possible, these processes should build on existing arrangements for environmental watering or event management.

DRAFT RECOMMENDATION 11.5

Where not yet in place, the Commonwealth Environmental Water Holder (CEWH) should set out the processes it will use to consult and coordinate with key stakeholders to make event-based watering decisions — including water managers, asset managers and other environmental water holders.

These processes should be in place and documented in the CEWH's 2019-20 annual portfolio management plans.

11.5 Maximising the benefits of environmental water

Additional uses and benefits of environmental water

In addition to maintaining and improving environmental outcomes, environmental water can frequently provide a number of secondary uses and benefits. For example, water released for environmental purposes can, in some instances, provide for Indigenous water values and uses (chapter 7) or improve amenity and recreational activities. These additional benefits can often be achieved without compromising the primary environmental benefits sought by the use of environmental water, and in many cases align with the overall objectives of the Basin

Plan[127]. For example, a number of participants[128] emphasised the importance of environmental water for recreation and tourism, and suggested that these benefits have not been adequately considered.

Understanding of these additional values and uses is required to enable opportunities for alignment with environmental water use to be identified. The identification of these opportunities must occur at the local scale, and community engagement is therefore critical. Engagement with Traditional Owners and Indigenous groups is also crucial to developing this understanding by allowing for the identification of cultural uses of environmental water, and increasing the efficiency of environmental water use by harnessing traditional ecological knowledge.

Processes for identifying additional values from environmental water use are already in place in some areas. For example, Basin States have identified Traditional Owner water objectives and outcomes through the development of WRPs (chapter 7). However, further effort is required to enable this to feed into asset and catchment scale planning across the entire Basin.

All Basin States and environmental asset managers should have formal processes for engagement with local communities and Traditional Owners, in order to identify opportunities to achieve social or cultural outcomes with environmental water while ensuring environmental outcomes are not compromised. These should be in place in time for the first revision of LTWPs.

DRAFT RECOMMENDATION 11.6

Before the first revision of long-term watering plans, Basin States and environmental asset managers should have processes to engage with local communities and Traditional Owners. These activities should identify opportunities to achieve social or cultural outcomes with environmental water, while ensuring environmental outcomes are not compromised.

Achieving environmental outcomes requires more than water

The provision of environmental flows, while necessary, is not always sufficient to achieve environmental outcomes. A range of non-flow related measures and activities need to be managed, mostly at the local scale, to maximise the benefits of environmental water use and ensure the achievement of the environmental outcomes outlined in the Plan. Examples of

127 For example, Chapter 5 of the Plan outlines the objective to 'optimise social, economic and environmental outcomes arising from the use of Basin water resources in the national interest' and the outcome of a healthy and working Basin that includes communities with sufficient and reliable water 'fit for a range of intended purposes, including domestic, recreational and cultural use'.

128 Including Environment Victoria (sub. 73), Riverina and Murray Regional Organisation of Councils (sub. 27) and Watson (sub. 54).

non-flow measures and activities important for facilitating the efficient use of environmental water and achieving the environmental objectives of the Basin Plan include:

- complementary waterway management activities, or '**complementary works**'. These refer to activities that protect or enhance rivers, wetlands and estuaries, and include the management of pest plants and animals, habitat restoration, water quality improvement and management of riparian corridors and catchment land (PC 2017b).
- the management of '**environmental works**'. These take the form of water management infrastructure such as regulators and levees, designed to facilitate the efficient delivery of environmental water to particular sites. For example, a suite of environmental works were built as part of The Living Murray, and continue to be developed under the Basin Plan's SDL adjustment mechanism.

Despite their importance for achieving the Basin Plan's objectives, these non-flow factors operate outside of the formal requirements of the Plan and are the responsibility of State Governments. Numerous participants[129] raised the lack of explicit requirements for complementary works in the Plan as an issue.

The approach taken to implement these non-flow measures varies across the Basin. Environmental water and complementary works tend to be managed by separate bodies, which can lack the authority or incentives to coordinate the development of their priorities (PC 2017b). The Commission's National Water Reform Inquiry (2017b) found that, of the Basin States, New South Wales and Queensland have the least integrated arrangements, while more robust arrangements for integrating water and waterway management exist in Victoria, South Australia and the ACT. In the latter cases, legislation provides a clear direction to align water and natural resource management (NRM) planning and this is implemented through institutions and policy frameworks that draw on the expertise of local managers.

As outlined in section 11.4, the risks to achieving the environmental outcomes of the Basin Plan should be identified in LTWPs. This should include identifying when environmental water delivery requires coordination with complementary works to achieve Plan outcomes. For example, providing environmental water to a particular wetland may only increase native fish populations if waterway managers also maintain wetland vegetation, reduce weeds and install screens to exclude carp (PC 2017b).

Identifying the need for complementary works in LTWPs provides some assurance that Basin States, environmental water holders, and NRM managers are aware of the issues and seek to align their management practices where appropriate. It also helps to ensure that environmental watering is being undertaken in the broader context of State NRM priorities and planning.

129 Including Cotton Australia (sub. 47), Lachlan Valley Water Inc. (sub. 49), NSWIC (sub. 80) and Speak Up Campaign Inc. (sub. 18).

The Commission's National Water Reform Inquiry (2017b) recommended State and Territory Governments ensure the management of environmental water is aligned and coordinated with complementary works at the local level by applying consistent management objectives and, where possible, a single planning process.

DRAFT RECOMMENDATION 11.7

Basin States should manage the risks to achieving the environmental watering objectives set out in long-term watering plans by delivering complementary waterway and natural resource management measures (such as habitat restoration or weed and pest control).

12 Compliance

Key points

- The *Water Act 2007* (Cwlth) assigns responsibility for ensuring compliance with the Basin Plan to the Murray-Darling Basin Authority (MDBA). However, Basin States remain responsible for water take compliance under state water laws.
- There are seven areas of the Basin Plan where the MDBA has compliance responsibility, namely: Water Resource Plans (WRPs); Sustainable Diversion Limits; water trading rules; water quality; illegal take; planning and protection of environmental water; and improving the metering and measurement of water take. Its full compliance role comes into effect on 1 July 2019, after WRPs are accredited. For the most part, assessing compliance in these areas involves assessing the actions of Basin States.
- Until late 2017, the MDBA had a limited focus on preparing for its upcoming compliance role. It is now implementing a range of actions including establishing an Office of Compliance and an Independent Assurance Committee.
- The MDBA has roles in both implementing and ensuring compliance with the Basin Plan. To internally separate these conflicting functions, the MDBA should immediately house all its compliance functions within the Office of Compliance.
- A Four Corners report into water management in the Basin, particularly in the northern Basin, caused serious concern and reduced confidence in state compliance regimes. A number of reviews were instigated. The message was that Basin States must be more active, consistent and transparent in enforcing water take laws.
- Basin Governments have instigated changes in response to these reviews. The New South Wales Government has established the Natural Resources Access Regulator, the Queensland Government has released a rural water management program and Basin Governments have released a Compliance Compact (yet to be endorsed by COAG).
- A key focus of the Compliance Compact is on improving metering as a basis for more transparent monitoring of water take.
  - Basin States should consider the role, costs and benefits of consistent metering policies and implementation plans should be supported by publicly available business cases.
  - Basin Governments should work with Standards Australia to revise metering standards to ensure quality and cost effectiveness in water measurement.
- There is confusion surrounding the MDBA's compliance and enforcement role in illegal take.
  - Enforcement of illegal water take is the responsibility of Basin States.
  - The MDBA's main role is to provide assurance of Basin State compliance and enforcement systems through conducting audits and investigating state practices and processes.
  - The MDBA should publicly report instances where Basin States are not effectively responding to concerns of illegal water take.
  - If this is ineffective, the MDBA should use system-wide policy levers such as Sustainable Diversion Limit accounting compliance mechanisms to enforce limits on water take.
- The Productivity Commission will review the efficiency and effectiveness of the new compliance arrangements in 2023.

Compliance is a key element of Basin Plan implementation. There are various compliance activities and responsibilities across different aspects of the Plan. The Murray-Darling Basin Authority (MDBA) is responsible for taking actions to enforce compliance with the Basin Plan and Water Resource Plans (WRPs) (including Sustainable Diversion Limit (SDL) compliance). Basin States are responsible for ensuring compliance with their own water laws, such as rules governing water take. Compliance regimes need to be effective and efficient (keeping cost to a reasonable level) while ensuring community confidence in water management regimes.

The first section of this chapter examines compliance with the Basin Plan, focussing on the MDBA's role, its response to compliance reviews and the inherent conflicts in the MDBA managing multiple roles and responsibilities. The second section discusses water take compliance including participants concerns, recent policy responses to compliance reviews and the roles of the Basin States and the MDBA in water take compliance.

12.1 Compliance with the Basin Plan

The *Water Act 2007* (Cwlth) is a Commonwealth legislative instrument and as such the Australian Government is accountable for assuring compliance under the Act. Under section 137 of the Water Act, the MDBA is assigned as the 'appropriate enforcement agency' for contraventions relating to Part 2 of the Water Act (Management of Basin Water Resources, including the Basin Plan) and the information gathering provisions of Part 10 of the Act.

The MDBA's role for ensuring compliance with the Basin Plan (including compliance with SDLs and WRPs) comes into full effect in July 2019, after WRPs are accredited. Its role in ensuring compliance with the Basin Plan trading rules came into effect when the rules commenced in 2014.

The MDBA's compliance role

The MDBA compliance and enforcement policy (MDBA 2018g) lists the areas of the Basin Plan where the MDBA has compliance responsibilities. These are summarised below, including a reference to where each area is discussed in more detail in this report. For the most part, assessing compliance in each of these areas involves assessing the actions of Basin States.

Sustainable diversion limits (SDLs, chapter 6)

The MDBA ensures compliance with the SDLs, which are limits on the amount of water that can be sustainably taken from the Basin and used for consumptive purposes. The MDBA is required to maintain and publish a register of water take annually, including the cumulative balance of permitted and actual take for each WRP Area (MDBA 2018g, p. 13). Where

jurisdictions do not comply with the SDL they are required to make good by reducing the cumulative balance of the register to zero.

Water Resource Plans (WRPs, chapter 6)

Developed by the Basin States, assessed by the MDBA and accredited by the Minister, WRPs are the key instrument through which Basin States implement SDLs and other requirements of the Basin Plan (such as critical human water needs and water quality) and through which the MDBA regulates state-level activities. The Water Act requires that an agency of a Basin state, an operating authority, an infrastructure operator or a holder of a water access right must not act inconsistently with a WRP or fail to act as required by a WRP. The MDBA's compliance role is to monitor and enforce compliance of all regulated entities with accredited WRPs. Once the WRPs are accredited, the MDBA and Basin States will need to ensure that state water laws and policies remain consistent with WRP requirements (MDBA 2018g, p. 12).

Planning and protection of environmental water (chapter 11)

The MDBA will report on compliance with environmental requirements under the Basin Plan, providing assurance that environmental water is protected in the Basin. It assesses WRP provisions relating to the identification and protection of planned and held environmental water and also assesses the effectiveness of Basin State policies in addressing pre-requisite policy measures (due to be implemented by June 2019). Commonwealth and State environmental water holders provide the MDBA with annual Statements of Assurance that they have performed their functions and exercised their powers in a way that is consistent with the Basin-wide environmental watering strategy.

Trading rules (chapter 10)

Trading rules are aimed at removing restrictions on trade and improving information in the market. The MDBA's compliance role includes ensuring that: restrictions on trade are compliant; water announcements are disclosed appropriately; irrigation infrastructure operators and Basin States meet information and reporting requirements; reporting of water trade prices is accurate; and use of exchange rates is compliant (MDBA 2018g, p. 17).

Illegal take (this chapter)

The MDBA provides assurance of the compliance and enforcement frameworks of each Basin State. For example, to improve confidence in the management of the Basin's water resources, it will conduct audits of Basin state compliance and enforcement processes. The MDBA's policy also states that the MDBA may directly regulate the compliance of individual water users with the Basin Plan, and it intends to do so in the absence of adequate action by a Basin State (MDBA 2018g, p. 14).

Water quality and salinity (chapter 8)

The Basin Plan sets out objectives and targets for water quality that aim to ensure that water quality is suitable for drinking, agricultural, recreational and environmental purposes. Basin States, river operators, the Basin Officials Committee and environmental water holders must have regard for water quality targets when making relevant water management decisions. The MDBA reports on whether objectives and targets are being met and provides assurance that Basin States and the Commonwealth Environmental Water Holder are having regard to water quality and salinity when managing flows and using environmental water. The MDBA must also monitor, assess and report on salinity levels in the River Murray (MDBA 2018g, p. 18).

Improving water metering and measurement of water take (this chapter)

The MDBA does not have regulatory functions in water metering, but will work to develop and implement methods to improve the accuracy of water measurement and increase the transparency of water take across the Basin. This includes the use of remote sensing and emerging technologies to support Basin Plan compliance and water compliance monitoring activities. (MDBA 2018g, p. 15)

Enforcement options vary by area of compliance

The enforcement options available to the MDBA vary by area of compliance (table 12.1).

In the compliance areas of SDLs, WRPs, planning and protection of environmental water, trading rules and illegal take, the MDBA can use declarations, enforceable undertakings, enforcement notices and investigations and audits using its power to request information to enable compliance action to be taken, if needed. In contrast, in the area of water quality, the MDBA's enforcement options are limited to non-judicial mechanisms such as investigations and audits, public reporting and data release.

Further, as Basin States are responsible for water take compliance, the MDBA does not have any enforcement mechanisms in the area of water metering. The MDBA's role in improving measurement and metering is limited to strategic oversight (this is discussed further in section 12.2).

Table 12.1 **MDBA compliance escalation pathways, by area of responsibility**

Sustainable Diversion Limits	*Water Resource Plans* *Planning & protection of environmental water*
Injunctions Declarations Growth in use response strategy Assessment of reasonable excuse claims Investigations and audits using power to request information Advisory letters and meetings Independent monitoring of water take Investigations and audits Public reporting Preparation of guidelines and technical and policy advice Capacity building Stakeholder education and engagement	Injunctions Declarations Enforceable undertakings Investigations and audits using power to request information Advisory letters and meetings Independent monitoring and audits Cooperative arrangements with other agencies Public reporting and data release Preparation of guidelines and standards Capacity building Stakeholder communication and engagement
Trading rules	*Illegal take*
Injunctions Declarations Enforceable undertakings Investigations and audits using power to request information Audits of high risk trade rules and issues Advisory letters and meetings Preparation of guidelines and standards and technical advice Public reporting and data release Capacity building Education and stakeholder engagement	Injunctions Declarations Enforceable undertakings Infringement notices Investigations and audits using power to request information Advisory letters Monitoring and evaluation, public reporting and data release (including allegations register) Audit, referral and investigation Preparation of guidelines, benchmarks and standards Stakeholder communication and engagement Capacity building
Water quality and salinity	*Improving metering and measurement of take*
Make good actions (such as for failure to report) Compliance audits using power to request information Advisory letters Cooperative audits Public reporting and data release Preparation of guidelines and standards Stakeholder communication and engagement Capacity building	Investigations and audits Public reporting and registers Development of new technology and compliance tools Basin Compliance Compact Community of practice Guidelines setting and technical and policy advice

Source: MDBA (2018g).

The MDBA is instigating change

Until late 2017, the MDBA had a limited focus on preparing for its role to ensure compliance with the Basin Plan. However, following evidence of non-compliance in the northern Basin which triggered a range of review processes (box 12.1), the MDBA acknowledged that it had given insufficient attention to the need for a clear statement of its compliance role and had not dealt adequately with allegations of compliance breaches.

The MDBA has also stated that it is committed to fixing compliance issues by implementing the recommendations of the *Murray–Darling Basin Water Compliance Review*, published in November 2017 (MDBA, sub. 86, p. 13). To this end, the MDBA is implementing a range of reform actions. Key amongst these are establishing an Office of Compliance and an Independent Assurance Committee (IAC).

The MDBA has established the Office of Compliance to address compliance concerns, provide accountability and ultimately increase the public's confidence and trust in the compliance regimes that support the Basin Plan. Its responsibilities include:

- setting compliance and enforcement policies and processes
- maintaining an audit program
- conducting investigations into allegations of non-compliance
- implementing compliance with the water trading rules
- developing best practice guidelines for different aspects of compliance
- benchmarking Basin State performance against best practice
- reporting publicly on compliance performance (MDBA 2018g, p. 7).

The MDBA has appointed an Independent Assurance Committee (IAC) to provide advice on the design, implementation and adequacy of the MDBA's compliance program. The committee comprises up to four experts in compliance, enforcement and regulation and was established under section 203 of the Water Act (with section 204 providing for the termination of member appointments by the MDBA at any time). The committee provides the MDBA with advice on its approach to compliance, and external assurance over how well this work is being implemented. It includes how the MDBA is managing conflicts of interest involving its Basin Plan responsibilities and the operation of the River Murray. The IAC's advice is to be made public. (MDBA 2018g, p. 7).

Other MDBA compliance reforms and commitments include: an online register to report on the handling and progress of compliance matters reported to the MDBA; protocols for handling allegations of breaches under the Basin Plan; and a Memorandum of Understanding with the New South Wales Natural Resources Access Regulator, to underpin a strong and cooperative approach to compliance (MDBA 2018a).

Box 12.1 Compliance reviews in response to issues raised by Four Corners

The broadcast of an ABC Four Corners program ('Pumped') in July 2017 raised issues about water management (including compliance) in the Barwon-Darling river system in New South Wales and generated considerable public interest. The program described cases of alleged non-compliance with water laws and regulations in New South Wales, and raised broader questions about the effectiveness of compliance and enforcement regimes. The episode resonated with Basin communities, raising issues that many had been concerned about for years.

Basin Governments, concerned with eroding community confidence and its impact on the implementation of the Basin Plan, initiated a number of investigations into compliance at both the Basin-wide and state level (table below).

The Murray-Darling Basin Authority (MDBA) and an Independent Panel conducted the *Murray-Darling Basin Water Compliance Review* at the request of the Australian Government. It assessed the legislative, policy and practical implementation of water management compliance across the Basin. In particular, concerns were raised about a lack of comprehensive reporting on compliance, deficiencies in the compliance efforts of some water regulators (including the commitment to accurate metering and measurement of water take) and relatively low levels of compliance resourcing in some Basin States. On release of the review the MDBA said:

> All Australians must be able to have trust and confidence in the MDBA's handling of compliance matters — so we will be more transparent and consistent in how we handle allegations of non-compliance. We will be revising our compliance and enforcement strategy and framework, providing a clear escalation pathway, and reporting publicly and regularly on handling and progress of compliance matters. (MDBA 2017m)

The MDBA and Basin States are in the process of implementing recommendations from the review.

Key compliance reviews

Date	*Author*	*Title*
September 2017	Mr Ken Matthews AO	*Independent Investigation into NSW Water Management and Compliance, interim report*
November 2017	Mr Ken Matthews AO	*Independent Investigation into NSW Water Management and Compliance, final report*
November 2017	Ombudsman NSW	*Investigation into water compliance and enforcement 2007–17, progress report*
November 2017	MDBA and the Independent Review Panel	*The Murray-Darling Basin Water Compliance Review*
November 2017	The Australian National Audit Office	*A limited assurance review of the Department of Agriculture and Water Resources' assessment of New South Wales' protection and use of environmental water under the National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin.*
March 2018	Ombudsman NSW	*Investigation into water compliance and enforcement 2007–17, final report*
March 2018	Independent Expert Panel	*Independent audit of the Queensland Government's regulatory frameworks for water measurement and compliance*

In line with these reforms, the MDBA sets compliance priorities for each water year based on a risk assessment for each of its compliance areas. The MDBA's 2018-19 priorities on high-level threats to Basin Plan compliance include:

- adequacy of compliance and enforcement of unauthorised take in the northern Basin (particularly the Barwon-Darling)
- protection of environmental water
- WRP assessment and development
- accurate reporting of water trade prices
- accurate measurement of water take and use (MDBA 2018h).

DRAFT FINDING 12.1

The Murray-Darling Basin Authority's reforms of its regulatory approach (including the establishment of an Office of Compliance) are a step forward in establishing its capability, but it is too early to gauge the likely effectiveness of the new arrangements. The Productivity Commission will examine these in its 2023 review of Basin Plan implementation.

There are inherent conflicting functions within the MDBA

The MDBA is managing multiple roles and responsibilities. On the one hand, the MDBA has a key role in the implementation of the Basin Plan, including providing technical advice to the Basin States and acting as their agent in a number of project areas. On the other hand, the MDBA is responsible for assessing how well it is undertaking these multiple roles and providing assurance that that it is complying with provisions in the Water Act and the Basin Plan. The MDBA explained:

> Where the MDBA has a specific role in complying with provisions in the Water Act and the Basin Plan, it will publish details of its performance in its annual report, including details of any independent auditing of its own activities to provide assurance that it is acting in accordance with the Basin Plan. If at any time the MDBA is found to be non-compliant with the Water Act or Basin Plan, it will move immediately to remedy the situation, with full public disclosure on the non-compliance and steps taken to address it. (MDBA 2018g, p. 4)

In effect, the MDBA is regulating itself. For example, the MDBA designed and developed the business case for the Hydro-cues supply measure project on behalf of the Basin Officials Committee. The MDBA was then responsible for assessing this project's contribution as part of the suite of supply measures and determining proposed SDL adjustments. In the next stage of implementation the MDBA will provide technical support to Basin States to implement key supply measure projects and will also be responsible for conducting SDL reconciliation.

Other areas where conflicts may occur between the MDBA's implementation and compliance responsibilities include:

- environmental planning — the MDBA coordinates environmental flow planning and management, and is also responsible for ensuring alignment of environmental watering with the requirements of the Basin Plan
- water trading rules — the MDBA informs and implements inter-valley and interstate trading rules, assesses deliverability, and is also responsible for ensuring compliance with water trading rules.

Chapter 14 discusses the principles of good governance. Key amongst these is that conflicting functions should be managed through the separation of regulatory, service delivery and policy making roles. The establishment of the MDBA's Office of Compliance provides an avenue to internally separate the MDBA's compliance role from its Basin Plan implementation functions. Conflicting functions have the potential to undermine accountability, bias judgment and decision making, erode trust in compliance regimes and tarnish the MDBA's public image.

Under the MDBA's operational structure only a partial separation has been achieved. In particular, two key areas of compliance (SDLs and WRPs) remain housed within other divisions of the MDBA, outside the MDBA's Office of Compliance. A more logical and effective structure would be to house all MDBA compliance responsibilities within the Office of Compliance.

