

Murray-Darling Basin Royal Commission Report

29 January 2019



**MURRAY-
DARLING BASIN
ROYAL COMMISSION**

Commissioner Bret Walker SC

29 January 2019

His Excellency the Honourable Hieu Van Le AC
Governor of South Australia
Government House
GPO Box 2373
ADELAIDE SA 5001

Your Excellency

In accordance with the letters patent issued to me on 23 January 2018, I enclose my report.

I note that I have been able to take account of materials available as at 11 January 2019.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Bret Walker'.

**Bret Walker
Commissioner**

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Commissioner**

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Acknowledgments

Acknowledgment of Traditional Owners & Aboriginal Nations of the Murray-Darling Basin

As the Commissioner, I acknowledge and pay respect to the Traditional Owners and Aboriginal Nations of the Murray-Darling Basin, including Elders past and present.

As Commissioner, I recognize the immeasurable history of Aboriginal people, and the past and continuing profound connexion of Traditional Owners with their customary lands and waters on all levels — cultural, social, economic, environmental and spiritual.

It is imperative that the cultural authority of Traditional Owners and Aboriginal Nations to speak and care for their Country is respected and listened to.

This example of Traditional Owner philosophy was shared with me:

Our Lands, Our Waters, Our People, All Living Things are connected. We implore people to respect our Ruwe (Country) as it was created in the Kaldowinyeri (the creation). We long for sparkling, clean waters, healthy land and people and all living things. We long for the Yarluwar-Ruwe (Sea Country) of our ancestors. Our vision is all people Caring, Sharing, Knowing and Respecting the lands, the waters and all living things.

(Ngarrindjeri Nation Yarluwar-Ruwe Plan 2006: 5.)¹

The damage and depletion of the water resources, ecosystems and biodiversity of the Murray-Darling Basin since European colonisation, and the trauma and dislocation experienced by Aboriginal people, are part of the same story. The necessary work to protect and restore the river systems must go hand in hand with the necessary measures to include Traditional Owners centrally in decision-making about water planning and management.

I extend my sincere thanks to the representatives of Traditional Owner groups and Aboriginal Nations who gave generous assistance to my inquiry.

General acknowledgments

I am indebted to all persons who took the time to contribute to the work of the Commission, set out and specifically acknowledged at the conclusion of this report. A large group of people went to considerable effort to engage, both in person and in writing with the Commission's work, and their willingness to give generously of their time and attention is very much appreciated.

Special acknowledgments

My experience and work as the Royal Commissioner could not have proceeded as it did without the thoroughgoing and splendid support of an excellent staff. Simply, this report and all the work producing it result from their demonstrated capacity and willingness to provide everything I needed, whenever necessary. Responsibility for the contents of the report, including any omissions, is entirely mine.

The entire administration of the Commission's work could not have run as smoothly and energetically as it did, without the leading contribution of Carolyn Lee as Director.

The wisdom and energy, and professional leadership, of Joanne Masters, Senior Instructing Solicitor, were indispensable. I was greatly assisted by the insights and contributions of Sarah Avey as Senior Advising Solicitor.

The thoughtfulness and intellectual curiosity of Sean O'Flaherty, Junior Counsel Assisting, has played a considerable role in the ability of the Commission to carry out its tasks.

It is impossible to overstate the significance to the work of this Commission of the leadership, acumen and inspirational analysis of Richard Beasley SC, Senior Counsel Assisting. I am very grateful for the opportunity to have attempted, with him, to serve the public interest.

It would be invidious to name others of the Commission staff, all of whom have excellently exceeded the requirements of their positions.

Appendix 2 records the phases of the Commission's work and designates certain of the contributions to it.

References

- ¹ Ngarrindjeri Regional Authority, Submission to Murray-Darling Basin Royal Commission, 9 May 2018 (RCE 194) 2.

Terms of Reference

- A. South Australia is a “Basin State” within the meaning of the *Water Act 2007* (Cth) (“**the Act**”), the Basin Plan made under s.44(3)(b)(i) of the Act, and is a party to the Murray-Darling Basin Agreement (“**the Basin Agreement**”), which forms Schedule 1 to the Act.
- B. There exist “Water Resource Plan Areas”, as defined in the Basin Plan, within the State of South Australia. The South Australian River Murray forms the downstream area of the Water Resource Plan Areas outlined in the Basin Plan.
- C. The objects and purposes of the Act and the Basin Plan include, but are not limited to, the following matters:
 - a. ensuring the return to environmentally sustainable levels of extraction for water resources that are over-allocated or over-used;
 - b. to protect, restore and provide for the ecological values and ecosystem services of the Murray-Darling Basin (taking into account, in particular, the impact that the taking of the water has on the water courses, lakes, wetlands, groundwater and water dependent ecosystems that are part of the Basin water resources and on associated biodiversity);
 - c. the establishment and enforcement of environmentally sustainable limits on the quantities of surface water and groundwater that may be taken from the Basin water resources (including by interception activities);
 - d. to give effect to relevant international agreements through the integrated management of Basin water resources;
 - e. to establish a sustainable and long term adaptive management framework for the Basin water resources, that takes into account the broader management of natural resources in the Murray-Darling Basin;
 - f. to optimise social, economic and environmental outcomes arising from the use of Basin water resources in the national interest;
 - g. to achieve certain “enhanced environmental outcomes”.

