
The Parliament of the Commonwealth of Australia

Report on the inquiry into the management and use of Commonwealth environmental water

**Inquiry into the management and use of Commonwealth
environmental water**

House of Representatives
Standing Committee on the Environment and Energy

December 2018
Canberra

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Foreword

I am pleased to present this report on the management and use of Commonwealth environmental water.

Setting aside water for environmental purposes is a relatively new practice and this inquiry provided an opportunity for the Committee to acquaint itself with progress being made.

As discussed in the report, the views and information provided to the Committee are generally positive towards the Commonwealth Environmental Water Holder. While current arrangements appear to be working well, there can always be scope to make improvements and refinements, such as in relation to communication and consultation.

I would like to thank all the individuals and organisations who contributed to the inquiry, as well as those who assisted with the Committee's site inspections.

Mr Andrew Gee MP
Chair



Membership of the Committee

Chair Mr Andrew Broad MP (to 28 August 2018)
 Mr Andrew Gee MP (from 11 September 2018)

Deputy Chair Mr Pat Conroy MP

Members Hon Warren Entsch MP
 Mr Trevor Evans MP
 Mr Luke Howarth MP
 Mr Craig Kelly MP
 Mr Peter Khalil MP
 Ms Anne Stanley MP

Committee Secretariat

Secretary Ms Peggy Danaee
 Ms Shennia Spillane

Inquiry Secretary Mr Nathan Fewkes

Research Officer Ms Emily Teding van Berkhout

Administrative Officer Ms Kathy Blunden



Terms of reference

On 28 February 2018, the Committee resolved:

That, pursuant to standing order 215(c), the Committee examine the 2016–17 annual report of the Department of the Environment and Energy. In doing so, the Committee will inquire into and report on the management and use of Commonwealth environmental water, giving particular consideration to the role of the Commonwealth Environmental Water Holder in:

1. maximising the use of environmental water for the protection and restoration of environmental assets;
 2. considering innovative approaches for the use of environmental water;
 3. monitoring and evaluating outcomes of the use of environmental water; and
 4. options for improving community engagement and awareness of the way in which environmental water is managed; and
- any other matters of relevance that the committee wishes to consider.



Executive summary

In the Murray-Darling Basin area, governments have agreed to set aside a proportion of water for environmental purposes (environmental water), to be used at times and locations where plants and animals benefit from higher river flows or replenishing wetlands.

A sizeable quantity of environmental water is controlled by the Australian Government. The Commonwealth Environmental Water Holder (CEWH) and staff in the Department of the Environment and Energy oversee how this water is managed. The *Water Act 2007* (Cth) outlines the CEWH's functions, powers and responsibilities. This includes a responsibility to protect and restore environmental assets in the Murray-Darling Basin.

Current legislative and policy arrangements aim to balance environmental objectives with water made available for consumptive uses. While healthy rivers have wider social, cultural and recreational benefits, witnesses frequently reminded the Committee that water availability also impacts on economic prosperity and agricultural production.

Environmental water is a relatively new concept – both in Australia and internationally. As knowledge and experience in managing environmental water develops, standards of best practice will continue to evolve. In this context, the inquiry has provided a timely opportunity to consider:

- How is Commonwealth environmental water currently being managed?
- Can it be done better? Is there scope to improve?
- What progress has been achieved?

In general, views presented during the inquiry praised the CEWH's work and the way environmental water holdings are being managed. The overall benefits from environmental watering are likely to become apparent over the long-term. For

example, eastern Australia is currently experiencing a drought, which may have a temporary impact on environmental conditions.

During the inquiry, the Committee heard generally favourable views of the CEWH's performance.¹ For example:

- A submission from Deakin University stated that Australia's system of held environmental water is a 'world-leading position' and 'the envy of many.'²
- The Nature Foundation SA Inc commended the CEWH for establishing a 'robust system' for managing environmental water.³
- Professor Michael Stewardson (University of Melbourne) said that with active management of the CEWH entitlement, 'environmental water punches above its weight.'⁴
- The National Farmers' Federation described the CEWH's performance as being 'sound, considered and consistent' with water being used 'as well as it can be in the regulatory paradigm that exists.'⁵
- The NSW Irrigators' Council submitted:

In reality, the CEWH has only had less than five years of experience in larger scale environmental water deployment, and it is premature to judge performance to date too critically.⁶

The Committee has recommended that certain practices continue, including the 'good neighbour' policy, working with Indigenous communities, funding complementary measures and water trading. Continued investment in infrastructure programs ensures that water efficiency is optimised.

While the CEWH's efforts were recognised, witnesses and submissions identified areas where there is potential to make improvements:

- Enhancing public awareness and communicating outcomes relating to environmental watering actions. The CEWH should update its

¹ Dr Jonathan Howard, *Submission 16*, p. 3; Mr Gavin McMahon, Chairman, National Irrigators' Council, *Committee Hansard*, Mildura, 1 May 2018, p. 17; Mr Garry Hera-Singh, Chairman, Southern Fishermen's Association, *Committee Hansard*, Murray Bridge, 2 May 2018, p. 7; Dr Anne Jensen, *Committee Hansard*, Murray Bridge, 2 May 2018, p. 8.

² Deakin University, *Submission 10*, p. 2; see also Professor Robyn Watts, Charles Sturt University, *Committee Hansard*, Albury, 30 April 2018, p. 10.

³ Nature Foundation SA Inc, *Submission 22*, p. 5; see also Dr Anne Jensen, *Submission 25*, p. 3.

⁴ Professor Michael Stewardson, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 8.

⁵ National Farmers' Federation, *Submission 29*, p. 3; see also Mr Les Gordon, Chair, Water Taskforce, National Farmers' Federation, *Committee Hansard*, Canberra, 23 May 2018, p. 1.

⁶ NSW Irrigators' Council, *Submission 32*, p. 4.

communications and engagement strategy and review the adequacy of its existing mechanisms for consultation with the community.

- The CEWH should consider establishing an advisory or consultative group to inform environmental water use decisions.
- Utilising the best available technology to monitor water movements and assess environmental conditions.

This report is structured as follows:

- Chapter 1 provides an introduction to environmental water and other background information;
- Chapter 2 relates to environmental water management issues, potential areas for improvement and environmental watering challenges;
- Chapter 3 considers how outcomes are being evaluated, measured and monitored; and
- Chapter 4 discusses how community awareness and engagement could be improved, including how local expertise and knowledge is being utilised.



List of recommendations

Recommendation 1

The Committee recommends that the Commonwealth Environmental Water Holder continue to:

- apply the 'good neighbour' policy;
- coordinate with state water managers and other partners to optimise environmental water releases;
- provide regular updates on environmental watering activities and outcomes;
- make funds available for non-flow complementary measures and projects, such as pest control and weed eradication;
- trade water that is excess to environmental requirements; and
- foster partnerships with the private sector and non-government organisations.

Recommendation 2

The Committee recommends that the Commonwealth Environmental Water Holder work with the Murray-Darling Basin Authority on practical methods to shepherd environmental water in a manner consistent with the rights of other water holders.

Recommendation 3

The Committee recommends that the Australian Government continue to fund and support an infrastructure program aimed at optimising water efficiency in the Murray-Darling Basin.

Recommendation 4

The Committee recommends that Basin states work to ensure that environmental water flows achieve their aims. Basin States should further ensure that reporting is comprehensive, timely and evidence-based.

Recommendation 5

The Committee recommends that the Commonwealth Environmental Water Holder's Knowledge Management Project and Long-Term Intervention Monitoring Project (or similar projects) be continued.

Recommendation 6

The Committee recommends that the Commonwealth Environmental Water Holder investigate additional monitoring techniques, including:

- aerial or satellite imagery; and
- observations and reports from experienced volunteers, including land holders, State authorities and other groups such as the Southern Fishermen's Association.

Recommendation 7

The Committee recommends that the Commonwealth Environmental Water Holder develop an updated communication and engagement strategy.

Recommendation 8

The Committee recommends that the Commonwealth Environmental Water Holder continue to work and consult with Indigenous communities to further understand and inform sympathetic water use policies.

Recommendation 9

The Committee recommends that the Commonwealth Environmental Water Holder review the adequacy of its existing mechanisms for consultation with the community. This review should consider if there is any benefit in establishing a formal advisory or consultative group to inform water use decisions.

Introduction

Overview

- 1.1 This inquiry relates to the management and use of Commonwealth environmental water in the Murray-Darling River Basin (the Basin), with particular consideration given to the role of the Commonwealth Environmental Water Holder (CEWH).
- 1.2 Since European settlement in Australia, water has been taken or diverted from rivers and lakes for irrigation and consumptive use. More recently, environmental water has been set aside to fill lakes, flood wetlands and to increase river flows – although progress towards restoration is a long-term process.¹ Sustainable diversion limits (SDLs) determine how much water can be extracted for consumptive purposes and allocated for the environment.²
- 1.3 While dry periods form part of the natural cycle, plants and animals rely upon having enough water at the right times to reproduce and sustain their growth. Australian climatic conditions vary and, depending on conditions, water may be abundant or there could be none.³ Environmental water also helps to counteract the effects of extended dry periods.⁴

1 National Irrigators' Council, *Submission 23*, p.2; see also Environmental Defenders Office Australia, *Submission 28*, p. 3; Murray-Darling Basin Authority, *Submission 34*, p. 3.

2 Department of Agriculture and Water Resources, *Submission 31*, p. 1.

3 Sarah Moles, *Submission 6*, p. 1.

4 Nature Conservation Council NSW, *Submission 24*, p. 3.

- 1.4 Choosing when and where to release the Commonwealth's environmental water is the task of the CEWH, subject to the legal requirements of the *Water Act 2007* (Cth) and other laws.⁵
- 1.5 The Commonwealth's environmental water 'portfolio' consists of 2,706 gigalitres of entitlements (the right to use water resources⁶) valued at around \$3.15 billion, in 22 river catchments. Over the long-term, these entitlements have yielded an average⁷ of 1,836 gigalitres of water.⁸ Since July 2009, 8,272 gigalitres of environmental water has been released into the Basin.⁹ The CEWH is required to progress environmental outcomes with its water assets, rather than a financial return.¹⁰
- 1.6 The Basin is an area with significant economic, social and environmental values:
- more than 2.6 million Australians live in the area;
 - tourism generates \$8 billion in annual revenue;
 - rivers and lakes are used for social and recreational activities;
 - annual food and fibre production is estimated at \$22 billion; and
 - there are 16 internationally recognised wetlands, as well as habitats for native animals.¹¹
- 1.7 The Basin is also important to Indigenous people and the connection their laws and customs have with the river system.¹²
-

5 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 28 March 2018, p. 1.

6 The *Water Act 2007* (Cth) (s. 3) defines water resources to include surface water, ground water, a dry or flowing watercourse (e.g. a river or creek), a lake, wetland or aquifer. The Act defines a water access entitlement as being 'a perpetual or ongoing entitlement, by or under a law of a State, to exclusive access to a share of the water resources of a water resource plan area.'

7 The total available water depends on rainfall and flows into water storages, which are then distributed (or allocated) based on size the of the ongoing water entitlement share. Less rain and low storage levels would reduce allocations. The Act (s. 3) defines a water allocation to be 'the specific volume of water allocated to water access entitlements in a given water accounting period.' See also Murray-Darling Basin Authority, 'Water markets and trade', at <<https://www.mdba.gov.au/managing-water/water-markets-and-trade>>.

8 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 16 (CEWH response to Question 14); Department of the Environment and Energy, *Submission 38*, p. 5.

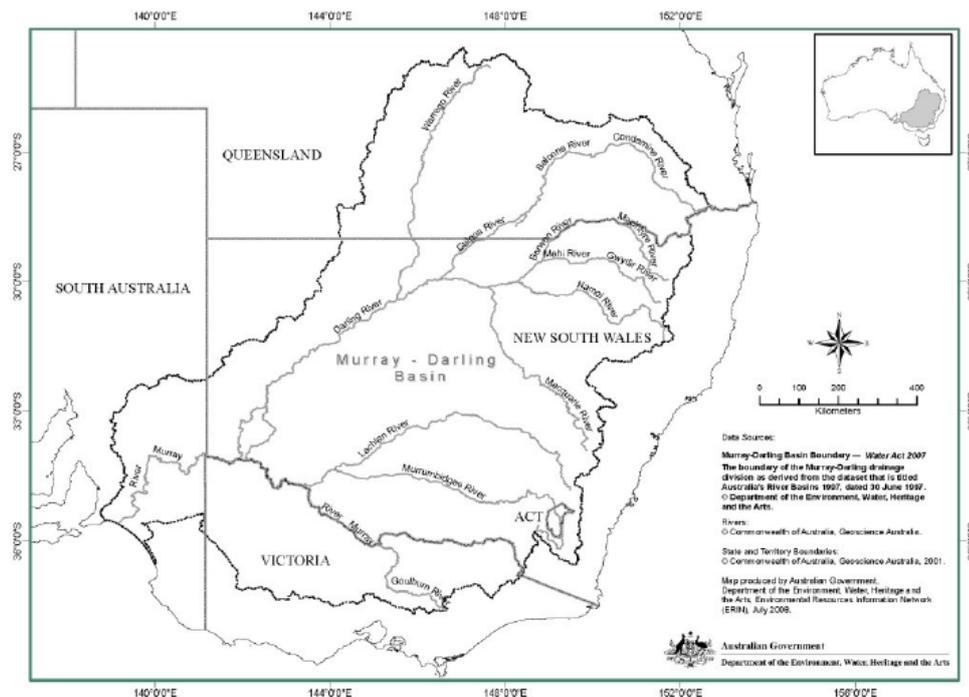
9 Department of the Environment and Energy, *Submission 38*, p. 15.

10 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 28 March 2018, p. 6.

11 Murray-Darling Basin Authority, 'Rivers - Worth It', at <<https://www.mdba.gov.au/rivers-worthit>>; Department of the Environment and Energy, 'The Ramsar Convention on Wetlands', at <<http://www.environment.gov.au/water/wetlands/ramsar>>; see also Southern Riverina Irrigators, *Submission 21*, p. 2; Nature Conservation Council NSW, *Submission 24*, p. 2; Mr Denis Flett, Chairperson, Victorian Environmental Water Holder, *Committee Hansard*, Albury, 30 April 2018, p. 1.

- 1.8 The Basin is an area defined by law, as shown in the map below. The Basin is divided into northern and southern regions, along a boundary running approximately between Broken Hill and Sydney, as well as a subset of 22 river catchments.

Figure 1.1 Map of the Murray-Darling River Basin



Source Water Act 2007 (Cth) Schedule 1A. The MDBA's website has detailed maps and profiles: <https://www.mdba.gov.au/discover-basin/catchments>.

- 1.9 Governance of water resources in the Basin is complex. A submission from the Department of the Environment and Energy summarised arrangements so far as these relate to environmental water:

The Commonwealth environmental water holdings are water entitlements and rights, issued by Basin State governments that were acquired by the Australian Government through investments in water-saving infrastructure and purchases on the water market. ... The rules governing the Commonwealth environmental water entitlements vary across states and across catchments but they are subject to the same fees, allocations, carryover and other rules, as equivalent entitlements held by other water users. These rules determine how the Commonwealth's water can be used, the value

12 Mr Frederick Hooper, Chairperson, Northern Basin Aboriginal Nations Ltd, *Committee Hansard*, Canberra, 20 June 2018, pp. 1-3. Mr Hooper mentioned in particular the movement of the Rainbow Serpent, fishing and bush plants with edible food. See also Murray Lower Darling Rivers Indigenous Nations, *Submission 26*, p. 6.

of the portfolio and the environmental outcomes that can be achieved.¹³

The role and functions of the CEWH

- 1.10 The CEWH is a position established by the *Water Act 2007* (Cth) (the Act). A person is appointed to the role under the *Public Service Act 1999* (Cth) with staff provided from the Department of the Environment and Energy, which forms the Commonwealth Environmental Water Office.¹⁴ The Office had 58 staff on average during 2017-18.¹⁵
- 1.11 The CEWH's two functions are prescribed in the Act:
- to manage the Commonwealth environmental water holdings; and
 - to administer the Environmental Water Holdings Special Account.¹⁶
- 1.12 The Act and the *Basin Plan 2012* (the Basin Plan¹⁷) includes further detail on the powers afforded to the CEWH to fulfil his or her functions, as well as certain objectives and considerations:
- to deal in water, water access rights, water delivery rights or irrigation rights and enter into contracts on behalf of the Commonwealth;
 - protecting or restoring 'environmental assets'¹⁸ in accordance with the national interest and relevant international agreements, such as the Ramsar Convention¹⁹; and
 - managing water in accordance with the environmental watering plan in the Basin Plan, which includes a management framework for planned and held environmental water, a 'Basin-wide environmental watering strategy'²⁰ and annual environmental watering priorities.²¹

13 Department of the Environment and Energy, *Submission 38*, p. 5.

14 Department of the Environment and Energy, *Submission 38*, p. 3; *Water Act 2007* (Cth), s. 115 and 116.

15 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 10 (CEWH response to Question 8).

16 *Water Act 2007* (Cth), s. 105(1).

17 The Basin Plan is a legislative instrument made in accordance with s. 44 of the *Water Act 2007* (Cth). See <https://www.legislation.gov.au/Details/F2018C00451>.

18 The *Water Act 2007* (s. 3) defines environmental assets to include: water-dependent ecosystems, ecosystem services and sites with ecological significance.

19 *Convention on Wetlands of International Importance especially as Waterfowl Habitat*, done at Ramsar, Iran, 2 February 1971, entry into force for Australia and generally, 21 December 1975; ATS 1975 No. 48, UNTC No. 14583.

20 Murray-Darling Basin Authority, 'Basin-wide environmental watering strategy', November 2014, at <https://www.mdba.gov.au/managing-water/environmental-water/basin-wide-environmental-watering-strategy>.

- 1.13 Further information on these statutory obligations can be found in the ‘Framework for Determining Commonwealth Environmental Water Use’ on the CEWH’s website.²²
- 1.14 When fulfilling most of the functions prescribed in the Act, the CEWH is not subject to direction from the Minister or the Department’s Secretary.²³ While this provides a degree of independence, the Act does not preclude the Minister from directing the CEWH to make available water from Commonwealth environmental water holdings. The Minister may also make legally binding operating rules in relation to the CEWH dealing in water and water access rights.²⁴
- 1.15 The Environmental Water Holdings Special Account²⁵ funds the CEWH’s costs incurred to perform the functions described in the Act, although it is not used for paying staff salaries.²⁶ This financial structure ensures that the CEWH does not need to sell environmental water to fund its own administrative expenses. As at 30 June 2017, the Account had a balance of around \$46 million.²⁷ The Account is used for:
- payment of statutory fees to state water authorities;
 - managing money credited or debited from the sale or purchase of environmental water; and
 - funding monitoring and evaluation of environmental water outcomes.²⁸
- 1.16 The CEWH shares responsibility for environmental watering with the Murray-Darling Basin Authority (MDBA) and the Department of Agriculture and Water Resources (DAWR).²⁹

21 Department of the Environment and Energy, *Submission 38*, p. 2; *Water Act 2007* (Cth), s. 3 and s. 105; *Basin Plan 2012*, s. 8.03, s. 8.14, s. 8.29 and s. 8.32 to 8.43; see also Department of Agriculture and Water Resources, *Submission 31*, p. 2; Murray-Darling Basin Authority, *Submission 34*, p. 2.

22 See <<http://www.environment.gov.au/water/cewo/publications/framework-determining-cew-use>>.

23 *Water Act 2007* (Cth), s. 107.

24 *Water Act 2007* (Cth), s. 109; see also ‘Revised Explanatory Memorandum’, *Water Bill 2007*, p. 31; Productivity Commission, *National Water Reform*, inquiry report 87, December 2017, p. 159, at <<https://www.pc.gov.au/inquiries/completed/water-reform/report>>.

25 A ‘Special Account’ is an amount of money held by the Commonwealth and set aside for a specific purpose (described in s. 113 of the *Water Act 2007*); see also *Public Governance, Performance and Accountability Act 2013* (Cth), s. 80.

26 *Water Act 2007* (Cth), s. 113.

27 Department of the Environment and Energy, *Annual Report 2016-17*, p. 238.

28 Department of the Environment and Energy, *Submission 38*, p. 6; *Water Act 2007* (Cth), s. 113.

29 Department of the Environment and Energy, *Submission 38*, p. 4.

Environmental watering

1.17 The CEWH plans and prepares for where and when environmental water will be used in consultation with third parties, such as other government agencies, non-government organisations and industry representatives.³⁰ The Department of the Environment and Energy (the Department) submitted:

...the CEWH looks to maximise the outcomes that can be achieved with the available water to ensure the best environmental return. This broadly involves trying to best match the available water (that is, 'supply') with identified environmental needs (or 'demands') using all available management options.³¹

1.18 When managing its environmental water, the CEWH has three overall options:

- deliver water to a river or wetland to meet an identified demand ('delivery');
- leave water on the accounts and carry it over for use in the next water year ('carryover'); and
- trade water by selling it and using the proceeds to either:
 - ⇒ buy water in another catchment or in a future year ('trade'),
 - or
 - ⇒ use the proceeds from selling water to invest in complementary environmental activities ('investment').³²

1.19 The Commonwealth cannot act unilaterally, as the States have responsibility for their own land and water resources. State water regulators and river authorities set the rules for each river valley and determine when Commonwealth environmental water can be released. The CEWH liaises with State waterway managers³³ who deploy the Commonwealth's environmental water as planned, subject to weather and flow conditions.³⁴ Without rain, the overall availability of environmental

30 Department of the Environment and Energy, *Submission 38*, p. 14.

31 Department of the Environment and Energy, *Submission 38*, p. 11; see also, Victorian Environmental Water Holder, 'Environmental Benefits' at <http://www.vewh.vic.gov.au/environmental-water/environmental-benefits>.

32 Department of the Environment and Energy, *Submission 38*, p. 11.

33 These 'delivery partners' are listed on the CEWH's website; see <http://www.environment.gov.au/water/cewo/delivery-partners>.

34 Department of the Environment and Energy, *Submission 38*, p. 11 and p. 15; Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 28 March 2018, pp. 1-2; see also Professor Michael Stewardson, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 8.

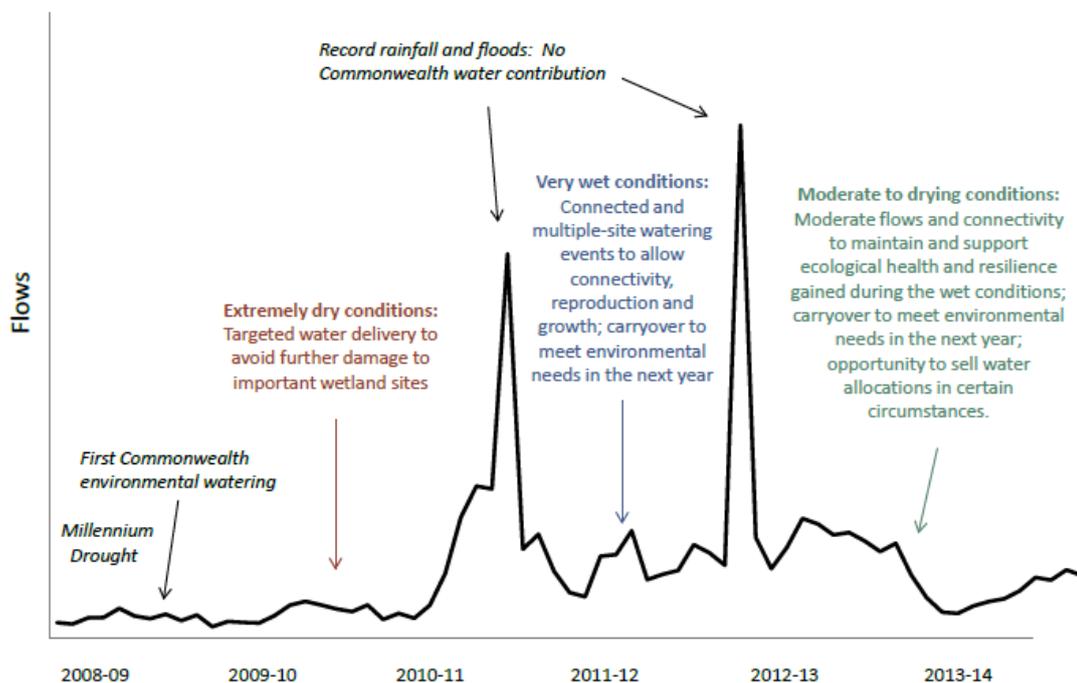
water is reduced, particularly for rivers furthest from upstream dam storage.³⁵

1.20 The Department's submission outlined five principles for determining how environmental water should be used:

- the ecological value of the targeted site(s);
- the expected outcomes;
- potential risks;
- the long-term sustainability and management of the site(s) (including any complementary management activities); and
- the cost effectiveness and feasibility of the watering action.³⁶

1.21 The graphic below (from the CEWH's website) shows how environmental water is managed over time, noting that conditions may not be the same in the entire Basin.