But, even if compliance functions are fully contained in the Office of Compliance, they remain under the remit of the MDBA, and the potential for conflicts will persist. The MDBA has recognised this lack of independence through the establishment of the IAC.

The IAC is a good first step but is not truly independent. IAC member appointments can be terminated by the MDBA at any time (under section 204 of the Water Act) and the MDBA also has the ability to provide procedural direction to the IAC as to the way it carries out its functions and holds meetings (section 205).

The success of the Basin Plan is dependent on confidence in the integrity of compliance arrangements. Independent and transparent compliance arrangements are critical to ensure that decisions are made on an objective, impartial and consistent basis.

The inherent risk from the MDBA's conflicting responsibilities must be resolved. As a first step, the MDBA should immediately, internally separate its Basin Plan implementation role from its compliance role by housing all compliance functions in the Office of Compliance. However, this will not fully address the inherent conflict between the MDBA's policy implementation and compliance roles. Chapter 14 examines governance solutions over the longer-term.

DRAFT RECOMMENDATION 12.1

As a transitional measure, the Murray-Darling Basin Authority should house its Sustainable Diversion Limit and Water Resource Plan compliance functions within the Office of Compliance, before its compliance role comes into full effect in July 2019.

12.2 Water take compliance

Illegal take is the take or use of water without authorisation from the relevant state regulatory authority. Illegal take occurs when:

- an individual takes water for which they do not have a water access right
- a water user takes water in contravention of:
  - conditions attached to a water access right (such as conditions as to total volume, rate or timing of take)
  - a works approval (such as location, pump size or use of a compliant meter)
- illegally built works interfere with the flow of water for the purpose of taking it (such as bores or levees) (MDBA 2017u, p. 118).

Illegal take is a crime which affects neighbours, downstream water users, and the environment.

Basin States are responsible for water take compliance

State water management laws govern the take of water by establishing when water may be taken, and under what conditions. Generally, a limited amount of water for non-commercial domestic or stock use (which is a very small proportion of total water take) may be taken without a licence. However, individuals can only take water for other purposes with a water licence issued by the relevant state authority.

In the Murray-Darling Basin, the Basin States are responsible for 'on the ground' water take compliance such as monitoring water take through meter checks and other information gathering, and enforcing their own laws with respect to water access.

State agencies have access to a range of penalties and sanctions for enforcing illegal water take under state laws. These include verbal and written warnings, fines, licence suspension and imprisonment.

There is overwhelming concern about water take compliance

Significant concerns have been raised (by Four Corners and in reviews) about compliance and enforcement of water take laws (box 12.1). In particular, the review undertaken by the MDBA and an Independent Panel found that 'all Basin State regulators need [to] be more active, consistent and transparent in enforcing compliance' and that 'compliance systems and activities in some jurisdictions are more effective than in others' (MDBA 2018f). The MDBA reported:

> There are significant variations between the Basin states in the degree to which there is a culture of compliance, the level of resourcing, the extent of transparency, the comprehensiveness and clarity of the policy framework and the kinds of challenges posed by compliance. (MDBA 2017u, p. 12)

By Basin State, the review found that:

- New South Wales faces the challenges of having the greatest number of licences, greatest volume of take and the largest geographic area. It also has a significant volume of unregulated water and floodplain harvesting, which is difficult to measure and assess whether there has been a compliance breach. Tackling compliance has been a low priority in the 20 water agencies that have been responsible for compliance in New South Wales in the past 20 years. The absence of a culture of compliance, organisational instability and limited resourcing have meant that compliance has relied heavily on custom and practice, resulting in a lack of effectiveness, consistency and transparency.
- Queensland has had the least experience with developing a compliance culture. Overland flow harvesting is more significant in Queensland than it is in New South Wales (where it is referred to as floodplain harvesting). Like New South Wales, Queensland's limited compliance resources face the challenges of distance and an industry with some very large entitlement holders.
- in Victoria, the review examined compliance within Goulburn Murray Water, the largest water authority in the Basin in Victoria. It reported that remote sensor meters efficiently provide accurate, real-time data on take. As a networked system, the interdependence of irrigators yields a culture of compliance. The specific issue to be addressed in Victoria is the lack of a full suite of penalties and sanctions.
- South Australia has had a long commitment to a compliance culture. Its compliance framework is the most extensively codified by way of guidelines for staff, transparent and decision-making responsibilities are clear. However, it faces an ageing meter fleet.
- in the ACT water take compliance is the most manageable of the Basin States. All licensed water extraction must be metered. With a small area to cover, staff are able to audit meters regularly and monitor compliance effectively. (MDBA 2017u, pp. 12–13)

Concerns with water take compliance were raised in all 14 public forums held by the Commission, and by an overwhelming number of inquiry participants in submissions. On the one hand, inquiry participants spoke of the importance of compliance and an intolerance for cheating. For example, the Murray Darling Association, Region 6 said:

> The allegations of non-compliance in NSW are of serious concern to our community … Proper compliance of water rules is crucial for ensuring community confidence in Basin Plan outcomes along the entire length of the river. In times of severe drought, communities at the end of the system need confidence that upstream States and water users are doing the right thing and that Basin Plan environmental watering will operate as expected. (sub. 74, p. 7)

And the National Irrigators' Council stated that it:

> has zero tolerance for water theft. Water is a valuable and expensive asset and irrigators are disadvantaged if someone else is able to undercut them in their production costs. (sub. 15, p. 3)

On the other hand, a number of inquiry participants suggested that non-compliance was not wide-spread, and that water take concerns are isolated to a small number of areas. Cotton Australia commented:

> Cotton Australia supports a very robust and transparent compliance regime, and it is clear from recent revelations and inquiries that the current regime is lacking. However, Cotton Australia does not believe that the current 'compliance environment' is as broken as many portray and is confident that the vast majority of the Basin's … licence holders have done and will continue to do the right thing. (sub. 47, p. 11)

And this view was also supported in reviews. For example, Ken Matthew reported:

> There continues to be strong and broad-based stakeholder support for firm and speedy action to fix the compliance and enforcement system. … irrigators have expressed concern to me that the Four Corners program and my report have left an impression that non-compliance by irrigators is rife across the state. I want to make clear that that is not my view. The overwhelming honest majority of NSW irrigators take compliance seriously themselves and are firmly in favour of action against the small minority who may not be playing by the rules. They too, want the system fixed. (Matthews 2017, p. 1)

Change has been instigated

In response to reviews, change has been instigated. At the Basin State level:

- the NSW Government has responded to concerns raised in the Matthews' report on New South Wales water management and compliance with the publication of a Water Reform Action Plan. Key amongst these actions is the establishment of the Natural Resources Access Regulator, which has investigation powers and will determine when to commence prosecutions or use other enforcement tools in cases of non-compliance. (MDB Ministerial Council 2018b, p. 13)
- the Queensland Government has released a rural water management program to deliver actions across four themes — appropriate regulatory frameworks, strengthened metering, transparent water information and robust compliance that builds community confidence. For example, robust compliance includes an education and awareness program, regulatory actions focused on priority areas, and up-to-date formal compliance processes. (Queensland Government 2018b)

Together, the Australian Government and Basin States have agreed on and recently released a Compliance Compact (yet to be endorsed by COAG). It is a collaborative approach that aims:

> to restore public confidence in water resource management in the Basin by providing transparency and accountability of surface and groundwater management and regulation, and a consistent approach to compliance and enforcement practices by governments across the Basin. (MDB Ministerial Council 2018b, p. 1)

The compact establishes priorities for reform, work plans that will be regularly reported and a response to recent compliance reviews. It focusses on five key compliance and enforcement themes including metering and measurement, transparency and accountability, compliance and enforcement frameworks, finalising WRPs and protecting and managing environmental water (MDB Ministerial Council 2018b).

It is too early to gauge the likely effectiveness of new arrangements in improving compliance and confidence in the Basin Plan. Going forward, a commitment to SDL compliance, transparency, ongoing reporting of the progress of implementing reforms and (in time) evaluating the effectiveness of the changes along with adaptive management of compliance regimes will be instrumental in fostering long-term confidence in water take compliance in the Murray-Darling Basin.

DRAFT FINDING 12.2

Compliance reforms by Basin State Governments are a step forward in improving water take compliance regimes. Their efficiency and effectiveness will be reviewed in 2023 by the Productivity Commission.

Metering is a key focus area for reform

Understanding water availability and water take is instrumental to managing the Basin's resources. Metering is a key means of collecting information on the water take of entitlement holders in the Basin. The MDBA commented:

> Metering is critical to good water use management by irrigators, to water managers quantifying water volumes and the amount available for extraction, and for public confidence in the robustness of water sharing, by assuring the community that entitlement holders are extracting the volumes of water they have been allocated. Metering is important to the social licence under which water is taken. It constitutes the way in which an entitlement holder demonstrates how they have acquitted themselves. (MDBA 2017u, p. 36)

While it is possible to meter all significant take from the Basin's watercourses it is not possible to meter all forms of take — in these instances, estimates of water take is measured rather than metered. The MDBA reported:

> Floodplain harvesting, or overland flows, in the northern Basin are the most prominent example [of non-metered water take], with recent estimates at 210 GL annual take (noting the high uncertainty of this estimate). In this regard, storage level recorders calibrated by volumetric survey data of

> individual storages are an important source of data. Farm dams and forestry plantations are also instances of non-metered take. For these forms of take, the hydrometric network and hydrological modelling are the way in which estimates are derived. (MDBA 2017u, p. 19)

Many participants to this inquiry emphasised that accurate metering and measurement are essential for water management, compliance and community confidence.

> All water take must be measured with the majority of take metered through highly accurate devices. All measurement must be auditable, verifiable and within accuracy requirements, but that accuracy and measurement methodology may vary depending on the establishment of state-wide thresholds and or the category of water take. (Gwydir Valley Irrigators Association, sub. 83, p. 17)

And many also expressed concern about a lack of metering in the northern Basin.

> There continues to be concern amongst the community about the inequity in metering requirements amongst valleys within the Basin. The issue of a lack of metering in the Northern Basin (particularly in the northern NSW section) must be considered as a matter of urgency. (Wentworth Shire Council, sub. 48, p. 2)

The MDBA compliance review reported that in 2015-16, 64 per cent of Basin surface water take was metered but there were wide disparities between Basin States. For example, 96 per cent of surface water take was metered in South Australia in 2015-16, compared with 29 per cent in the northern Basin. Similar disparities were also reported in groundwater metering — in 2015-16, 91 per cent of groundwater take was metered in Victoria, compared with 28 per cent in Queensland (MDBA 2017u, pp. 41, 88).

A commitment to improved metering through the Compliance Compact

A key focus of the Compliance Compact is on improving metering as a basis for more transparent monitoring of water take.

While the Matthews review and the MDBA compliance review recommended universal or close to universal metering of water extractions and real time reporting, jurisdictions did not agree on these measures (Craik 2018, p. 5). However, Basin States have agreed to publish (by 31 December 2018) a metering policy and implementation plan addressing: meter accuracy; meter coverage; transmission of data; high risk take (including large users in the Barwon-Darling) to be accurately metered by December 2019; and a timetable for the installation of new meters and telemetry and auditing and maintenance of the metering fleet (MDB Ministerial Council 2018b).

There was also agreement that implementation plans include the provision that, by no later than June 2025, all new and replacement meters must comply with the National Metering Standard (AS4747) — including pattern approval and verification. And until June 2025:

- all new and replacement meters must comply with AS4747 where available (with any exemption made by the Basin State to be supported by a justification published on the relevant agency website).

- where an AS4747 compliant meter is not available the use of an interim meter that has been verified with a manufacturer's certificate of accuracy to within +/- 5 per cent is acceptable.
- when an existing meter no longer meets +/- 5 per cent accuracy in the field it must be repaired and validated so that it is accurate to within +/- 5 per cent in the field, or replaced.
- all meters to be periodically validated consistent with the requirements of AS4747 (with any exemption made by the state to be supported by a justification published on the relevant agency website). (MDB Ministerial Council 2018b, pp. 5–6)

Other agreements on metering and measurement in the Compliance Compact include:

- annual reporting by each Basin State on progress with the implementation plan, and the relative proportion of take via AS4747 meters, interim verified meters, unverified meters, and unmetered take (commencing 30 September 2019)
- The Australian Government will work with testing laboratories, meter manufacturers and industry to set a timetable for delivering a comprehensive range of pattern approved meters (31 December 2018)
- New South Wales and Queensland will publish their programs for improved measurement of floodplain harvesting and overland flow harvesting, respectively (30 June 2019). (MDB Ministerial Council 2018b, p. 7)

In June, a *Draft NSW Metering Framework* was released for discussion with stakeholders (box 12.2). It is important that this is subject to scrutiny through standard regulatory and economic review processes.

The commitments in the Compliance Compact guiding the implementation of new Basin State metering frameworks should follow the principle of being risk-based (weighing the benefits of new metering measures with the costs). To this end, the new metering implementation plans being developed by Basin States should be supported by publicly available business cases.

Box 12.2 **A Draft NSW Metering Framework has been released**

In March 2018, the NSW Government released a consultation paper about water take measurement and metering. In June a *Draft NSW Metering Framework* was released for discussion with stakeholders.

The proposed policy applies to licensed water take where the water taken can be measured by a meter. The threshold proposed for when water supply works will be required to have a meter is:

- surface water: pumps of 100 mm or larger
- groundwater: extraction works of 200 mm or larger.

Users with multiple pumps or bores will be required to have meters if the capacity to take water is equivalent to the thresholds. And users with existing meters below the threshold will be required to keep and maintain their meters, and replace their meters if and when they fail.

The proposed threshold is expected to meter around 95 per cent of water infrastructure capacity for existing licensed water.

Other elements of the draft metering framework include:

- new and replacement meters must be pattern approved and meet the Australian Standard
- existing meters must be independently verified for accuracy (+/- 5 per cent)
- all meters will be required to have tamper-evident seals and data loggers.

The objective is to ensure that meters over the threshold are telemetered (with community consultation on the pathway to achieving this). And it is proposed that meters will be privately owned by users and where there are existing government-owned meters, these will be transferred to private ownership.

Source: DOI (NSW) (2018d, pp. 1–2).

Can the Australian metering standard be met?

While stakeholders are generally supportive of improvements in the accuracy of metering and metering coverage, there are concerns surrounding the Australian Standard (AS4747). The National Irrigators' Council said:

> In principle, we agree that accurate measurement is critical and the NSW objectives are sound. We would caution though, that there needs to be transition processes in particular for requirements like compliance with AS4747. So far that standard has proved difficult for manufacturers to comply with - some might say impractical. … The Commission needs to understand that even very modern meters being funded under modernisation programs are not compliant. This is a very significant problem and it results in the industry being given an impossible task. They can't comply because, through no fault of their own, there is no appropriate compliant meter available. (sub. 15, p. 25)

As discussed earlier, the Compliance Compact has set in place a transition process whereby all new and replacement meters must comply with AS4747 by June 2025. The key issue is whether the requirement for meters to meet AS4747 is practical, cost effective and deliverable by 2025.

In particular, there are concerns regarding the process that was undertaken for developing the National Metering Standard. The National Irrigators' Council (sub. 15, p. 25) stated that it 'was a process that developed an aspirational but impractical standard with no real consultation with irrigators and meter manufacturers. Similarly, in a submission to the Productivity Commission's Inquiry into National Water Reform, Coleambally Irrigation Co-operative Limited (CICL) commented:

> CICL cites the National Metering Standard as a very concrete example of a national water initiative that was very aspirational. To the best of CICL's knowledge, there are still only two meters that have met the standard. Quite simply, there were too few practitioners at the table when the standard was developed; the standards were set too high; and there was a lack of regard to the fact that there was insufficient capacity in Australia to undertake the testing required for pattern (meter) approvals. (CICL 2017, p. 3)

Further consideration is required as to the role, costs and benefits of consistent metering policies and the AS4747.

DRAFT RECOMMENDATION 12.2

Basin States should consider the role, costs and benefits of consistent metering policies including the role of metering standards.

Basin Governments should work with Standards Australia to formally revise standards to ensure quality and cost effectiveness in water measurement.

The new metering implementation plans being developed by Basin States should be supported by publicly available business cases.

Confusion surrounding the MDBA's role in water take compliance

Water take compliance is primarily the responsibility of Basin state water agencies. The MDBA, as the agency responsible for overseeing compliance at a Basin-wide level, has a role in providing assurance of the compliance and enforcement frameworks within each Basin State. The MDBA may conduct audits and investigate state practices and processes (MDBA 2018g, p. 14). This may also include supporting Basin States by (for example) providing information and guidance materials (such as metering standards and the establishment of a network of water compliance practitioners) to promote best practise in water take compliance and enforcement.

Confidence in the Basin Plan requires an unambiguous system of compliance. While this Basin-scale oversight role is well-accepted, there is confusion as to whether the MDBA has (or should have) an enforcement role with respect to breaches of State water take rules or licence conditions by individual water users.

The Independent Panel to the Compliance Review reported that under the Water Act, the MDBA has an enforcement role in respect of illegal take if:

- water is taken by the holder of a water access right inconsistent with a Water Resource Plan that applies to the water
- water is taken in a way that is inconsistent with the Basin Plan
- illegal take (including take by a person who does not have a water access right at all) prejudices, or has an adverse effect on, the effectiveness or implementation of the Basin Plan or a WRP. (MDBA 2017u, p. 118)

The Basin Plan requires that all 33 WRPs be accredited by 30 June 2019. After this date the MDBA's compliance responsibility for WRP's will commence.

Given the potential for duplication in enforcement roles between the MDBA and Basin States, it was agreed (under the *Basin Plan Implementation Agreement*) that the MDBA would only seek to exercise its powers under the Water Act as a 'last resort'.

> The MDBA will focus its efforts on promoting and monitoring compliance in areas where it has a reasonable belief that the underlying issue may impact materially on the achievement of Plan outcomes. If compliance issues arise, the MDBA would seek to resolve them in good faith, in a way that is proportional to the issue being addressed, considers the actions taken toward achieving compliance, and with a view to dealing effectively with the circumstance. The MDBA would only seek to exercise its powers under the Water Act 2007 (the Act) as a last resort. (MDBA, CEWH & Basin State Governments 2013, p. 4)

The MDBA has been working under the assumption that enforcement of water take is a matter for the Basin States. However, in light of recent allegations of illegal water take, many stakeholders view that that the MDBA should clarify its position as to whether it will pursue enforcement against illegal water take, in the absence of action by a Basin State.

> In developing the Basin Plan, the MDBA has worked on the basis of compliance and enforcement against individuals being a matter for states. However, in the course of the Review, it has been made very clear that the community does not accept this arrangement. Numerous stakeholders have expressed considerable frustration that the MDBA did not respond adequately to allegations of serious breaches. They are looking to the MDBA to take more responsibility for compliance and enforcement. (MDBA 2017u, p. 14)

The MDBA has stated that it will take a more proactive approach to water take compliance.

> The MDBA accepts that it has not adequately escalated allegations of water theft when the relevant state authorities have not dealt adequately with them. A more assertive and transparent approach to compliance by the MDBA is needed, including a proactive escalation strategy … an audit and assurance program, better public reporting, and a willingness to employ its enforcement powers where necessary. (MDBA 2017u, p. 23)

Further, the recently released MDBA compliance and enforcement policy (2018g) clearly signals the MDBA's intention to pursue an enforcement role with respect to breaches of water take licence conditions by individual water users. The policy states:

> The MDBA may also directly regulate the compliance of individual water users with the Basin Plan, and intends to do so in the absence of adequate action by a Basin state, for example in response to allegations of illegal take. (MDBA 2018g, p. 5)

The benefits of an MDBA role in this space are difficult to anticipate because it is unclear what is likely to be considered as evidence of 'the absence of adequate action by a Basin State'. Nevertheless, benefits may include increased levels of compliance, and improvements in the confidence of compliance systems supporting the Basin Plan.

The Commission considers that an MDBA enforcement role against individual water users may lead to perverse incentives. For example, Basin States may hold themselves less accountable to enforce breaches of water take laws or licence conditions by individual water users, under the expectation that the MDBA will ultimately respond to concerns of non-compliance. This will result in costly duplication of compliance processes and an unclear division in compliance responsibilities between the Basin States and the MDBA. It may also shift enforcement costs to the Commonwealth — the annual cost of compliance in New South Wales alone is over $4 million (MDBA 2017i, p. 90).

Further, Basin States (as opposed to the MDBA) are accountable for land and water management and must enforce compliance of their own water take laws, drive reform and tailor management responses to local variation. And as discussed in the previous section, Basin States have acknowledged the need for improvements in water take compliance and are in the process of implementing change.

The benefits of increased levels of compliance, and improvements in the confidence in compliance systems, may also be achieved through a comprehensive audit and assurance process and a spotlight mechanism whereby the MDBA publicly announces instances whereby Basin States are not effectively responding to concerns of illegal take. This mechanism may be capable of assisting Basin States to act on concerns of illegal take.

In instances where public reporting fails to compel a State to act on concerns of water take and a more proactive response is required the MDBA should use system-wide policy levers such as SDL accounting compliance mechanisms to enforce limits on water take (chapter 6).

DRAFT RECOMMENDATION 12.3

Enforcement of illegal water take is the responsibility of Basin States.

The Murray-Darling Basin Authority (MDBA) should publicly report instances where Basin States are not effectively responding to concerns of illegal water take.

In instances where public reporting is ineffective, the MDBA should use system-wide enforcement levers such as Sustainable Diversion Limit accounting compliance mechanisms to enforce limits on water take.