These objects and purposes are more fully outlined in ss.3, 20 and 28 of the Act, chapters 5 and 8 of the Basin Plan, and Schedule 5 of the Basin Plan in relation to enhanced environmental outcomes.

- D. The purpose of the Basin Agreement is to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of water and other natural resources of the Murray-Darling Basin, including implementing arrangements between the Basin States in order to give effect to the Basin Plan and the Act.
- E. As a Basin State, as a contracting party to the Basin Agreement, and as the downstream State, which includes the South Australian River Murray Water Resource Plan Area, South Australia has a significant interest in:
- a. compliance with and the effectiveness of the Basin Plan generally;
 - b. the delivery of Water Resource Plans defined by the Act and Basin Plan in forms compliant and consistent with the Basin Plan by 30 June 2019; and
 - c. the protection and improvement of the environment of the Murray-Darling Basin, which is itself dependent upon the implementation and effective operation of the Basin Plan.
- F. The South Australian Government is concerned at recent reports as to alleged non-compliance with the Basin Plan, the current state of implementation of the Basin Plan, and whether the Basin Plan will achieve its objects and purposes and those of the Act. It considers that an independent Commission of Inquiry with coercive powers is required to inquire into these and related matters.

I, the Governor, with the advice and consent of the Executive Council, DO HEREBY APPOINT YOU to be a Commissioner to inquire into and report upon the following matters:

1. Whether the Water Resource Plans defined by the Act and Basin Plan (which are to include the long-term average sustainable diversion limits for each Basin water resource) will be delivered in full and in a form compliant and consistent with the Basin Plan by 30 June 2019.
2. If any Water Resource Plans are unlikely to be delivered in full and in a form compliant and consistent with the Basin Plan, the reasons for this.
3. Whether the Basin Plan in its current form, its implementation, and any proposed amendments to the Plan, are likely to achieve the objects and purposes of the Act and Plan as variously outlined in ss.3, 20, 23 and 28 of the Act, and the 'enhanced environmental outcomes' and additional 450 GL provided for in s. 86AA(2) and (3) of the Act, respectively.
4. Whether the underlying assumptions in the original modelling used to develop the objects and purposes of the Act and the Basin Plan have been sufficiently adjusted for the impact of improved technologies.

5. If the Basin Plan is unlikely to achieve any of the objects and purposes of the Act and Basin Plan and/or the ‘enhanced environmental outcomes’ and the additional 450 GL referred to above, what amendments should be made to the Basin Plan or Act to achieve those objects and purposes, the ‘enhanced environmental outcomes’ and the additional 450 GL?
6. Any legislative or other impediments to achieving any of the objects and purposes of the Act and Basin Plan and/or the ‘enhanced environmental outcomes’ and additional 450 GL referred to above, and any recommendations for legislative or other change if needed.
7. The likely impact of alleged illegal take or other forms of non-compliance on achieving any of the objects and purposes of the Act and Basin Plan, and the ‘enhanced environmental outcomes’ and the additional 450 GL, referred to above.
8. In relation to any found instances of illegal take or work, whether appropriate enforcement proceedings have been taken in respect of such matters and if not, why.
9. Whether, in any event, the enforcement and compliance powers under the Act are adequate to prevent and address non-compliance with the Act and the Basin Plan, and any recommendations for legislative or other change if needed.
10. Whether monitoring, metering and access to relevant information (such as usage data) is adequate to achieve the objects and purposes of the Act and Basin Plan and the ‘enhanced environmental outcomes’ and additional 450 GL referred to above.
11. Whether water that is purchased by the Commonwealth for the purposes of achieving the objects and purposes of the Act and Basin Plan and/or the ‘enhanced environmental outcomes’ and the additional 450 GL referred to above will be adequately protected from take for irrigation under water resource plans, and any recommendations for legislative or other change if needed.
12. Whether the Basin Plan in its current form, its implementation, and any proposed amendments to the Plan, are adequate to achieve the objects and purposes of the Act and Basin Plan, the ‘enhanced environmental outcomes’ and the additional 450 GL referred to above, taking into account likely, future climate change.
13. Any other related matters.