Figure 1.2 Environmental watering in response to changing conditions



Source Commonwealth Environmental Water Office, 'Managing the Commonwealth Environmental Water Portfolio' at <<http://www.environment.gov.au/system/files/resources/1a947b47-08ac-453b-901e-4ed59c0b76cc/files/managing-cew-portfolio.pdf>>.

1.22 A change to the Act in 2016 permitted the CEWH to sell water and use the funds to progress 'complementary' projects with environmental benefits;

35 Murray-Darling Basin Authority, *Submission 34*, p. 7; Murray Irrigation, *Submission 30*, p. 10.

36 Department of the Environment and Energy, *Submission 38*, p. 14.

for example, tree planting and fish passages.³⁷ This is discussed further in Chapter 2.

- 1.23 Separately, Victoria and NSW have their own environmental watering programs. The submissions from the Victorian and NSW governments provide further information.³⁸

Conduct of the inquiry

- 1.24 The inquiry commenced on 28 February 2018. The Committee initiated the inquiry based on its power to examine the annual reports of government agencies, as determined in a schedule issued by the Speaker.
- 1.25 The Committee received 43 submissions and held public hearings in Albury, Mildura, Murray Bridge, Canberra and Sydney. Site inspections were conducted in the vicinity of the Goulburn River, Hattah Lakes and the Murray River mouth at Goolwa. Details of submissions received, public hearings and site inspections can be found in the appendices.
- 1.26 The Committee thanks all the individuals and organisations who contributed to the inquiry and assisted with site inspections.
- 1.27 While the CEWH could potentially use environmental water in locations around Australia,³⁹ in practice this inquiry has concentrated on the Basin area. Although the Basin Plan is also relevant, this report's focus is on environmental water and the CEWH.
- 1.28 The onset of drought conditions in eastern Australia became apparent after the Committee had completed public hearings for this inquiry. Views on whether environmental water should be released for drought mitigation are on the record in other places, such as in media reports and parliamentary debates.
- 1.29 The Committee notes that on 21 September 2018, documents comprising an 'induction briefing' for the current CEWH were made publicly available pursuant to an order of the Senate. These documents included:
- correspondence exchanged between the former CEWH and NSW government authorities on resolving compliance issues; and

37 Department of the Environment and Energy, *Submission 38*, p. 21; Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 28 March 2018, p. 2; Commonwealth Environmental Water Office, *Discussion Paper: Development of a Framework for Investing in Environmental Activities*, at <<http://www.environment.gov.au/water/cewo/investment-framework/discussion-paper>>.

38 NSW Government, *Submission 17*; Victorian Government, *Submission 41*.

39 *Water Act 2007* (Cth), s. 105(3)(b).

- documents relating to the CEWH's approach to public communication and engagement.
- 1.30 These documents became available late in the inquiry process after public hearings had concluded.⁴⁰

Past inquiries and reviews relating to environmental water

- 1.31 Past inquiries and reviews provide further background and context on the CEWH and the management of environmental water. A selection is listed below:
- A Victorian parliamentary committee report on the management, governance and use of environmental water (June 2018).⁴¹
 - A Productivity Commission report on progress towards national water reform, including environmental management (May 2018).⁴²
 - A Federal parliamentary committee inquiry into water efficiency programs in agriculture (December 2017).⁴³
 - A panel of experts' review of the Commonwealth Environmental Water Holder's operations and business processes (November 2017).⁴⁴
 - The Australian National Audit Office assurance review of the protection and use of environmental water (November 2017).⁴⁵
 - Wentworth Group of Concerned Scientists' review of water reform in the Murray-Darling Basin (November 2017).⁴⁶

40 Senate Order for the Production of Documents 1026, available at <https://parlinfo.aph.gov.au/parlInfo/download/publications/taledpapers/310741e2-76ac-43f1-acc9-e3523d3dedcd/upload_pdf/opd%20-%20water%20holder%20letter%20and%20attachments.pdf>.

41 See <<https://www.parliament.vic.gov.au/enrrdc/inquiries/article/3773>>.

42 Productivity Commission, *National Water Reform*, inquiry report 87, December 2017, p. 159, at <<https://www.pc.gov.au/inquiries/completed/water-reform/report>>.

43 House of Representatives Standing Committee on Water Resources, 'Making Every Drop Count: Inquiry into Water Use Efficiency Programs in Agriculture', December 2017, at <https://www.aph.gov.au/Parliamentary_Business/Committees/House/Standing_Committee_on_Agriculture_and_Water_Resources/Wateruseefficiency/Report>.

44 Dr R Neil Byron (and others), 'Review of the Commonwealth Environmental Water Holder's Operations and Business Processes', November 2017, at <<http://www.environment.gov.au/water/cewo/publications/cewo-review-final-report>>.

45 Australian National Audit Office Report No. 17 of 2017-18, *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*, November 2017, at <<https://www.anao.gov.au/work/assurance-review/dept-agriculture-water-resources-assessment-nsw-protection-use-environmental-water-mdb>>.

46 See <<http://wentworthgroup.org/2017/11/review-of-water-reform-in-the-murray-darling-basin/2017/>>.

- The Australian National Audit Office performance audit report on Commonwealth environmental watering activities (May 2013).⁴⁷



Goulburn River weir

47 Australian National Audit Office Report No. 36 of 2012-13, *Commonwealth Environmental Watering Activities*, May 2013, at <<https://www.anao.gov.au/work/performance-audit/commonwealth-environmental-watering-activities>>.

Environmental water management

Overview

- 2.1 While the Committee heard generally positive views on the Commonwealth Environmental Water Holder (CEWH), a range of issues, challenges and alternative approaches relating to environmental water management were discussed during the inquiry. These included:
- general principles for maximising environmental water;
 - how legal protections for environmental water flows in unregulated rivers could be resolved and enforced;
 - delivery of environmental water, third-party impacts and the CEWH's 'good neighbour policy';
 - trading and selling environmental water;
 - complementary measures;
 - funding for upgrades to water use efficiency; and
 - coordinating water releases.
- 2.2 During this inquiry, submissions and witnesses offered distinct perspectives on environmental water. A sample of these views is provided below, to provide a general sense of the evidence received during the inquiry.

Adequacy of water volumes

- 2.3 Some views focused on the importance of water volumes for achieving environmental outcomes, the timing of water releases (based on natural cues) and the strength of regulatory arrangements.

- 2.4 The NSW Conservation Council submitted that there had been long-term over extraction of water, which had caused the health of the Murray-Darling Basin to decline.¹ The submission stated:
- The need to add water back to the Basin is the key purpose of the Basin Plan. While other issues have been identified as impediments to environmental outcomes, many will not solve the problem without additional water.²
- 2.5 The Nature Foundation SA commended the CEWH's use of available environmental water, but also noted:
- ...the volume of water available to the CEWH is very significantly less than the 4,000 GL volume indicated by science as needed to achieve the environmental outcomes contained in the Basin Plan.³
- 2.6 Professor Lin Crase (University of South Australia) noted that while initial modelling by the Murray-Darling Basin Authority showed that 7,600 gigalitres of water was needed for the environment in the Basin,⁴ subsequently 2,750 gigalitres was settled upon as being sufficient for this purpose. He submitted that the science suggests the CEWH 'cannot deliver the system-wide benefits sought' and its position is similar to 'a farmer holding an entitlement but still not enough to grow a crop'.⁵ Professor Crase added that the 'the aim is to optimise within constraints' rather than to assume that 'more water entitlement sitting on CEWH books automatically equates to better environmental outcomes'.⁶
- 2.7 The Environmental Defenders Office of Australia commented on regulatory and legal issues relating to environmental water. Ms Rachel Walmsley (Policy and Law Reform Director, Environmental Defenders Office of Australia) said that environmental watering outcomes had been compromised due to instances of 'lawful mismanagement' and 'regulatory gaps'.⁷ The Office's submission gave some examples:
- extraction limits that do not take into account climate change and which are not based on best-available science;

1 Nature Conservation Council NSW, *Submission 24*, p. 4.

2 Nature Conservation Council NSW, *Submission 24*, p. 4.

3 Nature Foundation SA, *Submission 22*, p. 2.

4 Murray-Darling Basin Authority, *Guide to the Proposed Basin Plan, Volume 1, Overview*, 2010, pp. xvii-xxi and p. 100.

5 Professor Lin Crase, *Submission 1*, p. 2.

6 Professor Lin Crase, *Submission 1*, p. 1.

7 Ms Rachel Walmsley, Policy and Law Reform Director, Environmental Defenders Office of Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 1; see also Southern Fishermen's Association, *Submission 37*, pp. 4-5.

- lawful extraction of environmental or ‘community’ water purchased with taxpayers’ money;
- closed tender ‘buybacks’ lacking in transparency, value for money and environmental utility; and
- recovering water for the environment via on-farm efficiency upgrades which – based on best-available evidence – are likely to reduce environmental flows.⁸

Water efficiency and complementary measures

- 2.8 Other evidence emphasised the importance of water efficiency and how the environment could be improved with measures unrelated to water flows,⁹ such as eradicating pest species.
- 2.9 The National Irrigators’ Council’s submission stated that the acquisition of more water for the environment ‘will not on its own deliver environmental benefits’ and there should be ‘a shift of focus from numbers to outcomes’.¹⁰ The submission continued:
- ...to achieve improved ecological outcomes (which we support), a range of complementary, or non-flow, measures, should be examined ... Measures improving riverine and riparian outcomes have been routinely delivered through successive federal government programs such as Caring for our Country and the National Landcare Program.¹¹
- 2.10 The National Farmers’ Federation submitted that there are ‘gains to be made’ with the efficient use of environmental water:
- The goal must be to deliver improved environmental outcomes from the portfolio of water that has already been recovered for the environment – in essence more environmental outcome per unit of water held and delivered.¹²
- 2.11 Murray Irrigation observed:
- Success should be measured by the health of the environment not the volume of water transferred into environmental water portfolios.¹³

8 Environmental Defenders Office of Australia, *Submission 28*, p. 2.

9 Terms used to describe these options include ‘non-flow measures’, ‘complementary measures’ or ‘toolkit measures’.

10 National Irrigators’ Council, *Submission 23*, p. 4.

11 National Irrigators’ Council, *Submission 23*, p. 5.

12 National Farmers’ Federation, *Submission 29*, p. 3.

13 Murray Irrigation, *Submission 30*, p. 3; see also Cotton Australia, *Submission 5*, pp. 1-2.

2.12 The next sections of this chapter discuss in further detail the evidence received during the inquiry in relation to managing environmental water and innovative approaches.

Optimising or maximising environmental water

2.13 As described in Chapter 1, a quantity of water has been progressively set aside for CEWH in the Murray-Darling Basin area. In the past, this water may have been available for irrigation and consumption, but is now reserved for environmental purposes.

2.14 The optimal use of environmental water is regarded as important for three main reasons:

- there are many environmental assets in the Basin that need watering;
- the CEWH has a finite amount of water available; and
- other water users aim to be disciplined and efficient with their water use and expect similar diligence from the CEWH.

2.15 Mr Michael Murray (General Manager, Cotton Australia) said that the CEWH and other environmental managers ‘need to be very specific’ about the expected outcomes from water releases.¹⁴ He said:

...it has to be an outcome that local people can relate to. ... It’s got to be: ‘We want to make a release because we want to encourage fish breeding and we can measure that’ ... And then it has to be measured, monitored and evaluated.¹⁵

2.16 The NSW Irrigators’ Council submitted that ‘every litre of deployed environmental water should be used to best effect in reaching the Basin Plan’s environmental objectives’.¹⁶

2.17 The Ricegrowers’ Association of Australia submitted:

... the irrigation industry has been extremely proactive in ensuring its irrigation infrastructure operators and individual irrigators manage their water in the most efficient manner possible.

14 Mr Michael Murray, General Manager, Cotton Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 15.

15 Mr Michael Murray, General Manager, Cotton Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 15; see also Mr Mark Winter, Vice Chair, Gwydir Valley Irrigators Association Inc, *Committee Hansard*, Canberra, 30 May 2018, p. 7.

16 NSW Irrigators’ Council, *Submission 32*, p. 3.

Unfortunately the same standards of efficiency have not been upheld by environmental water users.¹⁷

- 2.18 Southern Riverina Irrigators recommended that water should be used in the region from where it originated, if there is surplus water due to natural events.¹⁸ Their submission added:

The key to successfully utilising environmental water is to ensure that addressing environmental concerns in one region does not come at the expense of environmental assets in another region.¹⁹

- 2.19 On the other hand, a submission from the National Farmers' Federation stated that these factors should not necessarily determine where money is invested:

Investment should flow to the environmental activities that best improves the capacity to achieve the environmental objectives of the Basin Plan.²⁰

- 2.20 Ms Caren Martin (Chairperson, South Australian Murray Irrigators) noted that the Basin includes significant national and international environmental assets.²¹ She said:

We don't actually have enough water here to give what the Coorong requires, so we need every catchment to contribute a little bit to the Coorong for its national significance.²²

- 2.21 The Nature Conservation Council NSW submitted:

The timing of environmental water release... requires adaptive management and flexible decision-making based on triggers and natural cues. This is particularly important in the case of supporting bird breeding and fish breeding events across the Basin.²³

- 2.22 The Department of the Environment and Energy submitted that the CEWH is 'committed to being a diligent, responsive and prudent water

17 Ricegrowers' Association of Australia, *Submission 19*, p. 5; see also Mrs Zara Lowien, Executive Officer, Gwydir Valley Irrigators Association Inc, *Committee Hansard*, Canberra, 30 May 2018, p. 10.

18 Southern Riverina Irrigators, *Submission 21*, p. 3; see also Mr Mark Winter, Vice Chair, Gwydir Valley Irrigators Association Inc, *Committee Hansard*, Canberra, 30 May 2018, p. 7.

19 Southern Riverina Irrigators, *Submission 21*, p. 4.

20 National Farmers' Federation, *Submission 29*, p. 5.

21 Ms Caren Martin, Chairperson, South Australia Murray Irrigators, *Committee Hansard*, Mildura, 1 May 2018, p. 25.

22 Ms Caren Martin, Chairperson, South Australia Murray Irrigators, *Committee Hansard*, Mildura, 1 May 2018, p. 28.

23 Nature Conservation Council NSW, *Submission 24*, p. 3.

manager who uses water efficiently and effectively'.²⁴ The Commonwealth Environmental Water Holder, Ms Jody Swirepik, said there is planning and liaison with river operators in real time to optimise environmental water.²⁵ She said:

We are looking at what is happening in the system and actually placing our water around other water so that we can make the most of it and get the best environmental outcomes. That's both tying it in with natural cues – it might be for breeding or spawning or for particular habitats to be wet at a good time of year – and also in terms of looking at the most efficient use of the water so that we use as little as possible to achieve that outcome.²⁶

2.23 The Department's submission noted that environmental outcomes 'will be significantly less' without the Basin States making two changes, due to take effect in July 2019:

1. credit environmental return flows for downstream environmental use (protection of environmental water).
2. allow the call of held environmental water from storage during unregulated flow events (piggybacking).²⁷

2.24 The submission stated that recognition of return flows would allow for water to be re-used at multiple sites, extending the benefits and outcomes using the same water. The submission advised that protecting environmental water from extraction by other users 'can be difficult', as the States are responsible for compliance systems and, currently, there is no guarantee of real-time protection for environmental water when it is released.²⁸ The submission added:

...better environmental outcomes could be achieved if Basin States provide event-based protection of environmental water, which will also increase public confidence that the water is being used as intended.²⁹

2.25 The practice of 'piggybacking' (discussed later in this chapter) involves releasing environmental water to increase the size of an existing flow already in the river, which creates a cumulative effect and replicates larger

24 Department of the Environment and Energy, *Submission 38*, p. 24.

25 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 2.

26 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 2.

27 Department of the Environment and Energy, *Submission 38*, p. 30; see also see also Victorian Government, *Submission 41*, appendix 3, p. 12.

28 Department of the Environment and Energy, *Submission 38*, pp. 30-31.

29 Department of the Environment and Energy, *Submission 38*, p. 31.

natural events. The Department submitted that this increases efficiency because 'a greater outcome can be achieved with the same volume of water'.³⁰

- 2.26 A submission from the Victorian Government noted how infrastructure can be used for efficiency:

Water supply infrastructure such as pumps, regulators and pipes can help to water important environmental sites in the absence of natural floods. This means that less water is needed to connect the river to its floodplain.³¹

- 2.27 The Department of the Environment and Energy's submission also outlined processes for environmental water planning, including 15 water resource planning principles.³²

- 2.28 During the inquiry, many submissions and witnesses discussed options to protect environmental water, particularly in the northern Basin area, as well as large flows leading to potential flooding and third-party impacts. This evidence is reviewed in the following sections.

Legal protections for environmental water

- 2.29 Environmental water receives protection from extraction while it flows within a catchment area.³³ However, once the environmental water flows into another catchment, other water users could be permitted to pump water from the river and use it for consumptive purposes.

- 2.30 The Murray-Darling Basin Authority's (MDBA) submission explained that in the southern Basin, water is released from storage to fulfil delivery orders, whereas in parts of the northern Basin, flow is dependent on rainfall and water is extracted based on these conditions.³⁴ The MDBA observed:

In these unregulated northern systems, specially tailored rules are required in order to be able to meet the ecological needs of the river system by allowing the water recovered by the

30 Department of the Environment and Energy, *Submission 38*, p. 30.

31 Victorian Government, *Submission 41*, appendix 3, p. 13; see also Deakin University, *Submission 10*, p. 1.

32 Department of the Environment and Energy, *Submission 38*, p. 24.

33 The Basin is divided into a subset of 22 river catchments. The MDBA's website detailed maps and profiles; see: <<https://www.mdba.gov.au/discover-basin/catchments>>.

34 Murray-Darling Basin Authority, *Submission 34*, p. 7.

Commonwealth to remain instream, while balancing the needs of other water users.³⁵

- 2.31 The CEWH said there is a 'very high' degree of certainty that environmental water is protected within a catchment; however, particularly in the Barwon-Darling catchment (in north-western NSW),³⁶ a licence holder can pump water when flows reach a certain level. This leads to the need for a practice known as environmental water 'shepherding', where an assurance is given that an environmental water flow will remain protected over vaster geographical distances.³⁷
- 2.32 Professor Michael Stewardson (University of Melbourne) noted that Commonwealth environmental water entitlements have the same character as irrigation entitlements. He said:
- That character means that when the water passes downstream of the section of river where that water was intended to be used it gets returned to the consumptive pool ... Clearly, that's not the intended purpose within environmental water use. The intended purpose of environmental water use is that the water is retained within the river system.³⁸
- 2.33 Dr Avril Horne (University of Melbourne) said that this could be addressed in regulated river systems, but is more complex in river systems where the rules allow users to pump water once the river reaches a certain level. She added that in these situations, there is no ability to distinguish environmental water.³⁹ Dr Horne explained that although irrigation water and environmental water share the same characteristics, both have different needs and objectives. She described environmental water as 'a new user that has entered the system' and said that the challenge is to create the flexibility needed to meet the objectives in the Basin Plan.⁴⁰

35 Murray-Darling Basin Authority, *Submission 34*, p. 8.

36 For further information about the Barwon-Darling catchment, refer to the Murray-Darling Basin Authority's website: <<https://www.mdba.gov.au/discover-basin/catchments/barwon-darling>>

37 Ms Jody Swirepik, Commonwealth Environmental Water Holder and Mr Mark Taylor, Assistant Secretary, Department of the Environment and Energy, *Committee Hansard*, Canberra, 28 March 2018, p. 5.

38 Professor Michael Stewardson, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 11; see also Environmental Defenders Office Australia, *Submission 28*, pp. 3-4.

39 Dr Avril Horne, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 12; see also Mr Michael Murray, General Manager, Cotton Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 13.

40 Dr Avril Horne, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, pp. 12-13; see also Mr Steve Whan, CEO, National Irrigators' Council, *Committee Hansard*, Canberra, 23 May 2018, pp. 8-9.

- 2.34 The Australian Floodplain Association observed that interest in the Barwon-Darling had only emerged following media attention.⁴¹
- 2.35 The NSW Government submitted:
- A key challenge to managing environmental water in NSW is the characteristics of the northern part of the Murray Darling Basin. Major regulated rivers in the northern part of the Basin are connected to the southern regulated rivers by the unregulated Barwon Darling River.⁴²
- 2.36 The submission continued:
- The NSW Government is committed to finding both interim and enduring solutions that will ensure environmental water is properly protected so the long term and short term objectives set for environmental water can be met.⁴³
- 2.37 The Nature Foundation SA, among others, submitted that ‘it is essential... to ensure that environmental water cannot be captured in transit by irrigation diversions’ and protected from the northern tributaries to the river mouth.⁴⁴ The Nature Conservation Council NSW emphasised that legal protections are particularly important in the Barwon-Darling river system and the connected Southern Basin.⁴⁵
- 2.38 Dr Emma Carmody (Senior Policy and Law Reform Solicitor, Environmental Defenders Office Australia) said that the preferable option for resolving this issue is to include rules in water sharing plans.⁴⁶ Alternatively, she said that water extraction could be embargoed for limited periods of time.⁴⁷
- 2.39 The Department of the Environment and Energy’s submission stated that Commonwealth-accredited water resource plans are required to be in

41 Australian Floodplain Association, *Submission 20*, pp. 3-4.

42 NSW Government, *Submission 17*, p. 7.

43 NSW Government, *Submission 17*, p. 7.

44 Nature Foundation SA Inc, *Submission 22*, p. 3; see also Professor Michael Stewardson, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 9, Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, p. 13; Professor Richard Kingsford, *Committee Hansard*, Sydney, 22 June 2018, p. 8.

45 Nature Conservation Council NSW, *Submission 24*, p. 3; see also Australian Floodplain Association, *Submission 20*, p. 3.

46 ‘Water sharing plans’ apply in NSW and form a component of water resource plans in the *Water Act 2007* (Cth) for implementing the Basin Plan.

47 Dr Emma Carmody, Senior Policy and Law Reform Solicitor, Environmental Defenders Office of Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 4.

place by July 2019 and, once approved, will set state regulation of water until 2029.⁴⁸ The submission added:

The rules and policies to be established... should provide the means to ensure that environmental water is protected from being repurposed, or extracted, as it flows throughout and between river systems.⁴⁹

2.40 Other witnesses and submissions described the issues as being more complex to resolve.⁵⁰ Mr Les Gordon (Chair, Water Taskforce, National Farmers' Federation) said that while in hindsight water resource plans 'should have been completed earlier', finalising them takes time:

They are really difficult, complex bodies of work... They need to be collaborative. They need to involve stakeholders to be done properly ... All of the jurisdictions will struggle to make that time line just because of the amount of work that's involved, but I'm confident that, given the opportunity, we'll get there.⁵¹

2.41 Mr Gordon said that for licences based on flow volumes, water shepherding is 'changing the whole underpinning methodology of those licences, and that's why it is such a difficult subject'.⁵² Mr Steve Whan (CEO, National Irrigators' Council) said that 'water rights are property rights and... if those rights are changed, that has implications for people's businesses'.⁵³

2.42 Ms Perin Davey (Executive Officer, Southern Riverina Irrigators) said that the northern and southern basins are managed differently, including the Barwon-Darling river system. She said water characteristics must not change and 'if you're going to adjust the rules for one they must be adjusted for all'.⁵⁴

2.43 Cotton Australia's submission acknowledged that there is 'a community expectation of better protection for environmental flows', as well as noting

48 Department of the Environment and Energy, *Submission 38*, p. 23.

49 Department of the Environment and Energy, *Submission 38*, p. 23.

50 Mr Jeremy Morton, President, Ricegrowers' Association of Australia, *Committee Hansard*, Canberra, 20 June 2018, pp. 6-7.