13 Reporting, monitoring and evaluation

Key points

- Effective reporting, monitoring and evaluation is critical to the successful implementation of the Basin Plan.
  - Reporting and monitoring holds Basin Governments to account by measuring their progress against their commitments under the Plan.
  - Monitoring and evaluation allows the outcomes of the Plan to be measured. This is required for informed judgements about whether the Plan is effectively and efficiently meeting its objectives. It also allows for judgements about whether the significant investment has been worthwhile and whether there is more that needs to be done.
- Milestones set under the National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin are inadequately defined and there is evidence that jurisdictions have been assessed as meeting milestones when there is information to the contrary.
  - The Australian Government should ensure that these deficiencies are not repeated in any future intergovernmental agreements on the implementation of the Plan.
- There is an unclear evaluation framework for the Plan and a lack of a strategy to coordinate information collection from the various established monitoring programs that are relevant to the Plan.
  - This creates risks going forward, including that information gaps will hinder forthcoming evaluations of the Plan; monitoring resources will be used inefficiently; and stakeholders may find it difficult to discern a clear, cogent message on the outcomes of the Plan.
- A revised Basin Plan evaluation framework and a Basin Plan monitoring and evaluation strategy should be developed.
  - The Basin Plan evaluation framework should define the specific questions (across a range of time periods and scales) that will be used to evaluate the outcomes and effectiveness of the Plan. Responsibility for developing this framework should lie with the Murray-Darling Basin Authority (MDBA) as Basin Plan Regulator.
  - The Basin Plan monitoring and evaluation strategy should describe the process by which the information needed to answer these evaluation questions will be obtained, including what information will be collected and by whom, the process to address knowledge gaps and the arrangements for sharing the costs of monitoring and evaluating the Plan between Basin Governments. Responsibility for developing this strategy should lie with Basin Governments, assisted by the MDBA as the agent of governments.
- The Plan is scheduled to be reviewed in 2026. This review will be informed by the outcomes of the 2020 and 2025 evaluations and the Commission's next inquiry into the implementation of the Plan in 2023. It will need to be forward-looking, and consider emerging risks (such as climate change). For the 2026 review to be based on the best available knowledge, new information may need to be generated, and planning for this should commence now.

While reporting, monitoring and evaluation of various aspects of water management occurred in the Basin before the commencement of the Basin Plan, the Plan represents a major change in how the Basin is managed. The information needed to monitor and evaluate progress in the Basin has changed as well. While all Basin Governments undertake reporting, monitoring and evaluation for their own purposes, it cannot be assumed that this will be sufficient to satisfy the need for reporting and evaluation for the Plan as a whole.

Basin Governments recognised the important role that good reporting and evaluation arrangements serve and have explicitly included requirements for these in the Plan. Ensuring that these new arrangements are effective is important for two reasons. First, significant aspects of the Plan are about to commence (such as the implementation of the supply measures and efficiency measures). Reporting on implementation is needed to ensure governments deliver on these commitments.

Second, as implementation progresses, governments and the community are going to expect good information on the outcomes of the Plan, and how these compare to the objectives that the Plan seeks to achieve. This will enable judgements of whether the significant investment that is the Plan has been worthwhile and whether there is more to be done.

This chapter examines reporting, monitoring and evaluation arrangements for the Plan.

- Section 13.1 provides an overview of reporting and evaluation arrangements (contained in the Plan itself, and in agreements underpinning the Plan's implementation).
- Section 13.2 outlines the Commission's approach to assessing the effectiveness of these arrangements.
- Section 13.3 assesses the extent to which current arrangements are effective in holding governments accountable for meeting their commitments under the Plan.
- Section 13.4 assesses the extent to which current arrangements are effective for evaluating the outcomes and effectiveness of the Plan as a whole.
- Section 13.5 briefly looks ahead to the review of the Plan scheduled in 2026.

13.1 Background on the reporting and evaluation requirements for the Plan

The Basin Plan specifies a range of reporting requirements that Basin Governments must meet. Reporting arrangements are also set out in the intergovernmental agreements that underpin the implementation of the Plan. A program to evaluate the Plan is also set out within the Plan itself.

Monitoring information is needed to meet these requirements. However, the Plan does not outline specific monitoring activities to be undertaken beyond specifying some broad principles to be upheld when monitoring outcomes. The onus lies with Basin Governments

to implement a monitoring regime that allows them to meet their obligations to report on and evaluate the Plan.

Reporting requirements set out in the Plan

Schedule 12 of the Basin Plan outlines a range of matters which the Murray-Darling Basin Authority (MDBA), the Commonwealth Environmental Water Holder (CEWH), the Department of Agriculture and Water Resources (DAWR) and Basin States are required to report against (table 13.1). The reporting framework is structured across two time scales. Some matters are reported annually. Others are reported on a five-yearly basis.

Table 13.1 **Matters to be reported as per Schedule 12 of the Basin Plan**

Matter	*Responsible party or parties*
Matters to be reported on an annual basis	
The effectiveness of the management of risks to Basin water resources	Basin States, MDBA
The transition to long-term average Sustainable Diversion Limits	Department
The extent to which local knowledge and solutions inform the implementation of the Basin Plan	Basin States, MDBA, CEWH
The identification of environmental water and the monitoring of its use	Basin States, MDBA, CEWH
The implementation of the environmental management framework	Basin States, MDBA, CEWH
The implementation, where necessary, of the emergency response processes for critical human water needs	Basin States, MDBA, Department
The implementation of the water quality and salinity management plan	Basin States, MDBA, CEWH
The implementation of water trading rules	Basin States, MDBA
Compliance with water resource plans	Basin States
The prioritisation of critical human water needs	Basin States
The accountability and transparency of arrangements for water sharing	Basin States
Matters to be reported on a five-yearly basis	
The transparency and effectiveness of the management of the Basin water resources	MDBA
The protection and restoration of water-dependent ecosystems and ecosystem functions in the Murray-Darling Basin, including for the purposes of strengthening their resilience in a changing climate	MDBA
The extent to which the Basin Plan has affected social, economic and environmental outcomes in the Murray-Darling Basin	MDBA, Department
The achievement of environmental outcomes at a Basin scale	MDBA, CEWH
The achievement of environmental outcomes at an asset scale	Basin States
The fitness for purpose of Basin water resources	MDBA
Progress towards the water quality targets	Basin States, MDBA
The facilitation, by efficient and effective water markets, of tradeable water rights reaching their most productive use	MDBA
The certainty of access to Basin water resources	MDBA
The efficiency and effectiveness of the operation of Water Resource Plans, including in providing a robust framework under a changing climate	Basin States, MDBA

Annual reporting requirements predominately relate to the implementation of, administration of, and compliance with, different elements of the Plan. Five-yearly reporting has a greater focus on the outcomes of the Plan.

Annual reporting began in 2013-14. However, the first tranche of five-yearly reporting is not scheduled to occur until 2020. The information from this reporting should provide a valuable source of evidence for the MDBA's evaluation of the effectiveness of the Plan also scheduled to be completed in the same year.

Reporting requirements through intergovernmental agreements

Implementation of the Plan is underpinned by a number of intergovernmental agreements. Key agreements include the:

- *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin* (IGA) (COAG 2013). In this agreement, Basin Governments expressed their joint commitment to implementing the Basin Plan
- *National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin* (NPA) (COAG 2014). The NPA sets out the outputs, outcomes and milestones that Basin States are required to achieve to meet their commitments. It also specifies Commonwealth payments to be made to the States in return for meeting these requirements. The NPA specifies that up to $174 million could be awarded to Basin States over the course of the agreement (which runs to 30 June 2020)
- *Murray-Darling Basin Plan Implementation Agreement* (BPIA). The BPIA establishes the implementation obligations of the Basin States, the MDBA and the CEWH and interdependencies between these obligations (MDBA, CEWH & Basin State Governments 2013). The BPIA is in operation until 22 November 2022 (ten years from when the Plan was adopted).

The BPIA and the NPA place additional reporting requirements on Basin Governments. Under the BPIA, parties are required to 'prepare annual statements of assurance of their compliance with Plan obligations that will be made public' (MDBA, CEWH & Basin State Governments 2013, p. 6).

Under the NPA, Basin States have a responsibility to report on 'milestone progress' (COAG 2014, p. 4). These milestones relate to actions taken by Basin States to:

- support the Australian Government in *bridging the gap* (relating to the commitment to recover water to meet the Sustainable Diversion Limits set by the Plan)
- ease constraints
- co-operate with arrangements for environmental watering.

This reporting feeds into an annual assessment of progress against NPA milestones (undertaken by DAWR), and decisions (made by the Water Minister) about whether milestone payments should be afforded to Basin States.

Evaluation requirements set out in the Plan

The Plan prescribes a program for evaluating its effectiveness, reflecting requirements in the *Water Act 2007* (Cwlth). These requirements are:

- annual reporting on the effectiveness of the Basin Plan
- advising on the impacts of the Basin Plan (to occur before the end of 2020)
- five-yearly reviews that focus on assessing the effectiveness of some elements of the Plan, including the water quality and salinity management plan targets and the environmental watering plan.

In undertaking evaluations, the Plan specifies a number of principles to be upheld, and identifies a number of key evaluation questions that must be considered.

The MDBA is responsible for undertaking these evaluations. The MDBA has commenced annual reporting on the Basin Plan, and undertook an 'interim' evaluation of the Plan (which was not statutorily required) in 2017. It has signalled its intention to undertake the next evaluations on the effectiveness of the Plan in 2020 and 2025 (MDBA 2017b).

There is also a requirement for the Plan to be reviewed every ten years (with the MDBA also responsible for this). The first ten-yearly review of the Plan is scheduled to occur in 2026 (although it may be requested to be undertaken earlier). Information from evaluations will be an important source of evidence for these ten-yearly reviews, although the scope of these reviews is wider.

The Plan also empowers the MDBA to undertake audits to assess the extent of compliance with the Plan, and to undertake periodic assessments of trends in the condition and availability of Basin water resources and the social, cultural and economic contexts in which these resources are used.

Although not explicit in the Plan, the statutory framework in which the Plan operates requires the Productivity Commission to undertake five-yearly public inquiries into the effectiveness of the implementation of the Basin Plan and Water Resource Plans. This Commission inquiry is the first of these.

13.2 How the Commission has assessed effectiveness

The Commission has assessed the extent to which current arrangements meet two critical functions.

First, the Commission has assessed the extent to which arrangements allow for progress on implementation to be measured and are effective in ensuring governments are accountable for meeting their commitments. As identified in other chapters, the forthcoming obligations of Basin Governments are significant. Meeting these obligations will require substantial resources and effort to implement and pose significant risks if not implemented well. Reporting tracks the progress of governments in implementing these obligations and allows for emerging issues to be identified and addressed as they arise.

Second, the Commission has assessed the extent to which current arrangements provide the information needed to evaluate the outcomes and effectiveness of the Plan. The Basin Plan is designed to achieve a range of environmental, social, economic and cultural objectives, and large investments in recovering water and providing infrastructure (along with significant changes to how the Basin is managed) have been made to meet these objectives. Monitoring and evaluation provides the evidence needed to determine whether these objectives are being realised and to enable judgements to be made on whether the Plan has been worthwhile and/or if more needs to be done.

The Commission's assessment also considers the extent to which current arrangements uphold principles of good design, some of which are outlined in box 13.1.

It is important to note that reporting, monitoring and evaluation is also required to facilitate the adaptive management of a number of specific functions that contribute to the implementation of the Basin Plan. For example, monitoring and evaluation provides information that is essential for the adaptive management of water quality, salinity and environmental watering and for general water resource management by Basin Governments across the Basin.

The Commission recognises the importance of reporting, monitoring and evaluation undertaken to improve management of specific elements of the Plan, and the information generated through this will provide useful input for evaluations of the Plan. However, the Commission is not examining the effectiveness of programs that monitor specific parts of the Plan, but rather reporting, monitoring and evaluation for the Plan as a whole.

Box 13.1 **Some features of good reporting, monitoring and evaluation arrangements**

Good reporting, monitoring and evaluation arrangements:

- are **clear**, which is achieved by:
  - establishing the purpose, scope and objectives of the reporting, monitoring and evaluation program
  - identifying the timelines and scales on which these objectives will be met
  - identifying the processes that will be used to meet these objectives
  - identifying the roles of different parties responsible for reporting, monitoring and evaluation.
- are **comprehensive**. This means that all the information needed to meet the objectives of the reporting, monitoring and evaluation program is collected, and any information gaps are actively managed
- seek and utilise the **best available knowledge** where practicable. This includes scientific knowledge, economic knowledge and cultural knowledge both on a localised and a Basin-wide scale
- are **transparent** and **promote impartiality**. This includes that the information collected, used and reported is evidence-based, accurate and is made publicly available
- are **built with input from the stakeholders** who will use the information. In the context of the Plan, this includes river managers, environmental, industry and Indigenous communities and local governments, among others
- are **designed and agreed to by the parties who will be responsible** for undertaking reporting, monitoring and evaluation. In the context of the Plan, this includes the Murray-Darling Basin Authority, the Department of Agriculture and Water Resources, Basin States and the Commonwealth Environmental Water Holder. Processes for collaboration across partners should also be developed
- are **timely**. Information provided through reporting, monitoring and evaluation should be sufficiently timely to hold those responsible for implementing the Plan to account, or to feed into decisions about the management of the Basin
- are **sufficiently resourced** both in terms of funding, and in terms of the capabilities of those responsible for reporting, monitoring and evaluation.

Sources: Adapted from Kusek and Risk (2004); DEC (NSW) (2014); OECD (2013); Queensland Government (2014); The World Bank (2013).

13.3 Reporting for measuring progress on implementation

Assessment of effectiveness

The MDBA developed guidelines to assist Basin Governments to meet their reporting responsibilities in 2013. These have since been 'codified' into a standard information collection template, drawing on reporting obligations from Schedule 12 of the Plan, the BPIA and the NPA (MDBA 2017b, 2018e). Each year, Basin Governments populate this

template with the information needed to meet their reporting requirements and submit these to the MDBA, who subsequently publishes them on its website.

In short, the process by which Basin Governments report implementation progress is clear and governments have been meeting their reporting requirements. However, deficiencies with the design of the NPA detract from the effectiveness of current reporting arrangements in holding governments to account for meeting their commitments under the Plan.

As an instrument for holding governments accountable, the NPA needs to serve two critical functions. First, it should clearly articulate the milestones against which Basin Governments are to deliver. Second, it should include incentives for Basin Governments to deliver these by linking payments to the milestones. There is evidence that the NPA has not fulfilled either of these functions effectively.

Under the NPA, each Basin State must submit an annual Statement of Assurance to the Australian Government, describing its progress against NPA milestones. An assessor (currently DAWR) prepares an annual milestone report using these statements and any supporting documentation provided by the Basin States. In this report, DAWR assesses the extent to which each State has met the performance milestones and if they have not met a milestone, whether they have taken steps to do so (COAG 2014). The assessment is provided to the Water Minister, who then decides whether payments to a Basin State should be made under the NPA.

There are a number of deficiencies with the NPA, and the subsequent assessment process, that detracts from its value as an accountability measure. These include that:

- Basin States have been assessed as having met milestones despite evidence of unsatisfactory progress. For example, the Australian National Audit Office (ANAO) reported that DAWR had assessed some milestones as having been met by New South Wales, 'despite instances identified by the CEWH and MDBA where NSW had not met its requirements under the Murray-Darling Basin NPA' (ANAO 2017, p. 16)
- there appear to be disparities in the way the assessment findings of 'met' and 'partially met' have been used. In some instances, jurisdictions that have met some (but not all) sub-milestones are assessed as having met the overall milestone, whereas in other cases, the overall finding is 'partially met'
- key advice provided to the Australian Government by the MDBA and CEWH to inform assessments of progress is not published in full
- there have been significant delays in reporting in some years. For example, the most recent assessment of milestone progress (for the 2016-17 year) was not published until July 2018, despite it being due to the Minister by 31 October 2017

- the design of payments for achieving milestones has not been effective in providing incentives for Basin States to deliver:
  - payments have been made even where Basin States have not met all milestones for that year
  - there is no option to recommend a partial payment. Payments are made in full or not at all (ANAO 2017, p. 13). So, even where a state has only partially met the required deliverables, it must receive either a full payment or no payment.

DRAFT FINDING 13.1

There are weaknesses with the National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin that reduce its usefulness as a means to hold Basin Governments to account for meeting their commitments in implementing the Plan.

These deficiencies include that:

- milestones are inadequately defined and have been assessed as met when there is evidence to the contrary
- key information that informs assessments of progress against National Partnership Agreement milestones is not publicly released
- there have been delays in the release of assessments of progress against National Partnership Agreement milestones in some years.

Improving arrangements

Basin Governments have a number of important responsibilities going forward as implementation of the Plan continues. Key obligations include the implementation of:

- supply measures (including easing constraints)
- efficiency measures
- the pre-requisite policy measures (PPMs)
- the Toolkit measures in the northern Basin.

These are substantial obligations and there are significant consequences if they are not implemented well. Implementation of these commitments will require significant resources (and significant effort) from Basin Governments.

Given this, future IGAs on the implementation of the Basin Plan need to embody robust reporting requirements that allow progress to be tracked and governments to be held to account. This means ensuring that the deficiencies of current IGAs do not get carried forward into any future agreements on Basin Plan implementation.

DRAFT RECOMMENDATION 13.1

Given deficiencies in past agreements, for any future intergovernmental agreements relating to the implementation of the Basin Plan, the Australian Government should ensure:

- the roles of the Australian Government and Basin States are clearly identified
- specific performance milestones are identified, and that clear responsibility is assigned for the delivery of each milestone
- where milestones are linked to payments, that these payments are disaggregated with a payment per milestone to provide a genuine incentive for implementation
- reporting on the progress of Basin Governments in meeting milestones is timely
- independent assessment of the progress of Basin Governments is undertaken
- advice provided by relevant agencies, such as the Murray-Darling Basin Authority or the Commonwealth Environmental Water Holder, that is used to inform assessments of progress is published in full.

13.4 Evaluation to assess the outcomes and effectiveness of the Plan

Assessment of effectiveness

The Plan installs new arrangements for evaluating outcomes in the Basin, and responsibility for evaluating the Plan as a whole lies with the MDBA.

For these evaluation arrangements to be effective, information on the environmental, social, cultural and economic impacts of the Plan is required. This information can come from many different parties, such as the MDBA, the CEWH, DAWR and various agencies of Basin State Governments.

Each of these organisations implement monitoring programs designed to provide information to meet their own statutory and policy accountabilities. This may include information that is needed to undertake adaptive management, program evaluation or for basic resource management more broadly. Monitoring is undertaken across a range of scales including at the local asset scale (for example, monitoring of the impacts of environmental watering on wetland condition) and at larger scales such as across catchments, state water systems or the Basin as a whole (such as monitoring of environmental condition, water quality and salinity).

Across the Basin, there is currently a heterogeneous mix of monitoring programs, many of which pre-date the Plan. All of these can be drawn upon to provide information to assist with evaluating the Plan, but which, when taken together, may not form a sufficient evidence base to evaluate the Plan as a whole.

In relation to the Plan:

- the MDBA is responsible for monitoring and evaluating the Plan as a whole, including looking at outcomes on a Basin-wide scale
- the CEWH is responsible for monitoring and evaluating the use and impacts of Commonwealth held environmental water and the contribution this water makes to meeting the environmental objectives of the Plan
- DAWR is responsible for monitoring and evaluating the programs that recover water for the environment, consistent with their commitment to *bridge the gap*
- the Basin States are responsible for monitoring and evaluating their own state-level actions (MDBA 2016b).

While not statutorily required, the first substantial evaluation of the Plan as a whole was undertaken by the MDBA in 2017 (MDBA 2017b). This evaluation drew on a range of information sources — including information from the monitoring programs of the CEWH, DAWR and the Basin States — to assess progress in implementing the Plan, and identify the preliminary environmental, social and economic outcomes that have been observed over the first five years of the Plan.

Monitoring programs in the Basin

Overviews of the key programs for monitoring the impacts of the Plan are provided in table 13.2 and box 13.2. Work for monitoring the cultural outcomes of the Plan has also commenced (chapter 7).

Table 13.2 **Major programs monitoring outcomes in the Basin**

Program	*Scale*	*Responsible agency or agencies*	*Overview of program*
Environmental programs			
Monitoring under the Living Murray (TLM) program	Asset	MDBA as an agent of governments. Funded by the Australian, New South Wales, Victorian, South Australian and the ACT Governments	Monitors ecological outcomes in the six 'icon' sites of the TLM program. These sites are: the Barmah-Millewa Forest; the Gunbower-Koondrook-Perricoota Forests, Hattah Lakes, Chowilla Floodplains and Lindsay-Wallpolla-Mulcra Islands, the Lower Lakes, Coorong and Murray Mouth and the River Murray Channel.
The Long-term Intervention Monitoring (LTIM) program	Asset and Basin-wide	The CEWH	Monitors the ecological impacts of Commonwealth environmental water across multiple water years at seven specified areas across the Basin: the Gwydir river system; the Lower Lachlan river system; the Murrumbidgee river system; the Edward-Wakool river system; the Goulburn River; the Lower Murray River; and the junction of the Warrego and Darling rivers. In addition, under the LTIM, the Murray-Darling Freshwater Research Centre has produced a basin-scale report (most recently in 2015-16) that seeks to determine 'outcomes from the portfolio of Commonwealth water across the Basin.'
Short-term intervention monitoring	Asset	The CEWH	At some sites, the CEWH undertakes short-term intervention monitoring, looking at the extent selected watering actions have met their intended objectives.
State government environmental monitoring programs	Asset and catchment	Basin States	Basin State Governments undertake a wide variety of monitoring programs. An overview of some of the key programs of Basin States is provided in box 13.2.
Water quality and quantity monitoring	Selected points across the Basin	MDBA as an agent of governments	Monitoring of water quality and quantity (for both surface and groundwater) is undertaken in a number of sites across the Basin.
Socio-economic programs			
MDBA socioeconomic monitoring	Community and Basin-wide	MDBA	Monitoring and analysis of the outcomes of the Plan in Basin communities. Work undertaken to date has, amongst other things, examined the extent that the Plan has impacted on irrigated hectares and employment in Basin communities.
DAWR socioeconomic monitoring	Community and Basin-wide	DAWR	Monitoring and analysis of the impacts of DAWR's water recovery programs on Basin communities.

Sources: DAWR (2017, 2018i); DEE (2015, nd); Gawne et al. (2017); Marsden Jacob Associates (2017); MDBA (2015d, 2016d, 2017b, 2018n, 2018t, nd(c)).