AND I:

1. Require you to begin your inquiry as soon as practicable.
2. Require you to make your inquiry as expeditiously as possible.
3. Require you to submit your final report by 1 February 2019. The provision of interim reports is at the discretion of the Commissioner.

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Two opposite impressions come from the experience of conducting this Royal Commission. The first is one of admiring praise for the enactment of the *Water Act 2007* (Cth) (**Water Act**) and, with crucial qualifications, for the making of the *Basin Plan 2012* (Cth) (**Basin Plan**) under the Act.

The second is one of deep pessimism whether the objects and purposes of the Act and Plan will be realized. There are many ways in which study of the grand national endeavour in question leaves a decidedly sour taste.

The focus required by the Terms of Reference for this Commission is on the last decade or so: the Water Act and the Murray-Darling Basin Agreement broadly dating from 2008. It is in these 10 years or so that one can see the outstanding idealism and the egregious shortcomings that produce the two abiding but opposite impressions.

As with most ambitious social and governmental projects, and especially those with tremendous long-term aims, the present approach to our stewardship of the Murray-Darling Basin (**Basin**) is a combination of history and evolving practice on the one hand, and a pivotal new turn in direction on the other hand. It is notorious that the history of the dealings with the Basin by Australia's settler society is not completely a happy one, or one that reflects nothing but credit on the acumen or prudence of our forebears. Pioneering was not always splendid and praiseworthy.

Books, and other estimable scholarship and polemic, have been written already about this problematic history. This Commission will not add to that literature, but has drawn on a deal of it (see Chapter 1). There are some elements of that history that warrant an opening emphasis in a report that seeks to explain adverse conclusions and to support remedial recommendations.

Some history

The location of the Basin immediately inland of the first settlements is evocative. (Without disrespect, the rather wetter island of Tasmania does not enter these considerations. Neither do the later settled, and still much less developed, tropical north of the continent. Only the Northern Basin has a fringe influence of tropical rains and flows, of marginal significance to the issues under report.) The Basin, in effect, is what became gradually known to the settlers as the vain searches for the putative great inland sea petered out in the spectacle of boats dragged into dry sandhills. The coastal South-East of the continent dominated the first phase of settlement, as indeed it continues to do with respect to population, employment, urbanization and voters.

The stock watering of nascent grazing ventures in the Basin was no doubt critical, but of lesser significance in the main eventual collision of short-term economic and long-term environmental values. That collision is the core narrative addressed by our national Parliament, and the Parliaments of New South Wales, Victoria, South Australia

and Queensland, in reaching the political consensus that is manifested in the Water Act. It is irrigated agriculture (including of forage for livestock, mostly cattle) that presents the chief aspect of the Basin's developed character. And that aspect really began to be acquired little more than 130 years ago, and became prominent, outside Victoria, only after the Second World War.

Although navigation was once vital as an interest of the colony of South Australia, on the Murray, and occasionally with freight traffic up and down the Darling, this use too of the Basin's water resources has lost its former economic and social importance. It lingers in the terms of the Commonwealth *Constitution*, including particularly sec 100, to which further reference is made below.

In the period leading up to Federation, and for several decades afterwards, two features of development of the Basin stand out. The first is the relative precocity of Victoria in later colonial times, so far as concerns serious irrigation. Mr Alfred Deakin was one of the most influential of the Victorian leaders in this effort. (Although it was not an untroubled progress: in 1903, after economic collapse and drought, Mr Deakin was privately describing irrigation as 'an ideal which had failed'.)¹

The second salient feature of the first phase of Basin irrigation development produced the irreversible alteration in the Basin water resources that is the basic ground of all present administration. That is, in the name of 'conservation', the rivers began to be 'regulated'. Both these terms are redolent of the spirit of heroic and beneficial engineering, eager to tame and train the forces of nature to the ends of a growing civilization.

'Conservation' in this historical usage must not be mistaken for a later 20th Century meaning which is directed to saving habitats, species and their ecology. International Anglophone usage in the late 19th and early 20th Century used 'conservation' to describe, most particularly, the storage of water from otherwise natural flows, in order to make it available later, as desired by (say) irrigators. In many contexts around the world, such as America and Australia, it was meant to provide against the high risk of drought.

By doing so, of course, 'conservation' projects would enable regions otherwise too arid to farm (as opposed to graze) to bear more profitable crops, and denser settlement to take root. For some advocates, it was partly a response to the crude geopolitics (and imperial racism) conveyed by the slogan 'Populate or Perish!' Contemporary polemic, by politicians, technocrats (as we would now call personages such as Major Mitchell, Surveyor-General) and irrigation boosters, was brimming with visions of massive irrigation schemes transforming unproductive dry, dull country into busy farms, orchards, meadows and gardens.²

'Regulation' was an allied concept, equally apt to justify massive engineering. Dams, weirs, bank reformation, snag removal and canalization are the more obvious physical modes of 'regulating' the rivers. The word conveys the evening out, or tempering, of the

natural variations that would be the essence of an ‘unregulated’ river, whether in moist or dry regions and climates.