51 Mr Les Gordon, Chair, Water Taskforce, National Farmers' Federation, *Committee Hansard*, Canberra, 23 May 2018, p. 3.

52 Mr Les Gordon, Chair, Water Taskforce, National Farmers' Federation, *Committee Hansard*, Canberra, 23 May 2018, p. 4.

53 Mr Steve Whan, CEO, National Irrigators' Council, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

54 Ms Perin Davey, Executive Officer, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, pp. 24-25.

negotiations with some irrigation entitlement holders to protect individual flow events.⁵⁵ The submission added:

Cotton Australia supports these respectful negotiations, providing everyone recognises that entitlement holders are currently operating within the rules, and those rules were clearly understood at the time the Commonwealth purchased the water entitlements.⁵⁶

2.44 Mr Michael Murray (General Manager, Cotton Australia) said that subject to consultation with stakeholders, water flows could be actively managed on a daily basis to protect environmental water in unregulated river systems.⁵⁷ The National Irrigators' Council submission provided a similar view:

While we are happy to work with Government on the protection of environmental flows in unregulated rivers, it is important to point out that there should be no change to the characteristics of different types of water right. In this context, water owned by a commercial irrigator has exactly the same characteristic and right as the same type of water owned by the Government.⁵⁸

2.45 The Council's submission added:

Most of the Basin's water is in regulated rivers and these rivers do not (generally) have the type of licenses that are involved in the problems outlined. It should also be clear that legal interaction of some licenses on unregulated rivers and environmental flows does not constitute theft.⁵⁹

2.46 The NSW Irrigators' Council submitted that it had 'deep concerns' about shepherding environmental water, including:

- if northern Basin irrigators may forego pumping water so an environmental flow can be protected, the 'next flow may be a long time coming'; and

55 Cotton Australia, *Submission 5*, p. 4.

56 Cotton Australia, *Submission 5*, p. 4.

57 Mr Michael Murray, General Manager, Cotton Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 13; see also Mr Mark McKenzie, CEO, NSW Irrigators' Council, *Committee Hansard*, Sydney, 22 June 2018, p. 22.

58 National Irrigators' Council, *Submission 23*, p. 17.

59 National Irrigators' Council, *Submission 23*, p. 16. The submission commented: 'NIC has zero tolerance for any illegal water take, whether that is by an irrigator or anyone else'.

- protecting environmental water in this way ‘in effect alters the nature of the held environmental water by ceding primacy to it over water rights held by irrigators’.⁶⁰
- 2.47 Ms Emma Bradbury (CEO, Murray-Darling Association) said the ability to measure and account for environmental water with greater precision would ‘make a major contribution to that whole concept of shepherding’.⁶¹
- 2.48 Chapter 3 contains further detail on measuring environmental water and evaluating outcomes.
- 2.49 The MDBA’s submission noted that a compliance review had recently been completed and its recommendations included:
- a possible ‘no meter, no pump’ rule;
 - more transparent compliance policies;
 - reporting of compliance regimes;
 - more effective penalty regimes; and
 - focus on having water resource plans ready by 30 June 2019.⁶²

Compliance issues

- 2.50 In the context of their evidence on the legal protections for environmental water, a number of witnesses and submissions discussed compliance and acknowledged allegations of water being improperly extracted or diverted. A number of references were made to a report on ABC television’s *Four Corners* program in July 2017.⁶³
- 2.51 Mr Michael Murray (General Manager, Cotton Australia) said that reports of water being illegally taken ‘remain allegations’. He said if water is being stolen, irrigators and farmers will respond with ‘white hot anger’ because in most cases, ‘it is not stealing water off the government or stealing water off the environment; it’s stealing another irrigator’s share’.⁶⁴

60 NSW Irrigators’ Council, *Submission 32*, p. 6.

61 Ms Emma Bradbury, CEO, Murray-Darling Association, *Committee Hansard*, Albury, 30 April 2018, p. 25.

62 Murray-Darling Basin Authority, *Submission 34*, p. 8.

63 For example: Cotton Australia, *Submission 5*, p. 3; Queensland Farmers’ Federation, *Submission 13*, p. 4; Department of Agriculture and Water Resources, *Submission 31*, p. 3; Professor Richard Kingsford, private capacity, *Committee Hansard*, Sydney, 22 June 2018, p. 8; see also <<http://www.abc.net.au/4corners/pumped/8727826>>.

64 Mr Michael Murray, General Manager, Cotton Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 16; see also Mr Mark McKenzie, CEO, NSW Irrigators’ Council, *Committee Hansard*, Sydney, 22 June 2018, p. 20; Mr Steve Whan, CEO, National Irrigators’ Council, *Committee Hansard*, Canberra, 23 May 2018, p. 8.

- 2.52 Professor Richard Kingsford (private capacity) said that water pumped from a river is metered before entering a channel linked to a storage dam. Water from a floodplain could fall into a channel, bypass the meter on the river and not be measured. He said that ‘another meter on the pump that takes the water up into the dam’ could be installed, which would be ‘one technical way of measuring how much water is taken’ from floodplains.⁶⁵ Professor Kingsford added that drones and satellite tracking could be other options, although he said these are indirect measures that are ‘never going to get down to the megalitre’.⁶⁶
- 2.53 Mr Murray said measuring water taken from a floodplain in this way is complex, because water held in storage comes from multiple sources, including rainfall run-off.⁶⁷
- 2.54 In November 2017, the Commonwealth Auditor-General conducted a limited assurance review relating to the protection of environmental water in NSW. The Auditor-General’s report noted advice the former CEWH had provided to the Department of Agriculture and Water Resources in April 2016, expressing concerns about the NSW Government’s level of support for environmental water delivery.⁶⁸ The Audit report cited the CEWH’s view on legal protections for environmental water in NSW:

The CEWH also stated that:

in the northern Basin, there appears to be a failure, if not active disinterest by officials in the NSW DPI Water (DPIW) to develop or implement operational arrangements, such as water shepherding and piggybacking, that support the effective delivery of environmental water to achieve agreed Basin Plan objectives. DPIW are not properly managing licensing regimes which allow the cross-border and cross-catchment ‘re-regulation’ of environmental water.⁶⁹

65 Professor Richard Kingsford, private capacity, *Committee Hansard*, Sydney, 22 June 2018, p. 9.

66 Professor Richard Kingsford, private capacity, *Committee Hansard*, Sydney, 22 June 2018, p. 9.

67 Mr Michael Murray, General Manager, Cotton Australia, *Committee Hansard*, Sydney, 22 June 2018, pp. 16-17.

68 Australian National Audit Office Report No. 17 of 2017-18, *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*, November 2017, p. 5 and pp. 16-18.

69 Australian National Audit Office Report No. 17 of 2017-18, *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*, November 2017, p. 17; see also Commonwealth Environmental Water Holder, *Supplementary Submission 2.1*, p. 1.

- 2.55 In the report, the Auditor-General also noted that the ‘following matters have come to my attention’ in regards to the Department of Agriculture and Water Resources’ assessment of NSW performance under the *National Partnership Agreement (NPA) on Implementing Water Reform in the Murray-Darling Basin*:
- the lack of specific, measurable deliverables, and outcome measures in the milestones and criteria for assessing the performance of NSW under the Murray-Darling Basin NPA represent significant weaknesses in the performance framework; and
 - while the Department of Agriculture and Water Resources has followed agreed processes for monitoring performance, there was a lack of evidence and explanation to substantiate its positive assessment of NSW’s progress under Milestone 81 of the Murray-Darling Basin NPA for 2015–16, in light of serious issues raised about the state’s water regulation arrangements. Importantly, there was little in the Department of Agriculture and Water Resources’ submission to the Minister for 2015–16 to suggest that there were risks that NSW was not delivering environmental water consistent with the Basin Plan. These factors have limited the effectiveness of Department of Agriculture and Water Resources’ assessment.⁷⁰
- 2.56 The ANAO Report noted that ‘the Department of Agriculture and Water Resources advised that it does not agree with this finding.’⁷¹
- 2.57 The NSW Government provided a submission noting that legislative reforms are being progressed to improve environmental water management and transparency.⁷² On two occasions, the Committee invited the NSW Office of Environment and Heritage to appear at a public hearing; however, the Office declined.
- 2.58 The CEWH advised that there has been ‘quite a change’ since the *Four Corners* report, with the NSW Government placing a ‘protection order’ on an environmental flow in the Barwon-Darling river system.⁷³
- 2.59 The MDBA’s submission noted that ‘robust compliance systems’ are essential for community confidence and for the CEWH to achieve its

70 Australian National Audit Office Report No. 17 of 2017-18, *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*, November 2017, p. 5.

71 Australian National Audit Office Report No. 17 of 2017-18, p. 6.

72 NSW Government, *Submission 17*, p. 10.

73 Ms Jody Swirepik, Commonwealth Environmental Water Holder and Mr Mark Taylor, Assistant Secretary, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, pp. 2-3.

environmental outcomes from recovered water.⁷⁴ Audits and investigations may be commenced 'in response to specific incidents or intelligence reports'.⁷⁵ The MDBA submitted:

... it is the role of all Basin governments to ensure effective compliance systems are in place and enforced across the Basin to ensure water is properly used within each jurisdiction.⁷⁶

- 2.60 The Department of Agriculture and Water Resources noted that governments have agreed to a draft 'Basin Compliance Compact', which includes 'timeframes to improve water metering and measurement of water take'.⁷⁷
- 2.61 This Committee does not have a role in investigating or resolving individual allegations of illegal take or water theft.

Environmental watering and third-party impacts

- 2.62 The CEWH has a responsibility to minimise risks to communities when conducting environmental watering activities, to avoid any unintended impacts on third parties.⁷⁸ A range of potential impacts relating to environmental water were discussed during the inquiry, including:
- the potential for private property to be flooded;
 - possible changes to water quality or river conditions;
 - channel capacity limitations, particularly a narrow section of the Murray River at the Barmah Choke; and
 - occupying water storage space and holding excess environmental water for future use ('carryover').
- 2.63 The CEWH follows a practice known as the 'good neighbour' policy. The policy aims to promote mutually beneficial relationships with other water users and landholders, subject to the CEWH's legal obligations.⁷⁹ The Department of the Environment and Energy's submission observed:

74 Murray-Darling Basin Authority, *Submission 34*, p. 8.

75 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 1 (MDBA response to Question 1).

76 Murray-Darling Basin Authority, *Submission 34*, p. 8.

77 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 4 (DAWR response to Question 4). A copy is available at <https://www.mdba.gov.au/sites/default/files/pubs/compliance-compact.pdf>.

78 Department of the Environment and Energy, *Submission 38*, p. 16.

79 Department of the Environment and Energy, *Submission 38*, p. 16.

Operating effectively in a working river system where much of Australia's food and fibre is produced necessitates that environmental water management must co-exist with agricultural production in a mutually respectful and harmonious manner.⁸⁰

2.64 The Department's submission described how the policy operates:

- The CEWH has not, and will not, place water orders that would flood private land without the consent of the landholder.
- An appropriate share of the channel capacity in a river system is used by the CEWH for environmental watering so as not to impact on agricultural producers.
- The [Commonwealth Environmental Water] Office works closely with communities and delivery partners (including state agencies, river operators and local advisory groups) so they can engage meaningfully on Commonwealth environmental water management.⁸¹

2.65 A submission from the Victorian Government noted that infrastructure works 'provide a way to target sites that cannot otherwise be watered due to the risk of third-party impacts'.⁸²

2.66 Mr Hugo Hopton (CEO, Nature Foundation SA) said that the good neighbour policy in effect relegates environmental water to second place in preference to irrigators' water. He said this deferment means the release of environmental water may not coincide with fish breeding. While Mr Hopton agreed that the policy had generated goodwill, he said:

The CEWH has been out there, sitting in on kitchen table meetings and local meetings, creating and maintaining the dialogue. That is wonderful, but we do need every person and every community to understand striking the balance. There's no point in having a really prosperous citrus orchard while having the foreshore of a river town dying because there's no water for environmental watering.⁸³

2.67 Mr Terry Hillman (Member, Wentworth Group of Concerned Scientists) suggested that to 'back off' environmental water may lead to missed opportunities.⁸⁴ He said:

80 Department of the Environment and Energy, *Submission 38*, p. 16.

81 Department of the Environment and Energy, *Submission 38*, p. 17.

82 Victorian Government, *Submission 41*, appendix 3, p. 13.

83 Mr Hugo Hopton, CEO, Nature Foundation SA, *Committee Hansard*, Murray Bridge, 2 May 2018, pp. 15-16.

84 Mr Terry Hillman, Member, Wentworth Group of Scientists, *Committee Hansard*, Albury, 30 April 2018, p. 26.

...that deprives us of the capacity to experiment with this to try to work out ways where we can share space better – in particular, channel space and, basically, river space.⁸⁵

2.68 Other views favoured the good neighbour policy. For example, Mr Michael Murray (General Manager, Cotton Australia) said:

I think the work that they've done to date has been very good. They've tried to minimise any negative impacts that they may have on neighbours and water markets and the like, and they've tried to work in with extractive users as much as possible.⁸⁶

2.69 The NSW Irrigators' Council submitted that the good neighbour policy should be 'formally enshrined' in the CEWH's environmental water management framework.⁸⁷

2.70 While there had been instances of environmental water releases being paused to conform with the good neighbour policy, Ms Jody Swirepik (Commonwealth Environmental Water Holder) said:

...fundamentally we would also say that, because we have a water right in the system, on a ratio basis we should be able to have our water delivered down the system like other water users. So we are not fundamentally giving up our right. We still believe we should have the same rights and responsibilities.⁸⁸

2.71 Issues relating to the good neighbour policy are also discussed in Chapter 4, in the context of community awareness and engagement.

Flooding private property

2.72 The Committee received evidence from people concerned about the potential for environmental water flows flooding private land.

2.73 A submission from the NSW Irrigators' Council discussed the potential for large volumes of environmental water to flood private property. The submission also stated that liability for unmitigated third party impacts from environmental watering should be settled prior to large-scale environmental water releases.⁸⁹ The submission added:

85 Mr Terry Hillman, Member, Wentworth Group of Scientists, *Committee Hansard*, Albury, 30 April 2018, p. 26.

86 Mr Michael Murray, General Manager, Cotton Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 15.

87 NSW Irrigators' Council, *Submission 32*, p. 3 and p. 5.

88 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 4.

89 NSW Irrigators' Council, *Submission 32*, p. 3.

Despite MDBA modelling that indicates that sub-flood level flows can be manipulated to meet Basin Plan end-of-system flow rates sufficient to keep the Murray Mouth open 90% of the time, NSWIC holds very serious doubts that the CEWH will be able to physically deliver the flow rates modelled by the MDBA to the end of the Murray system without causing very significant flooding of private property.⁹⁰

2.74 Mr Carl Binning (Executive Director, Partnerships Division, Murray-Darling Basin Authority) said:

There is no doubt that getting larger flows through the system is required to move the body of sand that sits at the Murray Mouth to keep the Murray Mouth open.⁹¹

2.75 A submission from Jan Beer stated that some property owners are 'resolute in their determination not to negotiate flood easements'. The submission added that channel capacity constraints 'cannot be mitigated' and the 'massive costs... cannot be justified' to flood public and private property.⁹²

2.76 Ms Jody Swirepik (Commonwealth Environmental Water Holder) told the Committee that there is a policy not to flood private property without the landholder's consent.⁹³

2.77 However, Mr Binning said that the Basin Plan has envisaged relaxing operating constraints so floodplains can be watered, particularly for black box and red gum forests.⁹⁴ He added:

That will involve, between now and 2024, detailed consultation with communities... and investment in infrastructure to allow those high flows. ... It's one of the most difficult parts of the reform because it involves balancing the need to get water out of the river bank, which is what's needed environmentally, along with the rights and the livelihoods of people who live along the river.⁹⁵

90 NSW Irrigators' Council, *Submission 32*, p. 5.

91 Mr Carl Binning, Executive Director, Partnerships Division, Murray-Darling Basin Authority, *Committee Hansard*, Canberra, 27 June 2018, p. 4.

92 Jan Beer, *Submission 4*, p. 2.

93 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 4.

94 Mr Carl Binning, Executive Director, Partnerships Division, Murray-Darling Basin Authority, *Committee Hansard*, Canberra, 27 June 2018, p. 4.

95 Mr Carl Binning, Executive Director, Partnerships Division, Murray-Darling Basin Authority, *Committee Hansard*, Canberra, 27 June 2018, p. 4; see also Professor Michael Stewardson, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 9.

- 2.78 Mr Binning said the Australian environment depends on floods from time to time and, although there may be impacts on communities, there are also environmental benefits.⁹⁶

Water quality

- 2.79 When floodplains are inundated with water, accumulated debris is flushed away. This can result in 'blackwater' events. Infrequent flooding causes more debris to accumulate and, when a flood eventually occurs, the water is overloaded with organic matter (for example, leaves from red gum trees) and the blackwater becomes harmful. Oxygen levels are reduced, which may affect fish populations or lead to fish deaths.⁹⁷
- 2.80 Mr Carl Binning (Executive Director, Partnerships Division, Murray-Darling Basin Authority) explained that smaller, managed floods would mitigate the size of blackwater events.⁹⁸
- 2.81 The Committee received two submissions stating that environmental water is negatively affecting water quality and causes blackwater events.⁹⁹
- 2.82 However, others agreed with Mr Binning's evidence, observing that blackwater events are natural, provide an overall benefit for rivers and that environmental watering mitigates the risks.¹⁰⁰ Professor Nick Bond (La Trobe University) said that despite perceptions, there is 'nothing to suggest' environmental water had recently contributed to blackwater.¹⁰¹ Rather, environmental water creates opportunities to manage how often accumulated material is washed away.¹⁰² Professor Bond explained:

...under the natural flow regime... there were more frequent opportunities for that carbon to be removed from the flood plain through leaching at much lower concentrations, because of the

96 Mr Carl Binning, Executive Director, Partnerships Division, Murray-Darling Basin Authority, *Committee Hansard*, Canberra, 27 June 2018, p. 5; see also Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 5.

97 Professor Nick Bond, La Trobe University, *Committee Hansard*, Albury, 30 April 2018, p. 14; Nature Foundation SA Inc, *Submission 22*, p. 3; see also Geoscience Australia, 'Anoxic and Hypoxic Events', at <http://www.ozcoasts.gov.au/indicators/anoxic_hypoxic_events.jsp>.

98 Mr Carl Binning, Executive Director, Partnerships Division, Murray-Darling Basin Authority, *Committee Hansard*, Canberra, 27 June 2018, p. 5.

99 Ian Boyle, *Submission 3*, p. 1; Jan Beer, *Submission 4*, p. 1.

100 Sarah Moles, *Submission 6*, p. 2; Nature Foundation SA Inc, *Submission 22*, p. 3; Nature Conservation Council NSW, *Submission 24*, p. 5; South Australian Government, *Submission 40*, p. 7.

101 Professor Nick Bond, La Trobe University, *Committee Hansard*, Albury, 30 April 2018, p. 10.

102 Professor Nick Bond, La Trobe University, *Committee Hansard*, Albury, 30 April 2018, p. 14.

lower accumulation of organic material between those flood events.¹⁰³

- 2.83 Dr Jonathan Howard (Charles Sturt University) cautioned against benchmarking the CEWH's performance on thresholds of water volume or money spent, noting that 'improvements in water quality are also needed'.¹⁰⁴
- 2.84 Environmental water could be used to flood land more often to minimise blackwater events, although reaching elevated areas presents challenges. As discussed above, there is opposition to flooding private land. Professor Michael Stewardson (University of Melbourne) said that to avoid impacts on riparian landowners, the CEWH had been 'heavily constrained' when attempting to replicate higher flows.¹⁰⁵ Dr Angus Webb (University of Melbourne) noted that water could be pumped onto floodplains, which uses smaller volumes than a natural flood.¹⁰⁶

Channel capacity

- 2.85 The Murray River's channel capacity is particularly limited at the Barmah Choke, upstream from Echuca along the Victorian and NSW border. Southern Riverina Irrigators observed that silting and a lack of maintenance limits the volume of water that can pass to around 8,000 megalitres daily.¹⁰⁷
- 2.86 Professor Richard Kingsford said that where channel space is limited, this poses challenges for consumptive and environmental water users in terms of who takes priority.¹⁰⁸ The CEWH's website states:

At times of critical environmental need, the Commonwealth may assert its rights to access its share of channel capacity. However, in the event of channel capacity becoming limited, we can be flexible about how and when environmental water is ordered so as to minimise any potential impact on others.¹⁰⁹

103 Professor Nick Bond, La Trobe University, *Committee Hansard*, Albury, 30 April 2018, p. 14.

104 Dr Jonathan Howard, *Submission 16*, p. 3.

105 Professor Michael Stewardson, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 9.

106 Dr Angus Webb, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 15.

107 Southern Riverina Irrigators, *Submission 21*, p. 4.

108 Professor Richard Kingsford, private capacity, *Committee Hansard*, Sydney, 22 June 2018, p. 7.

109 Department of the Environment and Energy, 'Planning - Approach to managing Commonwealth environmental water' at <http://www.environment.gov.au/water/cewo/about/planning>.

- 2.87 Mr Ian Davidson (Chair, Murray Darling Wetlands Working Group) said the Barmah Choke is ‘the vital pinch point in the whole system’.¹¹⁰ Mr Terry Hillman (Member, Wentworth Group of Concerned Scientists) explained that water is collected and stored over the winter for release during the summer; however, he said that the surrounding Barmah-Millewa Forest is naturally accustomed to flooding in winter and being dry in summer.¹¹¹
- 2.88 The Environmental Defenders Office Australia submitted that there has been ‘insufficient action’ to remove constraints at sites such as the Barmah Choke.¹¹² The submission stated:
- It is crucial that concrete steps are taken to remove constraints so as to allow for sufficient volumes of environmental water to be delivered to key locations. Failure to address this issue will undermine proper implementation of the Basin Plan...¹¹³
- 2.89 The South Australian Government submitted that the Coorong, Lower Lakes and Murray Mouth need water during the summer, when the CEWH tends to observe its good neighbour policy and does not compete for channel capacity. The submission stated that this policy limits the CEWH’s ability to deliver sufficient water volumes at ‘crucial times’.¹¹⁴ The submission noted:
- ...the Barmah Choke will be key to overcoming this. If not addressed, the key objectives of the Basin Plan in this area may be undermined.¹¹⁵
- 2.90 Mr Davidson said the solution to channel capacity is a ‘big investment’, although he noted that as it is situated on the border of Victoria and NSW, ‘there is no real champion’ to remedy this section of the Murray River.¹¹⁶ Murray Irrigation suggested that its infrastructure could be used to bypass the Barmah Choke constriction.¹¹⁷

110 Mr Ian Davidson, Chair, Murray Darling Wetlands Working Group, *Committee Hansard*, Albury, 30 April 2018, p. 27.

111 Mr Terry Hillman, Member, Wentworth Group of Scientists, *Committee Hansard*, Albury, 30 April 2018, p. 27.

112 Environmental Defenders Office Australia, *Submission 28*, p. 4; see also Southern Fishermen’s Association, *Submission 37*, p. 6.