Box 13.2 Some Basin State monitoring programs

Basin State Governments undertake and fund a variety of monitoring programs. Some examples include:

- the *Eastern Australian Waterbird Survey*, which is a multijurisdictional program (funded by both the Australian Government and the Basin States). Aerial surveys are conducted across major wetland sites in the Basin to identify the species and numbers of waterbirds present. The survey has been undertaken since 1983
- the *Victorian Environmental Flows Monitoring and Assessment Program*, which is funded by the Victorian Government. The Program has existed in a number of stages, but currently primarily focusses on intervention-based monitoring that examines the effects of environmental flows on fish and vegetation
- *WetMAP*, which is a monitoring program funded by the Victorian Government designed to assess the ecological responses of vegetation, fish, frogs and waterbirds to environmental water deliveries in a subset of Victoria's priority wetlands
- the New South Wales Office of Environment and Heritage has a program of monitoring for all its major valleys that includes inundation mapping, wetland vegetation condition and extent mapping, and surveys that assess the response of selected animals to watering events
- Natural Resources SA Murray-Darling Basin's wetland monitoring, which monitors the impacts of different wetting cycles in a range of wetlands and lagoons across a number of parameters, including water quality, vegetation and fauna
- the *Environmental Flows Assessment Program*, which monitors ecological responses to planned environmental water in Queensland
- hydrological monitoring networks which monitor water quality and quantity in rivers and streams across the Basin. Monitoring of the quality and quantity of groundwater resources is also undertaken.

Sources: DES (Qld) (2013); Department for Environment and Water (SA) (2015); OEH (NSW) (2017a); PC (2017b); DELWP (Vic) (2018a, 2018b); UNSW (2018).

Given that many different parties are undertaking programs that can assist with monitoring the outcomes of the Plan, a robust monitoring and evaluation framework is required to provide clarity about how the outcomes and effectiveness of the Plan will be evaluated. This will provide a basis for determining which of the available information will be used to evaluate the Plan, where additional monitoring will be required and who is responsible for collecting this information.

A lack of a clear framework outlining how the Plan will be evaluated carries a number of risks. These include:

- a lack of alignment across monitoring programs, leading to information gaps that can hinder the evaluations of the Plan scheduled to occur in 2020 and 2025 and the wider review of the Plan to occur in 2026
- resources being spent inefficiently by duplicating work already being undertaken, or by undertaking work that is not useful for evaluating the outcomes and/or effectiveness of the Plan

- a confused message on the outcomes and effectiveness of the Plan because there is no unifying framework to present individual or localised findings in the context of the Plan as a whole.

Some of these risks are materialising now. For example, the MDBA (2018u, p. 14) has commented on a lack of alignment across programs that monitor the outcomes of environmental watering in the Basin:

> Although there are a patchwork of useful programs and components that help report on the outcomes from the use of environmental water, they are currently not well linked or aligned. Work is needed to ensure that monitoring programs across Commonwealth and State agencies are aligned to the Basin Plan objectives and outcomes.

Ambiguity about how monitoring and evaluation on an asset scale will effectively align with monitoring and evaluation on a Basin-wide scale was also identified by some Basin Governments (for example, Queensland Government, sub. 87, South Australian Government, sub. 85).

The fact that both the MDBA, and Basin States (as parties responsible for monitoring the outcomes of the Plan) are expressing concern about a lack of alignment across different scales in the Basin is troubling. Also concerning is that this issue is not new. For example, the Independent Review of the Water Act (2014) reached a similar conclusion:

> Many stakeholders noted that the monitoring and evaluation activities of the MDBA, Commonwealth Environmental Water Holder and Basin States were not as coordinated and integrated as possible, resulting in duplication and/or fragmentation. This therefore leads to a real risk that those activities would not fit together to provide a clear and coherent Basin-wide picture on outcomes. Some stakeholders are also unclear about the roles and responsibilities of each of the entities involved and therefore are not confident in the Basin Plan Monitoring and Evaluation Program and how this is to be conducted. (Australian Government 2014, p. 13)

The potential establishment of a Northern Basin Commissioner, with a proposed remit that includes auditing and reporting on environmental outcomes (DAWR 2018c), risks adding further confusion.

Basin Governments have installed mechanisms to coordinate monitoring activity, such as the Monitoring and Evaluation Working Group (under the Basin Plan Implementation Committee). However, there is little evidence to suggest that these forums have been effective in fostering a coordinated and integrated monitoring and evaluation program.

An effective evaluation framework and a clear monitoring strategy are needed

To inform evaluations of the Plan, the MDBA released a Basin-wide evaluation framework in 2014. This framework (the Murray-Darling Basin Water Reforms: Framework for Evaluating Progress) outlines:

> … how the Murray-Darling Basin Authority will work with partner governments and the community to evaluate:

- the implementation of the Plan — how well it has been put in place by all those with obligations outlined in the legislation, and how it is working administratively
- the effectiveness of this significant water reform package — whether the intended environmental, social and economic objectives and outcomes are being achieved. (MDBA 2014d, p. 2)

The framework provides an overview of the approaches the MDBA could take when undertaking evaluations of the Plan. The framework identifies 14 sample evaluation questions, provides a broad overview of the types of methods that could be used when evaluating the Plan, and identifies 38 indicators (most of which are at a very high level) that could be used to assist with answering the sample evaluation questions. The framework also briefly acknowledges data sources that could be drawn upon when undertaking evaluations of the Plan.

However, the evaluation framework is inadequate. It is largely an exploratory document, outlining methodologies, indicators and data sources that could be used to evaluate the Plan, yet does not explicitly identify how the effectiveness of the Plan will be evaluated. DAWR has described the framework as 'high-level' and 'aspirational' (sub. 81, p. 26). The Queensland Government (sub. 87) and DAWR (sub. 81) submitted that the framework might need updating prior to the evaluation of the Plan in 2020. This suggests a lack of confidence in the framework to be a useful anchor to guide future evaluations of the Plan in its current form.

Further, the framework does not detail how progress towards meeting the enhanced environmental outcomes pursued through additional efficiency measures (as set out in Schedule 5 of the Plan) will be monitored (chapter 5).

The influence of the framework on the first substantive evaluation of the Plan (undertaken by the MDBA in 2017) is also not clear, with that evaluation taking a more thematic approach to assessing the outcomes of the Plan to date, rather than directly answering the evaluation questions specified in the framework.

The MDBA has described its 2017 evaluation as 'interim' and a 'health check on Basin Plan progress' (MDBA 2017b, p. 5) and its scope is different to that required for future evaluations of the Plan. Much of the evaluation centred on the progress of governments in implementing elements of the Plan. While early outcomes were examined, given data limitations and the fact that some outcomes require more time to observe, the analysis was often broad and centred on whether the Plan is 'on track' to deliver expected outcomes.

While the 2017 evaluation provides a useful stocktake of progress, future evaluations will need to examine more directly the specific outcomes attributable to the Plan (with reference to a counterfactual where practicable), and based on this, judge the extent to which the Plan has been effective in meeting its objectives. It is also worth noting that — notwithstanding the fact that some inquiry participants found the 2017 evaluation to provide useful information — there remains apprehension from participants about how the Plan will be evaluated in the future.

There is also a lack of a clear and publicly released strategy (agreed to by all Basin Governments) to coordinate monitoring in the Basin across the range of parties who have responsibility for undertaking it. As a result, it is not clear who has responsibility for collecting what monitoring information (and therefore, who has responsibility for closing information gaps), how this information will be integrated to evaluate the Plan and how collecting this information will be resourced.

DRAFT FINDING 13.2

The current Basin-wide evaluation framework is unclear and there is a lack of a clear strategy to coordinate the collection of the information needed to monitor the outcomes of the Plan. This means that:

- actions taken to monitor outcomes in the Basin are fragmented and inadequately integrated
- there is the potential for information gaps that may result in future evaluations being unable to accurately and comprehensively assess the impacts and outcomes of the Plan
- there is a risk of monitoring activity being duplicated
- the ability of Basin Governments to clearly communicate the outcomes of the Plan is impeded.

Improving arrangements

The Commission's focus has been on introducing greater clarity to monitoring and evaluation arrangements. This will ensure that all parties who have a role in monitoring and evaluation understand what their role is, what monitoring activities they are to undertake and how these will fit together. This will allow for accurate and comprehensive evaluations of the outcomes and effectiveness of the Plan across a range of scales.

Two instruments are required to achieve these goals:

- a revised Basin Plan evaluation framework
- a Basin Plan monitoring and evaluation strategy.

The Basin Plan evaluation framework

The Basin Plan evaluation framework should define the specific evaluation questions that are to be used to evaluate the outcomes and effectiveness of the Plan and the scales and times at which these questions will be answered. The primary objective of the framework should be to ensure there is a clear basis for evaluating the Plan in 2020 and 2025, and that these evaluations will be a useful source of evidence for reviewing the Plan in 2026.

Set out in the Plan are 'key evaluation questions' that the MDBA must consider when undertaking evaluations (box 13.3). However, these questions are too high level and generic to provide clarity and guidance on how the Plan will be evaluated. The framework should be the vehicle through which more specific questions are identified.

Box 13.3 Key evaluation questions

The 'key evaluation questions' as set out in section 13.06 of the Plan are:

- to what extent has the intended purpose of the Basin Plan set out in section 20 of the Act been achieved?
- to what extent have the objectives, targets and outcomes set out in the Basin Plan been achieved?
- how has the Basin Plan contributed to changes to the environmental, social and economic conditions in the Murray-Darling Basin?
- what, if any, unanticipated outcomes have resulted from the implementation of the Basin Plan?
- how could the effectiveness of the Basin Plan be improved?
- to what extent were the actions required by the Basin Plan suited to meeting the objectives of the Basin Plan?
- to what extent has the program for monitoring and evaluating the effectiveness of the Basin Plan contributed to adaptive management and improving the available scientific knowledge of the Murray-Darling Basin?

The framework will need to be multidimensional. For one, the framework should recognise that the Plan has a range of outcomes. These outcomes are environmental, social, cultural or economic. For each of these broad outcome classes, the framework should define the questions that will be used to determine whether the Plan has been effective in meeting its objectives. In defining evaluation questions, the importance of counterfactual analysis will need to be acknowledged, given that an important part of answering whether the Plan has met its objectives involves comparing the environmental, social, cultural and economic condition of the Basin to what it would likely be in the absence of the Plan.

The framework will also need to acknowledge that the outcomes of the Plan will occur on a range of scales, and set evaluation questions relevant to these scales. The framework should recognise that the most meaningful insights on the effectiveness of the Plan — for both Basin communities and water managers and policymakers — often come from examining outcomes at relatively localised scales. As such, the framework questions should place due emphasis on evaluating the local and regional outcomes of the Plan, while maintaining the flexibility to synthesise or supplement these to evaluate outcomes for the Basin as a whole.

It is important that this framework is made public. Making the framework public places discipline on governments to ensure the information required to answer the questions set out in the framework is collected and available. In short, it makes governments accountable for populating and applying the framework. Publicly releasing the framework also provides a

degree of certainty to stakeholders about the criteria against which the effectiveness of the Plan will be assessed.

When designing the framework, a key consideration should be mapping the evaluation questions to the relevant issues and concerns that are prominent in the community. This helps to ensure that the information generated through evaluating the Plan is valued by the Basin communities that it seeks to inform.

DRAFT RECOMMENDATION 13.2

The Murray-Darling Basin Authority (as Basin Plan Regulator) should develop a revised Basin Plan evaluation framework. This framework should define the specific questions that are to be used to evaluate the outcomes and effectiveness of the Plan, and the scales and times at which these questions will be answered. The framework should be made publicly available, and be published no later than 2019.

The Basin Plan monitoring and evaluation strategy

As outlined above, the evaluation framework establishes the questions that will inform evaluations of the effectiveness of the Plan. The Basin Plan monitoring and evaluation strategy describes the process by which the information needed to answer these questions is collected. Put simply, the strategy provides the 'who, what, when, where and how' for populating the evaluation framework. This means that the strategy should:

- describe the roles and responsibilities of the MDBA, the Basin States, the CEWH and DAWR with respect to undertaking monitoring and information gathering within the Basin
- describe what information needs to be collected to inform evaluations of the Plan (given the evaluation questions specified in the framework) and methodologies for collection and analysis
- identify the timeframes for which this information will be collected and on what scales this will occur
- identify the resourcing needed to collect this information and articulate how these resourcing requirements will be met by Basin Governments (including setting out cost-sharing arrangements).

A part of the strategy would be a process to conduct a 'stocktake' of the monitoring information currently being collected and undertaking an assessment of how this aligns with what will be required to answer the evaluation questions. This would allow for information gaps to be identified. The 2017 evaluation likely provides useful experience to draw upon when determining where these information gaps are.

Where a gap is identified, the strategy would be the vehicle to outline how this gap will be closed. This includes identifying the party responsible for addressing the gap, and outlining the process by which it will be addressed.

The strategy should be agreed to by all Basin Governments. Having all Basin Governments agree to the strategy signals joint ownership of, and a shared commitment towards, the approach that will be used to collect the information needed to evaluate the Plan. The strategy should also be made public.

DRAFT RECOMMENDATION 13.3

Basin Governments should develop a Basin Plan monitoring and evaluation strategy to implement the evaluation framework. This should describe the process by which the information needed to answer the evaluation questions set out in the framework will be collected. This includes:

- outlining what information will be collected and by whom
- identifying any information gaps, who will be responsible for addressing them and the process by which they will be addressed
- establishing the arrangements for sharing the costs of monitoring and evaluating the Plan between Basin Governments.

This implementation strategy should be developed by Basin Governments, supported by the Murray--Darling Basin Authority (as the agent of governments).

The strategy should be made publicly available and be published no later than 2019.

13.5 Looking towards the 2026 review

The Plan is to be reviewed in 2026. This review will draw upon the evaluations undertaken in 2020 and 2025. However, these are centred around whether the Plan has met its objectives and outcomes. As such, they are predominately backward-looking in nature. The review will need to be more forward-looking, and include consideration of:

- where more work needs to be done to improve the Plan going forward, and who will be responsible for undertaking this work
- emerging risks in the Basin that may need to be managed through (or impact on) the Plan
- the extent to which the Plan embodies the 'best available science' recognising that this will have advanced since the conception of the Plan.

The value of public investment in collaborative research and development with respect to water resources has been previously identified by the Commission (PC 2017b). Expanding the existing knowledge base through new knowledge generation (coupled with consistent monitoring activity) will be imperative to measuring the nature and magnitude of the risks

to water resources in the Basin, and allowing these risks to be identified and addressed in the 2026 review.

Given this, planning for the 2026 review needs to commence now, in part to avoid a last minute 'scramble' for necessary information that may require significant time and rigour to collect and analyse. The Commission considers that implementing a revised evaluation framework (draft recommendation 13.2) is the first step in this planning process.

14 Institutions and governance

Key points

- The institutional arrangements for implementing the Basin Plan are complex. This complexity arises as the Water Act and the Basin Plan are instruments of the Australian Government, while Basin States have constitutional responsibility for the management of water resources.
- Effective institutional and governance arrangements are characterised by: the assignment of clear roles and responsibilities, where conflicting functions are either separated or managed; effective processes for collaboration; effective mechanisms for accountability; transparent decision making that involves meaningful engagement with stakeholders; and adequate capability and resourcing.
- There are major shortcomings in the current institutional arrangements and these pose a significant risk to the next phase of implementation of the Basin Plan.
  - Responsibility for leading the implementation of the Basin Plan is not clear and there has been a lack of strategic leadership and direction. There is uncertainty about who should respond to issues as they arise.
  - There is significant conflict between the Murray-Darling Basin Authority's two key roles. It is both the agent of governments under the Murray-Darling Basin Agreement and an independent authority ensuring compliance with, and evaluating the effectiveness of, the Basin Plan. These roles are both critical to the next five years of implementation and the conflicts between them will intensify.
- Key deficiencies in institutional arrangements have led to a lack of transparency and accountability, and ineffective processes for intergovernmental collaboration. Key risks have not been managed, timelines have slipped and implementation has been managed through last minute negotiations as a crisis emerges or a deadline looms.
- Stakeholders are frustrated by the efforts made to engage them due to a perceived lack of responsiveness — they do not feel heard. Much of the community dissatisfaction is driven by the way Governments have sought to negotiate and navigate their way through issues.
- A complex task lies ahead for Basin Governments. The shortcomings identified in the institutional and governance arrangements need to be addressed to enable Basin Governments to work together, collaborate effectively and successfully navigate the next five years of implementation.
- Basin Governments should demonstrate strategic leadership, take joint responsibility and direct the implementation of the Basin Plan. The Murray-Darling Basin Ministerial Council should delegate responsibility for leading the implementation of the Plan to the Basin Officials Committee.
- In its current form, the Murray-Darling Basin Authority cannot be both a trusted adviser as the agent of Basin Governments and a credible regulator. Basin Governments should agree to restructure the Murray-Darling Basin Authority to separate its service delivery and regulatory functions into two institutions:
  - the Murray-Darling Basin Corporation — the agent of governments providing Murray-Darling Basin Agreement services and supporting Basin Governments to implement the Plan
  - the Basin Plan Regulator — an independent Australian Government regulator with compliance and evaluation functions.

14.1 Current institutional and governance arrangements

Water management in the Basin is a joint responsibility

The institutional and governance arrangements for the Basin Plan are complex, reflecting the differences in jurisdictional responsibilities across the Basin.

The *Water Act 2007* (Cwlth) and the Basin Plan are national instruments that provide the legal basis for setting the new sustainable balance and establishing a new Basin-wide sustainable water management system. These instruments establish a significant and ongoing role in water management in the Basin for the Australian Government. However, State and Territory Governments have constitutional responsibility for the management of water resources, and they do so in accordance with their State laws.

Basin Governments share the water resources of the Basin in accordance with the Murray-Darling Basin Agreement (2008) (MDB Agreement). This agreement builds on more than a century of cooperative management, which began when the River Murray Waters Agreement was first struck in 1914. Under the MDB Agreement, in shared and highly connected systems, such as the River Murray, the Murray-Darling Basin Authority (MDBA) as the agent of Basin Governments delivers many State-based responsibilities on their behalf — such as those for river operations and asset management.[130]

The institutional arrangements agreed by Basin Governments for the development and implementation of the Basin Plan acknowledge the constitutional responsibilities of the Basin States. In effect, the Basin Plan arrangements were super-imposed on long standing settings, including those of the MDB Agreement (figure 14.1). This has resulted in key institutions having multiple roles. The MDBA is:

- an independent authority that provides advice to the Australian Government in its role to prepare and recommend the Basin Plan and any amendments to the Plan
- a regulator that reports on the implementation of the Basin Plan by Basin Governments and ensures compliance with it
- a service provider, acting as the agent of Basin Governments, funded and directed by them under the MDB Agreement to deliver River Murray operations and other joint programs.

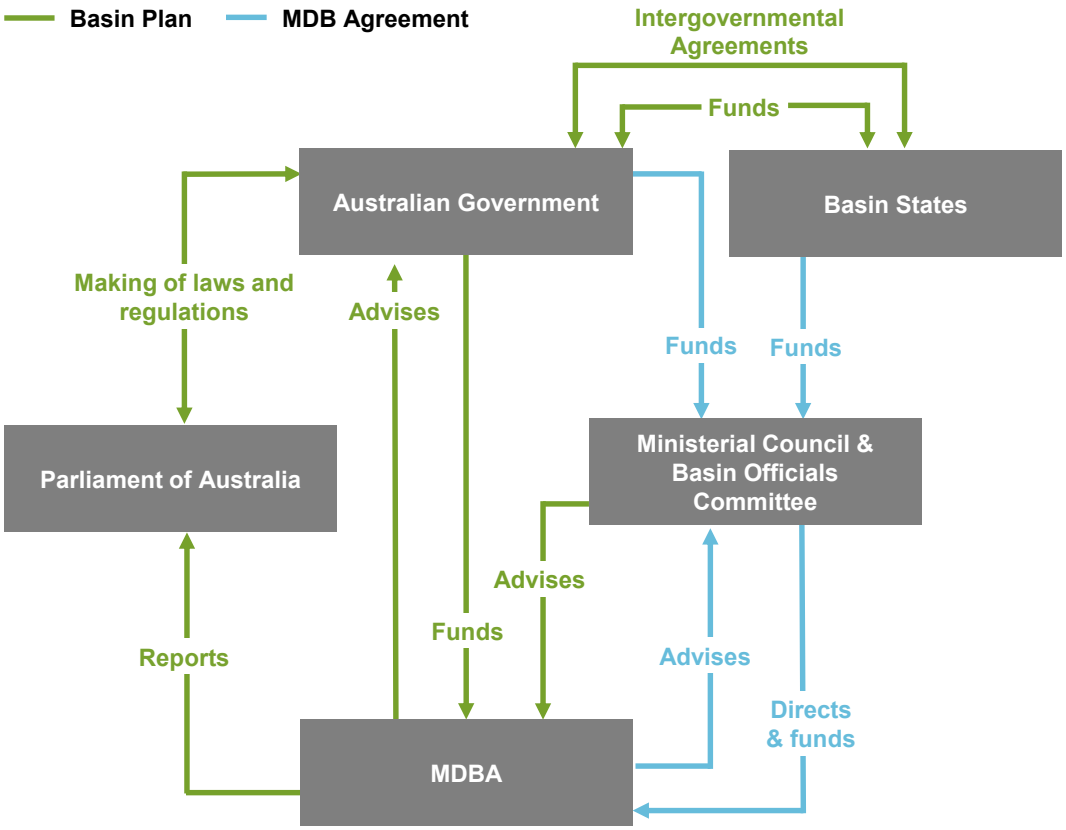
And the Basin Official's Committee (BOC) has two roles:

- Under the MDB Agreement, BOC directs the MDBA on MDB Agreement functions. It approves the MDBA's operating plan and budget for these functions, before the MDB Ministerial Council formally endorses them.

130 Each Basin State has passed laws to refer a limited range of their constitutional powers for water to the Commonwealth to enable the MDBA to act as their agent under the MDB Agreement. A Service Level Agreement between the MDB Ministerial Council and the MDBA describes the roles and responsibilities of each party. The MDB Ministerial Council approves an annual corporate plan and budget for programs and activities delivered by the MDBA.

- Under the Water Act and Basin Plan, BOC is required to provide advice and facilitate co-operation between the MDBA and jurisdictions during the development and implementation of the Plan, and to notify the MDBA in regard to supply and efficiency measures (chapters 4 and 5).

Figure 14.1 **Current institutional settings and relationships**



Sources: Basin Plan 2012 (Cwlth); *Water Act 2007* (Cwlth).

The roles (individually and jointly) of Basin Governments for the Basin Plan, and water resource management more broadly are set out in table 14.1.

The key change arising from the Water Act and the Basin Plan has been a more prominent role for the Australian Government. It has had a central role in resetting the balance by *bridging the gap* to Sustainable Diversion Limits (SDLs) (chapter 3) and investing in SDL adjustment measures (chapters 4 and 5). This role will conclude when these activities are finalised.