Together, these key 19th Century policies — articles of faith, perhaps — inexorably ordain their own (relative) permanence. Past a point of no return (long passed, in the Basin), the dams, weirs, development on banks and floodplains, and operating rules are not feasibly able to be eliminated. Even if (which it is not) it were desirable to dream of returning the Murray (say) to its supposedly pristine or pre-settlement, pre-development state, it is almost certain that doing so is now for all practical purposes virtually impossible (not to say, as should be stressed, quite simply undesirable). The hydrological and hydraulic factors alone make the reversal of our engineered rivers by way of (unrealistic) restoration unavailable as an option.

These policies were once more confidently seen, and commended, as the means by which the Basin water resources were to be used as a ‘servant’ or resisted as an ‘enemy’.³ Roughly, the efforts against drought and flood correspond to these two related views, respectively. It is clear, surely not only in retrospect, how radical an alteration of the Basin’s rivers and waters was destined to be achieved whenever their ‘conservation’ and ‘regulation’ reached a critical extent — as they did long ago. How much water flowed, when it flowed, where it flowed, with what effects on land, soil, plants, animals and other lifeforms — all these dimensions and characters have been transformed.

Thus, the mitigation of flood and the provision of irrigation water (including by using the stream as a delivery channel) are properly to be seen as ineradicable artificial qualities of Basin rivers. (There is nothing inherently wrong with being artificial, of course.) That is not to say that major improvements to the present engineering of the Basin (or their opposite) are beyond contemplation — far from it, as recent developments in the Basin exemplify. But it does involve a basal acceptance of a highly engineered state of affairs when evaluating the aims of the Water Act, and the progress to achieving them.

These matters of longer term history and culture affect, as noted further below, the proper reading of the central provisions of the Water Act, that are most significant for South Australia as the downstream Basin State (see Chapters 2, 3 and 8). They also produced the evident rivalries with resultant political tensions, upstream and downstream, that in large part still pervade the administration of the Basin. The Water Act represents a genuinely historic advance away from those internecine differences, but cannot cure all.

Finally so far as concerns more distant history with present relevance, it is fair to remark on the considerable peculiarities of each of the Basin States. (Without disrespect, the position of the Australian Capital Territory, both hydrologically and constitutionally, requires no specific attention in this report.) Victoria was the early mover, a steady booster of irrigation and strongly assertive of that priority at Federation. Its defence and promotion of Victorian interests — largely of irrigation industries and communities — have not slackened. So much is to be expected in a democratic Federation.

New South Wales developed its irrigation industries and areas much later and more slowly. A huge increase followed the last War, and the last three decades or so have witnessed very considerable expansion. On any view, the aggrandizement of New South Wales irrigation interests has been a bi-partisan political project in New South Wales, especially in its dealings with the other Basin States. Again, how else could it be when voters elect a State legislature and thereby the State executive government?

Queensland is a recent entrant in substantial irrigation development, comparatively speaking. Its Basin rivers, all tributaries of the Darling, contribute hugely distant and attenuated flows from run-off some of which is tropically influenced, so far north does the Basin extend. But those rains only spasmodically produce floods, and many of the streams are properly regarded as ephemeral. Perhaps because of this hydrologically more tenuous connexion, Queensland was so removed from former political differences inter-colonially, as once to have its Chief Justice proposed to be a neutral arbiter.⁴ Nowadays, the position of Queensland upstream of the Darling, literally and economically speaking, is the topic with sharpest point. Together with the practice of floodplain harvesting it shares with northern New South Wales, these are issues that loom large as one pays regard to the farming communities now so adept at cotton-growing, to mention one more recent evolution.

That leaves South Australia. In more ways than one. Downstream, contributing negligible run-off, dependent for crucial agriculture on the reliability of ultimate deliveries from across the border of large volumes of water. And, most poignantly at present, South Australia is the site of the globally prized wetlands and features called the Coorong (and Lower Lakes), themselves a kind of canary in the coalmine.

The disaster they may portend, of course, is the loss of sustainability to which some general comments turn further below.

South Australia has not succeeded in its repeated attempts to obtain a more advantaged position than it has had, in relation to sharing the waters of the Basin (see Chapters 1 and 9). Writ large, South Australia's position has elements of the hackneyed downstream apprehension and as a clichéd object of upstream disapproval.