113 Environmental Defenders Office Australia, *Submission 28*, p. 4.

114 South Australian Government, *Submission 40*, p. 6.

115 South Australian Government, *Submission 40*, p. 6.

116 Mr Ian Davidson, Chair, Murray Darling Wetlands Working Group, *Committee Hansard*, Albury, 30 April 2018, p. 28.

117 Murray Irrigation, *Submission 30*, p. 8; see also Minister for Agriculture and Water Resources, media release, 14 September 2018, ‘Delivering Water Faster in the Southern Murray-Darling’,

2.91 In its submission, the NSW Irrigators' Council noted that nut tree plantations in the lower end of the Murray River would increase demand for irrigated water (when added to existing requirements), exacerbate channel constraints and potentially lead to 'conflicting demands'.¹¹⁸ The submission continued:

If these environmental flows were shepherded using significant channel capacity it would be delivering licence primacy to environmental water at the expense of other water access licence holders and would put the CEWH in direct conflict with irrigators. As a consequence ... the 'good neighbour' policy previously employed by the CEWH should be formalised in CEWH water deployment planning to avoid such conflicts.¹¹⁹

2.92 In response to these concerns, Ms Jody Swirepik (Commonwealth Environmental Water Holder) said:

With the increasing competition for channel capacity in a few parts of the basin, I think there will need to be some work done by governments in consultation with water users to look at how we might share that water channel capacity and what that means for different types of users. ...there is a recognition within government that we need to undertake some work around channel capacity sharing.¹²⁰

2.93 The Department of the Environment and Energy's submission noted that there are prospective projects relating to removing physical constraints or barriers to environmental flows.¹²¹

Storage capacity and 'carryover'

2.94 Unexpected rainfall may fill rivers and lakes naturally at the right times and places. In this situation, the CEWH adjusts his or her plans and may hold more environmental water than is necessarily required for immediate use. The CEWH can elect to hold (or save) surplus environmental water in storage for future use – a practice known as 'carryover'.

2.95 Ms Emma Bradbury (CEO, Murray Darling Association) said that holding environmental water in storages 'occupies airspace otherwise used for

at <<http://minister.agriculture.gov.au/littleproud/Pages/Media-Releases/delivering-water-faster-in-the-sthn-mdb.aspx>>.

118 NSW Irrigators' Council, *Submission 32*, p. 6.

119 NSW Irrigators' Council, *Submission 32*, p. 7.

120 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 4.

121 Department of the Environment and Energy, *Submission 38*, p. 27; see also Murray-Darling Basin Authority, *Submission 34*, p. 10.

irrigation water and has the effect of triggering spills'. She said this 'can and does create economic losses'.¹²²

2.96 Ms Perin Davey (Executive Officer, Southern Riverina Irrigators) said that in these circumstances, there may be scope to adjust private water accounts to compensate. In very wet years, she said dam spills could be deemed to be an environmental water delivery, given this assists with the CEWH's overall objectives.¹²³

2.97 Ms Jody Swirepik (Commonwealth Environmental Water Holder) said that 'our rights to carryover water are the same as other water users in the system'.¹²⁴ Mr Hilton Taylor (Assistant Secretary, Department of the Environment and Energy) said that Commonwealth environmental water represents about three per cent of water in storages.¹²⁵ He said that the environmental watering season runs counter-cyclical to the irrigation season at a time when dams are filling with water:

So by running counter-cyclically, we're in fact creating air space at a good time for other water holders and we're getting the environmental benefits, and it's quite intentional that we do maintain carryover from year to year.¹²⁶

2.98 Mr Hilton said that 'carryover is critical for us to be able to maintain those activities across water years'.¹²⁷

Trading and selling environmental water

2.99 The CEWH can trade environmental water, subject to the provisions of the *Water Act 2007* (Cth) (Water Act) and guided by the 'Commonwealth Environmental Water Trading Framework'.¹²⁸ Nine operating rules guide CEWH water trading decisions:

122 Ms Emma Bradbury, CEO, Murray Darling Association, *Committee Hansard*, Albury, 30 April 2018, p. 22; Murray Darling Association, *Submission 27*, p. 3.

123 Ms Perin Davey, Executive Officer, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 26.

124 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 5.

125 Mr Hilton Taylor, Assistant Secretary, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 6.

126 Mr Hilton Taylor, Assistant Secretary, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 6.

127 Mr Hilton Taylor, Assistant Secretary, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 6.

128 Department of the Environment and Energy, *Submission 38*, p. 19.

1. The CEWH will not trade if aware of a water announcement that has not been made generally available.
2. All trades will be undertaken using a competitive process.
3. Decisions to trade will be informed by a market assessment.
4. Price limits to be used in any trading action.
5. Consistent, equitable and transparent assessment of trade offers.
6. Regular guidance on trading intentions.
7. Trading actions to be announced prior to trade.
8. Market information to be released prior to each trading action.
9. Public reporting following trading actions.¹²⁹

2.100 The Department of the Environment and Energy advised:

Since 2014 the CEWH has sold 39.9 gigalitres of water allocations in four trading actions, worth \$12.6 million. The proceeds of trade are held in the Environmental Water Holdings Special Account. Less than 0.5 per cent of the allocations received by the CEWH have been sold to date.¹³⁰

2.101 The submission stated that the CEWH is 'likely' to participate in the water market more often, with trades being conducted by an open tender.¹³¹

2.102 Submissions and witnesses discussed the CEWH's role in the water trading market. The National Irrigators' Council characterised the CEWH's position as being 'significant', given it is 'by far the biggest owner of water in the Murray-Darling Basin'.¹³²

2.103 In contrast, Dr Jonathan Howard described such language as 'reckless' because, in his view, irrigated agriculture remains the single largest holder of water entitlements in the Basin in an overall sense.¹³³ However, Dr Howard supported the prospect of environmental water being sold:

The CEWH could realise an integrated approach by being able to sell water, under a set of clear guidelines, on the open market. The

129 Commonwealth Environmental Watering Office, *Commonwealth Environmental Water Trading Framework*, January 2014, pp. 14-17, at <http://www.environment.gov.au/water/cewo/publications/water-trading-framework>.

130 Department of the Environment and Energy, *Submission 38*, p. 20.

131 Department of the Environment and Energy, *Submission 38*, p. 21.

132 National Irrigators' Council, *Submission 23*, p. 3; Mr Gavin McMahon, Chairman, National Irrigators' Council, *Committee Hansard*, Mildura, 1 May 2018, p. 18; see also Cotton Australia, *Submission 5*, p. 2.

133 Dr Jonathan Howard, *Submission 16*, p. 1; see also Nature Conservation Council NSW, *Submission 24*, pp. 1-2.

money obtained could be used to resource the associated other works needed to make environmental water most effective.¹³⁴

2.104 A submission from Cotton Australia supported the CEWH's ability to trade water allocations and entitlements.¹³⁵ The National Irrigators' Council (among others) submitted that the proceeds of trading environmental water could be used to fund complementary measures.¹³⁶ (Complementary measures are discussed later in this chapter.)

2.105 The Ricegrowers' Association of Australia supported granting 'further flexibility in regards to the trade of environmental water';¹³⁷ however, the Association's submission noted:

...it is also critical that the involvement of environmental water agencies in the market does not have a material impact on the ability of other water users to trade water.¹³⁸

2.106 The Gwydir Valley Irrigators' Association described the ability to trade water as a 'critical step' allowing the CEWH to generate revenue to invest in projects. The Association's submission cited the CEWH's sale of 6.7 gigalitres to Gwydir irrigators in January 2018 for \$2.8 million to water their crops.¹³⁹ Mr Mark Winter (Vice-Chair, Gwydir Valley Irrigators' Association) said that less water for production in the Moree area has had 'a big effect on the town, on the jobs and the dollars going around the whole community'.¹⁴⁰

2.107 A submission from the Nature Conservation Council NSW opposed trading held environmental water. The Council's submission suggested that trades in the Gwydir Valley may be based on 'political pressure rather than a considered approach based on the environmental condition of key assets in the catchment'.¹⁴¹ The submission stated:

The lack of transparency around the decision-making process for CEWH water trading is a key issue. Commonwealth held

134 Dr Jonathan Howard, *Submission 16*, p. 3.

135 Cotton Australia, *Submission 5*, p. 2.

136 National Irrigators' Council, *Submission 23*, pp. 8-9; see also Cotton Australia, *Submission 5*, p. 2; Queensland Farmers' Federation, *Submission 13*, p. 3; NSW Irrigators' Council, *Submission 32*, p. 4.

137 Ricegrowers' Association of Australia, *Submission 19*, p. 7 and p. 8.

138 Ricegrowers' Association of Australia, *Submission 19*, p. 7.

139 Gwydir Valley Irrigators' Association, *Submission 39*, p. 5; see also Department of the Environment and Energy, 'Sale of Gwydir water allocation provides win-win' at <<https://www.environment.gov.au/water/cewo/media-release/sale-gwydir-water-allocation-provides-win-win>>.

140 Mr Mark Winter, Vice Chair, Gwydir Valley Irrigators' Association, *Committee Hansard*, Canberra, 30 May 2018, p. 6.

141 Nature Conservation Council NSW, *Submission 24*, p. 3.

environmental water was purchased with taxpayers' funds to protect and restore environmental assets. The public have the right to know how this water is being managed in a transparent manner.¹⁴²

- 2.108 The CEWH said that its approach to trading to date has been cautious and conducted within the requirements of the Commonwealth Procurement Rules.¹⁴³
- 2.109 The South Australian Government indicated that it 'does not support any further changes to the capacity of the CEWH to trade environmental water'.¹⁴⁴

Complementary measures

- 2.110 A number of submissions and witnesses recommended a greater use of complementary or toolkit measures, which do not necessarily require or rely on environmental water flows.¹⁴⁵ Examples of complementary measures proposed during the inquiry include the following:
1. pest and feral animal control, such as carp eradication and culling wild pigs;
 2. weed control;
 3. mitigation of cold water pollution;
 4. improved passages for fish migration; and
 5. improved fish habitats.¹⁴⁶
- 2.111 The Department of the Environment and Energy noted that since 2016 amendments to the Water Act to allow greater scope to trade environmental water,¹⁴⁷ an investment framework is being developed.
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142 Department of the Environment and Energy, *Submission 38*, p. 19.

143 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 28 March 2018, p. 8.

144 South Australian Government, *Submission 40*, p. 12.

145 Cotton Australia, *Submission 5*, p. 2; Queensland Farmers' Federation, *Submission 13*, p. 3; Ricegrowers' Association of Australia, *Submission 19*, p. 5; National Irrigators' Council, *Submission 23*, p. 5; Murray Irrigation, *Submission 30*, p. 6.

146 National Irrigators' Council, *Submission 23*, pp. 5-8; see also Cotton Australia, *Submission 5*, p. 2; Deakin University, *Submission 10*, p. 2; Ricegrowers' Association of Australia, *Submission 19*, p. 5; Mr Mark Winter, Vice Chair, Gwydir Valley Irrigators Association Inc, *Committee Hansard*, Canberra, 30 May 2018, p. 10; Professor Richard Kingsford, private capacity, *Committee Hansard*, 22 June 2018, p. 10.

147 The Water Amendment (Review Implementation and Other Measures) Bill 2015 repealed and replaced s. 106 of the *Water Act 2007* (Cth). The amendment took effect from 5 May 2016 and allows the CEWH greater flexibility to trade water.

This framework is intended to ‘guide the CEWH on how and what types of environmental activities should be considered for investment’.¹⁴⁸ The submission noted that proceeds raised would not necessarily be invested in the same catchment from which water was traded.¹⁴⁹

- 2.112 The Gwydir Valley Irrigators’ Association Inc submitted there are a ‘myriad of constraints’ limiting the effective use of environmental water and, with targeted complementary measures, ‘environmental water managers will be more likely to achieve environmental outcomes... in the best interests of communities and the broader public’.¹⁵⁰
- 2.113 Murray Irrigation noted that Landcare groups could ‘rally volunteers to revegetate riparian regions or undertake wetland rehabilitation’.¹⁵¹ The National Irrigators’ Council suggested that CEWH investment in complementary measures projects could involve in-kind contributions from third parties, such as machinery, labour and professional advice.¹⁵²
- 2.114 A submission from the Environmental Defenders Office Australia did not support using complementary measures:

There is no credible evidence base to support this approach, particularly in light of the fact that the SDLs [sustainable diversion limits] set under the Basin Plan are unlikely to satisfy the definition of an environmentally sustainable level of take (ESLT).¹⁵³

- 2.115 The submission added: ‘natural resource management should be additional to – not a substitute for – water for the environment’.¹⁵⁴

- 2.116 A submission from Murray Lower Darling Rivers Indigenous Nations opposed the use of infrastructure or engineering works in place of ‘real water delivery’. The submission stated:

Infrastructure projects and environmental water ‘offsets’ entail considerable risks to cultural heritage and water-dependent

148 Department of the Environment and Energy, *Submission 38*, p. 21. The Department’s submission also included examples of projects that could be considered.

149 Department of the Environment and Energy, *Submission 38*, p. 22.

150 Gwydir Valley Irrigators’ Association Inc, *Submission 39*, p. 5.

151 Murray Irrigation, *Submission 30*, p. 11.

152 National Irrigators’ Council, *Submission 24*, p. 9.

153 Environmental Defenders Office Australia, *Submission 28*, p. 6. An ‘environmentally sustainable level of take’ is the amount of water that can be taken from that water resource without compromising its environmental, ecological, productive base or environmental outcomes; see *Water Act 2007* (Cth) s. 3.

154 Environmental Defenders Office Australia, *Submission 28*, p. 6.

cultural values. They also risk ecological impacts if implemented without appropriate environmental criteria and safeguards.¹⁵⁵

- 2.117 The NSW Irrigators' Council submitted that 'steady progress' has been achieved and did not support reserving more water for the environment, stating that the position of environment groups 'ignores the already significant damage to the social and economic fabric of Basin communities from the current level of water recovery'.¹⁵⁶ Instead, it submitted that the Water Act should be amended again to provide the CEWH with further flexibility to trade environmental water, 'including investment in local water management infrastructure where this can significantly increase environmental watering efficiencies'.¹⁵⁷

Pumping water into wetlands

- 2.118 Pumps and pipes can be used take water from the Murray River over elevated land and into surrounding creeks, which flow into nearby lakes and wetlands. Relying on natural flows would require vastly greater quantities of water to achieve the same outcome.¹⁵⁸
- 2.119 The suitability of pumps and pipes was discussed during the inquiry and the Committee inspected a pump station at Chalka Creek, in the Hattah Lakes area in north-western Victoria.
- 2.120 Dr Angus Webb (University of Melbourne) said that pumping water over physical barriers meant the natural floodplain could be bypassed and a wetland can be filled with 'a far smaller volume of water than a natural flood'.¹⁵⁹ Murray Irrigation noted how infrastructure could be used:
- ...there are physical solutions such as infrastructure construction (regulators, pump sites) and upgrades that can assist in the delivery of volumes of water to specific sites to contribute to the maintenance and improvement of the environment.¹⁶⁰

155 Murray Lower Darling Rivers Indigenous Nations, *Submission 26*, p. 4.

156 NSW Irrigators' Council, *Submission 32*, p. 2.

157 NSW Irrigators' Council, *Submission 32*, p. 3.

158 Department of the Environment and Energy, *Submission 38*, p. 28.

159 Dr Angus Webb, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 15.

160 Murray Irrigation, *Submission 30*, p. 6.



Pumps at Chalka Creek in the Hattah Lakes area

2.121 However, Dr Anne Jensen (private capacity) said that Hattah Lakes have a single inlet channel suited to a water pump solution. She said other cases may not be as effective:

...if you want to flood the channel of a flood plain, and you use a regulator to do it with much less water, you do not get the connectivity through all the creeks, through flooding out onto the floodplain and bringing that biomass back into the river.¹⁶¹

2.122 Dr Clayton Sharpe agreed that these techniques involve lower rates of water use; however, he cautioned:

The natural cues for flooding for biota that are adapted to respond to floods aren't present and they disconnect really important processes between the river and its floodplain as well ...they can work for some elements of the ecosystem but they are not the answer.¹⁶²

2.123 Dr Sharpe added that reducing water volumes in real terms could have implications for native fish, such as the golden perch in the Menindee Lakes.¹⁶³ Professor Richard Kingsford said that measures such as carp eradication need to be pursued; however, he noted: 'I think it all helps, but it doesn't replace the water'.¹⁶⁴

161 Dr Anne Jensen, *Committee Hansard*, Murray Bridge, 2 May 2018, p. 12.

162 Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, p. 12.

163 Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, p. 12.

164 Professor Richard Kingsford, private capacity, *Committee Hansard*, Sydney, 22 June 2018, p. 10.

- 2.124 An alternative approach is to ‘piggyback’ water to achieve higher river flows with less water (discussed below).

Infrastructure upgrades and water efficiency

- 2.125 The Department of Agriculture and Water Resources administers funding for projects designed to improve water use efficiency in the Basin area.¹⁶⁵ Water saved can then become part of the Commonwealth’s environmental water holdings.¹⁶⁶ A submission from the Department of Agriculture and Water Resources advised:

The Department is prioritising investment in infrastructure over water purchasing to implement the Basin Plan in a way that supports strong agricultural industries and local communities, as well as a healthy environment.¹⁶⁷

- 2.126 Projects could include:

- works on off-farm irrigation systems;
- works on farms to improve water use efficiency;
- works to improve ecological health and restore natural flows;
- water saving municipal projects; and
- environmental works and changes to river operations that enable the same environmental outcomes to be achieved with less water.¹⁶⁸

- 2.127 Dr Angus Webb (University of Melbourne) observed:

I think the decision to recover a substantial proportion of the water through infrastructure upgrades is effectively an investment in social infrastructure in the basin. We could have purchased total basin plan volumes of water on the open market, but economic and social damage would have been that much greater. ... A

165 Department of Agriculture and Water Resources, ‘Sustainable Rural Water Use and Infrastructure Program’, at <<http://www.agriculture.gov.au/water/mdb/programs/basin-wide/srwiup>>. Around \$238 million is allocated to this program in 2018-19; see Department of Agriculture and Water Resources, ‘Portfolio Budget Statements 2018-19 – Budget Related Paper No. 1.1’, p. 57.

166 Department of Agriculture and Water Resources, *Submission 31*, p. 1; see also Murray-Darling Basin Authority, *Submission 34*, p. 11.

167 Department of Agriculture and Water Resources, *Submission 31*, p. 1; see also Department of the Environment and Energy, *Supplementary Submission 38.1*, pp. 2-3 (DAWR response to Question 2).

168 Department of Agriculture and Water Resources, ‘Sustainable Rural Water Use and Infrastructure Program’, at <<http://www.agriculture.gov.au/water/mdb/programs/basin-wide/srwiup>>.

decision was made to pay more to look after basin communities
...an understandable decision was taken.¹⁶⁹

- 2.128 Some witnesses and submissions questioned whether these projects are providing value for money. Professor Lin Crase suggested that the benefits of irrigation upgrades accrue to a small group within regional communities and ‘the flow-on effects of an irrigation upgrade accrue to very few’.¹⁷⁰ He submitted:

If governments were genuinely concerned about the prosperity of rural and regional communities and engaging on environmental water they would invest in those activities that yielded the greatest public benefit. Improving public infrastructure rather than private irrigation infrastructure would be a useful starting point.¹⁷¹

- 2.129 A submission from the Southern Fishermen’s Association stated that proposed water saving projects ‘lack transparency’ and there is ‘no detailed information available... showing exactly how much water could be saved and returned to the river’.¹⁷²

- 2.130 Ms Emma Bradbury (CEO, Murray Darling Association) said that investment in on-farm efficiency infrastructure benefits communities, but only ‘up to a certain point’ and then it ‘starts to benefit just individual landholders and farmers’.¹⁷³

- 2.131 Southern Riverina Irrigators commented that water recovery ‘effectively puts a cap on the productivity in our area’ and potentially reduces the potential for economic growth.¹⁷⁴ The Ricegrowers’ Association of Australia submitted that increasing the total supply available to all water users (by a small percentage) would improve productivity:

For the rice industry, an additional 400 gigalitres of water supply is equivalent to an additional 400,000 tonnes of rice per annum or \$120 million of farm-gate value (based on a value of \$300 per tonne).¹⁷⁵

169 Dr Angus Webb, Melbourne University, *Committee Hansard*, Albury, 30 April 2018, p. 18.

170 Professor Lin Crase, *Submission 1*, p. 5.

171 Professor Lin Crase, *Submission 1*, p. 5.

172 Southern Fishermen’s Association, *Submission 37*, p. 5.

173 Ms Emma Bradbury, CEO, Murray Darling Association, *Committee Hansard*, Albury, 30 April 2018, p. 23.

174 Mrs Gabrielle Coupland, Chair, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 23.

175 Ricegrowers’ Association of Australia, *Submission 19*, p. 8.

2.132 The Environmental Defenders Office Australia submitted that on-farm efficiency works 'are likely to increase (rather than reduce) consumptive use'.¹⁷⁶ The submission stated:

It is deeply concerning that one of the core planks of the Commonwealth's water recovery program is not only fundamentally flawed, but is lacking in any sort of appropriate oversight ...in the absence of the necessary checks and balances, public money may be misused at the expense of the environment and other users in the Basin.¹⁷⁷

2.133 The submission added that these farm efficiency programs may be subsidising the expansion of private storages to capture overland flows, which could include CEWH environmental water.¹⁷⁸ At a subsequent public hearing, the Office clarified that 'we support incentives for farmers to put in water efficiency measures', provided there is auditing, transparency and more detail on what is working.¹⁷⁹

2.134 In response, Mr Tim Fischer (Assistant Secretary, Department of Agriculture and Water Resources) said:

To the extent that there is a problem with return flows, that problem would exist anyway as irrigators invest by themselves and irrigation delivery corporations invest in upgrading their delivery systems and reducing leakage. To a certain extent, this problem exists and will continue to exist in the future irrespective of the government's efforts in recovering water through infrastructure programs.¹⁸⁰

2.135 Mr Fisher added that irrigators have the right to develop their properties and make use of their water entitlements as efficiently and effectively as possible.¹⁸¹

176 Environmental Defenders Office Australia, *Submission 28*, p. 5.

177 Environmental Defenders Office Australia, *Submission 28*, pp. 5-6.

178 Environmental Defenders Office Australia, *Submission 28*, p. 7

179 Ms Rachel Walmsley, Policy and Law Reform Director, Environmental Defenders Office of Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 4.

180 Mr Tim Fisher, Assistant Secretary, Department of Agriculture and Water Resources, *Committee Hansard*, Canberra, 27 June 2018, p. 9.

181 Mr Tim Fisher, Assistant Secretary, Department of Agriculture and Water Resources, *Committee Hansard*, Canberra, 27 June 2018, p. 9.

Coordinating water releases

- 2.136 The Committee received evidence on how a coordinated approach or governance changes could improve overall outcomes, by doing more with less environmental water.
- 2.137 As discussed below, several submissions and witnesses suggested that current governance and institutional arrangements for environmental watering coordination could be reviewed or changed, such as by reducing duplication and creating an advisory body.
- 2.138 The Committee also received evidence on the CEWH's ability to involve other parties from the private sector, volunteer groups or individual landowners in environmental watering and environmental restoration.
- 2.139 In addition, the timing of water releases was discussed during the inquiry. The Committee heard views suggesting that environmental water could be released at the same time as water ordered for irrigation purposes. This would increase the overall flow and raise river levels – a practice known as 'piggybacking'.
- 2.140 The Victorian Government submitted that the Victorian Environmental Water Holder has a 'bottom-up approach' based on collaborative partnerships:
- This approach helps to maximise environmental outcomes by ensuring that:
- the collective effort of environmental water managers is efficient with minimal duplication.
 - the various 'buckets' of water for the environment are delivered in a coordinated manner, and work towards objectives that are aligned rather than conflicting.
 - communities are actively engaged in setting priorities relevant to their local area.¹⁸²
- 2.141 Mr Denis Flett (Chairperson, Victorian Environmental Water Holder) said that 'the timing of environmental watering events is as critical as the volume of water'.¹⁸³
- 2.142 The CEWH has a number of formal partnership agreements with state governments and non-government organisations. The CEWH is also involved in external fora and committees, including the Southern Connected Basin Environmental Watering Committee. The CEWH

182 Victorian Government, *Submission 41*, appendix 3, p. 5.

183 Mr Denis Flett, Chairperson, Victorian Environmental Water Holder, *Committee Hansard*, Albury, 30 April 2018, p. 1.

advised that 'at this time, there is no equivalent environmental water coordination forum for the northern Basin'.¹⁸⁴

- 2.143 Ms Swirepik referred to environmental watering in the Gunbower Creek (a regulated anabranch of the Murray River used for irrigation), where water had been routed into the creek on its journey downstream. She said that as environmental water flowed alongside water for other uses, 'we're actually getting a very good environmental outcome for a very small parcel of water'.¹⁸⁵

Piggybacking environmental water

- 2.144 The practice of 'piggybacking' is where environmental water is released into a regulated river at times when flow levels are already elevated.¹⁸⁶ For example, environmental water could be released at times coinciding with irrigation water, so that the combined volume enlarges the overall flow and river height. When rivers run with sufficiently high flows, some water spills into wetlands that are usually isolated from the river.
- 2.145 An alternative approach is to pump water over physical barriers into wetlands (discussed above).
- 2.146 The Nature Conservation Council NSW submitted:
- The use of piggy-backing onto natural tributary inflows below storages and onto return flows into regulated river systems will enhance the benefits of environmental water.¹⁸⁷
- 2.147 Professor Richard Kingsford said that piggybacking water raised rivers to higher levels and, in this way, the environmental water will flow over physical barriers and into wetlands. He added that there are challenges, such as limited channel capacity during irrigation season and which water takes priority.¹⁸⁸
- 2.148 Ms Perin Davey (Executive Officer, Southern Riverina Irrigators) said that trials had been conducted involving return flows of environmental water. She said the environmental water enters an area such as the Barmah-Millewa Forest and, allowing for some loss, an assessment is made of the

184 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 6 (CEWH response to Question 6).