Table 14.1 **Basin Plan and water resource management roles**

	Australian Government[a]	*Basin States*	*Joint Governments*	*MDBA*	*Productivity Commission*
Resetting the balance					
Setting and reviewing SDLs				▲	
Recovering water	▲				
Implementing SDL adjustment measures	▲	▲	▲	■	
Reconciling SDL adjustment measures				▲	
Delivering structural adjustment programs	▲				
Funding to improve Indigenous outcomes	▲				
New management arrangements					
Water resource planning	▲	▲ ●		▲	
Environmental water management	▲	▲ ●	■	▲ ■	
Facilitating water trading	▲	▲ ■ ●	■	▲ ■	
Facilitating Indigenous values and uses	▲	▲ ■ ●	■	▲ ■	
Meeting critical human water needs		▲ ■ ●	■	▲ ■	
Managing water quality and salinity		▲ ■ ●	■	▲ ■	
Ensuring compliance with SDLs and Basin Plan				▲	
Ensuring compliance with water take rules		■ ●			
Reporting, monitoring, and evaluation	▲	▲ ●	■	▲ ■	▲
River management, asset management and operation		■ ●	■	■[b]	

[a] Includes the roles of the Commonwealth Environmental Water Holder, Department of Agriculture and Water Resources, and Department of Infrastructure, Regional Development and Cities. [b] River Murray only.

▲ Basin Plan ■ MDB Agreement ● State water resource management laws

Sources: Basin Plan 2012 (Cwlth), National Water Initiative (COAG, 2004), *Water Act 2007* (Cwlth).

The Australian Government also has ongoing roles under the new water resource management arrangements established by the Basin Plan. These include the management of the Commonwealth Environmental Water Holdings, the setting of Basin-wide environmental watering priorities (chapter 11), ensuring compliance with the Plan

(chapter 12) and reviewing the Plan in 2026 (chapter 13). The Australian Government assigned this first role to the Commonwealth Environmental Water Holder (CEWH). The latter roles have been assigned to the MDBA.

These strategic, Basin-wide roles are a key feature of the new management arrangements of the Plan. However, ultimately the Plan will be implemented through State-based water resource management arrangements and, for shared water resources, the joint arrangements set out in the MDB Agreement.

The National Water Commission (2013, p. 28), in its first review of implementation of the Basin Plan warned that the institutional and governance arrangements:

> … run the risk of being complex and therefore not well understood by implementing parties or communities. Lack of clarity about who is responsible for what and by when would impede effective implementation.

Based on the contributions of participants to this inquiry, it is apparent that the risks associated with lack of clarity of roles foreshadowed by the National Water Commission have been realised.

14.2 Have institutional and governance arrangements been effective?

Principles for effective institutional and governance arrangements

The Commission has used six key principles to assess the effectiveness of the current institutional and governance arrangements (box 14.1). These principles draw primarily on the work of the OECD and the Australian National Audit Office in relation to best practice institutional and governance arrangements, particularly where there are shared responsibilities between governments.

Key amongst these principles is role clarity. Clear specification of the purpose, functions and powers assigned to each institution is a fundamental driver of effective institutional arrangements. When roles and responsibilities are unclear, there is a risk that key governance mechanisms such as those to ensure accountability, to facilitate collaboration, and to ensure access to the right capability are inefficient or less effective than they would otherwise be. Sound institutional and governance arrangements facilitate effective engagement with stakeholders. Where there are shortcomings in arrangements, there is a risk that any efforts by agencies to engage with stakeholders become muddled.

Box 14.1 Principles for effective institutional arrangements and good governance

Clear roles and responsibilities

Role clarity supports clear expectations and accountabilities among collaborating institutions, by ensuring that each understands its own role as well as the roles and responsibilities of its partner institutions. It enables governments and external stakeholders to have clear expectations of key institutions, which supports accountability and promotes public trust and confidence.

Role clarity requires:

- clearly specifying the purpose and objectives to be achieved by each institution
- clearly specifying the powers and functions assigned to each institution, and ensuring that these powers and functions are sufficient for the entity to fulfil its responsibilities
- clear assignment of responsibilities for decision making between a governing body and its CEO, with the CEO answerable to the governing body.

Conflicting objectives and functions are effectively managed

Conflicts can arise where an institution has multiple functions that could compromise its ability (or perception of its ability) to perform each function impartially and effectively. In public institutions, this can be avoided by separating regulatory, service delivery, and policy-making functions. This principle has been a long-standing feature of Australian public policy, since the introduction of competition policy reforms in the 1990s.

Effective mechanisms for accountability

Public institutions are accountable to the relevant Minister or governing body for achieving their stated objectives and performing their required functions efficiently, effectively and impartially. They have a responsibility to fulfil their duties towards regulated entities (in the case of a regulatory body) or provide services as agreed (in the case of a service delivery agency). Public entities are also accountable to the broader community for exercising their powers and functions as expected and contributing to intended policy objectives. Accountability is supported by:

- an effective framework for monitoring, reporting and assessing the progress of implementation
- open and transparent processes that enable stakeholders to understand the reasons behind decisions and how their views have been taken into consideration. Transparency includes making publicly available the rules, data and information that inform policy, operational, and compliance decisions (except where confidentiality is required), together with any necessary guidance material to support understanding.

Effective processes for collaboration

Coordination among government institutions helps streamline decision making and avoids overlaps and duplication. Effective cross-entity collaboration requires that:

- all parties have a genuine commitment to shared goals and cooperative working arrangements
- arrangements for collaboration are clearly documented — including how collaborative work is to be undertaken, and how collaborative activities are overseen, tracked and reported on.
- information about shared programs and functions is communicated across entities
- shared risks are identified and managed
- potential overlaps and gaps (between entities' roles) are identified and addressed.

(continued next page)

Box 14.1 (continued)

Capability

All institutions should have appropriate resources and capabilities to comply with legislative obligations, discharge their functions, and achieve policy objectives. In this context, capability includes:

- adequately resourcing Basin Governments to cover the costs of Basin Plan implementation, and resourcing agencies to cover the efficient costs of performing their functions
- ensuring that responsible agencies, such as the MDBA, have the core technical capabilities to perform their functions, as well as access to people with appropriate expertise.

Effective engagement of stakeholders

Constructively engaging stakeholders in government decision making supports the identification of new opportunities or potential problems (and possible solutions). Done well, it is a key mechanism to manage risks, both through better program design and smoother implementation. Engagement also facilitates openness and transparency, which promotes accountability.

Meaningful stakeholder engagement enables governments to prioritise their activities to take into account stakeholder and community views; offers valuable feedback on how their activities are viewed by the community; and builds public confidence in decision making. It is characterised by:

- fair consideration of the diverse interests and expectations of all affected stakeholders
- consultation methods that are fit-for-purpose and that offer stakeholders genuine opportunities to influence decisions
- a culture of engagement, where stakeholders' views are valued.

Meaningful engagement with stakeholders involves identifying key stakeholders that may be materially affected and those that may be interested in the outcomes of a particular decision or program of work. Stakeholders should be involved in the design of the processes for engagement.

Sources: ANAO (2014, 2018b); OECD (2014); PC (2016, 2017a).

The current arrangements are deficient

The role of 'leading implementation' is not clear

The Water Act confers on the MDBA the functions to prepare, evaluate and review the Basin Plan and it assigns the MDBA as the 'appropriate enforcement agency' for contraventions relating to the Basin Plan.

Following the refusal of the Basin States to refer in full their constitutional responsibility for water management to the Australian Government, in 2008 Basin Governments agreed that the MDBA would have a role to 'to prepare, implement, monitor and enforce the Basin Plan' (COAG 2008). This agreement acknowledged that the MDBA would play a central role in the planning, analysis and consultation to develop the Plan. It was also agreed that once the Plan was made, Basin States would implement the Plan by managing their water resources

in a way that was consistent with the Plan. For implementation, it was anticipated that the role of the MDBA would evolve to one of 'monitoring, reporting and enforcements', ensuring that the States' water management arrangements complied with the Plan (COAG 2008).

However, as a result of the intense negotiations during its development, the Plan agreed in 2012 was more complicated than originally envisaged. For many elements (such as the SDL adjustment mechanism) the Plan set out decision making frameworks and the timeframes by which decisions had to be made. The clear and straightforward transition from 'plan development' to 'plan implementation' foreshadowed in 2008 did not eventuate.

The 2013 *Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin* (COAG 2013) was silent on assigning clear responsibility for leading the implementation. It is now not clear who is now responsible for leading implementation: the MDBA or Basin Governments.

Basin Governments have taken a more central role in negotiating how the Plan would be implemented because responsibility for water resource management resides with them. For example:

- Basin States have been responsible for developing Water Resource Plans (WRPs), for working with environmental water holders to plan and manage environmental water, and for ensuring water take compliance.
- Basin Governments (through BOC) have worked together, with technical support from their own specialists and those of the MDBA, to further develop key elements, such as the supply, constraint easing and efficiency measures.

The MDBA continues to view its functions as including 'preparing, implementing, evaluating and reviewing an integrated plan for the sustainable use of the Basin's water resources' (MDBA 2017j, p. 7). It has positioned itself to 'lead the implementation of the Basin Plan', a goal clearly identified in its corporate plans (MDBA 2017j, p. 6) and that it is 'charged with leading the implementation of the Basin Plan' (MDBA 2017j, p. 8). This positioning is a key source of stakeholder confusion about roles and responsibilities for implementation. Some stakeholders perceive them to be an Authority that is in charge.[131]

The shift in responsibility from the MDBA to Basin Governments has been implicit. Basin Governments have not sought to challenge this position, or explicitly claim this role. This has left Basin Governments and the MDBA open to accusations from stakeholders that they are blame shifting and not taking accountability for their actions.[132]

131 McBride (sub. 78), Australian Floodplain Association (sub. 41), Leeton Shire Council (sub. 17), Goulburn Murray Irrigation District (GMID) Water Leadership (sub. 62).

132 Goulburn Murray Irrigation District (GMID) Water Leadership (sub. 62), McBride (sub. 78).

The lack of clear responsibility has made it difficult for stakeholders to navigate the institutional landscape for implementing the Plan. There is confusion about who to contact when issues arise, and concerns about the costs of duplication.[133]

The implicit shift in responsibility for implementation has led to ineffective arrangements for intergovernmental collaboration to implement the Plan. Participants in the inquiry[134] have commented that there have been:

- too many multi-jurisdictional committees and groups, resulting in duplication and inefficiency
- a lot of 'process', but little decision making
- a focus on operational matters rather than consideration of strategic issues.

Ultimately, the absence of clearly assigned responsibility for implementation means that key risks to successful implementation have not been managed strategically.

- Timelines for decisions, such as the notification of supply measures have slipped and had to be amended (chapter 4).
- Approaching deadlines to resolve key issues, such as the implementation of pre-requisite policy measures and provisions to protect environmental flows are at risk of not being met by some jurisdictions (chapter 11).
- There has been uncertainty about who should respond to issues (such as water take compliance) as they arise, and as such issues have been managed reactively.

Effectively, no one has been in charge. Basin Governments have managed implementation through last minute negotiations as a crisis emerges or a deadline looms.

There are conflicts in the MDBA's roles

In its submission, the MDBA acknowledged its multiple roles in relation to water management in the Basin. It highlighted the 'benefits of working under one roof'. Having the Basin Plan and MDB Agreement responsibilities in one institution 'generates the cross-fertilisation of ideas and sharing of knowledge, which serve to achieve the healthy working Basin to which all governments are committed' (MDBA sub. 86, p. 60).

133 Cotton Australia (sub. 47), Ricegrowers' Association of Australia Inc. (sub. 70), New South Wales Irrigators' Council (sub. 80).

134 MDBA (sub. 86), Queensland Government (sub. 87).

However, an alternative view expressed by many participants in this inquiry, is that the MDBA's multiple roles can create conflicts.[135] The MDBA's roles include:

- providing independent advice to the Australian Government to make and amend the Basin Plan
- being a regulator that ensures compliance with the Basin Plan
- acting as the agent of Basin Governments, providing services under the MDB Agreement.

There are conflicts between these roles:

- on the one hand the MDBA developed the Plan and is involved in implementing it and on the other hand it is responsible for evaluating the impacts and effectiveness of the Plan — it 'marks its own homework'[136]
- as the agent of Basin Governments, working with them and then being responsible for calling them out when they are not compliant with the Plan.

Marking its own homework

Responsibility for assessing the outcomes and effectiveness of the Plan resides with the MDBA (chapter 13). As a party responsible for implementation and as the agent assisting governments implement their obligations, the MDBA is assessing its own performance. Where evaluations are not undertaken by an independent party, there is a high risk that the public will view these evaluations sceptically — or even dismiss them.

Trusted adviser and independent regulator

Areas where the conflict is greatest between the MDBA's role as the agent of governments and its role to regulate the Basin Plan include:

- Under the MDB Agreement, functions of the MDBA in relation to inter-valley and interstate water trade include the development of protocols to 'prohibit, restrict or regulate' the transfer of entitlements. This is in conflict with its role to ensure compliance with Basin Plan Trading Rules, including the making of declarations in relation to trade restrictions and enforcing compliance when State rules are inconsistent.
- As the operator of the River Murray (as the agent of governments), the MDBA developed the business case for the Hydro-cues supply measure project for consideration by BOC. The MDBA was then responsible for assessing this project as part of the suite of supply

135 Inland Rivers Network (sub. 23), Murray Irrigation (sub. 26), NSW Nature Conservation Council (sub. 43), Australian Dairy Industry Council Inc. (sub. 44), Murray River Council NSW (sub. 50) Murray Darling Association Inc. (sub. 52), Goulburn Murray Irrigation District (GMID) Water Leadership (sub. 62), Lower Edward River Pumpers and Landholders (sub. 63).

136 Lower Edward River Pumpers and Landholders (sub. 63), Murray Valley Private Diverters Inc. (sub. 69), Murray Darling Association Inc. (sub. 52), New South Wales Irrigators' Council (sub. 80).

measures and determining proposed adjustments. This assessment process was subject to a number of peer reviews.

- As the agent of governments, the MDBA is chair of the Southern Connected Basin Environmental Watering Committee. In this role, the MDBA has assisted the Basin Governments to coordinate environmental watering activities by encouraging cooperation between water holders and river operators. It is then responsible for assessing whether these activities align with the Plan and the effectiveness of these activities in achieving the outcomes of the Plan.
- As the agent of governments the MDBA operates salt interception schemes, which are a key influence on whether the salinity targets in the Plan are achieved.

The MDBA manages the conflict between its agent of governments role under the MDB Agreement and its independent Basin Plan role by internal delegations. Amendments to the Water Act made in 2008 included the MDB Agreement as a schedule to the Act. These amendments also included transitional provisions that delegated all functions and powers (except for making, amending and reviewing the Basin Plan) to the Chief Executive.[137] These delegations are still in place.

Despite these delegations, the Chief Executive has conflicting responsibilities. This position has full responsibility for MDB Agreement roles and is a member of the appointed Authority that is responsible for the MDBA's Basin Plan role.

The six member appointed Authority has no role in MDB Agreement functions, the MDBA does not communicate these internal controls, and based on the contributions of participants to this inquiry, understanding of these provisions is not widely understood.

The conflicts in the MDBA's functions are largely the result of it being necessary, efficient and effective for States to rely on their agent to provide the technical capabilities to perform these functions. Basin Governments and the MDBA have built these capabilities to enable the MDBA to deliver its MDB Agreement functions.

Key accountability arrangements have been not been used to full effect

Key mechanisms for stakeholders to hold Basin Governments accountable for implementing the Basin Plan include:

- annual reporting by Basin Governments against Category B matters in Schedule 12, the schedules of the Basin Plan Implementation Agreement and the reporting and assessment of the milestones set out in National Partnership Agreements (NPA)
- the MDBA's role in ensuring compliance with the Plan.

Open and transparent decision making by Governments also aids accountability.

137 *Water Amendment Act 2008* (Cwlth), Schedule 3 Part 3 Section 7.

There have been key shortcomings in the annual reporting of Basin Governments on their progress in implementing the Basin Plan (chapter 13). These include:

- the design of milestones in the NPA (including the lack measurable deliverables) and the assessment of milestones having been met despite evidence of unsatisfactory progress
- delays in reporting assessments of performance against the milestones set out in the NPA.

The MDBA's compliance role to date has been limited to the Basin Plan water trading rules, and the approach to resolving compliance issues with Basin States on these matters has not been effective (chapter 12). The finalisation of reviews into compliance in late 2018 was the trigger for the MDBA to turn its focus towards establishing its compliance capability in preparation for its full suite of compliance responsibilities that will commence once WRPs are accredited (chapter 12).

Many stakeholders raised concerns about a lack of transparency in the decision making of key institutions.[138] Participants stated that publicly available information has been inadequate regarding the:

- business cases for supply measure projects notified by Basin Governments under the SDL adjustment mechanism (chapter 4)
- likely costs, benefits and impacts of supply measure projects on environmental outcomes (chapter 4)
- value for money of strategic water purchases, and whether these align with the needs of the environment (chapter 3).

This lack of transparency has resulted in stakeholders seeking information through other means, including Freedom of Information requests and orders for the production of documents in the Australian Parliament. The absence of transparency has engendered an environment of low confidence and trust in Governments.

Shortcomings in accountability mechanisms has also manifested in the additional commitments made by the Australian Government to secure the passage of amendments to the Plan through the Parliament. These commitments were required to gain the support of the Parliament, following the initial rejection of the northern Basin amendment. The establishment of a Northern Basin Commissioner to monitor and advise on the implementation of the Toolkit measures and compliance reforms in the northern Basin have sought to add an additional layer of accountability. The Australian Government has indicated that it will fund these commitments from existing resources by diverting funding from other implementation activities.

138 Colloff, Williams and Grafton (sub. 12), Goulburn Valley Environment Group Inc. (sub. 13), Beer (sub. 9), Leeton Shire Council (sub. 17), Murray Darling Association Inc. (sub. 52), Murray Valley Private Diverters Inc. (sub. 69), National Parks Association of NSW (sub. 76), Harvey (sub. 51), Warren Shire Council (sub. 22), Wentworth Group of Concerned Scientists (sub. 42), Moles (sub 67).

The capability of the MDBA to perform its functions has been questioned

Some participants in the inquiry expressed a lack of confidence in the capabilities of the MDBA to execute its functions. In particular, participants questioned the preparedness of the MDBA for its forthcoming compliance role, and the quality of the MDBA's technical analysis conducted to inform decision making.[139]

While the MDBA has a broad, longer term *Strategic Workforce Plan 2016–26*, it has been reactive when conducting specific assessments to inform capability and resourcing decisions. Examples of this include:

- a review of compliance and enforcement capability, conducted as part of establishing the Office of Compliance following compliance reviews (chapter 12)
- a recently initiated review of monitoring and evaluation capability following the identification of shortcomings in the 2017 interim evaluation (chapter 13).

Peer review processes are an important check to provide confidence to decision makers and to the community that the technical and scientific analyses used to support decision making are sound. The MDBA commissions peer reviews of its technical and scientific work when the work is used to support significant decisions. The MDBA said that:

> the requirements of the peer review [is] matched to the individual programs of work. The appropriate type of review is chosen depending on the subject matter … Reviews are carried out by an external subject-matter expert, such as an expert panel, contractor, academic, or other technical experts within a government agency … it is always undertaken by an independent party. (MDBA, pers comm. 13 July 2018)

However, the MDBA lacks a policy to guide its decisions about when, how and in what form peer reviews are commissioned. This leaves the MDBA open to criticism that it does not have a genuine commitment to peer review, and allegations that conflicted or favourable reviewers may be downplaying any technical deficiencies.

Shortcomings in arrangements mean that stakeholders do not feel engaged

In its submission, DAWR highlighted that key institutions have made efforts to engage with regional communities, including:

- MDB Ministerial Council meetings being held in regional towns
- the MDBA establishing a Regional Engagement Officer network
- the CEWH appointing six local engagement officers (sub. 81, p. 28).

[139] Colloff, Williams and Grafton (sub. 12), Murray River Council NSW (sub. 50), Murray Darling Association Inc. (sub 52), Moles (sub. 67), Murray Valley Private Diverters Inc. (sub. 69).

The MDBA (sub. 86, p. 8) emphasised the importance of stakeholder consultation as being 'critical to the effectiveness of the Plan's implementation' and stated that it 'devote[s] considerable effort to engaging with the community'.

The CEWH's efforts to improve its regional engagement have received some recognition. The National Irrigators' Council (sub. 15, p. 21) welcomed the CEWH's efforts 'in acknowledging the importance of local information and experience.' Participants in the 2014 review of the Water Act gave 'widespread positive feedback on the [CEWH's] approach to engagement, particularly at the local level' (Australian Government 2014, p. 74).

Despite acknowledging the importance of working together to effectively engage local communities, Basin Governments have not always demonstrated this in practice. The approach to engaging stakeholders in the development of supply projects (which lacked detailed information and was perceived by stakeholders as tokenistic) is a key example of the lack of a coordinated and meaningful approach to engaging with stakeholders on major decisions that they are concerned about.

For the most part, participants to this inquiry expressed dissatisfaction with the community engagement processes of government agencies.[140] A common concern was that stakeholder engagement involved one-way communication (from governments to communities), where government officials 'come out to tell the community what has already been decided' (Goulburn Murray Irrigation District (GMID) Water Leadership, sub. 62, p. 19).

Many stakeholders do not perceive that Basin Governments have taken the necessary time to listen to and understand their concerns, to conduct the evidenced-based analysis required to understand potential impacts and to explore options for managing these. They are also concerned that governments have been unwilling to listen and respond to community views, and they have not considered stakeholder views in decision-making.

This has led to distrust, a lack of confidence and growing scepticism on the ability and commitment of Basin Governments to successfully implement and achieve the outcomes of the Basin Plan. Much of the community dissatisfaction is driven by the way Governments have sought to negotiate and navigate their way through issues.

140 Beer (sub. 9), Goulburn Valley Environment Group Inc. (sub. 13), Country Mayor's Association of New South Wales (sub. 7), NSW Farmers' Association (sub. 60), Goulburn Murray Irrigation District (GMID) Water Leadership (sub. 62), Lower Edward River Pumpers and Landholders (sub. 63), New South Wales Irrigators' Council (sub. 80).

Significant risks to successful implementation are unlikely to be managed well under current arrangements

Significant risks to the successful implementation of the Plan identified in this inquiry include:

- the delivery of complex supply and constraints projects and the Northern Basin Toolkit (chapter 4)
- the effective acquisition of extra water (efficiency measures) to achieve enhanced environmental outcomes (chapter 5)
- ensuring that arrangements to monitor and evaluate the outcomes of the Plan are effective (chapter 13).