These historical observations are dominated by the experience of settlement, the processes set in train in 1788. That is appropriate, given the reasons why, as noted below, the historic pivot sought to be carried out by the Water Act was seen as imperative. That is, we need to fix what we have spoiled, and we are spoiling. The 'we' in that mea culpa, it must be admitted, does not include the traditional owners, the First Nations, the Aboriginal inhabitants of the various Basin countries. The indigenous ancestors of those of us who are Aboriginal citizens of Australia are not, in any decent sense, responsible for the plight that the Basin is in.

A respectful regard for the prior rights of the traditional owners and a dignified recognition of historical disregard of their continuing attachments and responsibilities

for the river countries combine to mandate a better way be found and followed (see Chapter 11). Officially expressed sentiments are not lacking in this direction, but concrete and routine actions have not sufficiently ensued. It is an area where urging reform can feasibly lead to favourable change, and soon.

Constraints on change

The present condition of the developed Basin, principally concerning irrigated agriculture, is obviously a product of the histories and cultural movements sketched above. It is, in the nature of such human activities, still dynamic — change is the normal state for farming, commerce and associated technology. The size and location, make-up and prosperity of the communities engaged in or affected by irrigated agriculture are all dynamic factors. Growth is not guaranteed. There are winners and losers, as in all market driven business.

Nonetheless, the recent history — perhaps better called the politics — of the Basin is acutely framed by what may be called constraints that limit or discourage what may otherwise be regarded as beneficial change or improvements. (This is, in this Overview, a wider concept than the particular kind of constraint, called by that term, considered in Chapter 8.) These general constraints consist of geographical (physical) features, engineered components, social and fairness issues, and economic implications. This presence is not to be regretted — rather, they are inherent in the necessity to manage the Basin water resources for worthy ends, in a democracy, whose population has civil rights as well as real environmental concerns.

The physical features and engineered components, as discussed above, present the challenge of handling a permanently altered river (and rain) system. The constant study of its hydrology (and hydraulics) should become, and continue to be, a national priority in the funding of science and technology for the national interest — happily, also unequivocally in the global interest of good environmental stewardship. Obviously, they constitute constraints in the sense of limits imposed on the volume, timing and location of flows, and the possible availability of water for consumptive uses of which irrigation is the centre of this report's attention. But the imperfect nature of our scientific and empirical knowledge of how they operate, in full detail, and as they change and vary, represents a major constraint on the scope for beneficial change.

It was once the case that Australia's water expertise was a human resource of distinction and earned renown. So much the better in the driest inhabited continent. And it was manifest in this Commission that Australia still has available some very estimable scientists, researchers and thinkers, deeply engaged in the topics raised by the management of the Basin (see Chapters 4, 5, 6, 7, 9, 10 and 11). Unfortunately, the future of this leading cadre of scientists vital to our care for the Basin water resources is clouded. Public funding has been unwisely cut.

Almost as dangerously, the habitual behaviour of the Murray-Darling Basin Authority (**MDBA**), and to a lesser but alarming extent the CSIRO, is marked by an unfathomable predilection for secrecy. That is the bane of good science — and an obstacle to the democratic and informed design and improvement of public policy that must be based on science. A sea change is required to remove this aspect of the general constraints on beneficial change.

A deal of evidence and submissions to the Commission presented the picture of how the climate in the Basin — most dramatically, drought — and the reformed management of its water resources — the headlines being reductions in water for irrigation — impact on the people involved. Individuals, local communities and whole regions were cogently described as facing a range of actual or threatened deprivations, both material (ie financially palpable) and social-psychological. This picture is the most enduring after nearly one year of travel, hearings and reading. It is affecting. It must never be removed from the centre of our national consideration of the Basin.

The massive importance of irrigated agriculture in the Basin is hard to overstate. It lends itself to economic statistics (eg see Chapters 1, 4 and 6), but at heart it is a question of people, as workers, families and in society. It is surely one of the brightest hopes for sustainable production and export of high quality foodstuffs to the enormous and growing markets among the neighbouring populations of Asia. Nothing in this report should be understood, let alone feared, as a voice against the continued enterprise of our already top notch irrigation farmers.

(However, a word of caution. Dryland farming, and grazing, of course, remain very substantial modes of production and ways of life in the connected watersheds that comprise the Basin. They are constantly significant as alternatives — adaptations — when the cost or risks of irrigation farming are unattractive, that is, in the relatively confined zones within the Basin where irrigation is at all feasible. Again, nothing in this report should be taken to disparage the great contributions, and promise, of that different way of producing food and fibre for our customers to the North.)

It is therefore a key element in the Water Act's scheme for the beneficial management of the Basin's water resources that constant and compelling regard be had to the social well-being of those who live and work in the Basin, and most pointedly those whose livelihoods depend directly or indirectly on irrigated agriculture. This concern can be viewed from two different vantage points. First, the dynamic and contestable nature of market economics as they affect that kind of farming cannot be forgotten. Second, national gains and benefits, including environmental safeguards and enhancements, must not be sought at the particular expense of, or losses to, the smaller groups of Australians who live in the Basin and work in irrigated agriculture.