185 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 2; see also Victorian Government, *Submission 41*, appendix 8 para. 2.2; Department of the Environment and Energy, *Submission 38*, p. 24.

186 Department of the Environment and Energy, *Submission 38*, p. 30.

187 Nature Conservation Council NSW, *Submission 24*, p. 4.

188 Professor Richard Kingsford, *Committee Hansard*, Sydney, 22 June 2018, p. 7.

active water returning to the river. This returning water ‘stays environmental’;¹⁸⁹ however, Ms Davey said:

Our concern is that we don’t know what those assessments are. We are not against that process, but we need to have some sort of guarantee or certainty, as irrigators, that that practice is not negatively impacting on what is our property right, which was formed under the National Water Initiative.¹⁹⁰

2.149 The National Farmers’ Federation submission noted that piggybacking water can have impacts (such as lower water quality) and gave qualified support for coinciding water releases:

...where there is scope for environmental water to be released ‘on top of’ or ‘alongside’ industrial water and leverage the environmental outcome at no cost to industry then it should be contemplated and implemented where sensible.¹⁹¹

2.150 As noted earlier in this chapter, the Department of the Environment and Energy’s view is that piggybacking allows for environmental water to be used more efficiently, ‘because a greater outcome can be achieved with the same volume of water’.¹⁹²

Governance and CEWH independence

2.151 Professor Richard Kingsford, among others,¹⁹³ made a general observation about how environmental water is governed:

One of the big challenges is that we have so many different plans out there for a piece of river – and they don’t necessarily talk to each other very well and people are necessarily working for an organisation even if it’s the same government – and there’s tension.¹⁹⁴

2.152 Cotton Australia’s submission stated that there is duplication between the MDBA and CEWH in relation to environmental watering priorities.¹⁹⁵ The

189 Ms Perin Davey, Executive Officer, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 25.

190 Ms Perin Davey, Executive Officer, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 25.

191 National Farmers’ Federation, *Submission 29*, pp. 5-6; Mr Les Gordon, Chair, Water Taskforce, National Farmers’ Federation, *Committee Hansard*, Canberra, 23 May 2018, p. 1.

192 Department of the Environment and Energy, *Submission 38*, p. 30.

193 For example: Sarah Moles, *Submission 6*, p. 1; Ricegrowers’ Association of Australia, *Submission 19*, p. 4; Southern Fisherman’s Association, *Submission 37*, p. 5.

194 Professor Richard Kingsford, private capacity, *Committee Hansard*, Sydney, 22 June 2018, p. 9.

195 Cotton Australia, *Submission 5*, p. 3; see also Queensland Farmers’ Federation, *Submission 13*, p. 4.

National Irrigators' Council recommended that the CEWH should control environmental water planning, delivery, monitoring, metering and evaluation.¹⁹⁶ The submission observed:

There is opportunity to examine current governance arrangements, which cause confusion around the roles and responsibilities of the government agencies involved at a state and federal level (not to mention the cost to taxpayers). This is demonstrated in the context of the annual environmental watering priorities where the CEWH, MDBA and states all appear to have their own versions.¹⁹⁷

2.153 The Murray Darling Association submitted that 'more work' is needed to ensure unity and close collaboration between the CEWH and the MDBA. The Association added that a board comprising independent experts could be appointed.¹⁹⁸

2.154 The National Farmers' Federation also recommended establishing a formal advisory committee or group to assist the CEWH.¹⁹⁹ Mr Les Gordon (Chair, Water Taskforce, National Farmers' Federation) said that there is reliance on the person appointed to the role being effective. Mr Gordon made no criticism of the current or former CEWH, but he said there is a potential 'risk of someone not being competent going into the job'. He said that a safeguard could be to formalise a role for a consultative or guidance committee.²⁰⁰

2.155 Mr Gavin McMahon (Chairman, National Irrigators' Council) said environmental watering is a 'crowded space' with multiple entitlement holders.²⁰¹ He said an approach based on localism should be supported:

Governments and bureaucrats come and go, but generally the locals are there for the long-term and they actually want the best. There's an opportunity to embrace those organisations.²⁰²

2.156 The National Irrigators' Council submitted:

Local knowledge is a key part of the effort to achieve healthy river systems. NIC members have consistently expressed concern about

196 National Irrigators' Council, *Submission 23*, p. 13.

197 National Irrigators' Council, *Submission 23*, p. 13.

198 Murray Darling Association, *Submission 27*, pp. 3-4.

199 National Farmers' Federation, *Submission 29*, p. 5.

200 Mr Les Gordon, Chair, Water Taskforce, National Farmers' Federation, *Committee Hansard*, Canberra, 23 May 2018, p. 2.

201 Mr Gavin McMahon, Chairman, National Irrigators' Council, *Committee Hansard*, Mildura, 1 May 2018, p. 17.

202 Mr Gavin McMahon, Chairman, National Irrigators' Council, *Committee Hansard*, Mildura, 1 May 2018, p. 17.

turnover of staff dealing with environmental water planning and/or those staff being remote from the on the ground knowledge.²⁰³

- 2.157 On the other hand, Professor Kingsford added that while the CEWH is vested in one person, there is ‘a whole architecture underneath, and they work very well with the state agencies and with the Murray Darling Basin Authority’.²⁰⁴ He said that a different structure would not necessarily be helpful.²⁰⁵ Mr Mark McKenzie (CEO, NSW Irrigators’ Council) said that while there is ‘good coordination’ between state environmental water holders and the CEWH, ‘wholesale intervention’ from the Commonwealth is unnecessary.²⁰⁶
- 2.158 As discussed in Chapter 1, the CEWH has a degree of statutory independence. The Goulburn Valley Environment Group submitted that it is ‘critical that the CEWH maintains its independence and is allocated sufficient funding to carry out its responsibilities’.²⁰⁷
- 2.159 The Committee notes that the Productivity Commission recently suggested that the CEWH could benefit from increased independence:
- ...the CEWH should not be subject to directions from the Minister or departmental secretary concerning the use of the Commonwealth environmental water holdings.²⁰⁸
- 2.160 The Commission also proposed separating the CEWH from the Department of the Environment and Energy and constituting it as a statutory body.²⁰⁹
- 2.161 The CEWH and MDBA advised that there are benefits from having multiple agencies and stakeholders involved in environmental watering:
- The ability to bring a range of Basin-wide, regional and local skills and perspectives when planning for, and delivering, environmental water across jurisdictions.
 - Having shared responsibility between the CEWH, Basin States and the MDBA engenders shared ownership in Basin Plan outcomes and risks.

203 National Irrigators’ Council, *Submission 23*, p. 15.

204 Professor Richard Kingsford, private capacity, *Committee Hansard*, Sydney, 22 June 2018, p. 9.

205 Professor Richard Kingsford, private capacity, *Committee Hansard*, Sydney, 22 June 2018, p. 9.

206 Mr Mark McKenzie, CEO, NSW Irrigators’ Council, *Committee Hansard*, Sydney, 22 June 2018, p. 20.

207 Goulburn Valley Environment Group Inc, *Submission 15*, p. 1.

208 Productivity Commission, *Inquiry Report 87, National Water Reform*, December 2017, p. 160.

209 Productivity Commission, *Inquiry Report 87, National Water Reform*, December 2017, p. 161.

- Driving innovation and collaboration across agencies optimises the effectiveness and efficiency of Commonwealth and state water portfolios to deliver environmental outcomes.
- Recognition of the long history of environmental watering programs in the catchments of the Basin and relationships between government agencies, Basin communities and Traditional Owner groups. These histories can span many decades and are an invaluable source of community input and feedback on the value of water for the environment.²¹⁰

- 2.162 To illustrate how current arrangements are working, the MDBA submitted that in 2016-17, around 37 per cent of environmental watering events were coordinated and involved multiple environmental water holders. The submission stated that environmental water managers and river operators work together on 'real-time actions' to identify where water could be used at multiple environmental demands.²¹¹
- 2.163 The South Australian Government's submission described an example where a coordinated water release from combined water portfolios had generated a 'pulse' of water, supporting migrating fish between the sea and the Murray River.²¹²
- 2.164 The CEWH said she is 'open to have a discussion' about establishing a committee or advisory group.²¹³

Partnerships with third parties

- 2.165 The NSW Irrigators' Council noted that major irrigation corporations and a number of private individuals and wetlands trusts have assisted with deploying environmental water to target sites. The Council supported extending this approach and using successful examples as a template for future partnerships.²¹⁴ Murray Irrigation submitted:

The expertise and infrastructure of the consumptive water industry are part of the solution, not a contributor to the problem.²¹⁵

210 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 6 (CEWH and MDBA response to Question 5).

211 Murray-Darling Basin Authority, *Submission 34*, p. 13.

212 South Australian Government, *Submission 40*, pp. 4-5.

213 Ms Jody Swirepik, Commonwealth Environmental Water Holder, Department of the Environment and Energy, *Committee Hansard*, Canberra, 27 June 2018, p. 7.

214 NSW Irrigators' Council, *Submission 32*, p. 5; see also Southern Riverina Irrigators, *Submission 21*, p. 4; Murray Irrigation, *Submission 30*, p. 4.

215 Murray Irrigation, *Submission 30*, p. 12.

- 2.166 A submission from the National Irrigators' Council listed examples of where its members had collaborated with the CEWH and other government agencies:
1. floodplain restoration in the Renmark Irrigation District;
 2. Murray private property wetlands watering program;
 3. Lyrup Forest Reserve lagoon;
 4. Goulburn trade flows; and
 5. Burrendong dam thermal curtain.²¹⁶
- 2.167 Ms Rosalie Auricht (Business Manager, Renmark Irrigation Trust) said that floodplain rehabilitation around Renmark had used Commonwealth environmental water and received global certification for water stewardship.²¹⁷ The Nature Foundation SA Inc submitted:
- Continued delegations to local and regional groups with proven delivery capacity can extend the reach of environmental watering to a greater range of sites... These partnerships bring very significant value-adds through in-kind and cash contributions, which also lead to community engagement.²¹⁸
- 2.168 Mr Ken Hooper (private capacity) provided information to the Committee on wetland restoration at two properties. Mr Hooper submitted:
- ...the future will see more smaller-scale projects, probably mostly private/public partnerships dotted across the floodplains that will produce great biodiversity benefits and complement the restoration and management of the icon sites.²¹⁹
- 2.169 Councillor Mark Eckel (Mayor, Mildura Rural City Council) said local government could have an increased role in environmental water projects:
- Local government has the skill and institutional capacity to inform policy development and has rich and established regional networks that offer an individual interface, and an effective resource, for state and federal policy makers.²²⁰
- 2.170 The Murray Darling Association recommended the formal inclusion of local government in planning for environmental water use. The Association submitted that this would improve public confidence and

216 National Irrigators' Council, *Submission 23*, pp. 10-11.

217 Ms Rosalie Auricht, Business Manager, Renmark Irrigation Trust, *Committee Hansard*, Mildura, 1 May 2018, pp. 18-19.

218 Nature Foundation SA Inc, *Submission 22*, p. 3.

219 Mr Ken Hooper, *Submission 14*, p. 6.

220 Councillor Mark Eckel, Mayor, Mildura Rural City Council, *Committee Hansard*, Mildura, 1 May 2018, p. 2.

involve knowledge in solving any ‘unintended and adverse consequences inherent in environmental watering events’.²²¹

- 2.171 The Committee also received evidence on how traditional ecological knowledge (TEK) could be utilised. Murray Lower Darling Rivers First Nations submitted:

For TEK to be an effective input to planning and decisions around use of environmental water, there must be a framework for partnerships, protection of intellectual property and capacity building. A joint or co-management framework, formalising agreements between water holders and First Nations, is an optimum approach to secure the benefits of input from First Nations.²²²

- 2.172 Mr Grant Rigney (Acting Chair, Murray Lower Darling Rivers First Nations) said there could be scholarships created for Indigenous hydrologists. He added that Indigenous nations are ‘the experts in their own areas’ and this should be recognised.²²³

- 2.173 The Ricegrowers’ Association suggested an approach based on the concept of co-management.²²⁴ Mr Neil Bull (Environmental Projects Manager, Ricegrowers’ Association of Australia) said irrigation requirements and environmental interests could coincide:

Rice in Australia... provides habitat for a lot of key species. In Australia, we have one of the top listed threatened species living in our rice farming environment and breeding... What we find in an irrigation farm and a rice farm are opportunities to provide very good habitat with very efficient use of water to benefit species. It’s a complementary thing to what should happen in the natural habitats and wetlands.²²⁵

- 2.174 Mr Jeremy Morton (President, Ricegrowers’ Association of Australia) said that at present, however, there is ‘no way that the Commonwealth could apply Commonwealth held water to a commercial crop’.²²⁶

221 Murray Darling Association, *Submission 27*, p. 2. The Association is the peak body for local government in the Basin area.

222 Murray Lower Darling Rivers First Nations, *Submission 26*, p. 3.

223 Mr Grant Rigney, Acting Chair, Murray Lower Darling Rivers First Nations, *Committee Hansard*, Murray Bridge, 2 May 2018, p. 6.

224 Ricegrowers’ Association of Australia, *Submission 19*, p. 5.

225 Mr Neil Bull, Environmental Projects Manager, Ricegrowers’ Association of Australia, *Committee Hansard*, Canberra, 20 June 2018, pp. 6-7.

226 Mr Jeremy Morton, President, Ricegrowers’ Association of Australia, *Committee Hansard*, Canberra, 20 June 2018, p. 9.

2.175 The CEWH advised that a portion of environmental water is delivered with industry groups, non-government organisations and community groups. The CEWH is 'currently investigating options to grow and expand these arrangements'.²²⁷ Furthermore, 'our water cannot be delivered without the cooperation of a broad range of partners across the Basin'.²²⁸

Committee comment

2.176 In general, views presented during the inquiry praised the Commonwealth Environmental Water Holder's work and the way environmental water holdings are being managed.

2.177 In relation to many environmental water management practices, the Committee is satisfied that existing arrangements are conducive to the broader objective of restoring rivers and wetlands in the Murray-Darling Basin area.

2.178 The focus ought to be on outcomes and ensuring the CEWH can optimise the available environmental water. A range of measures could assist with achieving environmental outcomes, including:

- Developing legal protections for environmental water, in a way that duly recognises the existing rights of all water licence holders and meets community expectations.
- Working to resolve channel capacity and other physical constraints affecting efficient water delivery, such as at the Barmah Choke.
- Environmental water releases being coincided with other water deliveries, where possible ('piggybacking').
- Trading water, when opportunities arise.
- Using local knowledge to inform decision-making.
- Complementary projects and measures to improve rivers and wetlands, such as pest control and weed eradication.

2.179 The Committee notes the range of views on environmental water protections (to 'shepherd' water over greater distances), including

227 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 8 (CEWH response to Question 7); see also Department of the Environment and Energy, 'Agreements on the Use of Commonwealth Environmental Water', at <https://www.environment.gov.au/water/cewo/publications/agreements-use-commonwealth-environmental-water>.

228 Department of the Environment and Energy, *Submission 38*, p. 48.

discussion arising from an episode of the *Four Corners* program and a subsequent Auditor-General's report.

- 2.180 Progress is being made among governments and water licence holders to find lasting and amicable solutions. Water shepherding would improve the way environmental water is used. At the same time, the Committee agrees that this should be done in a way that does not unduly alter water licence characteristics. Nor should the 'good neighbour' policy relating to third party impacts be disregarded.
- 2.181 The Committee notes the potential for environmental water releases to inadvertently cause private property to be flooded. While the Committee did not receive evidence that any such flooding has occurred to date, the Australian Government and the CEWH may wish to consider whether existing safeguards are adequate to avoid private property being flooded in the future.
- 2.182 The CEWH should be in a position to monitor the operational use of environmental water, account for its end uses, show that it has been optimised and link its actions to outcomes. Monitoring and evaluation of outcomes is discussed further in the next chapter.
- 2.183 Some witnesses and submissions discussed current governance arrangements and whether the CEWH is sufficiently independent from the government of the day. The Committee notes that the Productivity Commission has recently examined these questions in greater detail and made its own recommendations.
- 2.184 The Committee recognises that there are a range of individuals and organisations with expertise to offer to the CEWH, particularly on local issues. A consultative body may also assist with communication, transparency and building mutual understanding about how Commonwealth environmental water is managed. Consultation with Indigenous communities may also warrant further consideration. These issues are discussed further in Chapter 4.

Recommendations

Recommendation 1

The Committee recommends that the Commonwealth Environmental Water Holder continue to:

- apply the 'good neighbour' policy;
- coordinate with state water managers and other partners to optimise environmental water releases;
- provide regular updates on environmental watering activities and outcomes;
- make funds available for non-flow complementary measures and projects, such as pest control and weed eradication;
- trade water that is excess to environmental requirements; and
- foster partnerships with the private sector and non-government organisations.

Recommendation 2

The Committee recommends that the Commonwealth Environmental Water Holder work with the Murray-Darling Basin Authority on practical methods to shepherd environmental water in a manner consistent with the rights of other water holders.

Recommendation 3

The Committee recommends that the Australian Government continue to fund and support an infrastructure program aimed at optimising water efficiency in the Murray-Darling Basin.

Recommendation 4

The Committee recommends that Basin states work to ensure that environmental water flows achieve their aims. Basin States should further ensure that reporting is comprehensive, timely and evidence-based.

Monitoring and evaluating outcomes

Overview

- 3.1 Demonstrating environmental outcomes is essential for the management of environmental water.¹ More broadly, this provides Basin communities and taxpayers with confidence that the Australian Government's investment in environmental water has been worthwhile.² The Murray-Darling Basin is a large area, which poses challenges for measuring and demonstrating outcomes.³
- 3.2 Monitoring and evaluating environmental water takes three main forms:
- operational monitoring – gathering information on current river system conditions, water flows and verifying environmental water delivery;
 - intervention monitoring – observing and verifying how environmental water has changed rivers, wetlands, the surrounding environment and fulfilled Basin Plan objectives; and
 - knowledge and research – to improve the understanding of ecological processes.⁴
- 3.3 During the inquiry, witnesses and submissions discussed:
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1 Department of the Environment and Energy, *Submission 38*, p. 33. There is also further information on the Department's website: <http://www.environment.gov.au/water/cewo/monitoring>.

2 Australian Academy of Technology and Engineering, *Submission 11*, p. 2; Bureau of Meteorology, *Submission 12*, p. 1.

3 Dr Stuart Barrow, Senior Policy Analyst, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 2.

4 Department of the Environment and Energy, *Submission 38*, p. 34; see also Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 10 (CEWH response to Question 8).

- improvements to the way environmental outcomes are measured and demonstrated;
 - areas where more research and development would be beneficial;
 - views on accounting for environmental water and ensuring it reaches the intended places and provides expected benefits; and
 - consideration of broader social and economic impacts.
- 3.4 Mr Mark McKenzie (CEO, NSW Irrigators' Council), for example, noted that the Murray-Darling Basin Plan is partly fulfilled and is due to be fully implemented in 2024.⁵ The National Irrigators' Council observed that environmental watering outcomes should be judged on long-term results.⁶

Roles and responsibilities

- 3.5 Evaluation and monitoring tasks are shared among several government agencies. As the Ricegrowers' Association of Australia's submission noted, the respective roles and responsibilities of agencies involved in monitoring and reporting outcomes can be unclear. The Association suggested that this poses challenges for communities seeking to understand and engage with environmental watering.⁷
- 3.6 The Murray-Darling Basin Authority's (MDBA) submission provided an overview of arrangements for monitoring and evaluating environmental water outcomes:
- the Murray-Darling Basin Authority is responsible for reporting on the achievement of the environmental objectives of the Basin Plan at a Basin scale.
 - Basin States are responsible for reporting on the achievement of environmental objectives of the Basin Plan at a local or site (asset) scale (via long-term environmental watering plans).
 - the Commonwealth Environmental Water Holder is responsible for reporting on the contribution of Commonwealth environmental water to the environmental objectives and achievement of Basin scale environmental outcomes of the Basin Plan.⁸
- 3.7 The MDBA also outlined how environmental water is monitored:

5 Mr Mark McKenzie, CEO, NSW Irrigators' Council, *Committee Hansard*, Sydney, 22 June 2018, p. 20.

6 Mr Steve Whan, CEO, National Irrigators' Council, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

7 Ricegrowers' Association of Australia, *Submission 19*, p. 6.

8 Murray-Darling Basin Authority, *Submission 34*, pp. 13-14; see also Department of the Environment and Energy, *Submission 38*, p. 33.

- each year, the MDBA releases the Basin Plan Annual Report... This report includes a section dedicated to environmental outcomes.
 - every five years the MDBA conducts an evaluation of the Basin Plan, which includes a more detailed examination of the environmental outcomes that have been achieved over the previous five years. The first Basin Plan Evaluation was completed and released in late 2017.
 - the MDBA also annually monitors the environmental outcomes associated with The Living Murray (TLM) program, which is a joint venture between Commonwealth and state agencies to deliver water to icon sites along the River Murray.⁹
- 3.8 Environmental flows are monitored using gauges (maintained and operated by the Basin States). Monitoring extends to the depth, duration, inundation and hydraulic habitat created from environmental water use. River operators assist with tracking water in the river system and accounting for its use.¹⁰
- 3.9 The Bureau of Meteorology submitted that it collates, assesses and reports information on water resources in Australia:
- This information informs public policy, programs and practices for better management of the nation's water resources. The Bureau also makes available to the public standardised data with national coverage that underpins a range of water resources analyses and assessments.¹¹
- 3.10 The Commonwealth Environmental Water Holder (CEWH) relies on third parties for primary data relating to operational delivery.¹² The Department of the Environment and Energy submitted:
- We continue to work with delivery partners and river operators to review delivery arrangements and establish a future model of best practice accounting and reporting for environmental water use.¹³
- 3.11 Around 40 to 45 per cent of the CEWH's staff are involved in operational monitoring and engagement on environmental water delivery. Around 10 to 15 per cent contribute to evaluating outcomes and research.¹⁴ At the
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9 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 9 (MDBA response to Question 9).

10 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 9 (MDBA response to Question 9).

11 Bureau of Meteorology, *Submission 12*, p. 1.

12 Department of the Environment and Energy, *Submission 38*, p. 26.

13 Department of the Environment and Energy, *Submission 38*, p. 26.

14 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 10 (CEWH response to Question 8).

MDBA, around 10 to 15 staff are involved in evaluating environmental outcomes, although there is seasonal variability.¹⁵

Accounting for environmental water

3.12 During the inquiry, a number of witnesses and submissions suggested that environmental watering lacks precision and, by implication, the outcomes may be uncertain. The Committee was told that these doubts affect confidence in how environmental water is being managed.

3.13 The CEWH agreed that ‘public accountability requires accurate, reliable and credible information that demonstrates how Commonwealth resources are used’.¹⁶

3.14 The Committee received evidence that if water cannot be measured, it cannot be managed.¹⁷ Murray Irrigation expressed concern that there is inadequate rigour applied to environmental water use:

- the use of environmental water continues to be poorly measured and there is no accountability for its destination.
- there is no transparency supporting assumed-use models and loss data is not effectively collected and analysed.
- environmental water managers have not set robust, location-specific environmental water management targets against which key performance indicators can be applied.¹⁸

3.15 Murray Irrigation submitted that environmental water is ‘not measured nor subject to the same rigours applied to commercial users’, with overbank events,¹⁹ usage and losses based on assumptions and modelling.²⁰ The submission stated:

15 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 9 (MDBA response to Question 8).