The roles of both Basin Governments and the MDBA are crucial to successful implementation of the Plan. The MDBA's role as the agent of governments and as an independent regulator of the Plan are both increasingly important in the next stage of implementation. The conflict between the MDBA's roles will intensify when:

- its role in ensuring compliance with the Plan comes into full effect (chapter 12)
- it conducts the first required evaluation of the impacts of the Plan in 2020 (chapter 13)
- Basin Governments need its technical capability and river operations skills to implement supply projects (chapter 4).

Structural conflicts are likely to be exacerbated by the very different operational culture and approach that will be required to perform each of these roles effectively.

As the agent of Basin Governments, the MDBA provides services, advice and capability. More than that, it actively facilitates coordination and collaboration, and helps to drive the consensus decision-making process of Governments. Having to regulate and 'stand in judgment' of the States undermines the MDBA's credibility as a collaborative leader, and its ability to work closely and openly as a trusted adviser to Basin Governments as they implement the Plan.

The MDBA's position as a trusted adviser to Basin Governments compromises its ability to be a firm and impartial regulator, calling out Basin Governments when they are non-compliant with the Plan. The MDBA lacks true independence to report on progress and evaluate the impacts and outcomes of the Plan. While the MDBA remains a party to implementation, there is a risk that their reports on progress and evaluations will not be viewed credibly by stakeholders, or the public more broadly.

The intensifying conflict is best illustrated by the MDBA's roles in implementation of supply measure projects. Basin Governments will need the technical support of the MDBA to implement key projects (such as Hydro-cues, Menindee Lakes and River Murray rules changes). However, the MDBA is also the regulator of the Basin Plan. It will track the progress of Basin Governments in implementing projects and will be responsible for any reconciliation of the success or otherwise of supply projects in 2024.

The MDBA has already taken steps to separate some conflicting functions in its internal structure by establishing an Office of Compliance (chapter 12) and to delegate responsibilities to the Chief Executive under the MDB Agreement. These internal controls are insufficient to resolve the inherent conflict that undermines the ability of the MDBA to perform these functions effectively and credibly. In its current form, the MDBA cannot be a trusted adviser to Basin Governments and be a credible regulator.

Basin Governments should address the shortcomings identified in the institutional and governance arrangements to enable them to manage the significant risks to successful implementation. This is essential to building community confidence that the sizable investment made in the Basin Plan has led to meaningful change in the way water resources in the Basin are managed.

DRAFT FINDING 14.1

There are major shortcomings in the current institutional and governance arrangements and these pose a significant risk to the next phase of implementation of the Basin Plan.

- Responsibility for leading the implementation of the Basin Plan is not clear and there has been a lack of strategic leadership. There is uncertainty about who should respond to issues as they arise.
- The Murray-Darling Basin Authority has conflicting roles. Its ability to effectively perform its collaborative service delivery functions (as an agent of governments) and be an independent and credible regulator that ensures compliance with the Plan has been compromised by these conflicts.

These key deficiencies in institutional and governance arrangements have led to:

- a lack of transparency and accountability
- ineffective processes for intergovernmental collaboration
- stakeholders who are confused and frustrated by the efforts made to engage them due to a perceived lack of responsiveness
- key risks not being strategically managed and timelines slipping
- implementation being managed through last minute negotiations as a crisis emerges or a deadline looms.

14.3 Reform of institutional and governance arrangements is required

Since the Basin Plan was made in 2012, the attention of Basin Governments has been on negotiating and reaching agreement on the detailed settings of the Plan. The interests of their individual constituencies has been their central focus in finalising these negotiations. With the settings now largely settled, Basin Governments should commit to implementing the agreed Plan.

A complex task lies ahead for Basin Governments in the next phase of implementation. To navigate this successfully, Basin Governments will need to work together and collaborate effectively.

A fundamental foundation of collaboration is commitment to and accepting accountability for implementation. Commitment and accountability must manifest themselves through the actions of Basin Governments. Reform is required to improve cooperative working arrangements, so that collaborative efforts are coordinated and significant risks are managed effectively.

Reform is required to:

- ensure Basin Governments can effectively work together and be jointly accountable to implement the Plan
- enable the dual roles of the MDBA to be effectively fulfilled, as both its independent regulator role and its agent of governments role are increasingly important in the next five years.

Basin Governments should lead and be accountable for implementing the Basin Plan

The Basin Plan is (and must be) a joint responsibility of Basin Governments. For the outcomes of the Basin Plan to be achieved and sustained, the Plan must be integrated into State water resource management frameworks and in joint arrangements for shared water resources.

For many elements of the Plan, this integration occurs when WRPs are accredited. For other elements, there are significant risks to successful implementation, particularly with the delivery of supply and constraint easing measures. In managing this program of projects Basin Governments will need to make joint decisions to ensure consistent approaches (including those for engaging stakeholders) and for logical sequencing. To navigate the next five years of implementation successfully, Basin Governments will need to work together.

Basin Governments, through the MDB Ministerial Council, should provide strategic leadership, take joint responsibility and be accountable for implementing the Plan. BOC should take a central role, with delegated responsibility to drive intergovernmental collaboration and to manage risk strategically and effectively.

DRAFT RECOMMENDATION 14.1

Basin Governments should demonstrate strategic leadership, take joint responsibility and direct the implementation of the Basin Plan.

The Murray-Darling Basin (MDB) Ministerial Council should collaborate to provide the strategic leadership and policy direction required to implement the Plan, and be ultimately accountable for implementation.

The MDB Ministerial Council should reform the institutional and governance arrangements for implementing the Basin Plan by:

- enhancing the role of and delegating accountability for implementation to the Basin Officials Committee (BOC). BOC should be responsible for managing the significant risks to successful implementation and ensuring effective intergovernmental collaboration
- ensuring that formal directions to BOC regarding implementation are publicly available
- ensuring that arrangements to assess progress, evaluate outcomes, and ensure compliance with the Plan are fully independent
- recognising that the Murray-Darling Basin Authority will continue to be key to driving collaboration between and providing technical support to Basin Governments as they implement the Plan
- ensuring that Basin Governments are individually and collectively resourced to perform their roles to implement the Plan.

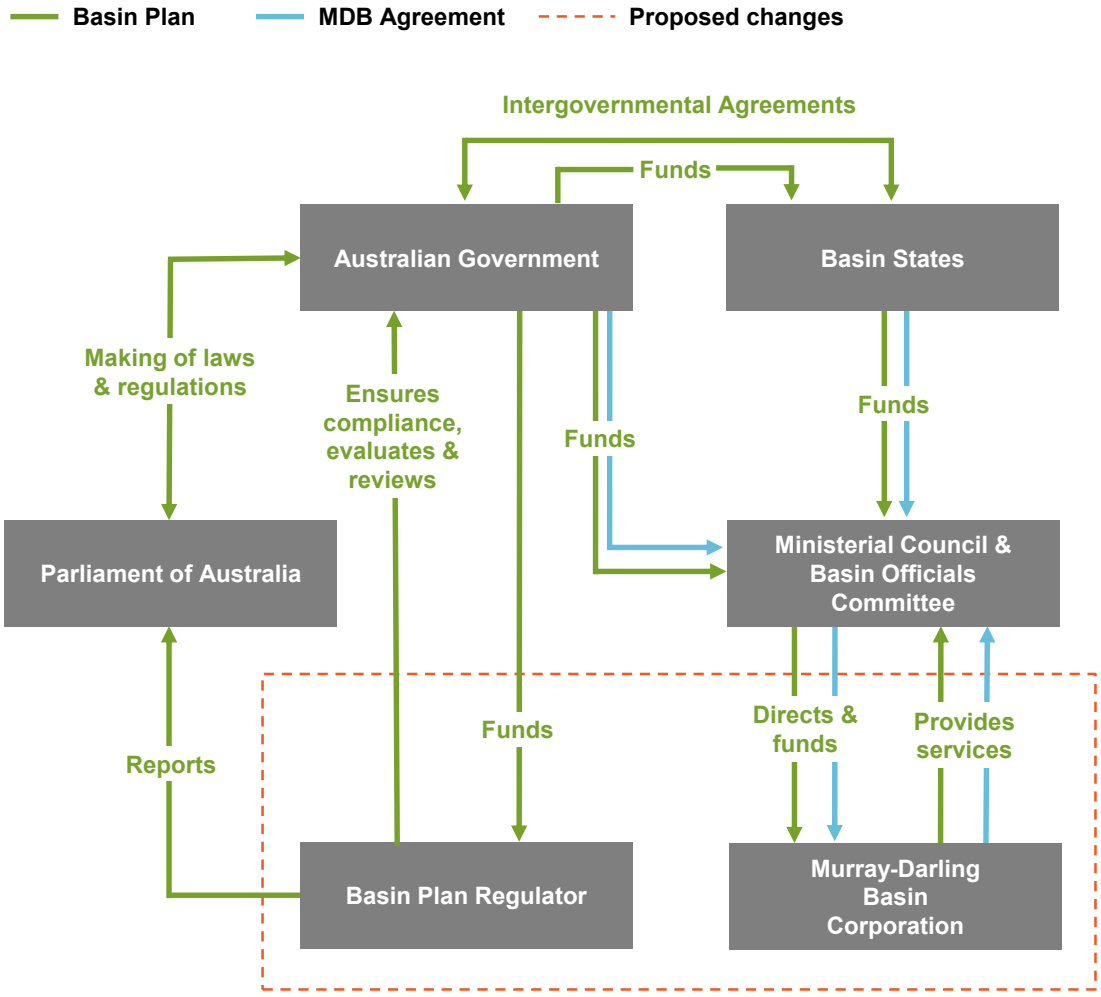
Structural reform is required to manage the conflicts in the MDBA's key roles

Structural reform to the MDBA is required to address the significant conflicts in its future suite of roles. Complete structural separation is required to assign its agent of governments functions and its regulatory functions to separate entities. This aligns with the principle of role clarity and with recommended practices for managing conflicting functions (box 14.1). Structural separation would involve assigning the roles of the MDBA to two entities:

- the Basin Plan Regulator — with compliance and evaluation responsibilities
- the Murray-Darling Basin Corporation — the agent of governments providing MDB Agreement services and supporting Basin Governments to implement the Plan.

Structural separation would enable the roles to support Basin Plan implementation and deliver services under the MDB Agreement to be clearly delivered as the agent directed and funded by Basin Governments. Regulatory and evaluation functions would be delivered by an independent regulator that operates objectively and at arms-length from those responsible for implementation (figure 14.2).

Figure 14.2 **Proposed institutional arrangements**



Structural separation would involve assigning the MDBA's current roles to either the Murray-Darling Basin Corporation (the Corporation) or the Basin Plan Regulator (the Regulator) (table 14.2).

There are risks and potential costs associated with structural separation. These include the risk of separating technical capability from Plan evaluation and review functions, and that reform will divert focus and resources from implementation.

In the proposed separation of functions (table 14.2), the MDBA's core technical capabilities (including hydrological modelling) would go to the Corporation. A key risk is that the Basin Plan Regulator does not have the technical capabilities required to enable it to deliver its functions. As is the case in other sectors, the Regulator can put in place formal and transparent arrangements for the supply of technical capability from the Corporation, Basin Governments, or other providers when it is required.

Table 14.2 **Proposed roles and functions of the Corporation and the Regulator**

Murray-Darling Basin Corporation — the agent of Basin Governments	*Basin Plan Regulator — an independent regulator*
MDB Agreement functions including asset management, River Murray operations, interstate water trading rules and River Murray critical human water needs	Ensuring compliance with the Basin Plan, including water trading rules, WRP accreditation and compliance, and SDL compliance (draft recommendations 6.2,10.1, 12.1, 12.3)
Supporting Basin Governments to assist them to implement the Plan, including by: • providing coordination and technical support for implementation as directed by BOC • maintaining technical capabilities, including modelling	Independently assessing the progress of Basin Governments against agreed milestones (draft recommendation 13.1)
Coordinating environmental water planning and management (draft recommendations 11.1, 11.2)	Ensuring environmental water planning aligns with the outcomes of the Basin Plan
Providing technical support to Basin Governments to assist them to implement supply projects	Conducting the SDL adjustment reconciliation (draft recommendation 4.3) Reporting annually on the progress of Basin Governments in delivering on their commitments to implement supply measures (draft recommendations 4.1, 4.5) Tracking progress and assessing the effectiveness of the Northern Basin Toolkit (draft recommendation 4.5)
Updating the modelling of the environmental benefits of additional water recovery (draft recommendation 5.1)	
Identifying and managing risks to delivery arising from changes in water use and trade in connected systems (draft recommendation 10.2)	Determining the extent of over-recovery (draft recommendation 3.2)
Supporting Basin Governments to develop a Basin Plan monitoring and evaluation strategy (draft recommendation 13.3)	Undertaking scheduled evaluations of the impacts of the Plan in 2020 and 2025 Reviewing the Plan in 2026 Revising the Basin Plan Evaluation Framework (draft recommendation 13.2) Evaluating the effectiveness of WRPs (draft recommendation 6.3) Reviewing the salt export objective (draft recommendation 8.1)

Some stakeholders may view institutional reform as a distraction, at a time when Basin Governments need to get on with the job of implementing the Plan. Intergovernmental collaboration is a key issue for delivery of the supply and efficiency measures. For these projects to be a success, it will be essential for Basin Governments to rely on the MDBA as both a trusted adviser and a source of technical expertise. To build community confidence that these projects are on track and are achieving their outcomes, independent assessments of progress and evaluation are required. Institutional reform is necessary to create the incentives to perform functions more effectively.

Some may perceive these proposed reforms as handing the Basin Plan back to the Basin Governments. It was always envisaged that the Basin States would implement the Plan, as the MDBA alone cannot deliver success. To achieve the outcomes of the Plan, changes are required in the way that Basin States manage water resources. The creation of a truly independent regulator will hold Basin Governments to account — by independently tracking implementation and ensuring they comply with the Plan.

The MDBA's roles as the agent of governments and as an independent regulator of the Plan are both critically important in the next stage of implementation. In its current form, the MDBA cannot be a trusted adviser to States (a role that involves providing collaborative leadership, advice and technical capability to the Basin States) and a credible regulator (where independence is critical to restoring public confidence in the Plan).

In the absence of structural reform, in 2024 the MDBA will be responsible for deciding to reconcile the effectiveness of supply projects in achieving equivalent environmental outcomes. It will do this having had a key hand in the success or otherwise of these projects. Given the level of community dissatisfaction about supply measures (chapter 4), maintaining the status quo risks ongoing scepticism about whether implementing the projects will be worth it.

If Basin Governments do not commit to and progress structural reform, the credibility of the MDBA (as both regulator and agent of governments) will be extremely compromised, and the likelihood of successful implementation significantly diminished.

The institutional incentives created through structural separation outweigh the administrative costs associated with transition.

Structural separation should begin as soon as possible, and should be completed by 2021.

DRAFT RECOMMENDATION 14.2

Basin Governments should agree to the restructure of the Murray-Darling Basin Authority to separate its service delivery and regulatory functions into two institutions.

The Australian Government should then embark on the necessary institutional reforms to establish the:

- Murray-Darling Basin Corporation — as the agent of Basin Governments
- Basin Plan Regulator — an independent Commonwealth Statutory Authority.

These institutional reforms should be in place by 2021.

Enhancing the role of the Basin Officials Committee

BOC is the governance 'engine room' that operates under the auspices of the MDB Ministerial Council. With Basin Governments committed to and accepting accountability for implementing the Plan, it is logical for them to direct BOC to take a more central role. The MDB Ministerial Council should assign BOC responsibility for leading the implementation of the Basin Plan and for ensuring that the risks to implementation are effectively managed.

The MDB Ministerial Council should adjust the role and focus of BOC to enable it to underpin their strategic leadership effectively. Specifically, the role of BOC should be to:

- provide advice to the MDB Ministerial Council on Basin policy matters
- direct the Corporation in relation to MDB Agreement matters
- lead the implementation of the Basin Plan, including managing the significant risks to successful implementation
- direct the Corporation in relation to matters where they require support, coordination or joint capability to implement the Plan.

BOC's focus should be on the 'Basin as a whole' and its culture should be one of collaborative custodians of the Basin. To enable BOC to maintain this focus, senior officials should convene in a separate forum at points of significant Commonwealth-State negotiations (such as the development of new funding agreements) to enable the parties to negotiate in good faith.

Membership of BOC

BOC currently consists of a representative from each Basin State, with a Chair appointed by the Australian Government Minister. Since 2008, the Chair of BOC has been a senior Australian Government bureaucrat from the Department responsible for water. The Australian Government is not a neutral chair. Its roles in funding the development and delivery of SDL adjustment measures and in deploying the Commonwealth Environmental Water holdings highlight its active and ongoing role.

To encourage and support a shift in the focus of BOC, from operational to strategic and from individual interests to 'Basin as a whole', there is strong case for an independent chair of this Committee.

The Murray-Darling Basin Corporation should retain its observer status of BOC given its role as the agent of governments. The Basin Plan Regulator should not have observer status.

A suggestion made by the MDBA (sub. 86) to include the CEWH as a member of BOC is inappropriate. Together with other environmental water holders in the Basin, the CEWH's role in the implementation of the Basin Plan is to contribute to coordinated environmental water planning and management. It is not a policy maker and it is not responsible for the

overall management of water resources. The CEWH supports BOC to deliver its responsibilities for implementing the Plan.

Ensuring capability for joint implementation

Each Basin Government has its own processes for ensuring it has the capability to deliver its individual resource management responsibilities. Collectively, Basin Governments have well-established arrangements for resourcing joint programs and shared responsibilities under the MDB Agreement. With a shift to collective responsibility, BOC should ensure that it has the shared capability and resourcing required for implementation.

Historically, the shared capability provided by the MDBA has focused on the River Murray and natural resource management programs. However, in the next phase of implementation, there are likely to be areas where enhancing current or developing new areas of joint capability is desirable. In some cases, the Corporation may be best placed to house these new capabilities. Examples of this might be the development and delivery of major integrated works programs or in improving the understanding of risks (such as climate change) to Basin water resources.

Consistent with the current process set out in the Service Level Agreement for the MDBA's agent of government role, the new Corporation's corporate plans should set out the activities it will deliver for Basin Governments. These corporate plans should include the agreed cost shares for activities and following consideration by BOC, be approved by the MDB Ministerial Council.

Basin Governments should structure future intergovernmental funding arrangements for the next stages of implementation in a way that clearly recognises the role of the Corporation as the agent of governments assisting them to implement the Plan. New agreements should not be a barrier to rapid reform, but rather enable the commencement of the proposed model ahead of full structural reform.

Reviewing the operational processes for collaboration

The structures and processes for operational collaboration for joint resource management and those for the implementation of the Basin Plan have become unwieldy. BOC should conduct a wholesale review of sub-committees and other arrangements to ensure that they:

- are clearly aligned to BOC's functions and the decisions that BOC is responsible for taking (noting that some of these decisions may be appropriately delegated to sub-committees)
- comprise membership of those parties with the skills, capability, and technical expertise required to inform these decisions and to implement them
- have clear terms of reference and work programs that are reviewed at regular intervals
- are accountable to BOC for delivering against these work programs.

DRAFT RECOMMENDATION 14.3

To enable it to carry out its enhanced role, by 2020 the Basin Officials Committee should:

- comprehensively review the capability and the resourcing it requires to jointly implement the Plan
- agree on the capability and services Basin Governments require of the Murray-Darling Basin Corporation to support them to implement the Plan and for shared water resource management
- establish new arrangements and processes to support ongoing intergovernmental collaboration.

The transition to a new Basin Plan Regulator

An interim MDBA internal structure

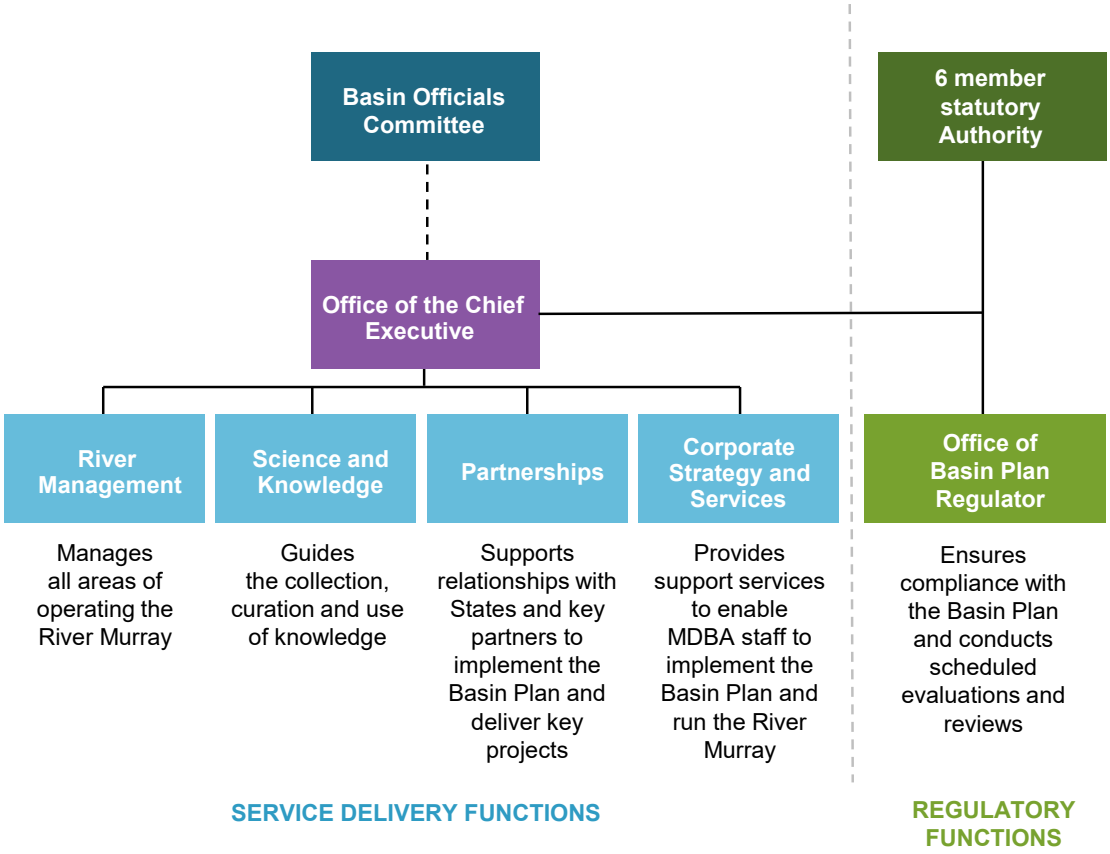
The MDBA's main compliance role commences in mid-2019 (chapter 12) and the first scheduled evaluation of the impacts of the Plan is to occur in 2020 (chapter 13). While it would be ideal to have these functions commence in the context of a separate Australian Government regulator, the Commission acknowledges that institutional reform in this timeframe is not realistic.