In short, a kind of constraint on proposed change to Basin water resources management is that we should always take great care to understand and alleviate the detriments that will be suffered by our fellow Australians most affected by, especially,

reductions in the availability of water for current levels, let alone future expansions, of irrigation. It being in the national interest to go less hard on the rivers, the whole nation (and not only the farmers and related others) should pay — both compensation in the strict sense, and for adjustments more generously.

That imperative of fairness or social justice is not exactly large in the scheme of the Water Act, although the sentiment is broadly at work in some aspects of the Act. Principally, the former expedient of buying back water entitlements by voluntary agreement could be seen as ensuring that farmers relinquished the value of that (uncertain) future water in return for an acceptable price. Unfortunately, that familiar market basis for according fairness to those affected by a legislated scheme for public benefit is now itself capped, and so severely constrained, in an unwise response to real community disquiet (see Chapters 4, 5, 7, 8 and 9).

Finally, as to these systemic general constraints, the Water Act poses at various decision points the test of neutral socio-economic effect. Undoubtedly, that recognizes, by way of understandable if unstable trade-off, the fraught politics that accompanied passage of the Water Act and the later making of the Basin Plan. Perhaps too much has been conceded. As explained below, the cardinal aim of the Water Act is contradicted by any notion that improvement can come only at no cost. In a sense, as explained below, the notion of ‘cost’ has to be teased out, so as to appreciate differences between private and public, short-term and long-term, regional and national, national and global, human and environmental, to name only some of the dualities in play.

The progression of historical developments and these general constraints against change in Basin management might lead some to the default position that nothing should be done to deprive, say, any irrigator of any water already promised. The rhetoric is easy. But that would be to play a grim game of musical chairs, arbitrarily favouring the current dispositions as they stood when we decided enough was enough. Happily for Australia, we did no such thing. The pivot enacted by the Water Act was much more principled.

The Water Act pivot

If the core achievement of the Water Act was preceded by anything similar anywhere else in the world, or for that matter emulated since, this Commission did not discover it. It looks as if the political success of 2007 is a deserved distinction for this country. It has its special and defining quality in the combination of a legislated acceptance of a basal fact about environmental degradation, a legislated requirement that it be redressed, and a legislated insistence that the administration of the statutory scheme to do so must be based on science.

The Federal genesis of all this, and its most prominent attributes, are spelled out in this report (see Chapters 1, 2 and 3). The missed opportunities of the 1890’s — leaving water management to the States, preventing Commonwealth laws regulating trade and

commerce from abridging State rights to the reasonable use of the waters of rivers for conservation or irrigation — meant that the topic on which most words at the Convention Debates were uttered was one of those about which the nation most sorely lacks national power to address. The interplay of the Commonwealth’s external affairs legislative power enlivened, for the Basin, by international treaties such as to protect migratory birds, and its vicarious legislative power on matters referred to its Parliament by one or more of the States, renders Basin water resources management a constant object of legal and political-scientific concern and study. The full ramifications of this are beyond the scope of this Commission, but extend to the question of any one State’s (eg South Australia’s) legitimate concerns with the whole Commonwealth scheme, to which further comments are directed below (and see further in Chapter 2).

A proper reading of the Water Act involves appreciation of the somewhat mixed registers of language in its central provisions. There are environmental, international, aspirational and figurative words and phrases alongside the more sober words of command and prohibitions. The Water Act may be remarkable in the extent of this mixture, but the interpretive task is the same as for any statute. Context and so-called purpose are necessary considerations in construing the enacted text. But, at bottom, the provisions with which this Commission has been most engaged are not obscure (see Chapter 3).

It is by means of the Basin Plan that the objects of the Water Act are, in the main, to be achieved. The purpose of the Basin Plan is the integrated management of the Basin water resources including by providing for ‘the establishment and enforcement of environmentally sustainable limits on the quantities of surface water and ground water that may be taken’ (para 20(b)). It looks to provide for ‘Basin-wide environmental objectives for water dependant ecosystems of the Murray-Darling Basin’ (para 20(c)).

At the same time, the Basin Plan is to provide for ‘the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes’ (para 20(d)), consistently with one of the objects of the Water Act that its giving effect to the relevant treaties ‘promote the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes’ (para 3(c)). As well, the MDBA and the Minister must ‘take into account the principles of ecologically sustainable development’ (para 21(4)(a)), defined to include the principle that ‘decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations’ (para 4(2)(a)). This repeated language may have been the source of the very unhelpful slogan of a ‘triple bottom line’.