16 Department of the Environment and Energy, *Submission 38*, p. 26.

17 Southern Riverina Irrigators, *Submission 21*, p. 6; Murray-Darling Association, *Submission 27*, p. 3.

18 Murray Irrigation, *Submission 30*, p. 2.

19 Overbank flow events are ‘the larger flow events that fill the river channel and may inundate channel benches, the riparian zone, anabranches/flood-runners and low parts of the floodplain, and replenish local groundwater’. Murray-Darling Basin Authority, ‘Basin-wide environmental watering strategy’, November 2014, p. 21, at <https://www.mdba.gov.au/managing-water/environmental-water/basin-wide-environmental-watering-strategy>.

20 Murray Irrigation, *Submission 30*, p. 9. The submission noted that the CEWH would utilise water meters where they are available. See also Ms Emma Bradbury, CEO, Murray Darling Association, *Committee Hansard*, Albury, 30 April 2018, p. 25.

If any assumptions or loss factor calculations are incorrect, integrity suffers and faith in the system falters. These failures represent a major commercial risk to water users who instead would respond positively to increased equity and accountability. Water users need to be confident that they are not wearing the losses incurred by environmental water managers.²¹

- 3.16 The submission added that Murray Irrigation uses water metering that transfers its data in real time.²²
- 3.17 Southern Riverina Irrigators submitted that the CEWH does not have to 'deliver their water through an approved or compliant meter', report losses or report on how much water reached the end of the river system.²³ The submission added that with the practice of return flows being trialled, this issue should be resolved so 'the community can have faith that the water held is being used efficiently and responsibly with no adverse risk to third parties'.²⁴ Mrs Gabrielle Coupland (Chair, Southern Riverina Irrigators) said that environmental water 'must be measured to the same standard as for consumptive water'.²⁵
- 3.18 Mr Mark Winter (Vice Chair, Gwydir Valley Irrigators Association Inc) said there should be 'a lot more transparency' on environmental watering targets and results to ascertain whether the water 'could be in production, or that water is doing a job for the environment and communities further down the system'. Mr Winter said that 'a lot of the time it's very difficult to find out the results – what an event of the environmental water has achieved'.²⁶ Cotton Australia submitted that the CEWH and other environmental water managers have a responsibility to communicate with communities before, during and after environmental water releases:

That is, the purpose/expected environmental outcome from a release should be specifically communicated. The progress to achieving the specific outcome/s should be also communicated, and the actual outcomes should be objectively measured and reported on. All three elements need to occur to keep the community informed.²⁷

21 Murray Irrigation, *Submission 30*, p. 9.

22 Murray Irrigation, *Submission 30*, p. 9.

23 Southern Riverina Irrigators, *Submission 21*, p. 3.

24 Southern Riverina Irrigators, *Submission 21*, p. 4.

25 Mrs Gabrielle Coupland, Chair, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 22 and p. 29.

26 Mr Mark Winter, Vice Chair, Gwydir Valley Irrigators Association Inc, *Committee Hansard*, Canberra, 30 May 2018, p. 9.

27 Cotton Australia, *Submission 5*, p. 3.

- 3.19 Mr Daryl Buckingham (CEO, Mildura Regional Development) said the community would value clearer and real-time information about ‘what exactly is going on’ with environmental water, adding that this would ‘take away some of the political angst as well’.²⁸
- 3.20 The Environmental Defenders Office Australia agreed that there is ‘insufficient information... regarding the fate of environmental water after it is released from public storages’. The submission stated that there could be greater clarity on the percentage of water reaching targeted environmental assets.²⁹ The submission added that easily accessible information about environmental water management would assist with improving community awareness.³⁰
- 3.21 Some evidence referred to the benefits of receiving information from volunteers and using local knowledge. For example, Murray Irrigation suggested:
- Increasingly, mobile phone apps are being used to monitor bird and wildlife populations. A similar approach can be taken to working with community groups who can provide monitoring services to the CEWO in return for funding a specific environmental project.³¹
- 3.22 The Murray Darling Association submitted:
- The impacts of environmental watering events are complex and differ from wetland to wetland, community to community and government to government ... Environmental water management could be enhanced by greater investment in and reliance on local knowledge to develop solutions to unintended and adverse consequences inherent in environmental watering events.³²
- 3.23 There is further discussion of citizen science in Chapter 4 in relation to community engagement.
- 3.24 The Australian Academy of Technology and Engineering submitted that managing environmental water is a technically challenging process and the science is ‘relatively immature’.³³ The submission added:
- Australia requires stable and adequate investment in strategic research and science to support improved environmental water
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28 Mr Daryl Buckingham, CEO, Mildura Regional Development, *Committee Hansard*, Mildura, 1 May 2018, p. 9.

29 Environmental Defenders Office Australia, *Submission 28*, p. 7.

30 Environmental Defenders Office Australia, *Submission 28*, p. 9.

31 Murray Irrigation, *Submission 30*, p. 12.

32 Murray Darling Association, *Submission 27*, p. 2.

33 Australian Academy of Technology and Engineering, *Submission 11*, p. 1.

management, solve its many unique water challenges, and to develop and maintain its expertise and research capacity. The current level of research funding allocated to this area is very low.³⁴

3.25 Mr Denis Flett (Victorian Environmental Water Holder) said that while measuring water flow along a pipe or channel is relatively easy, overland flows are ‘much more difficult and the water measurement methods have to become far more sophisticated’.³⁵ Mr Flett said that in these circumstances, ‘the assumptions made in the water accounting are appropriately conservative’.³⁶

3.26 A submission from the Bureau of Meteorology noted that open access to its water information and data promotes efficiency and transparency. The submission added:

Our products and services related to the use of environmental water include assessments of past water use and standardised water accounts, near-real-time collation and publication of water flow measurements from multiple agencies, and forecasts of daily and sub-daily flow volumes in rivers out to seven days ahead.³⁷

3.27 The Department of the Environment and Energy’s submission stated that environmental water use is not necessarily comparable to consumptive water, ‘which is taken at a particular location and predominately measured through metered pumps and gauges on engineered channels’.³⁸ The submission stated that the CEWH:

...uses the best available methods for each watering, but they vary depending on how and where the water is delivered. Examples of methods used to account for environmental water are: metered pumps, channel delivery, river gauging stations and floodplain models.³⁹

3.28 The submission continued:

34 Australian Academy of Technology and Engineering, *Submission 11*, p. 1.

35 Mr Denis Flett, Chairperson, Victorian Environmental Water Holder, *Committee Hansard*, Albury, Albury, 30 April 2018, p. 4.

36 Mr Denis Flett, Chairperson, Victorian Environmental Water Holder, *Committee Hansard*, Albury, 30 April 2018, p. 2.

37 Bureau of Meteorology, *Submission 12*, p. 1.

38 Department of the Environment and Energy, *Submission 38*, p. 26.

39 Department of the Environment and Energy, *Submission 38*, p. 26.

We continue to work with delivery partners and river operators to review delivery arrangements and establish a future model of best practice accounting and reporting for environmental water use.⁴⁰

- 3.29 The Department of the Environment and Energy advised that the CEWH ‘continues to invest in new information to make sure all decision-making is supported by the best possible evidence sources’.⁴¹

Measuring and demonstrating outcomes

- 3.30 Witnesses and submissions agreed that outcomes are important and, generally, recommended investing more in monitoring and scientific research. Evidence received during the inquiry showed there is also significant interest in validating that environmental water is serving its purpose.
- 3.31 Although the outcomes of environmental watering will take many years to be realised, the CEWH submitted that environmental water is yielding positive results.⁴²
- 3.32 Professor Robyn Watts (Charles Sturt University) said environmental water monitoring has had four benefits:
- determining the effectiveness of the Basin Plan;
 - reporting the outcomes of individual environmental watering actions;
 - contributing to community engagement and the CEWH’s knowledge of Basin communities; and
 - improving knowledge of the river system and thereby its management into the future.⁴³
- 3.33 The Australian Academy of Science submitted that recent water reforms in the Murray-Darling Basin are ‘critical to the ongoing environmental health of the region and downstream areas’.⁴⁴ The submission continued:
- For this reason, it is critical these reforms be informed by the best and most rigorous scientific assessments, and their impacts are studied in detail and used to inform future water policy.⁴⁵

40 Department of the Environment and Energy, *Submission 38*, p. 26.

41 Department of the Environment and Energy, *Submission 38*, p. 26.

42 Department of the Environment and Energy, *Submission 38*, p. 41. The Department’s submission contains further detail, with examples and case studies.

43 Professor Robyn Watts, Charles Sturt University, *Committee Hansard*, 30 April 2018, pp. 10-11.

44 Australian Academy of Science, *Submission 8*, p. 1.

45 Australian Academy of Science, *Submission 8*, p. 1.

3.34 The submission added:

A key goal is to provide integrated assessments of water planning and management in Australian river basins, especially the Murray Darling.⁴⁶

3.35 Other witnesses regarded monitoring, evaluation and explaining outcomes as being important to dispel misrepresentations of the Murray River's condition.

3.36 For example, Mr Gavin McMahon (Chairman, National Irrigators' Council) said he had heard comments made to the effect that 'everything's dead'. He said this is a 'long way' from the experience of living and working in the Basin and 'areas of it are quite vibrant'.⁴⁷ Mr Jeremy Morton (President, Ricegrowers' Association of Australia) said that variation of river and wetland conditions is normal and natural. He noted:

Think about what has happened recently in the Darling. It hasn't rained much up there for nearly 18 months or two years. The river has basically dried up. Then the rain will come again and life will go on and fish will breed and your aquatic life will all occur.⁴⁸

3.37 He added:

We can't get caught up on what is happening right here and right now when it's perhaps a really dry spell. It is normalising the variability for the community and the public in general and longer term monitoring.⁴⁹

46 Australian Academy of Science, *Submission 8*, p. 1.

47 Mr Gavin McMahon, Chairman, National Irrigators' Council, *Committee Hansard*, Mildura, 1 May 2018, p. 17.

48 Mr Jeremy Morton, President, Ricegrowers' Association of Australia, *Committee Hansard*, Canberra, 20 June 2018, p. 8.

49 Mr Jeremy Morton, President, Ricegrowers' Association of Australia, *Committee Hansard*, Canberra, 20 June 2018, p. 8.



The Committee tours the Hattah Lakes area

Current evaluation and monitoring activities

3.38 Mr Denis Flett (Victorian Environmental Water Holder) explained that the outcomes of environmental watering are accounted for with empirical evidence. He said:

The measurement of those benefits... is basically then the subject of observation and measurement in a scientific sense: did we get the benefit? Did the colonial waterbirds get through nesting and fledge the young? Did the vegetation improve?⁵⁰

3.39 Mr Flett said that watering decisions are based on a combination of scenario planning, community input and observation.⁵¹ The NSW Government submitted:

Due to the complexities in determining the incremental benefit of managed and planned environmental water, it is important to monitor the long-term trends in condition as well as the short-term responses to each watering event.⁵²

3.40 The NSW Government submission added:

50 Mr Denis Flett, Chairperson, Victorian Environmental Water Holder, *Committee Hansard*, Albury, 30 April 2018, p. 6.

51 Mr Denis Flett, Chairperson, Victorian Environmental Water Holder, *Committee Hansard*, Albury, 30 April 2018, p. 5.

52 NSW Government, *Submission 17*, p. 8.

While monitoring and reporting of ecological outcomes is currently focused at the asset and catchment scale, NSW is working with the Commonwealth to develop local and basin scale monitoring programs so that improved system health can be demonstrated at the Basin Scale.⁵³

- 3.41 The CEWH advised the Committee that monitoring and evaluation is a 'critical component of the effective and efficient use of environmental water'.⁵⁴ In addition:

The outcomes of the monitoring and evaluation form a key part of adaptive management and is incorporated into the annual planning and the operational delivery of environmental water.⁵⁵

- 3.42 The CEWH reiterated that a 'significant proportion' of time and resources (around \$42 million) are being invested into short-term and long-term monitoring.⁵⁶

How to measure outcomes

- 3.43 The Australian Academy of Engineering and Technology recommended that the CEWH establish 'a strategic relationship with the Bureau of Meteorology to leverage the Bureau's water information reporting service'.⁵⁷

- 3.44 Mr Neil Bull (Environmental Projects Manager, Ricegrowers' Association of Australia) said that monitoring needs to consider the long-term outcomes and changes to landscapes, including on privately held land.⁵⁸

- 3.45 Deakin University submitted that monitoring programs should include a mix of scales and targets:

A holistic suite of monitoring that spans the Basin at the largest scale, with detailed biological monitoring at high-value sites, will provide the best basis for ongoing management of the Basin as a whole.⁵⁹

53 NSW Government, *Submission 17*, p. 8.

54 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 9 (CEWH response to Question 8).

55 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 9 (CEWH response to Question 8).

56 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 10 (CEWH response to Question 8).

57 Australian Academy of Technology and Engineering, *Submission 11*, p. 2.

58 Mr Neil Bull, Environmental Projects Manager, Ricegrowers' Association of Australia, *Committee Hansard*, Canberra, 20 June 2018, p. 8.

59 Deakin University, *Submission 10*, p. 2.

3.46 In relation to fish population levels, Dr Clayton Sharpe (private capacity) said ‘evaluating the actual targeted response’ is the best approach. Dr Sharpe said the habitat and flow requirements for spawning Murray cod are known and monitoring could involve verifying how many survived and grew into small fish.⁶⁰ He said fish species respond depending on whether they are ‘generalist’ fish or ‘specialist’ fish that rely on distinct conditions.⁶¹ He said:

On a recent examination of Gunbower forest under managed flooding, using infrastructure to inundate around 5,000 hectares, we saw only two native species proliferate while 11 others weren’t even present on the flood plain.⁶²

3.47 Deakin University also observed that monitoring tends to focus on vegetation, birds and fish. The submission suggested that a more transparent approach would be to monitor the ‘processes that support biodiversity’, which includes recruitment (organism survival), decomposition and nutrient cycling.⁶³

3.48 Professor Nick Bond (La Trobe University) said that long-term outcomes will take ‘considerable time to accrue and then... be detected’. He said this includes changes to native fish populations and plant diversity in wetlands.⁶⁴ Mr Hugo Hopton (CEO, Nature Foundation SA) and Mr Garry Hera-Singh (Chairman, Southern Fishermen’s Association) said that the river system had been highly modified from its original form and the results of environmental watering would take time to become evident.⁶⁵

Investing in monitoring

3.49 A number of witnesses and submissions commented on the need to invest in monitoring environmental outcomes. The NSW Irrigators’ Council submitted:

If we are to have a comprehensive picture and hard data on the effectiveness of the Plan in returning environmental assets to better health, we need to invest in a monitoring and evaluation network in greater depth.⁶⁶

60 Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, p. 12.

61 Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, pp. 14-15.

62 Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, p. 15.

63 Deakin University, *Submission 10*, p. 2.

64 Professor Nick Bond, La Trobe University, *Committee Hansard*, Albury, 30 April 2018, p. 10.

65 Mr Garry Hera-Singh, Chairman, Southern Fishermen’s Association and Mr Hugo Hopton, CEO, Nature Foundation SA, *Committee Hansard*, Murray Bridge, 2 May 2018, p. 7.

66 NSW Irrigators’ Council, *Submission 32*, p. 4.

3.50 The submission continued:

If we cannot measure progress against the Plan objectives it is too easy for critics to claim no progress has been made, but an even greater imperative should be in instilling public confidence... that the significant investment by Government in water recovery is paying environmental dividends.⁶⁷

3.51 Professor Lin Crase submitted that 'some in government actively seek to suppress the creation of scientific evidence, else their political options are narrowed'.⁶⁸ The National Farmers' Federation submitted that 'in such a continually emotive and politically charged debate more and more reliance on quality and reliable data is inevitable'.⁶⁹

3.52 The Australian Academy of Technology and Engineering submitted:

It is essential that the CEWH and allied agencies... have adequate resources to undertake effective monitoring and evaluation activities incorporating the best available science and technology. A long-term commitment to monitoring and evaluation is necessary because ecosystems respond in complex ways to variable cycles of climate and water use.⁷⁰

3.53 Professor Michael Stewardson (University of Melbourne) said that a 'small portion' of the CEWH's watering actions are monitored and investment in monitoring is needed to inform water management decisions.⁷¹ He said:

For example, in the Goulburn River, winter flows have been delivered in some years to improve bank vegetation. This watering event alone represents about \$10 million of water each year, but there's no funding to monitor its environmental effects.⁷²

3.54 Dr Grant Trantor (Executive Officer, Macquarie River Food and Fibre) said that the environmental water portfolio is a sizeable asset and 'it would be somewhat silly to underspend on monitoring and evaluation'.⁷³

67 NSW Irrigators' Council, *Submission 32*, p. 4.

68 Professor Lin Crase, *Submission 1*, p. 4.

69 National Farmers' Federation, *Submission 29*, p. 5.

70 Australian Academy of Technology and Engineering, *Submission 11*, p. 2.

71 Professor Michael Stewardson, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 9.

72 Professor Michael Stewardson, University of Melbourne, *Committee Hansard*, Albury, 30 April 2018, p. 9.

73 Dr Grant Trantor, Executive Officer, Macquarie River Food and Fibre, *Committee Hansard*, Sydney, 22 June 2018, p. 18; see also Professor Lin Crase, *Submission 1*, p. 4.

- 3.55 The Nature Conservation Council NSW suggested that more funding could be made available for monitoring and evaluation, by taking funding away from 'very expensive and unproven infrastructure projects'.⁷⁴

Satellite imagery

- 3.56 The Committee received evidence on how satellite imagery could be used to monitor environmental watering. The Australian Academy of Technology and Engineering submitted:

Automated digital measurements, and monitoring using satellite and drone imagery offer great potential for improved monitoring.⁷⁵

- 3.57 Dr Stephen Turton (Chair, National Committee for Geographic Sciences, Australian Academy of Science) agreed that satellite imagery could be used with geographic information systems. He said:

We would take this enhanced spatial resolution, integrated with information about market actions, hydrology and agricultural responses to water availability, to provide modelling of environmental water releases under different scenarios. This would allow for extremely efficient targeted, optimised water releases by the water holder.⁷⁶

- 3.58 Dr Turton added that while there is a role for satellite technology, 'ground truthing' practices would also be required, such as remote sensing and measurements of stream flow and ecological change.⁷⁷

Knowledge and research

- 3.59 The Committee received evidence that there may be uncertainties or gaps in relation to evaluating environmental outcomes. More generally, the Committee heard that to some extent information is always going to be incomplete and decisions have to be improvised.⁷⁸ Furthermore, the future poses challenges – for example, the next major drought or the effects of climate change on the environment.

74 Nature Conservation Council NSW, *Submission 24*, p. 5.

75 Australian Academy of Technology and Engineering, *Submission 11*, p. 2.

76 Dr Stephen Turton, Chair, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 1.

77 Dr Stephen Turton, Chair, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 3.

78 Dr Stuart Barrow, Senior Policy Analyst, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 4.

- 3.60 Dr Stuart Barrow (Senior Policy Analyst, National Committee for Geographic Sciences, Australian Academy of Science) said having a deeper understanding and knowledge of the river system is always beneficial. He added that a ‘strong role’ exists for scientific advice to guide policy settings.⁷⁹ He also noted:
- As a principle, you should be making decisions on the best and most accurate information available. But there is also the consideration that you are almost always going to be making decisions on incomplete information.⁸⁰
- 3.61 In cases where accuracy is a challenge, Dr Barrow said data could be reviewed, gaps identified and processes improved.⁸¹
- 3.62 Dr Stephen Turton (Chair, National Committee for Geographic Sciences, Australian Academy of Science) said climate change could create uncertainties in the future for managing the Basin area:
- The Darling system is fed more by tropical or subtropical events, and the southern system is more to do with winter rainfall, spring rainfall and, of course, snow melt. All of those things are going to change, and it may well be that the hydrology of the system in the future relies more on the summer input into the Darling system.⁸²
- 3.63 Dr Turton continued:
- Whether that affects the total flow, no-one really knows, but that research is also important if we’re thinking decades down the track.⁸³
- 3.64 The National Farmers’ Federation observed that while environmental water builds resilience, ‘most ecosystems are also dependent on a dry spell’ and ‘no plan will stop the Lower Lakes from drying up’.⁸⁴
- 3.65 The Ricegrowers’ Association’s submission encouraged further research and development needed for long range weather forecasting capability, as rainfall and climate largely correlate with water supply.⁸⁵
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79 Dr Stuart Barrow, Senior Policy Analyst, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 2.

80 Dr Stuart Barrow, Senior Policy Analyst, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 4.

81 Dr Stuart Barrow, Senior Policy Analyst, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 4.

82 Dr Stephen Turton, Chair, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 5.

83 Dr Stephen Turton, Chair, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 5.

84 Mr Les Gordon, Chair, Water Taskforce, National Farmers’ Federation, *Committee Hansard*, Canberra, 23 May 2018, pp. 4-5.

- 3.66 The Department of the Environment and Energy submitted that the CEWH is applying adaptive management practices that are ‘drawing from the best available science... and the experiences of those people living and working in the Basin’.⁸⁶
- 3.67 There are currently two notable projects, discussed below:
- The *Murray-Darling Basin Environmental Water Knowledge and Research Project* relates to on-ground monitoring and research projects for vegetation, waterbirds, fish and food-webs.⁸⁷
 - The *Long-Term Intervention Monitoring Project*, to monitor and evaluate the outcomes of Commonwealth environmental water in the Basin over 5 years from 2014 to June 2019.

Knowledge and research project

- 3.68 Dr Stephen Turton (Chair, National Committee for Geographic Sciences, Australian Academy of Science) said the CEWH’s Environmental Water Knowledge and Research Project should continue beyond 2019.⁸⁸ The Australian Academy of Technology and Engineering submitted that the project should be reviewed and consideration given to ‘follow-on arrangements of some kind to ensure the continuity of research and development activity in this area’.⁸⁹
- 3.69 The Committee asked the CEWH whether this project would be continued beyond 2019. In response, the CEWH advised that investment in research would continue, as indicated in the Department of the Environment and Energy’s forward budget estimates. The CEWH also noted that ‘continuity will be a major consideration in our procurement so understanding and knowledge can continue to build over time’.⁹⁰

Long-Term Intervention Monitoring project (LTIM)

- 3.70 The CEWH is conducting long-term monitoring in seven areas (or regions), over a five year period from June 2014 to June 2019. This monitoring is intended to establish whether environmental water is

85 Ricegrowers’ Association of Australia, *Submission 19*, p. 7.

86 Department of the Environment and Energy, *Submission 38*, p. 37.

87 Department of the Environment and Energy, *Submission 38*, pp. 36-37.

88 Dr Stephen Turton, Chair, National Committee for Geographic Sciences, Australian Academy of Science, *Committee Hansard*, Canberra, 30 May 2018, p. 2.

89 Australian Academy of Technology and Engineering, *Submission 11*, p. 2.

90 Department of the Environment and Energy, *Supplementary Submission 38.1*, pp. 10-11 (CEWH response to Question 9).

achieving outcomes at both a local level and across the Basin.⁹¹ The MDBA noted:

There is a lag between the use of environmental water, changes to ecological conditions and measurable changes to social and economic outcomes.⁹²

- 3.71 Professor Nick Bond (La Trobe University) said the LTIM program has been 'absolutely critical in providing an information base' around ecological outcomes and environmental watering. He said the project should continue for a further phase beyond 2019. The South Australian Government submitted that in a future phase, the LTIM should include the Lower Lakes, Coorong and Murray Mouth.⁹³
- 3.72 Deakin University submitted that while the LTIM project is a critical investment, there should be an integrated strategy that involves high-level and broad monitoring over many years, combined with spatial and temporal scales.⁹⁴

Measuring social and economic trends

- 3.73 The Australian Floodplain Association's submission observed that monitoring efforts have been directed towards how flows improve the environment, rather than broader impacts on Basin communities. The submission recommended adopting the term 'community water' and added:

We all own and benefit from this community water; it is not just for the birds, bees, trees, frogs and fish. A paradigm shift will result in truly healthy rivers and healthy communities.⁹⁵

- 3.74 Mrs Gabrielle Coupland (Chair, Southern Riverina Irrigators) said that Basin communities had 'suffered very real pain' and people want to be assured of the outcomes being achieved with environmental water.⁹⁶ She

91 Department of the Environment and Energy, *Submission 38*, p. 35. There is further information on the Department's website, including the locations selected for monitoring: <http://www.environment.gov.au/water/cewo/monitoring/ltim-project>.