Ahead of structural separation, transitional arrangements should involve the consolidation of all compliance (draft recommendation 12.1) and evaluation functions into the Office of the Basin Plan Regulator. This should continue to be subject to the assurance process of an Independent Assurance Committee. The six appointed statutory Authority members would be responsible for making decisions relevant to these functions including the making of any future amendments to the Plan, compliance and enforcement, and evaluation and reviews.

This interim arrangement would require an adjustment to the internal structure of the MDBA (figure 14.3) and the delegation of responsibility for the Basin Plan service delivery functions to the Chief Executive. It would not require legislative change. The MDBA Chair should rescind its role as an observer of BOC under the interim arrangements.

To ensure that the Office of the Basin Plan Regulator has the skills to effectively deliver its functions, it should consolidate the outcomes of reviews of monitoring and evaluation capability and compliance capability that are in progress. The Office of the Basin Plan Regulator should identify areas where technical capability or administrative services are required from the service delivery divisions. For each of these areas, formal agreements should be established to provide confidence and transparency that these functions are conducted at arms-length ahead of structural separation.

Figure 14.3 **Proposed interim MDBA organisational structure**



Source: MDBA (2018i).

The MDBA should complete these interim arrangements before July 2019, to ensure that it is ready for the commencement of its full suite of compliance responsibilities and to undertake the preparation required to deliver the 2020 evaluation of the impacts of the Plan.

DRAFT RECOMMENDATION 14.4

As a transitional measure, and before the Murray-Darling Basin Authority's compliance role comes into full effect in July 2019, the Office of Compliance should be broadened to be the Office of the Basin Plan Regulator, and include compliance and evaluation functions.

The Australian Government should be responsible for the Basin Plan Regulator

As a regulator of Commonwealth law, the Australian Government should have sole responsibility for the Basin Plan Regulator and ensure that it can perform this role effectively.

A multi-member decision making model is proposed, to bring diverse perspectives to decision making and reduce the risk of undue influence.

This will involve the Australian Government reviewing the provisions of the Water Act to ensure that the:

- objects, functions and powers of the Regulator are clearly established to reflect its new role in ensuring compliance with the Plan and evaluating its impacts
- composition and skills mix of the statutory appointments align with its function as a regulator and evaluator.

Consistent with the Australian Government's approach to good corporate governance of other independent statutory authorities[141] the Australian Government Minister for Water, while respecting the independence of the Regulator, should:

- publicly issue an annual statement of expectations to the Regulator, which formally sets out how it should take into account the broader policy frameworks of Government, its relationship with the Government, and for transparency and accountability
- require the Regulator to respond to this statement, by publicly issuing a statement of intent that sets out how it will respond to these expectations.

Adequate resourcing and appropriately skilled staff will be critical if the Regulator is to have the requisite capabilities and organisational culture to play a strong regulatory role and to evaluate the outcomes of the Plan effectively.

The Australian Government should fund the Regulator.

DRAFT RECOMMENDATION 14.5

In establishing the Basin Plan Regulator by 2021, the Australian Government should ensure that it will be effective, including by reviewing the skills mix of the statutory appointments and establishing a statement of expectations.

[141] For example the Australian Taxation Office, the Australian Bureau of Statistics, Australian Energy Regulator, and the Australian Prudential Regulation Authority.

A Inquiry conduct and participants

This appendix describes the stakeholder consultation process undertaken for the inquiry and lists the organisations and individuals that have participated.

Terms of reference receipt

The terms of reference for the inquiry — reproduced in the preliminary pages of this report — was received from the Treasurer on 7 March 2018. An initial circular advertising the inquiry was distributed to industry organisations and individuals and the inquiry was advertised in national newspapers. A consultations paper was released on 13 March 2018.

Consultations

The Commission received 89 public submissions (table A.1) and 10 comments via the website (table A.2) prior to the release of this draft report. All public submissions are available on the inquiry website.

- 22 from industry associations, groups or peak bodies
- 24 from State and Local governments or government agencies
- 5 from academics or university groups
- 23 from individuals
- 5 from farmers/irrigators and private sector business
- 2 from Rural water services provider
- 18 NGOs (community, environmental, Indigenous)

In addition, the Commission held separate discussions with businesses, business groups, academics, government agencies and individuals (table A.3) and public forums were held in regional centres across all Basin States (table A.4).

In accordance with section 89 of the *Water Act 2007*, the Commission has established a stakeholder working group (SWG). The SWG is an important avenue for consultation. It provides a forum to exchange information and views on issues relevant to the is inquiry. The SWG members are listed in table A.5. The SWG held meetings on 2 May 2018 and 4 July 2018.

The Commission welcomes further contributions to the inquiry from interested individuals or groups. Submissions on this draft report close on **10 October 2018** and public hearings will be held in October 2018. Further details on registering for hearings and making submissions can be found on the inquiry website.

The inquiry final report will be provided to Government by the 31 December 2018.

Table A.1 **Public submission received**

Participants	*Submission no.*
Liberal Party of Australia, Victoria, Mildura Branch, Water Advisory Committee	1
Brewarrina Shire Council	2
Patrick Johnston	3
Brian Bycroft	4
Murrumbidgee Valley Food and Fibre Association	5
Frances Pietroboni	6
Country Mayors Association of New South Wales	7
Paul Connellan	8
Jan Beer	9
Sen. David Leyonhjelm	10
Bill Bagley	11
Matthew Colloff, John Williams and R. Quentin Grafton	12
Goulburn Valley Environment Group Inc.	13
EDO's of Australia	14
National Irrigators' Council	15
Griffith City Council	16
Leeton Shire Council	17
Speak Up Campaign Inc.	18
Frederick Bouckaert, Yongping Wei, Karen Hussey & Ray Ison	19
Lindsay Leake	20
Rel Heckendorf	21
Warren Shire Council	22
Inland Rivers Network	23
Smartrivers	24
International Association of Hydrogeologists	25
Murray Irrigation	26
Riverina and Murray Regional Organisation of Councils	27
Dr Anne Jensen	28
Southern Riverina Irrigators	29
Dr Bethany Cooper	30
WWF-Australia	31
Edward River Council	32
Bonlac Supply Company	33
Strategic Advisory Committee of Lower Murray Water	34
Sandy MacKenzie	35

(continued next page)

Table A.1 (continued)

Participants	*Submission no.*
Murray River Group of Councils	36
Barrie MacMillan	37
Coleambally Irrigation Co-operative Limited	38
Murrumbidgee Private Irrigators Inc.	39
Professors Sarah Wheeler, Jeff Connor, Quentin Grafton, Lin Crase and John Quiggin	40
Australian Floodplain Association	41
Wentworth Group of Concerned Scientists	42
NSW Nature Conservation Council	43
Australian Dairy Industry Council Inc.	44
Australian Competition and Consumer Commission	45
Anne Hartnett	46
Cotton Australia	47
Wentworth Shire Council	48
Lachlan Valley Water Inc.	49
Murray River Council NSW	50
Paul Harvey	51
Murray Darling Association Inc.	52
Ann Lucas	53
Alistair Watson	54
Bob Newman	55
Macquarie River Food and Fibre	56
Warren Shire Council	57
Renmark Paringa Council	58
Balonne Shire Council	59
NSW Farmers' Association	60
Queensland Farmers' Federation	61
Goulburn Murray Irrigation District (GMID) Water Leadership	62
Lower Edward River Pumpers & Landholders	63
Frances Pietroboni	64
Islex Australia Pty Ltd	65
Dean Brown AO	66
Sarah Moles	67
Macquarie Marshes Environmental Landholders Association	68
Murray Valley Private Diverters Inc.	69
Ricegrowers’ Association of Australia Inc.	70
Greater Shepparton City Council	71
Murray Lower Darling Rivers Indigenous Nations (MLDRIN)	72
Environment Victoria	73
Murray Darling Association Region 6	74
Commonwealth Environmental Water Holder	75
National Parks Association of NSW	76
National Farmers’ Federation	77

(continued next page)

Table A.1 (continued)

Participants	*Submission no.*
Robert and Katharine McBride	78
River Lakes and Coorong Action Group Inc.	79
New South Wales Irrigators' Council	80
Australian Department of Agriculture and Water Resources	81
Namoi Water	82
Gwydir Valley Irrigators Association Inc.	83
Brian Mills	84
South Australian Government	85
Murray-Darling Basin Authority	86
Queensland Government	87
Australian Rivers Deltas	88
Victorian Government	89

Table A.2 **Brief comments received**

Participants	*Comment no.*
Doug Mackintosh	1
Kerry Tucker	2
Howard Jones	3
Griffith Business Chamber	4
Robert Gillespie	5
Gary Ellett	6
Gwydir Shire Council	7
Rosa Hillam	8
Sunset Strip Residents	9
Western Murray Land Improvement Group	10

Table A.3 **Consultations**

ACT Environment, Planning and Sustainable Development Directorate
Aither Pty Ltd
Alexandrina Council
AnaBranch Water
Australian Floodplain Association
Australian Government Department of Agriculture and Water Resources
Badger Bates
Balonne Shire Council
Barry McMillon
Barwon-Darling Water
Basin Community Committee
Border Rivers Food and Fibre
Bourke Shire Council
Brewarrina Shire Council
Commonwealth Environmental Water Office
Coorong District Council
Darling River Action Group
David Harriss
Dried Fruits Australia
Goondiwindi Regional Council
Goulburn Broken Catchment Management Authority
Goulburn Murray Irrigation District Leadership Forum
Goulburn Valley Environment Group
Griffith City Council
Gwydir Valley Irrigators Association
Howard Jones (BCC member, Lower Darling)
John Cooke
Jon Greer
Katharine McBride
Katrina Humphries
Lower Darling Horticulture Group
Macquarie Marshes Environmental Landholders Association
Macquarie River Food and Fibre
Matthew Colloff and John Williams
Menindee Local Aboriginal Land Council and local Elders
Murray-Darling Basin Authority
Murray Darling Association
Murray Irrigation Limited
Murray Lower Darling Rivers Indigenous Nations
Murray River Action Group
Murray Valley Private Diverters Inc.
Murray Valley Wine Growers
Murrumbidgee Field Naturalists

(continued on next page)

Table A.3 (continued)

Murrumbidgee Irrigation
Namoi Water
Neil Byron
New South Wales Department of Industry
New South Wales Office of Environment and Heritage
Pomona Irrigators Trust
Queensland Department of Natural Resources, Mines and Energy
Queensland Murray-Darling Committee
Renmark Irrigation Trust
Renmark Paringa Council
Ricegrowers' Association of Australia
River Lakes and Coorong Action Group Inc.
Rory Treweeke
Sarah Moles
Smart Rivers
South Australian Department for Environment and Water
South Australian Murray Irrigators
South West Water Users
Southern Alexandrina Business Association
Southern Riverina Irrigators
Speak up for Water
Victorian Department of Environment, Land, Water and Planning
Victorian Environmental Water Holder
Victorian Farmers' Federation
Wentworth Group of Concerned Scientists
Wentworth Shire Council
Western Murray Irrigation
Yanco Creek and Tributaries Advisory Council

Table A.4 **Public Forums**

New South Wales

Warren — 21 March 2018
Bourke — 22 March 2018
Deniliquin — 28 March 2018
Moree — 3 April 2018
Griffith — 13 April 2018

Victoria

Shepparton — 26 March 2018
Echuca — 27 March 2018
Mildura — 29 March 2018

Queensland

Goondiwindi — 4 April 2018
St George — 5 April 2018
Dirranbandi — 6 April 2018

ACT

Canberra — 11 April 2018

South Australia

Goolwa — 16 April 2018
Renmark — 17 April 2018

Table A.5 **Stakeholder Working Group members**

Australian Conservation Foundation
Australian Floodplain Association
EDOs of Australia
Murray Darling Association
Murray Lower Darling Rivers Indigenous Nations
National Farmers' Federation
National Irrigators' Council
Northern Basin Aboriginal Nations

B Analysis of the cost of recovering water for the environment

This appendix outlines the analysis that underpins some of the cost estimates discussed in the main body of the report.

- B.1 examines the extra cost (or premium) paid by the Australian Government by choosing to recover water for the environment through infrastructure investment rather than purchasing entitlements (chapter 3).
- B.2 examines the potential budgetary cost of recovering water to 'make good' should some key projects in the 605 GL supply package not proceed (chapter 4).
- B.3 examines the potential budgetary cost of recovering the extra 450 GL through efficiency measures if future water recovery is based on the approach outlined in the Australian Government's Murray-Darling Basin Water Infrastructure Program (chapter 5).
- B.4 examines the financial cost of recovering additional environmental water before it can be delivered effectively (chapter 5).

B.1 Premium for recovering water through infrastructure investment

Basin Governments (primarily the Australian Government) have recovered almost all of the water needed to *bridge the gap* to the Basin Plan's Sustainable Diversion Limits (SDLs). The Australian Government acquired much of this water (about 60 per cent) through the direct purchase of entitlements from willing sellers. However, about one-third of this water was recovered through projects that modernise irrigation infrastructure. These projects aim to improve the technical efficiency of water use for irrigated agriculture, and provide a share of the saved water to the Australian Government for environmental use.

Basin Governments chose to recover some water through infrastructure modernisation to help manage the social and economic impacts of reduced water availability. However, water acquired through infrastructure modernisation has a higher cost (per unit) than the prevailing market price. It is a more expensive way to recover a fixed volume of water for the environment compared with directly purchasing the same water entitlements.

To understand the cost implications of this approach to water recovery, the Commission has compared:

1. the cost to the Australian Government of recovering water through infrastructure modernisation, with;
2. the estimated cost if the Australian Government had instead purchased the same water entitlements at market prices.

The difference between these two values represents the additional cost incurred of pursuing those additional policy objectives.

Method and data

The Commission has derived the additional cost of recovering water through infrastructure modernisation from published 'market multiples'. The market multiple is the ratio of the cost of water (per unit) contracted under an infrastructure program against the prevailing market price (DOE 2014). For example, a market multiple of 2.0 for a project implies that the water recovered cost the Australian Government twice as much as purchasing those same entitlements on the market.[142]

The market multiple can be multiplied by the amount of water contracted under a program to provide an estimate of the total additional cost of recovering water through that program, compared with purchasing the same volume in the market.

The (then) Department of the Environment published the market multiples for contracted water recovery programs in 2014 (DOE 2014). This information has not been released for more recent projects, and has not been publicly updated for subsequent revisions to costs or the quantity recovered.

The implied project premium in table B.1 is calculated as:

$$Project\ Premium = Project\ cost - Implied\ market\ value$$

Where:

$$Implied\ market\ value = \frac{Project\ cost}{Market\ multiple}$$

Results

Based on 2014 data, the total amount contracted to recover water through infrastructure modernisation to bridge the gap was about $2.9 billion (table B.1). Had that water been instead purchased at the implied market price, recovering the same amount of water would have cost about $1.0 billion.

142 Assuming there are no impacts on prices from the Australian Government's decision.

This implies that the amount extra paid to recover water through the infrastructure projects in table B.1 was about $1.9 billion. This equates to an average premium per unit of about $3300 per ML in terms of long-term average annual yield (LTAAY).

Table B.1 **Market multiples**

For water recovery programs as of June 2014

Program	*Amount recovered*	*Cost to Australian Government*	*Average unit cost*	*Market multiple*	*Implied project premium*	*Implied market price*	*Implied premium per unit*
	A	B	C = B ÷ A	D	E = B – (B ÷ D)	C ÷ D	E ÷ A
	GL LTAAY	$m	$ / ML LTAAY	scalar	$m	$ / ML LTAAY	$ / ML LTAAY
NSW PIIOP (rounds 1 & 2)	113	642	5 681	2.4	374.5	2 367	3 314
NSW Water Metering (pilot)	4	22	5 500	3.5	15.7	1 571	3 929
NSW Water Metering (excl. pilot)	28	199	7 107	2.3	112.5	3 090	4 017
NSW Basin Pipes	30	137	4 567	2.5	82.2	1 827	2 740
NSW IFM pilot	0.5	7	14 000	2.3	4.0	6 087	7 913
NSW IFM	12	85	7 083	2.5	51.0	2 833	4 250
Nimmie-Caira	133	180	1 353	2.4	105.0	564	789
Healthy Headwaters	7	51	7 286	2	25.5	3 643	3 643
GMW Connections Stage 2	102	956	9 373	4.9	760.9	1 913	7 460
NVIRP on-farm	10	44	4 400	2.3	24.9	1 913	2 487
VFMP	30	100	3 333	1.9	47.4	1 754	1 579
Sunraysia Modernisation	7	103	14 714	7.1	88.5	2 072	12 642
SA PIIP	3	14	4 667	2.6	8.6	1 795	2 872
SARMS	16.8	80	4 762	2.5	48.0	1 905	2 857
OFIEP (pilot and rounds 1 to 3)	83	296	3 566	2.3	167.3	1 551	2 016
TOTAL	**579.3**	**2 916**	**5 034**		**1 916**		**3 307**

Source: DOE (2014).

Notes: PIIOP = Private Irrigation Infrastructure Operators Program; IFM = Irrigation Farm Modernisation; GMW = Goulburn Murray Water; NVIRP = Northern Victoria Irrigation Renewal Program; VFMP = Victorian Farm Modernisation Program; PIIP = Private Irrigation Infrastructure Program; SARMS = South Australia River Murray Sustainability; OFIEP = On-Farm Irrigation Efficiency Program

Note: Total costs and premiums calculated inclusive of 17 GL of non-gap bridging water recovered in the Lachlan.

B.2 Cost of making good if key projects in the 605 GL supply package do not proceed

In the southern Basin, a package of 36 supply projects was agreed in May 2018, with funding of up to $1.0 billion.[143] These projects provide equivalent environmental outcomes using less water, enabling the water recovery target to be offset by 605 GL.

The Basin Plan requires projects to be fully operational by June 2024, and projects that will not be operational by 2024 must be withdrawn. Many of the supply projects are at the scoping or concept design stages of development. This includes six highly complex projects (Menindee Lakes, four constraints and hydro-cues supply projects). Achieving the 605 GL determination relies heavily on implementing these projects as they could account for between one-third and half of the 605 GL offset (discussed in chapter 4 and below).

If the six key supply projects do not proceed — because of the strict 2024 deadline — then Basin States or the Australian Government may be required to make good by recovering the water. This example considers the case where the Australian Government is required to make good. To understand the cost implications to the Government of such a scenario, the Commission compared:

1. the cost of the aforementioned key supply projects, with;
2. the cost of making good the shortfall in the water recovery target should the projects not proceed (which requires estimating how much of the 605 GL offset is attributable to these projects and how the Government recovers the water).

The difference between the second and first cost represents the net cost to the Government of the projects not going ahead.[144] This assumes that all of the project costs are avoided. However, if some of the project costs are incurred prior to the deadline, then the net cost would be larger.

Method and data

Cost of supply projects

Table B.2 presents the costs of supply projects in the analysis. The Commission obtained cost estimates for five of the projects (Menindee Lakes and constraint easing in the Murrumbidgee, South Australian Murray, Hume to Yarrawonga and Yarrawonga to Wakool) from publicly available business cases. The business case for the hydro-cues project (with permission to publish the included cost estimate) was obtained from the Basin Officials Committee.

143 Constraints projects included in the supply package will also be able to seek up to $200 million in funding from the Water for the Environment Special Account.

144 The analysis considers capital costs only (not any costs of operating the infrastructure built as part of the supply projects, or management costs of holding more water entitlements to meet a revised target).

Mid-points and upper and lower bounds for the cost of each supply project are included in the table. The mid-points for all four constraint easing projects are the Commission's calculations, as their business cases expressed cost estimates as ranges only. Conversely, the business cases for Menindee Lakes and hydro-cues only provide midpoint estimates. To account for uncertainty in those projects' costs, the Commission imputed lower and upper bounds for the costs in proportion to the ranges of the constraint projects. This was done by calculating the average magnitude of the cost range relative to the magnitude of the midpoint across the constraints projects, and applying the same relative range to the Menindee and hydro-cues costs (box B.1).

Table B.2 **Costs of selected supply projects**

Project		*Mid-point cost ($ million)*	*Cost range ($ million)*
	Menindee Lakes	152	130-175 **a**
	Hydro-cues	27	23-31
Constraints	Hume to Yarrawonga	30 **b**	26-34
	Murrumbidgee	139	113-164
	South Australian Murray	47	38-55 **c**
	Yarrawonga to Wakool Junction	280	254-306
	Total	**674**	**583-765**

a Range for Menindee Lakes and hydro-cues imputed in proportion to the ranges provided for the constraints projects. **b** Mid-points for all constraint projects calculated from ranges provided in their business cases. **c** Cost estimate released as part of *Senate Motion No 685 for production of documents*.

Sources: DELWP (Vic) (2016); DEWNR (SA) (2016); DPI (NSW) (2016a, 2016b, 2017b); MDBA (nd (b)).

Box B.1 Imputed cost ranges for the Menindee Lakes and hydro-cues projects

The lower and upper bound costs for the projects are imputed respectively as:

$$c^l = c \times (1 - \frac{d}{2})$$
$$c^u = c \times (1 + \frac{d}{2})$$

Where c is the single cost figure given in the business case, and the average deviation of the four constraint projects, d, is:

$$d = \frac{1}{4}\sum_{i=4}^{4} \frac{(c_i^u - c_i^l)}{\frac{1}{2}(c_i^u + c_i^l)}$$

Cost of water recovery to make good

The cost of a water recovery scheme to make good in the event of the projects not going ahead depends on:

- the volume of water recovery required to make good (that is, how much water recovery the supply projects are deemed to offset in achieving equivalent environmental outcomes)
- the manner in which the Government recovers the water.