That slogan, or tendentious paraphrase, was probably conceived innocently. It has later morphed into a misleading and dangerous misunderstanding, not always so innocently. Originally, it could be tolerated as a colloquial way of emphasizing that the financial balance-sheet approach to evaluating industries or enterprises (such as irrigated agriculture) was no longer a sufficiently ample measure of things — social

and environmental factors and consequences also had to be included in relevant policy considerations. As such, the slogan was salutary, reminding us that the monetary revenues from farming are not a complete yardstick of its success or merits.⁵

The later misguided use of this figure of speech, as a slogan in place of the enacted statutory text, is discussed further below. At this point, it is enough to note how oddly it sits, in its later misleading guise, next to the clear words of the Water Act, to which this Overview now comes.

Preparation of the Basin Plan must have regard to ‘the fact that the use of the Basin water resources has had, and is likely to have, significant adverse impacts on the conservation and sustainable use of biodiversity’, and ‘the fact that the Basin water resources require, as a result, special measures to manage their use to conserve biodiversity’ (para 21(2)(a)). Other provisions of the Water Act add to the force of these relatively straightforward — albeit remarkable — legislated ‘facts’ (see Chapter 3).

In particular, the ultimate quantitative control imposed by the Water Act is the sustainable diversion limit (**SDL**), that is intended to cap the volume of Basin water taken for consumptive use, such as for irrigated agriculture (subsec 22(1) item 6 and sec 23). It must, in turn, ‘reflect an environmentally sustainable level of take’ (**ESLT**) (subsec 23(1)). This involves a crucial definition (subsec 4(1)):

environmentally sustainable level of take for a water resource means the level at which water can be taken from that water resource which, if exceeded, would compromise:

- (a) key environmental assets of the water resource; or*
- (b) key ecosystem functions of the water resource; or*
- (c) the productive base of the water resource; or*
- (d) key environmental outcomes for the water resource.*

Some of these defining expressions are themselves defined, but not so as to detract from the ordinary English of this essential element of the Water Act’s scheme. Right at its heart is the concept of a level of take beyond which key environmental values would be compromised. And, lest there be captious doubt, the word ‘compromise’ has nothing to do with trade-offs, give-and-take, split-the-difference, or the like. It has another colloquial meaning, clearly, to the effect of danger, risk or weakening resistance to harmful outcomes — as in, ‘smoking compromises human health’.

The central role of these provisions can also be seen in the object of the Water Act, ‘to ensure the return to environmentally sustainable levels of extraction for water resources that are overallocated or overused’ (subpara 3(d)(i)). That is accompanied by the further object ‘to protect, restore and provide for the ecological values of ecosystem services of the Murray-Darling Basin ...’ (subpara 3(d)(ii)). It is important to note in this

context that the object ‘to maximise the net economic return to the Australian community from the use and management of the Basin water resources’ is expressly subject to these two earlier quoted objects (subpara 3(d)(iii)).

The historic pivot accomplished by the Water Act — in precept, that is — was thus to mandate that we, Australians and humans, had to reduce the amount of water being taken for (mainly) irrigation in the Basin. As enacted law, the solemn and binding expression of our democratic will was (and remains) that we have taken too much, and must stop doing so. Thus, a legislated national program of reduced water for irrigation. It is simply impossible to reduce that agricultural input without having some effect, sometimes grievous, on pre-existing or planned private enterprises. That is why market sales (the vilified ‘buybacks’), compensation and adjustment provisions are critical to a socially just approach.

But it would be absurd, and against all central requirements of the Water Act outlined above, for the national program to halt or falter in the face of demonstrated consequences of reduced water for irrigation leading to adverse impact on some farming enterprises. The Water Act requires less water to be taken, and so provisions in it recognizing the interests that may thereby be harmed (at least, financially) have to be read as fitting into the scheme’s defining characteristic, its cardinal feature, that less water will be taken than in the past — measured from an historical baseline (in 2009).

Triple bottom line myth

The most pernicious of the polemical uses to which the slogan of the triple bottom line has been turned is to argue, in various forums and with varying approaches to frankness, that the triple bottom line requires the volume of reduction in consumptive take (sometimes called the water to be ‘recovered’, ie for the environment) somehow to be less than it would be on solely the environmental grounds stipulated in the Water Act, whenever it can be seen that recovering less would benefit farming, therefore the economy and therefore society. It is, admittedly, hard not to travesty the argument, so bereft as it is of a serious purposive reading of the actual enacted text.

No-one, in or out of this Commission, has explained how this triple bottom line is meant to work, directed as it must be to a numerically designated ‘limit’ of take. If all three dimensions are operating equally and simultaneously, as the slogan and the statutory term ‘optimises’ might at first sight suggest, how does a statutory decision-maker adjust — up or down — the recovery target by reference to each of the three dimensions? They are, at least partially, incommensurables. And what is the real difference, when it comes to irrigated agriculture, between economic and social outcomes? How far does one project in order to assess the best available outcomes?