92 Department of the Environment and Energy, *Supplementary Submission 38.1*, p. 11 (MDBA response to Question 10).

93 South Australian Government, *Submission 40*, p. 10.

94 Deakin University, *Submission 10*, p. 3.

95 Australian Floodplain Association, *Submission 20*, pp. 1-2.

96 Mrs Gabrielle Coupland, Chair, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 29.

added that 'volume alone will not achieve the environmental outcomes that we all need'.⁹⁷

- 3.75 Similarly, the National Irrigators' Council submitted that water acquisition has been 'devastating for many communities as a result of the removal of water'.⁹⁸ The National Irrigators' Council submitted that people and communities are being given a lower priority than the environment:

The trajectory of reform... has traditionally been heavily biased towards water as the only environmental management solution to address environmental decline in our river systems. ...volume of water has taken precedence over the welfare of people, communities and agriculture food and fibre production with... questionable environmental outcomes.⁹⁹

- 3.76 Greater Shepparton Council advised that 'further loss of water from the region will see irreparable devastation'.¹⁰⁰

- 3.77 Dr Clayton Sharpe (private capacity) commented on the importance of recreational fishing in the Basin area:

I think there are over 400,000 anglers that generate \$1.3 billion to the economy of the Murray-Darling Basin, and there are a number more that live outside the Murray-Darling Basin. So it's important that we consider the impacts of environmental water on promoting fish populations from their point of view.¹⁰¹

- 3.78 Dr Sharpe said fish populations are good in some locations, but 'precarious in the majority'.¹⁰² He said:

This is not because of environmental water managers not operating at their maximum efficiency; it is because we are a long way off achieving balance between the consumptive use of our water and the sustainability of our system.

...

This is none more evident than in the Darling River, which has run dry for almost as long as it has flowed in the past five years

97 Mrs Gabrielle Coupland, Chair, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 22; see also Dr Grant Trantor, Executive Officer, Macquarie River Food and Fibre, *Committee Hansard*, Sydney, 22 June 2018, p. 12.

98 National Irrigators' Council, *Submission 23*, p. 3; see also Mrs Gabrielle Coupland, Chair, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 29. Mrs Coupland said that in the Finley township in southern NSW, 'half of the shops are vacant now'.

99 National Irrigators' Council, *Submission 23*, p. 3.

100 Greater Shepparton Council, *Submission 35*, p. 1.

101 Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, p. 14.

102 Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, p. 11.

because of water extraction, consumptive use and mismanagement.¹⁰³

- 3.79 Mr Frederick Hooper (Chairperson, Northern Aboriginal Nations Limited) said that ‘for Aboriginal people, water is water’. He continued:

It’s water that comes down the system and it’s water that sustains us. We don’t put labels on the water. ... We don’t say that’s environmental water or that’s coal seam gas water or that’s cultural water. Water, for us, is water. The benefits that come from that water sustain us as well. So it’s not just the water that is coming down the system. It is the plants that rely on that water. It’s the fish that are in that river system that we catch to sustain us as well.¹⁰⁴

- 3.80 The Australian Academy of Sciences suggested that there could be more analysis of the ‘social and economic impacts of the continuing structural changes in the economies of rural areas’.¹⁰⁵ Furthermore:

Geographical sciences provide the ability to integrate knowledge from the natural and social sciences, research grounded in field work, and a focus on places and their communities.¹⁰⁶

- 3.81 Mr Denis Flett (Victorian Environmental Water Holder) said shared benefits are given due consideration. He said:

While we are environment first... We now take into account the implementation of and report on all those shared benefits – be it Aboriginal connection to country, be it recreational or be it anything to do with water quality...¹⁰⁷

Committee comment

- 3.82 While the Committee understands that environmental watering objectives can take time to materialise and some results are intangible, reporting outcomes is important for public confidence. The Commonwealth’s environmental water holdings represent a significant financial investment.

103 Dr Clayton Sharpe, private capacity, *Committee Hansard*, Mildura, 1 May 2018, p. 11.

104 Mr Frederick Hooper, Chairperson, Northern Basin Aboriginal Nations Ltd, *Committee Hansard*, Canberra, 20 June 2018, p. 4; see also Australian Floodplain Association, *Submission 20*, p. 3.

105 Australian Academy of Sciences, *Submission 8*, p. 2.

106 Australian Academy of Sciences, *Submission 8*, p. 3.

107 Mr Denis Flett, Chairperson, Victorian Environmental Water Holder, *Committee Hansard*, Albury, 30 April 2018, p. 5.

Water is a limited resource and there is an expectation that environmental water use will be efficient and effective.

- 3.83 Continued improvements to operational monitoring, real-time tracking, metering and public disclosure can provide ongoing confidence in the way environmental water is being used and managed. Nevertheless, environmental watering is a relatively new concept and notions of best practice may evolve over time.
- 3.84 Monitoring of long-term outcomes shows how environmental water releases are contributing to broader improvements to rivers and wetlands. The CEWH and other agencies involved in environmental water should continue to invest in these areas. A range of pathways are available that could be explored further:
- Examining social and economic variations related to environmental watering.
 - Analysing aerial or satellite imagery, linking it to environmental water events and related ecological changes.
 - Coordinating with other government agencies on contingency planning, forecasting and anticipating impacts from climate change.

Recommendations

Recommendation 5

The Committee recommends that the Commonwealth Environmental Water Holder’s Knowledge Management Project and Long-Term Intervention Monitoring Project (or similar projects) be continued.

Recommendation 6

The Committee recommends that the Commonwealth Environmental Water Holder investigate additional monitoring techniques, including:

- **aerial or satellite imagery; and**
- **observations and reports from experienced volunteers, including land holders, State authorities and other groups such as the Southern Fishermen’s Association.**

Improving community awareness and engagement

Overview

- 4.1 Communication and engagement builds an increased understanding about environmental water, how it is used and the outcomes being achieved.
- 4.2 The Commonwealth Environmental Water Holder (CEWH) relies on the support of third parties for environmental water delivery:
- State governments;
 - local groups and non-government organisations, including the irrigation industry;
 - environment groups; and
 - Indigenous communities.¹
- 4.3 The CEWH told the Committee the ‘basics are in place’ and that there is an intention to ‘upsize’ its engagement with the community.²
- 4.4 The Committee received evidence welcoming the CEWH’s work in this regard, but also identifying areas where its communication and community engagement could be strengthened.

1 Department of the Environment and Energy, *Submission 38*, p. 4.

2 Ms Jody Swirepik, Commonwealth Environmental Water Holder, *Committee Hansard*, Canberra, 28 March 2018, p. 3.

Communicating information on environmental water

4.5 A number of submissions and witnesses regarded the CEWH's approach to communication as generally being successful.³ Examples included the 'good neighbour' policy, interactions with community reference groups, and acknowledging the importance of local expertise in environmental water management.⁴

4.6 Others suggested that improvements could be made.⁵ For example, Mr Mark McKenzie (CEO, NSW Irrigators' Council) stated:

We believe that in the water space CEWH has been probably the best communicator of what they're doing with their water and how they do it, but I agree... it can always be done better.⁶

4.7 Mr McKenzie said communicating with local communities and demonstrating outcomes is an important element of managing expectations. He added that this is necessary to justify the Commonwealth's investment in environmental water.⁷

4.8 Ms Gabrielle Coupland (Chair, Southern Riverina Irrigators) said:

Our communities have suffered very real pain in terms of water recovery... We want to know that our very real pain is delivering very tangible outcomes throughout the basin. We want to make sure that our water is going to where it was acquired for, and I think the best way to do that is to be very clear about: this is how much water we've recovered, this is what this water is going to be used for and these are the outcomes that we've achieved.⁸

3 Nature Foundation South Australia, *Submission 22*, p. 4; Nature Conservation Council, *Submission 24*, p. 5; New South Wales Irrigators Council, *Submission 32*, p. 6; Mr Les Gordon, Chair, Water Taskforce, National Farmers' Federation, *Committee Hansard*, Canberra, 23 May 2018, p. 1.

4 National Irrigators' Council, *Submission 23*, p. 16; Professor Robyn Watts, *Committee Hansard*, Albury, 30 April 2018, p. 11.

5 Ricegrowers' Association of Australia, *Submission 19*, p. 7; Nature Conservation Council, *Submission 24*, p. 6; National Farmers' Federation, *Submission 29*, p. 6; Dr Grant Tranter, Executive Officer, Macquarie River Food and Fibre, *Committee Hansard*, Sydney, 22 June 2018, p. 16.

6 Mr Mark McKenzie, Chief Executive Officer, NSW Irrigators' Council, *Committee Hansard*, Sydney, 22 June 2018, pp. 20-21.

7 Mr Mark McKenzie, Chief Executive Officer, NSW Irrigators' Council, *Committee Hansard*, Sydney, 22 June 2018, p. 21.

8 Mrs Gabrielle Coupland, Chair, Southern Riverina Irrigators, *Committee Hansard*, Albury, 30 April 2018, p. 29.

- 4.9 As discussed in Chapter 2, the CEWH's good neighbour policy aims to 'promote mutually beneficial relationships with other water users and landholders'⁹ and includes:
- not releasing water that would flood private land, without the consent of the landholder; and
 - flexibility in the use of channel capacity to minimise impact on other water orders from third parties.¹⁰
- 4.10 A number of irrigation and industry groups commended the CEWH's good neighbour policy, and called for its continuation.¹¹ For example, the New South Wales Irrigators' Council suggested that this policy has 'underpinned a constructive relationship' between irrigators, Basin communities and the CEWH.¹²
- 4.11 The Committee heard that education and awareness about environmental water is important for managing community expectations. Murray Irrigation, for example, submitted that the community needs to remember that environmental water use is an 'evolving science' and to understand the limits of what environmental watering can achieve, especially in a dry year.¹³ Similarly, Mr Jeremy Morton (President, Ricegrowers' Association of Australia), commented that the river system can experience wet and dry cycles and be healthy – which could be emphasised in public education programs.¹⁴
- 4.12 The Murray Darling Association submitted that more resources targeted at community stakeholders could assist to educate communities about environmental water and the role of the CEWH, through water literacy programs.¹⁵ The Greater Shepparton City Council recommended that a community education program would assist to increase environmental water literacy in local communities.¹⁶ Nature Foundation SA suggested

9 Department of the Environment and Energy, *Submission 38*, p. 16.

10 Department of the Environment and Energy, *Submission 38*, p. 17; see also Commonwealth Environmental Water Office, *Commonwealth Environmental Water Portfolio Management Planning – Approach to planning for the use, carryover and trade of Commonwealth environmental water 2017-18*, 2017, p. 2.

11 New South Wales Irrigators' Council, *Submission 32*, p. 2; Mr Michael Murray, General Manager, Cotton Australia, *Committee Hansard*, Sydney, 22 June 2018, p. 15; Mr Steve Whan, CEO, National Irrigators' Council, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

12 New South Wales Irrigators' Council, *Submission 32*, p. 6.

13 Murray Irrigation, *Submission 30*, p. 11.

14 Mr Jeremy Morton, President, Ricegrowers' Association of Australia, *Committee Hansard*, Canberra, 20 June 2018, p. 8.

15 Murray Darling Association, *Submission 27*, p. 2.

16 Greater Shepparton City Council, *Submission 35*, p. 2.

that existing activities, such as public workshops, should receive additional funding.¹⁷

4.13 Professor Robyn Watts said that while improving community awareness can be difficult, it is essential for the success of the Basin Plan. She also believed that awareness of environmental water should reach a wider audience.¹⁸

4.14 Ms Jody Swirepik (Commonwealth Environmental Water Holder) agreed. She said that when the CEWH engages with the community via fora such as water advisory groups, the community members participating are often already educated about environmental water.¹⁹ Broader community engagement, however, had been complex:

We still have problems with people knowing what we're trying to achieve – the real basics of: what is environmental water; how are we using it; is that what's flowing past my door? I think that we have a communication challenge to try and get to the broader community rather than the informed subset.²⁰

4.15 The Murray-Darling Basin Authority (MDBA) and Department of the Environment and Energy advised that all twelve environmental water management agencies are in the process of collaboratively developing an 'overarching communications framework' for water for the environment.²¹

4.16 The framework will be based on community needs, and aim to:

- improve consistency in the language and content of communications across agencies;
- enhance communication effectiveness; and
- enhance community understanding.²²

4.17 Mr Carl Binning, Executive Director Partnership Division, MDBA, said that 'a strategy for that process has almost been finalised' and that the strategy would see environmental watering actions 'communicated

17 Nature Foundation SA, *Submission 22*, p. 4.

18 Professor Robyn Watts, *Committee Hansard*, Albury, 30 April 2018, p. 11.

19 Ms Jody Swirepik, Commonwealth Environmental Water Holder, *Committee Hansard*, Canberra, 28 March 2018, p. 3.

20 Ms Jody Swirepik, Commonwealth Environmental Water Holder, *Committee Hansard*, Canberra, 28 March 2018, p. 3.

21 Murray-Darling Basin Authority, *Submission 34*, p. 17.

22 Murray-Darling Basin Authority, *Submission 34*, p. 17; Department of the Environment and Energy, *Submission 38.1*, p. 12.

effectively' across the Basin and supported by all the environmental water agencies.²³

Language and terminology

- 4.18 The National Irrigators' Council submitted that there is confusion within communities around the roles, responsibilities and activities of each of the main water management agencies – the CEWH, MDBA and State agencies.²⁴ The National Irrigators' Council suggested that 'aligning language and frameworks' could be an initial step in reducing this confusion.²⁵
- 4.19 The Murray-Darling Basin Authority agreed that the different terminologies used by different agencies can add complexity and cause confusion for community members.²⁶ Mr Denis Flett, Chairperson of the Victorian Environmental Water Holder, said:
- Recent research illustrated to us that there needs to be a simplification in the way water management concepts are communicated, emphasising the importance of speaking to people in a language they understand.²⁷
- 4.20 The Victorian Government also submitted that 'water sector language' contributes to communities' confusion around, and misunderstanding of, environmental water.²⁸
- 4.21 Some submissions suggested that the term 'environmental water' could be replaced with 'community water'.²⁹

Determining environmental water priorities

- 4.22 While the MDBA sets the formal annual water priorities for the Murray Darling Basin, the Basin states and CEWH also develop watering priorities of their own.³⁰

23 Mr Carl Binning, Executive Director, Partnerships Division, Murray-Darling Basin Authority, *Committee Hansard*, Canberra, 27 June 2018, p. 8.

24 National Irrigators' Council, *Submission 23*, p. 13.

25 National Irrigators' Council, *Submission 23*, p. 13.

26 Murray-Darling Basin Authority, *Submission 34*, p. 17.

27 Mr Denis Flett, Chairperson, Victorian Environmental Water Holder, *Committee Hansard*, Albury, 30 April 2018, p. 2.

28 The Victorian Government, *Submission 41*, p. 20.

29 Dr Tony Alessi, *Submission 7*, p. 1; Australian Floodplain Association, *Submission 20*, pp. 2-3; Mr Steve Whan, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

30 Murray-Darling Basin Authority, *Submission 34*, p. 1.

- 4.23 The Queensland Farmers' Federation submitted that there is an 'unclear definition of roles' for setting environmental watering priorities between agencies, which may cause unnecessary duplication of effort.³¹ Cotton Australia and the National Irrigators' Council shared this concern and submitted that the determination of priorities for Commonwealth owned water should sit solely with the CEWH.³²
- 4.24 The Committee also received evidence on the importance of involving local groups in the development of watering priorities.³³ For example, Mr Steve Whan said that a vital part of local knowledge is building upwards to a large-scale view, to engage with local communities. He commented that at the state level Victoria and NSW already link watering plans with local priorities by engaging with local communities through catchment management authorities (VIC) and watering committees (NSW).³⁴
- 4.25 Mr Grant Rigney (Acting Chair, Murray Lower Darling Rivers Indigenous Nations) said that Indigenous communities are consulted late in the development process and given minimal time to respond to watering priorities.³⁵
- 4.26 The Department of Environment and Energy submitted that the annual watering priorities it sets are developed in collaboration with multiple stakeholders, including local communities and delivery partners. The Department noted that future watering priorities will also be guided by the Basin states' long-term environmental watering plans.³⁶

Local engagement officers

- 4.27 The CEWH employs six permanent 'local engagement officers' across the Basin. The local engagement officers live and work in towns across the Basin, and their key role is to 'assist members of the community to participate in environmental water planning and decision making'.³⁷ This includes:
- providing outreach to local communities;

31 Queensland Farmers' Federation, *Submission 13*, p. 4.

32 Cotton Australia, *Submission 5*, p. 3; National Irrigators' Council, *Submission 23*, p. 13.

33 Mr Grant Rigney, Acting Chair, Murray Lower Darling Rivers Indigenous Nations, *Committee Hansard*, Murray Bridge, 2 May 2018, p. 2; Mr Steve Whan, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

34 Mr Steve Whan, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

35 Mr Grant Rigney, Acting Chair, Murray Lower Darling Rivers Indigenous Nations, *Committee Hansard*, Murray Bridge, 2 May 2018, p. 2.

36 Department of the Environment and Energy, *Submission 38*, pp. 11-12.

37 Commonwealth Environmental Water Office, *Commonwealth Environmental Water Portfolio Management Planning – Approach to planning for the use, carryover and trade of Commonwealth environmental water 2017-18*, 2017, p. 4.

- accessing local knowledge to feedback to the CEWH;
 - participating in community events, industry forums and state agency committee meetings; and
 - allowing locals to raise concerns about environmental water management and delivery.³⁸
- 4.28 The 2017 *Review of the Commonwealth Environmental Water Holder's operations and business processes* highlighted the importance of local engagement officers, commenting that they 'help keep everyone in the loop, avoid surprises, and ensure information disseminates ... as fast and as far as possible'.³⁹
- 4.29 The Committee received evidence in support of the continued employment of the local engagement officers. For example, the Nature Foundation SA noted positive connections with local engagement officers,⁴⁰ and the NSW Irrigators' Council commended the employment of the officers to build community engagement.⁴¹ Dr Anne Jensen suggested that expanding the local engagement officer initiative would help to further increase community knowledge and engagement.⁴²

Reporting information and outcomes

- 4.30 There are multiple government agencies involved in managing environmental water within the Murray-Darling Basin. Each has its own specified reporting requirements.

38 Department of the Environment and Energy, *Submission 38*, p. 55; Department of the Environment and Energy, *Annual Report 2015-16*, p. 77.

39 Dr R Neil Byron, *Review of the Commonwealth Environmental Water Holder's operations and business processes*, November 2017, p. 27, at <http://www.environment.gov.au/system/files/resources/11eb1ffc-653c-482e-bc06-d6fc2dec5379/files/cewh-review-final-report.pdf>.

40 Mr Hugo Hopton, CEO, Nature Foundation SA, *Submission 22*, p. 4; see also: Dr Anne Jensen, Environmental Consultant, *Submission 25*, p. 2.

41 New South Wales Irrigators' Council, *Submission 32*, p. 2.

42 Dr Anne Jensen, *Submission 25*, p. 2.

Table 4.1 Environmental water reporting

Agency	Reporting requirements	Scale
Murray-Darling Basin Authority	Environmental objectives of the Basin Plan	Basin wide
Basin States	Environmental objectives of the Basin Plan	Local or site level
Commonwealth Environmental Water Holder	Contribution of Commonwealth environmental water to environmental objectives Environmental outcomes achieved	Basin wide

Source Murray-Darling Basin Authority, *Submission 34*, pp. 13-14.

4.31 The Committee received evidence on the need to ensure clear, regular and transparent reporting on environmental water.⁴³ Current arrangements may lead to confusion, for reasons that include:

- a lack of clarity around the roles and responsibilities of the different organisations;⁴⁴
- having multiple and overlapping reports on environmental watering outcomes;⁴⁵ and
- different language use among organisations and jurisdictions.⁴⁶

4.32 For example, Ms Sarah Moles submitted that it is not clear 'who is who in the water zoo' and that the community is 'often ill-informed' about which agency is responsible for different areas of water management.⁴⁷ Ms Moles suggested that more information could be made available online.⁴⁸

4.33 Councillors Jason Modica and Anthony Cirillo from the Mildura Rural City Council believed that public reporting needs to be increased. They suggested that reporting should specify clearly where and how much water has been used and the expected environmental outcomes for that

43 The Australian Academy of Technology and Engineering, *Submission 11*, p. 2; Southern Riverina Irrigators, *Submission 21*, p. 3; National Irrigators' Council, *Submission 23*, p. 14; Murray Darling Association, *Submission 27*, p. 3.

44 Ricegrowers' Association of Australia, *Submission 19*, p. 6.

45 Gwydir Valley Irrigators' Association, *Submission 39*, p. 4.

46 National Irrigators' Council, *Submission 23*, p. 13.

47 Ms Sarah Moles, *Submission 6*, p. 3.

48 Ms Sarah Moles, *Submission 6*, p. 3.

water.⁴⁹ Dr Grant Tranter (Executive Officer, Macquarie River Food and Fibre) said that local communities see environmental water released down the river and need to know what is going to be achieved from the water to be confident in its use.⁵⁰ Dr Tranter said:

If there's one thing the CEWH could probably do better, it's their communications strategy. There are these success stories out there, but it's up to the super sleuths at home to google the success stories. They should be front and centre.⁵¹

4.34 Dr Robyn Watts also commented that while the CEWH produces media releases and notices about environmental water, this is not always done regularly. She said this can lead to misunderstandings about events within the river system. Dr Watts said:

In the absence of regular information from the CEWH, I think the community has often attributed some of the detrimental outcomes they see in river systems to environmental water at times when in fact no environmental water is being delivered.⁵²

4.35 The Gwydir Valley Irrigators' Association emphasised the importance of clarity in reporting on the outcome of environmental watering events:

We would like to see a lot more transparency on the government's behalf as far as what the target for the environmental water is and then, afterwards, to see the results...A lot of the time it's very difficult to find out the results – what an event of the environmental water has achieved.⁵³

4.36 The Association further submitted that information sharing by the CEWH and related organisations should be more timely. The submission noted that while the CEWH's monitoring reports are made available following the completion of a water year in June, the timeframe does not support forward planning:

For example, the monitoring report for the 2015-16 water year was provided in late November 2016, which appears timely following

49 Councillor Jason Modica, Mildura Rural City Council, *Proof Committee Hansard*, Mildura, 1 May 2018, p. 3; Councillor Anthony Cirillo, Mildura Rural City Council, *Committee Hansard*, Mildura, 1 May 2018, p. 6.

50 Dr Grant Stephen Tranter, Executive Officer, Macquarie River Food and Fibre, *Committee Hansard*, Sydney, 22 June 2018, p. 18.

51 Dr Grant Stephen Tranter, Executive Officer, Macquarie River Food and Fibre, *Committee Hansard*, Sydney, 22 June 2018, p. 16.