In determining the offset of the supply measures package, the MDBA was not required to calculate the offset attributable to each project individually. The MDBA has indicated that there is large uncertainty in estimating the offset of individual projects due to 'the interlinked and interdependent nature of river management' (MDBA 2017s, p. 28). For example, the environmental benefits of the hydro-cues project are heavily dependent on easing constraints. Estimates made during the development of the package provide some insight into the offset that could be attributed to the six key projects (box 4.3 in chapter 4). These estimates suggest that the contribution of these projects could be in the order of 200-300 GL.

For this analysis, the middle value of this range (250 GL) is taken as the main estimate.

Two policy scenarios were considered for the Government's method of water recovery:

1. The Government purchase water entitlements directly up until reaching the legislative 1500 GL cap for purchases, then acquires the remaining volume required through infrastructure programs.
2. The Government acquires entitlements solely through infrastructure programs.[145]

Under the first scenario the cost of the recovery is given by:

$$\begin{cases} C_p = V_r \times P, V_r \leq V_c \\ C_p = V_c \times P + (V_r - V_c) \times P \times M, V_r > V_c \end{cases}$$

While under the second the cost is:

$$C_i = V_r \times P \times M$$

Where C_p is the total cost of purchasing water up to the 1500 GL cap before turning to infrastructure programs, C_i is the total cost of making good through infrastructure programs only, V_r is the volume of water needed to make good, V_c is the volume of water remaining under the 1500 GL purchase cap, P is the average price paid for water entitlements per GL LTAAY, and M is the average market multiple paid by the Government for entitlements under infrastructure programs.

[145] The Australian Government has stated a preference for recovering water in this manner (DOE 2014).

The price of water entitlements is based on the 12 month volume weighted average price per ML for the entitlements listed in table B.4. A volume weighted average price was constructed following the 'balanced recovery' approach described in section B.3.[146] The price obtained from this process is $2644 per ML LTAAY.

The market multiple used here is 1.75, which is the number that sets the maximum funding available for projects which transfer entitlements to the Commonwealth under the Murray-Darling Basin (MDB) Water Infrastructure Program. This multiple is below those of previous infrastructure projects (table B.1) and there is a risk that it may be too low to encourage sufficient participation. The estimated cost of making good through infrastructure programs may represent a lower bound on the true value.

Finally, the volume of water purchases remaining to the Government under the 1500 GL purchase cap (assuming the remaining 29.5 GL yet to be recovered to *bridge the gap* is obtained through purchase, chapter 3) is 246.5 GL.

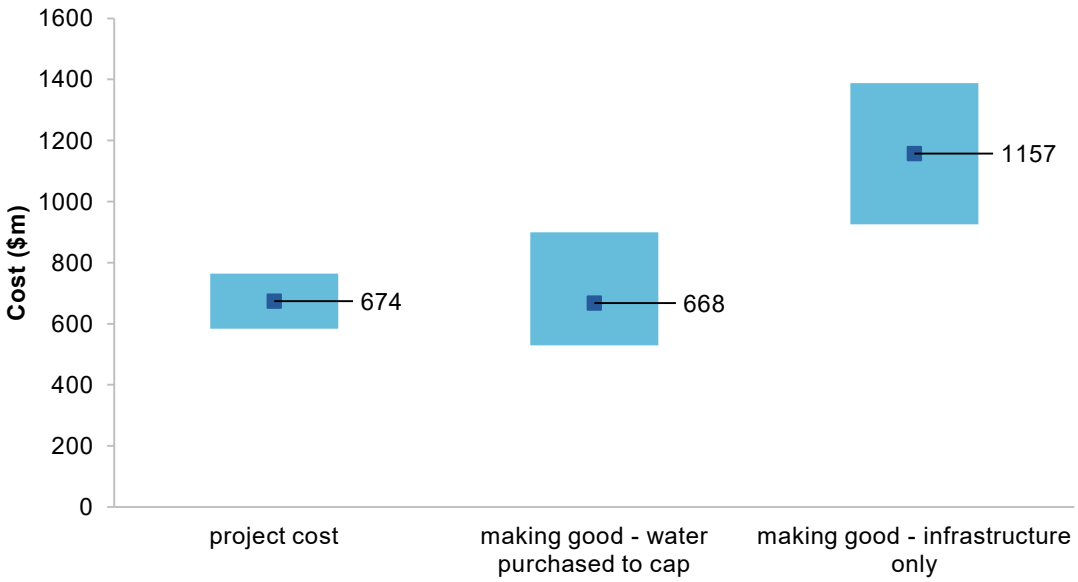
Results

Figure B.1 presents the ranges for the costs of key supply projects (column 1) and water recovery to make good should the projects not proceed (column 2 and 3). In the case of the latter two columns, the range stems from the uncertainty in the volume of water to be recovered. The dark blue squares show the costs computed using the middle value of the supply project cost range, and the middle value of the water volume range.

The results indicate that the relative value of the supply projects depends greatly on whether the Government is committed to acquiring water through infrastructure programs. If so, the supply projects are likely to save between $161 million and $805 million compared with water recovery (table B.3), with a saving of $483 million at the middle estimates. Things are less clear if the Government recovers water through purchases, with recovery being $6 million cheaper than the supply projects at the average offset estimate (ranging from $236 million cheaper to $316 million more expensive at the extremes of the two estimate ranges).

146 Weighting instead by the proportions in the CEWH's existing portfolio ('aligned recovery') gives only a minimal difference in price.

Figure B.1 **Costs of selected supply projects and making good**



Source: Productivity Commission estimates.

Table B.3 **Costs of selected supply projects and making good**

	Supply projects ($m)	*Making good – water purchased to cap ($m)*	*Making good – infrastructure only ($m)*
Cost	674 (583-765)	668 (529-899)	1,157 (925-1,388)
Cost difference relative to supply projects		-6 (-236-316)	483 (161-805)

Mid-point estimates with lower and upper bounds in parentheses.

Source: Productivity Commission estimates.

B.3 Cost of recovering an additional 450 GL

This section outlines the estimated potential budgetary cost to the Australian Government of recovering 450 GL through efficiency measures. There have been significant increases in water entitlement prices since the original Water for the Environment Special Account (WESA) budget allocation in 2013 (see chapter 5, figure 5.1). If prices remain at current levels (or increase), there is a material risk that the cost of recovering water will be significiantly higher than the WESA budget. The cost of recovering water is dependent on the types of water entitlements recovered, the price of those entitlements and the market multiple offered for infrastructure projects that recover the water. The Commission estimates detailed below consider the cost of efficiency measures based on various recovery strategies.

The cost of efficiency measures could change depending on the type of entitlements recovered by the Department of Agriculture and Water Resources (DAWR); primarily the amount of high reliability or general or low reliability entitlements recovered.[147]

Based on a *balanced recovery* approach (at current market prices and with a market multiple of 1.75) the estimated cost of recovering 450 GL is $2.1 billion (the basis for these assumptions is outlined below). The WESA budget allocates $1.575 billion to recover 450 GL of water through efficiency measures. Thus, the cost of recovering 450 GL through efficiency measures could be more than $500 million higher than the allocated budget.

In summary, these estimates show that there is a significant risk that the cost to the Australian Government of acquiring 450 GL of water through efficiency measures would exceed its budget allocation by hundreds of millions of dollars.

Method and data

Modelling that informed the Basin Plan assumed that all of the additional water recovery beyond the benchmark was in the southern Basin (chapter 5, box 5.2).[148] For this reason, it is assumed that the extra 450 GL worth of entitlements will be recovered from the southern Basin only.[149]

The cost of recovering water through efficiency measures is calculated as:

$$Cost = \sum^{i} E_i \times P_i \times M$$

Where:

- E_i is the mix of entitlements recovered as a volume measured in long-term average annual yield (LTAAY)

147 Even when converted into long-term average annual yield, high reliability entitlements are more expensive than general or low reliability (table B.5).

148 As discussed in chapter 5, the modelling that is the basis for efficiency measures compared water recovery scenarios of 2800 GL and 3200 GL where the extra 400 GL was recovered in the southern Basin. The 450 GL is designed to give effect to a modelled 3200 GL water recovery scenario, relative to the 2750 GL target in the Basin Plan. That modelling run included 50 GL recovered in the Condamine-Balonne (Queensland) that was not included in the Basin Plan. As the scenario analysis only adjusted recovery targets in the southern Basin (MDBA 2012b), it is unclear why 450 GL rather than 400 GL is considered necessary to deliver the enhanced environmental outcomes, and where this 450 GL should be recovered if it is considered different to the 400 GL. For consistency with the Basin Plan requirement, the Commission has estimated the cost based on 450 GL of recovery.

149 The Murray-Darling Basin Water Infrastructure Program is being rolled out Basin-wide, and may recover water in the northern Basin. DAWR has specified that their evaluation of proposed efficiency measures will take into account their contribution to the enhanced environmental outcomes in Schedule 5 (DAWR 2018e).

- P_i is the corresponding price of those entitlements as a price per volume in long-term average annual yield (LTAAY)
- M is the market multiple.

Various scenarios have been considered, reflecting differences in the suite of entitlements used to recover water. The scenarios are:

- **balanced recovery:** 450 GL of water is recovered proportional (based on LTAAY of entitlements) to the remaining entitlements on offer in the market (i.e. all entitlements minus the Commonwealth Environmental Water Holder's (CEWH's) current holdings)
- **aligned recovery:** 450 GL of water is recovered proportional (based on LTAAY) to the CEWH's current portfolio
- **rebalanced recovery:** 450 GL of water is recovered so that after the water is recovered, the CEWH owns the same proportion of all entitlements on offer
- **415 GL balanced recovery:** 415 GL of water is recovered using the same method as balanced recovery. This scenario is considered because up to 35 GL of over-recovered water in the southern Basin could be reclassified to efficiency measures (EY 2018, p. 198).

These scenarios illustrate possible strategies that could be used by DAWR in recovering 450 GL. They are useful because they demonstrate the potential costs with different proportions of high and general or low reliability entitlements recovered.

The 415 GL scenario is used to demonstrate the potential additional funding needed to recover a total of 450 GL of efficiency measures if 35 GL of entitlements had already been recovered.

Also included is some sensitivity analysis for each scenario that estimates the cost if a higher market multiple is needed to attract enough participation.

Entitlements that could be recovered

The only entitlement types included are those where reliable price data are available. Most commonly used entitlements for the major river systems in the southern Basin are captured in the analysis (table B.4). These entitlements account for 83 per cent of the CEWH's holdings in the southern Basin.[150] Registered CEWH holdings are correct as of 31 May 2018 (the most recent data publicly available).

150 Other entitlements excluded because of a lack of price data include NSW conveyance and supplementary water entitlements. The CEWH holds a significant amount of NSW supplementary (Lowbidgee) entitlements that were recovered as part of the Nimmie-Caira Project which involved purchasing 19 properties and 381 GL (171 GL in LTAAY) of water entitlement (DOI (NSW) 2018e). This entitlement type was excluded from the analysis because of a lack of reliable price information. Furthermore, the CEWH holds over half of the total amount of this type of entitlement.

Table B.4 **Entitlements in the southern Basin**

Region	Entitlement type	Registered CEWH entitlements (ML)	Registered CEWH entitlements LTAAY [a] (ML)	All entitlements (ML)	All entitlements LTAAY [a] (ML)
NSW Murray	High	17,858	16,965	191,637	182,054
NSW Murray	General	368,487	298,474	1,672,097	1,354,396
Murrumbidgee	High	10,199	9,689	380,830	361,787
Murrumbidgee	General	282,973	181,103	1,891,995	1,210,879
Goulburn	High	285,205	270,240	1,046,067	991,179
Goulburn	Low	42,467	19,265	456,049	206,885
Vic Murray	High	324,116	308,342	1,244,848	1,184,264
Vic Murray	Low	25,489	10,125	311,581	123,769
SA Murray	High	155,492	139,943	548,287	493,459

[a] Long-term average annual yield based on Department of the Environment estimates.

Sources: DEE (2018); MDBA (2016i).

Entitlement prices

Volume weighted average price[151] data for the 12 months to June 2018 are used to calculate the potential cost of efficiency measures (table B.5).

Water entitlement prices have increased significantly in recent years (chapter 5). For example, New South Wales Murray high security entitlements have increased in price from approximately $1500 per ML in 2014 to over $4000 per ML in 2018 (DAWR 2018d).

Given the inherent uncertainty in predicting future prices, the prices used are current ones, with an understanding that these may not perfectly reflect those paid for future water recovery. Cost estimates are directly proportional to the price of water entitlements, and any increase in the cost of water entitlements will increase the cost of efficiency measures. For instance, if entitlement prices increased by 10 per cent, the cost of water recovery would increase by 10 per cent.

151 Volume weighted average price refers to the average price of water entitlements based on eligible trade of entitlements (excludes zero-price trades). The average is weighted based on the volume of water traded.

Table B.5 **Entitlement prices in the southern Basin**

Region	*Entitlement type*	*Price[a] ($/ML)*	*Conversion factor*	*Price (LTAAY)[b] ($/ML)*
NSW Murray	High	3 534	0.95	3 720
NSW Murray	General	1 347	0.81	1 663
Murrumbidgee	High	3 748	0.95	3 945
Murrumbidgee	General	1 635	0.64	2 555
Goulburn	High	2 815	0.95	2 971
Goulburn	Low	371	0.45	818
Vic Murray[c]	High	3 082	0.95	3 240
Vic Murray[c]	Low	389	0.40	979
SA Murray	High	3 059	0.90	3 399

[a] Price calculated based on volume weighted average price over the previous 12 months from June 2018. [b] Price converted to long-term average annual yield based on Long-term divergence equivalence factors. [c] Prices for Vic Murray entitlements differ above and below the Barmah Choke. A volume weighted average price was calculated.

Sources: DAWR (2018d); DEE (2018).

Market multiples

The MDB Water Infrastructure Program sets maximum funding for projects at 1.75 times the market price of the water rights transferred to the Australian Government. However, multiple lines of evidence suggest that a maximum market multiple of 1.75 could be inadequate to achieve any reasonable level of participation in the efficiency measures program.

Stakeholders have indicated that a market multiple of 1.75 is unlikely to attract enough participation to allow 450 GL to be recovered by 2024 (EY 2018). This is also evidenced by participation in the Commonwealth On-Farm Further Irrigation Efficiency (COFFIE) pilot program. It has been running in South Australia since 2016 using a maximum market multiple of 1.75 and only recovered 1.2 GL to date (chapter 5).

Nearly all other infrastructure recovery programs have had market multiples above 2.0, with a median market recovery multiple for the various infrastructure programs of 2.4 (section B.1). All completed infrastructure programs have had market multiples higher than the proposed maximum market multiple of the MDB Water Infrastructure Program of 1.75.

Programs that target on-farm projects have typically been cheaper than off-farm projects (EY 2018), but on-farm projects have been excluded from the MDB Water Infrastructure Program in Victoria and New South Wales.

It should be noted that some infrastructure projects may have market multiples below the maximum allowable (of 1.75), and good program design is important to ensure that people do not ‘game’ the system and inflate the cost of works (discussed in chapter 5). However,

even where a maximum market multiple is in place (for example with COFFIE), this may be exceeded where participation is prioritised over cost.

A market multiple of 1.75 is used here as the base case for the analysis, reflecting the maximum market multiple of the MDB Water Infrastructure Program. Sensitivity analysis using multiples of 2.0 and 2.4 is included to demonstrate the potential costs if higher market multiples are required to attract enough participation.

Results

Water entitlements recovered under the four scenarios are detailed in table B.6. These represent examples of the potential portfolio of entitlements that could be recovered.

Table B.6 **Efficiency measure recovery under different scenarios**

Region	*Entitlement type*	*Balanced*	*Aligned*	*Rebalanced*	*415 GL balanced*
		GL	GL	GL	GL
NSW Murray	High	15.3	6.1	33.8	14.1
NSW Murray	General	97.9	107.1	79.4	90.3
Murrumbidgee	High	32.6	3.5	91.2	30.1
Murrumbidgee	General	95.5	65.0	156.7	88.0
Goulburn	High	66.8	97.0	6.3	61.6
Goulburn	Low	17.4	6.9	38.5	16.0
Vic Murray	High	81.2	110.6	22.0	74.9
Vic Murray	Low	10.5	3.6	24.4	9.7
SA Murray	High	32.8	50.2	- 2.3	30.2
Total		**450**	**450**	**450**	**415**
Per cent high reliability		51%	59%	34%	51%

Note: All recovery estimates are presented in long-term average annual yield.

Source: Productivity Commission estimates.

Based on current market prices, there is a material risk that the cost of recovering 450 GL could exceed $2 billion. If higher market multiples are used, the cost could be as high as almost $2.9 billion (table B.7).

The balanced recovery cost of $2.08 billion is approximately 30 per cent larger than the current budget. At an average market multiple of 2.4, the cost of $2.86 billion represents an increase in costs by approximately 80 per cent.

The cost of water recovery in this analysis is highly dependent on the composition of water entitlements recovered. For scenarios where a higher proportion of high reliability entitlements are recovered, costs are also higher. However, the extent to which budget issues can be solved by purchasing general or low reliability entitlements may be limited. In the

rebalanced scenario, only 34 per cent of entitlements recovered are high reliability, but the estimated cost is still $450 million higher than the budget. Recovering general or low reliability entitlements should only be the strategy of DAWR if these entitlements align with the requirements of the CEWH in meeting its environmental objectives.

There are other ways that the efficiency measure program may be able to reduce costs (chapter 5). However, costs would need to be reduced by 30 per cent in order to recover 450 GL within the budget. For instance, reclassifying 35 GL of over-recovered water in the southern Basin as efficiency measures would reduce the budget outlay by $160 million (noting that the cost of recovering 450 GL is not reduced by that amount).

Finding projects that have lower market multiples than the maximum could reduce the cost of recovering water. On-farm infrastructure projects have typically been the lowest cost way of recovering water, but these are currently excluded from the MDB Water Infrastructure Program in New South Wales and Victoria (DAWR 2018e). It may be possible that urban and industrial measures may provide more cost-effective projects, which would help reduce overall cost pressures of the program. However, these projects are unlikely to contribute a significant volume of water to the overall 450 GL (EY 2018).

Table B.7 **Cost of efficiency measures**
And difference to current budget

Market multiple	*Rebalanced ($m)*	*Balanced ($m)*	*Aligned ($m)*	*415 GL balanced ($m)*
1.75	2 022	2 082	2 112	1 920
2.00	2 311	2 380	2 414	2 195
2.40	2 774	2 856	2 896	2 633
Increase compared with current budget of $1.575 billion				
1.75	447	507	537	345
2.00	736	805	839	620
2.40	1 199	1 281	1 321	1 058

Source: Productivity Commission estimates.

B.4 Notional cost saving of extending the water recovery timeframe

The Basin Plan allows for the recovery of an extra 450 GL of water to pursue environmental outcomes additional to those that can be achieved by recovering the equivalent of 2750 GL (outlined in Schedule 5 of the Plan). These enhanced environmental outcomes are dependent on progress in easing or removing constraints. As noted in chapter 4, constraints projects are unlikely to be fully operational by 2024 and may not deliver the full range of required constraint easing. If constraints are not eased, rushing to recover the full 450 GL by 2024

would risk the Australian Government spending money on an asset that potentially cannot be used for some time.

To understand the magnitude of these potential costs, the Commission estimated the financial costs of bringing forward expenditure on water entitlements before they can be used. As there is currently little information on how long it will take to ease constraints or how much water can be used to contribute to enhanced outcomes with partial constraints easing, the numbers used should be treated as illustrative but plausible.

Method and data

Various linear trajectories of water recovery are tested (table B.8) based on the requirement to recover 62 GL by 30 June 2019 and 450 GL by the deadline.

Table B.8 **Potential water recovery trajectories considered**

	Year recovery completed			
Year	***2024***	***2026***	***2028***	***2030***
	GL (LTAAY)	GL (LTAAY)	GL (LTAAY)	GL (LTAAY)
2018	2	2	2	2
2019	62	62	62	62
2020	140	117	105	97
2021	217	173	148	133
2022	295	228	191	168
2023	372	284	234	203
2024	450	339	278	238
2025	450	395	321	274
2026	450	450	364	309
2027	450	450	407	344
2028	450	450	450	379
2029	450	450	450	415
2030	450	450	450	450

Source: Productivity Commission estimates.

Future expenditure (in current dollar terms) is discounted to reflect the present value financial cost of that expenditure. This is calculated based on:

$$DC = \sum_{n=0}^{N} \frac{C_n}{(1+r)^n}$$

Where:

- DC is the discounted cost in present value terms
- C_n is the cost incurred n years into the future
- r is the discount rate.

Results are calculated for four water recovery trajectories.

Future costs are discounted into net present value terms based on rates of 3, 5 and 7 per cent.

The future costs incurred are dependent on the cost of water recovery. The estimated cost is based on costs of $3500 per ML (LTAAY) (the cost per ML given by recovering 450 GL within the WESA budget allocation) and $4500 per ML (LTAAY) (approximately the estimated cost per ML of recovering water in section B.3).

Results

The results show that delaying efficiency measures expenditure reduces the program's net present cost (table B.9). The size of the saving varies significantly depending on the assumptions made about the timing of water recovery, the discount rate and the price of water recovery. Based on a discount rate of 5 per cent and a water recovery cost of $4500 per ML (LTAAY), completing water recovery in 2030, relative to 2024, would represent a financial saving to the Australian Government of $184 million.

Any decision to extend the timeframe for recovering water for efficiency measures should consider all factors, including what environmental benefits can be achieved from recovering additional water before constraints are eased.

Table B.9 **Potential financial saving from delaying expenditure**

Relative to recovering water by 2024

		Year recovery completed		
Discount rate	***2024 ($m)***	***2026 ($m)***	***2028 ($m)***	***2030 ($m)***
Cost of $3500 per ML				
3 per cent	1 419	1 384	1 352	1 320
5 per cent	1 327	1 276	1 228	1 184
7 per cent	1 244	1 180	1 122	1 068
Cost of $4500 per ML				
3 per cent	1 824	1 780	1 738	1 697
5 per cent	1 706	1 641	1 579	1 522
7 per cent	1 599	1 518	1 443	1 374
Saving relative to 2024				
Cost of $3500 per ML				
Discount rate	***2024 ($m)***	***2026 ($m)***	***2028 ($m)***	***2030 ($m)***
3 per cent	-	34	67	99
5 per cent	-	51	98	143
7 per cent	-	64	122	176
Cost of $4500 per ML				
3 per cent	-	44	86	127
5 per cent	-	65	127	184
7 per cent	-	82	157	226

Source: Productivity Commission estimates.

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