52 Dr Robyn Watts, Environmental Sciences, Charles Sturt University, *Committee Hansard*, Albury, 30 April 2018, p. 11.

53 Mr Mark Winter, Vice-Chair, Gwydir Valley Irrigators' Association Inc., *Committee Hansard*, Albury, 30 May 2018, p. 9.

the completion of the water year in June. But basin-wide and local planning process are required to be completed prior to June, meaning this information is not formally used to inform water actions until the following year and verbal updates are instead used throughout the planning process.⁵⁴

- 4.37 The Association commented that without timely reports on the outcome of the previous water year's activities, water managers will be limited in their ability to practice adaptive management effectively.⁵⁵
- 4.38 Murray Irrigation submitted that all environmental outcomes should be reported, including watering events that do not achieve the intended outcomes. Murray Irrigation suggested that such reporting will help build community confidence in the accuracy of future reporting, by fostering trust that the CEWH will not conflate positive outcomes or hide negative ones.⁵⁶
- 4.39 The Environmental Defenders Office Australia submitted that the CEWH's reporting requirements should be expanded to include water 'disposed of' during the watering year. This would include information on the proceeds from the sale of the water and how the proceeds have been or will be used.⁵⁷

Fostering community engagement

- 4.40 The Department of Environment and Energy submitted that the CEWH prioritises 'active engagement and participation' with local communities.⁵⁸ Such engagements include informal partnerships developed through participation in state-led groups such as Environmental Water Advisory Groups (EWAGs).⁵⁹
- 4.41 The Department of Environment and Energy advised that it engages with local communities through formal and informal partnerships, including formal partnerships with environmental organisations, First Nations groups, irrigation trusts and private individuals as well as government agencies.⁶⁰

54 Gwydir Valley Irrigators' Association, *Submission 39*, p. 3.

55 Gwydir Valley Irrigators' Association, *Submission 39*, pp. 3-4.

56 Murray Irrigation, *Submission 30*, p. 11.

57 Environmental Defenders Offices of Australia, *Submission 28*, p. 9.

58 Department of the Environment and Energy, *Submission 38*, p. 52.

59 Department of the Environment and Energy, *Submission 38*, p. 52.

60 Department of the Environment and Energy, *Submission 38*, p. 49.

- 4.42 Ms Swirepik stated that the CEWH intends to ‘upsized’ the engagement that occurs through those partnerships and make it common practice.⁶¹
- 4.43 The Ricegrowers’ Association of Australia suggested that ‘significant improvement’ could be made to engagement with rural communities. It submitted that community stakeholders want to work in partnership with government agencies to ensure that local knowledge is used in watering decisions.⁶²
- 4.44 In a 2017 report on national water reform, the Productivity Commission recommended that where practicable, management of Commonwealth environmental water be entrusted to local or State or Territory partners.⁶³ A number of witnesses and submissions similarly expressed support for localism in community engagement.⁶⁴ Mr Steve Whan described the concept of localism:
- That means talking to communities on the ground and catchments about the priorities that they want to see for their areas and involving them in the management process.⁶⁵
- 4.45 Mr Whan expressed support for the recommendations made in the Productivity Commission’s report.⁶⁶
- 4.46 EWAGs are predominantly NSW based and consist of local community members, water managers, landholders, scientists, First Nations groups, local land services and government representatives.⁶⁷ These groups:
- provide advice on the use of environmental water to state government;
 - assist in the development of annual and long term environmental water planning, monitoring and evaluation; and
 - provide a forum for local community members to express their views and access water experts and government representatives.⁶⁸

61 Ms Jody Swirepik, Commonwealth Environmental Water Holder, *Committee Hansard*, Canberra, 28 March 2018, p. 3.

62 Ricegrowers’ Association of Australia, *Submission 19*, p. 7.

63 Productivity Commission, *National Water Reform*, Report no. 87, 2017, p. 32.

64 National Irrigators’ Council, *Submission 23*, p. 16; Murray Darling Association, *Submission 27*, p. 4; Mr Gavin Geoffrey McMahon, Chairman, National Irrigators’ Council, and CEO, Central Irrigation Trust, *Committee Hansard*, Mildura, 1 May 2018, p. 18; Mr Hugo Hopton, Nature Foundation SA, *Committee Hansard*, Murray Bridge, 2 May 2018, p. 9.

65 Mr Steve Whan, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

66 Mr Steve Whan, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

67 NSW Department of Industry, *Submission 17*, p. 9; Nature Conservation Council, *Submission 24*, p. 5.

68 NSW Department of Industry, *Submission 17*, p. 9; Department of the Environment and Energy, *Submission 38*, p. 52.

- 4.47 The Committee received evidence that EWAGs and similar groups are effective ways of engaging with communities, and fulfilling the objectives of localism.⁶⁹
- 4.48 The NSW Irrigators' Council submitted that since EWAGs already advise state government at a regional level, the CEWH should consider formally establishing EWAGs or similar groups to 'specifically advise' the CEWH.⁷⁰
- 4.49 The Nature Conservation Council observed that the CEWH previously had a formal partnership with community stakeholders. The CEWH's 2013-14 Business Plan included a 'Commonwealth Environmental Water Stakeholder Reference Panel'.⁷¹ This panel was chaired by the CEWH and its membership was comprised of community representatives. The Panel:
- shared information and views on Commonwealth environmental water;
 - identified community and state-level issues;
 - provided opportunity to keep local communities informed about CEWH activities; and
 - allowed for the assessment of the efficacy of stakeholder engagement.⁷²
- 4.50 The Nature Conservation Council noted that the Reference Panel was dissolved in 2014, commenting that this was a significant loss for local community engagement.⁷³
- 4.51 As discussed in Chapter 2, some other witnesses recommended formalising arrangements for an advisory or consultative group to the CEWH. The Department of the Environment and Energy submitted:
- Local people are well placed to see the changes in their local environment and often have an understanding or knowledge that can date back generations. This wealth of knowledge and

69 Cotton Australia, *Submission 5*, p. 3; Inland Rivers Network, *Submission 9*, p. 4; National Irrigators' Council, *Submission 23*, p. 16; Mr Steve Whan, *Committee Hansard*, Canberra, 23 May 2018, p. 7.

70 NSW Irrigators' Council, *Submission 32*, p. 6; see also Councillor Jason Modica, Mildura Rural City Council, *Committee Hansard*, Mildura, 1 May 2018, p. 3.

71 Commonwealth Environmental Water Holder, *Commonwealth Environmental Water Office Business Plan 2013-14*, p. 17, at <http://www.environment.gov.au/water/cewo/publications/cewo-2013-2014-business-plan>.

72 The Nature Conservation Council, *Submission 24*, p. 6; Commonwealth Environmental Water Holder, *Commonwealth Environmental Water Office Business Plan 2013-14*, p. 17, at <http://www.environment.gov.au/water/cewo/publications/cewo-2013-2014-business-plan>.

73 The Nature Conservation Council, *Submission 24*, p. 6.

experience is important in informing environmental water use decisions.⁷⁴

- 4.52 Ms Swirepik acknowledged the importance of accessing community opinions, including through EWAGs. She added that she would be open to considering a formal advisory group, and that the CEWH may be able to use existing forums, such as the Murray-Darling Basin Community Committee, as a structure for a formal group.⁷⁵

Citizen science

- 4.53 'The Committee heard that 'citizen scientists' could be another effective way to engage communities and assist with monitoring activities.
- 4.54 Murray Irrigation submitted that the Commonwealth Environmental Water Office could make use of 'citizen scientists' by establishing partnerships with local community groups, which could undertake monitoring and measuring of environmental water projects, in return for funding.⁷⁶
- 4.55 Southern Riverina Irrigators also submitted that the CEWH could develop a program in which local landholders could contribute to the monitoring of environmental outcomes. It suggested that community members would welcome the opportunity to partner with water managers in this way.⁷⁷
- 4.56 Both Murray Irrigation and Southern Riverina Irrigators commented that modern technology allows for volunteers to individually participate in essential monitoring programs, such as by using mobile phone applications.⁷⁸

Engagement with First Nations groups

- 4.57 The shared benefits of environmental water are important considerations in assessing the outcomes of watering activities. The *Water Act 2007* (Cth) requires the Basin Plan to have 'regard to... social, cultural, Indigenous and other public benefit issues'.⁷⁹

74 Department of the Environment and Energy, *Submission 38*, p. 52.

75 Ms Jody Swirepik, *Committee Hansard*, Canberra, 27 June 2018, p. 7.

76 Murray Irrigation, *Submission 30*, p. 11.

77 Southern Riverina Irrigators, *Submission 21*, p. 7.

78 Southern Riverina Irrigators, *Submission 21*, p. 7; Murray Irrigation, *Submission 30*, p. 11.

79 Department of Environment and Energy, *Submission 38*, p. 51; see also *Water Act 2007* (Cth), s. 21(4)(c)(v).

- 4.58 The Department of the Environment and Energy submitted that the CEWH is collaborating with Indigenous communities on the use of environmental water.⁸⁰ The Department submitted that:
- Although these types of partnerships are in their infancy and will require ongoing commitment over many years, they are important to help build an understanding of our mutual aims, maximising the outcomes that can be achieved together.⁸¹
- 4.59 The Department's submission added that that the CEWH is 'endeavouring to grow our engagement with Indigenous people in the management of Commonwealth environmental water'.⁸² The CEWH has provided \$600,000 in funding towards the National Cultural Flows research project, alongside the Murray Darling Basin Authority and other agencies.⁸³ The project aims to 'secure a future where Indigenous water allocations are embedded within Australia's water management regimes'.⁸⁴
- 4.60 Mr Frederick Hooper, from the Northern Basin Aboriginal Nations (NBAN), commented that the National Cultural Flows research project has been one of the few occasions where the NBAN feel they have been consulted by government authorities, particularly the MDBA.⁸⁵
- 4.61 The CEWH has also provided funding for traditional owners to be trained in environmental monitoring. Notably, during this process the traditional owners being trained also imparted cultural knowledge to the trainers, and thereby to the CEWH.⁸⁶
- 4.62 The Murray Lower Darling Rivers Indigenous Nations submitted that engagement with First Nations could be improved by:
- establishing Indigenous identified positions in the CEWH and other agencies;
 - establishing pathways for First Nations to contribute to decisions about how environmental water is used; [and]
 - including Indigenous representation at high levels within management agencies, including the CEWH.⁸⁷
- 4.63 The submission also stated:
-

80 Department of the Environment and Energy, *Submission 38*, p. 51.

81 Department of the Environment and Energy, *Submission 38*, p. 52.

82 Department of Environment and Energy, *Submission 38*, p. 51.

83 Department of Environment and Energy, *Submission 38*, p. 51.

84 Murray Low Darling River Indigenous Nations, *Submission 26*, p. 2. For more information on the Cultural Flows Research Project, see <<http://culturalflows.com.au/>>.

85 Mr Frederick Arnold Hooper, Chairperson, Northern Basin Aboriginal Nations Ltd, *Committee Hansard*, Canberra, 20 June 2018, p. 2.

86 Department of Environment and Energy, *Submission 38*, pp. 51-52.

87 Murray Low Darling River Indigenous Nations, *Submission 26*, p. 9.

Aboriginal people should be engaged at the decision-making level, as well as through on-country assessments, to inform decision-making about the delivery of Commonwealth environmental water. Inclusion at the decision-making level supports integration of on-ground objectives into long-term planning.⁸⁸

- 4.64 Mr Grant Rigney (Acting Chair, Murray Lower Darling Rivers Indigenous Nations) said consultation and input from Indigenous groups could be delayed or belated. He said Indigenous nations would like to be involved 'at the beginning of the program' rather than 'three quarters of the way through then given about two or three weeks to give a response to environmental and water priorities'.⁸⁹ He said 'we've been pushed back and it's getting to the stage where we are pretty agitated about it'.⁹⁰
- 4.65 Mr Rigney said he would like to conclude agreements with the CEWH that provide 'a guarantee of what's going to be happening within that program or project itself'.⁹¹

Committee comment

- 4.66 The Committee encourages the CEWH to demonstrate clearly in its various public reports and updates:
- how much environmental water is being used, or will be used;
 - the expected environmental outcomes of that environmental water; and
 - the actual outcomes achieved or not achieved, including negative outcomes.
- 4.67 The Committee believes that localism is key to encouraging effective engagement with local communities, and is pleased that the CEWH values its formal and informal partnerships with local community groups.
- 4.68 The Committee notes that the Environmental Watering Advisory Groups (EWAGs) in NSW appear to be particularly effective methods of interacting with local communities. The Committee encourages the CEWH to promote similar forums in other Basin States.

88 Murray Low Darling River Indigenous Nations, *Submission 26*, p. 8.

89 Mr Grant Rigney, Acting Chair, Murray Lower Darling Rivers Indigenous Nations, *Committee Hansard*, Murray-Bridge, 2 May 2018, p. 2.

90 Mr Grant Rigney, Acting Chair, Murray Lower Darling Rivers Indigenous Nations, *Committee Hansard*, Murray-Bridge, 2 May 2018, p. 2.

91 Mr Grant Rigney, Acting Chair, Murray Low Darling River Indigenous Nations, *Committee Hansard*, Murray-Bridge, 2 May 2018, p. 3.

- 4.69 The Committee considers that the CEWH's efforts to strengthen community awareness and engagement on environmental water would benefit from the development of a clear and integrated strategy setting out both current activities and proposed future initiatives and objectives.
- 4.70 The Committee acknowledges the deep connection that First Nations people have to the Murray River system, and the valuable contribution that they can make to the planning and management of environmental water in their local regions. While the Committee is pleased that the CEWH values its current formal and informal partnerships with First Nations groups, it encourages the CEWH to ensure that First Nations groups are engaged with as early as practicable in the planning and establishment of watering priorities.

Recommendations

Recommendation 7

The Committee recommends that the Commonwealth Environmental Water Holder develop an updated communication and engagement strategy.

Recommendation 8

The Committee recommends that the Commonwealth Environmental Water Holder continue to work and consult with Indigenous communities to further understand and inform sympathetic water use policies.

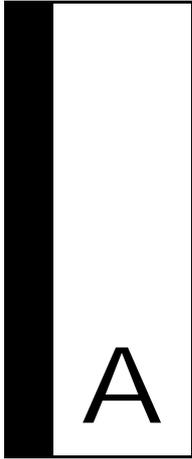
Recommendation 9

The Committee recommends that the Commonwealth Environmental Water Holder review the adequacy of its existing mechanisms for consultation with the community. This review should consider if there is any benefit in establishing a formal advisory or consultative group to inform water use decisions.

Mr Andrew Gee MP

Chair

5 December 2018



Appendix A – Submissions

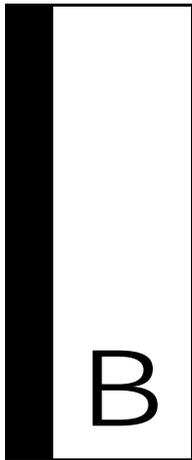
- 1 Professor Lin Crase
- 2 Commonwealth Environmental Water Holder¹
- 2.1 Supplementary to submission 2
- 3 Mr Ian Boyle
- 4 Jan Beer
- 5 Cotton Australia
- 6 Ms Sarah Moles
- 7 Dr Tony Alessi
- 8 Australian Academy of Science
- 8.1 Supplementary to submission 8
- 8.2 Supplementary to submission 8
- 9 Inland Rivers Network
- 10 Deakin University
- 11 Australian Academy of Technology and Engineering
- 12 Bureau of Meteorology
- 13 Queensland Farmers' Federation

¹ The Commonwealth Environmental Water Holder lodged a submission at an early stage of the inquiry. Subsequently, the Department of the Environment and Energy provided an updated version received as Submission 38.

- 14 Mr Ken Hooper
- 15 The Goulburn Valley Environment Group Inc
- 16 Dr Jonathon Howard
- 17 NSW Government
- 18 ACT Environment, Planning and Sustainable Development
Directorate
- 19 Ricegrowers' Association of Australia
- 20 Australian Floodplain Association
- 21 Southern Riverina Irrigators
- 22 Nature Foundation SA Inc
- 23 National Irrigators' Council
- 24 Nature Conservation Council of NSW
- 25 Dr Anne Jensen
- 26 Murray Lower Darling Rivers Indigenous Nations
- 27 Murray Darling Association Inc.
- 28 Environmental Defenders Offices of Australia
- 29 National Farmers' Federation
- 30 Murray Irrigation
- 31 Department of Agriculture and Water Resources
- 31.1 Supplementary to submission 31
- 32 NSW Irrigators' Council
- 33 Friends of Lake Wallace
- 34 Murray-Darling Basin Authority
- 35 Greater Shepparton City Council
- 36 Murray Darling Wetlands Working Group Ltd
- 37 Southern Fishermen's Association
- 38 Department of the Environment and Energy
- 38.1 Supplementary to submission 38

39	Gwydir Valley Irrigators Association Inc
40	South Australian Government
41	Victorian Government ²
42	Dr Angus Webb
43	Macquarie River Food and Fibre

2 The Victorian Government's submission included attached submissions from the Victorian Environmental Water Holder and the North Central Catchment Management Authority. Other attachments were received as exhibits.



Appendix B – Public hearings and site inspections

Wednesday, 28 March 2018 – Canberra, ACT

Department of the Environment and Energy

- Ms Jody Swirepik, Commonwealth Environmental Water Holder
- Mr Mark Taylor, Assistant Secretary

Monday, 30 April 2018 – Albury, NSW

Charles Sturt University

- Professor Robyn Watts, Environmental Sciences

CSIRO Land and Water

- Dr Rick Stoffels, Research Scientist

La Trobe University

- Professor Nick Bond, Research Centre, Director, School of Life Sciences

Murray Darling Association

- Ms Emma Bradbury, Chief Executive Officer
- Mr Ian Davidson, Chair
- Councillor David Thurley, National President

Southern Riverina Irrigators

- Mrs Gabrielle Coupland, Chair
- Ms Perin Davey, Executive Officer

University of Melbourne

- Professor Michael Stewardson, Discipline Leader, Environmental Hydrology and Water Resources

University of Melbourne

- Dr Avril Horne, DECRA Fellow, Water, Environment and Agriculture Program
- Dr Angus Webb, Senior Lecturer, Water, Environment and Agriculture Program

Victorian Environmental Water Holder

- Mr Denis Flett, Chairperson

Wentworth Group of Concerned Scientists

- Terry Hillman, Member

Monday, 30 April 2018 – Shepparton, VIC

The Committee held an informal meeting in Shepparton with representatives of organisations from the area.

Tuesday, 1 May 2018 – Mildura, VIC

National Irrigators' Council; and Central Irrigation Trust

- Mr Gavin McMahon, Chairman; and Chief Executive Officer

Mildura Regional Development

- Mr Daryl Buckingham, Chief Executive Officer

Mildura Rural City Council

- Mayor Mark Eckel
- Councillor Anthony Cirillo
- Councillor Jason Modica
- Mr Martin Hawson, General Manager Community

Renmark Irrigation Trust; and Renmark Environmental Watering Committee

- Ms Rosalie Auricht, Business Manager and Facilitator
- Mr R Humphrey Howie, Deputy Presiding Member and Chair

Private capacity

- Dr Clayton Sharpe

Wednesday, 2 May 2018 – Murray Bridge, SA

Murray Lower Darling Rivers Indigenous Nations

- Mr Grant Rigney, Acting Chair

Nature Foundation SA

- Mr Hugo Hopton, Chief Executive Officer
- Mr Bob Lott, President
- Natalie Stalenberg, Program Manager, Water for Nature

River Lakes and Coorong Action Group Inc, and Healthy Rivers Ambassador

- Mrs Rosa Hillam, Member

Southern Fishermen's Association

- Mr Garry Hera-Singh, Chairman
- Mr Neil MacDonald, Executive Officer

Private capacity

- Dr Anne Jensen

Wednesday, 23 May 2018 – Canberra, ACT

National Farmers' Federation

- Mr Les Gordon, Chair
- Mr Warwick Ragg, General Manager, National Resource Management

National Irrigators' Council

- Mr Steve Whan, Chief Executive Officer

Wednesday, 30 May 2018 – Canberra, ACT

Australian Academy of Science

- Dr Stuart Barrow, Senior Policy Analyst
- Dr Stephen Turton, Chair, National Committee for Geographical Sciences

Gwydir Valley Irrigators Association Inc

- Mrs Zara Lowien, Executive Officer
- Mr Mark Winter, Vice-Chair

Wednesday, 20 June 2018 – Canberra, ACT

Ricegrowers' Association of Australia

- Mr Neil Bull, Environmental Projects Manager
- Mr Jeremy Morton, President

Northern Basin Aboriginal Nations Limited

- Mr Frederic Hooper, Chairperson

Friday, 22 June 2018 – Sydney, NSW

Cotton Australia

- Mr Michael Murray, General Manager

Environmental Defenders Offices of Australia

- Dr Emma Carmody, Senior Policy and Law Reform Solicitor
- Ms Rachel Walmsley, Policy and Law Reform Director

Macquarie River Food and Fibre

- Dr Grant Stephen Tranter, Executive Officer

NSW Irrigators' Council

- Mr Mark McKenzie, Chief Executive Officer

Private capacity

- Professor Richard Kingsford

Wednesday, 27 June 2018 – Canberra, ACT

Department of Agriculture and Water Resources

- Mr Paul Morris, First Assistant Secretary, Water Division
- Ms Mary Colreavy, Assistant Secretary, Water Recovery Branch, Water Division
- Mr Tim Fisher, Assistant Secretary, Murray-Darling Basin Policy Branch, Water Division

Department of the Environment and Energy

- Ms Jody Swirepik, Commonwealth Environmental Water Holder, Commonwealth Environment Water Office
- Mr Hilton Taylor, Assistant Secretary, Commonwealth Environmental Water Office

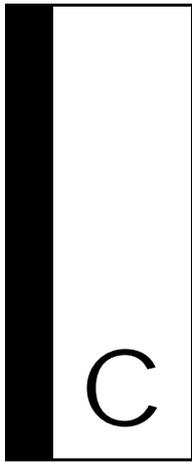
- Mr Mark Taylor, Assistant Secretary, Commonwealth Environmental Water Office

Murray-Darling Basin Authority

- Mr Carl Binning, Executive Director, Partnerships Division

List of site inspections

- Monday, 30 April 2018 - Goulburn River Weir, Victoria
- Tuesday, 1 May 2018 - Chalka Creek and Hattah Lakes, Victoria
- Tuesday, 1 May 2018 - aerial inspection of Menindee Lakes area, New South Wales
- Wednesday, 2 May 2018 - Goolwa Barrages and Murray Mouth Lookout, South Australia



Appendix C – List of Exhibits

- 1 'Coordinated CEWO flows across seven catchments'
- 2 'Lower Darling Flows Essential for Native Fish'
- 3 'Waterbirds in Decline'
- 4 'Germinants from 2011 flood' [two photographs]
- 5 'Monitoring of Environmental Water Sites', Interim Report, January 2018
- 6 'Delivery of Environmental Water', October 2016
- 7 Victorian Government submission to the Environment, Natural Resources and Regional Development Committee
- 8 Victorian Environmental Water Holder submission to the Environment, Natural Resources and Regional Development Committee
- 9 Victorian Government, 'Victoria's Basin Plan – Environmental Report Card' [undated]
- 10 Victorian Government, 'Progress towards outcomes from environmental water in Victoria' (2017)
- 11 Victorian Environmental Water Holder, 'Water allocation trading strategy 2017-18' (July 2017)
- 12 'Waterway and catchment health' [undated]
- 13 Victorian Government, 'Water for the environment – monitoring ecological outcomes' [undated]

- 14 Victorian Government, 'Victorian environmental flows monitoring and assessment program - stage 6' [undated]
- 15 Arthur Rylah Institute and the Victorian Department of Environment, Land, Water and Planning, 'VEFMAP Stage 6 - Part A' (October 2017)
- 16 Arthur Rylah Institute and the Victorian Department of Environment, Land, Water and Planning, 'VEFMAP Stage 6 - Part B' (October 2017)
- 17 Victorian Department of Environment, Land, Water and Planning, 'Pilot Monitoring of Aquatic River Bank Vegetation' (2017)
- 18 Victorian Department of Environment, Land, Water and Planning, 'Fish Study - Northern Victorian Rivers' (2017)
- 19 Victorian Government, 'Water for the environment - monitoring ecological outcomes' [undated]
- 20 Victorian Environmental Water Holder, 'Listen Up! Hearing Victorian views about water for the environment' [undated]
- 21 Victorian Environmental Water Holder, 'What is environmental water' (June 2015)
- 22 Victorian Environmental Water Holder, 'Why is environmental watering important?' (June 2015)
- 23 Victorian Environmental Water Holder, 'What does environmental watering aim to achieve?' (June 2015)
- 24 Victorian Environmental Water Holder, 'How do we know if environmental watering is successful?' (June 2015)
- 25 Victorian Environmental Water Holder, 'What does environmental watering involve?' (June 2015)
- 26 Victorian Environmental Water Holder, 'What is environmental water trading?' (June 2015)
- 27 OECD work on water
- 28 Photos of Macquarie Marshes