None of these imponderable puzzles exists on the plain reading of the Water Act, by which the environmental threshold level (no ‘compromise’ of key environmental

values) is set — and then as much irrigation water as can sensibly be made available is made available, in order to optimise the economic and social outcomes generated by the continuation of modern and efficient irrigated agriculture. Of course, from time to time, not least because of the inter-generational ecologically sustainable development principles, social outcomes — and even economic outcomes — may well come to be seen as mandating less rather than more (or the same) volume of consumptive take. But the true, single, bottom line is that no more water may be taken than at the level beyond which the key environmental values would be compromised.

The late Professor John Briscoe, whose distinguished career culminated at Harvard, was a doyen of international water resources management studies. His insights and eminence were acknowledged by, among many other weighty assignments around the world, his selection to play a leading role in the 2010 High-Level External Review Panel convened by the MDBA to scrutinize and critique the beleaguered draft Guide to the proposed Basin Plan (**Guide**) (see Chapter 4). In 2011, he corresponded with the Senate's Standing Committee on Legal and Constitutional Affairs, which has published his notable letter dated 24 February 2011, by way of a submission by him to the Committee's inquiry into provisions of the Water Act. The whole letter is instructive, as might be expected. The following extracts pungently address the triple bottom line myth, expressing conclusions which command agreement. (As opposed to some other conclusions expressed in his letter, where Professor Briscoe is arguably too pessimistic, concerning in particular the aptness of the Water Act itself. The letter, to repeat, deserves re-reading.)

The substance of the Act 2: Balance between the environment and human uses

There are claims that the Water Act of 2007 was not an environmental act but one that mandated balance between the environment and human uses. Digging deep into the turgid 236 pages of the Water Act for confirmatory phrases, the Honorable Malcolm Turnbull claims, now, that the Act was all about balance.

To a disinterested reader this is poppycock. The National Productivity Commission's interpretation of the Water Act (2007) is that "it requires the Murray-Darling basin Authority to determine environmental water needs based on scientific information, but precludes consideration of economic and social costs in deciding the extent to which these needs should be met". Similarly, the High-Level Review Panel for the Murray Darling Basin Plan (of which I was a member) stated that "The driving value of the Act is that a triple-bottom-line approach (environment, economic, social) is replaced by one in which environment becomes the overriding objective, with the social and economic spheres required to "do the best they can" with whatever is left once environmental needs are addressed."

This interpretation was also very clearly (and reasonably, in my view) the interpretation taken by the Board and Management of the MDBA in developing the Guide to the Basin Plan. This was transmitted unambiguously to the members of the High-Level Review Panel for the Murray Darling Basin Plan.

(As an aside, I have wondered whether this logic is derived from (a) a belief that this is the right thing to do or (b) an understanding that this was the only constitutionally-defensible approach given that state powers were being abrogated in the name of meeting the Commonwealth's Ramsar obligations.)

The substance of the Act 3: The roles of science and politics

The Act is based on an extraordinary logic, namely that science will determine what the environment needs and that the task for government (including the MDBA) is then just to “do what science tells it to do”.

In the deliberations of the High Level Review Panel, we pointed out that, taken literally, this would mean that 100% of the flows of the Basin would have to go to the environment, because the native environment had arisen before man started developing the basin. The absurdity of this point was to drive home the reality — that the Murray is one of the most heavily plumbed river basins in the world, and that the real choice was to decide which set of managed (not natural) environmental (and other) outcomes were most desirable.

The job of science in such an instance is to map out options, indicating clearly the enormous uncertainties that underlie any scenario linking water and environmental outcomes. In its final report, the High-Level Review Panel stated:

Far from being “value neutral”, a set of value judgements are fundamental to the aspirations of all Acts, including the Water Act. ... It is a fundamental tenet of good governance that the scientists produce facts and the government decides on values and makes choices. We are concerned that scientists in the MDBA, who are working to develop “the facts”, may feel that they are expected to trim those so that “the sustainable diversion limit” will be one that is politically acceptable. We strongly believe that this is not only inconsistent with the basic tenets of good governance, but that it is not consistent with the letter of the Act. We equally strongly believe that government needs to make the necessary tradeoffs and value judgements, and needs to be explicit about these, assume responsibility and make the rationale behind these judgements transparent to the public.

A basis in science

The crucial steps of setting a SDL, which governs its localized component parts, and observing its mandatory reflection of the ESLT, are among the most important decisions called for by the Water Act. They are forbidden to be politically dictated, say, by Ministerial directions (eg para 48(5)(b)). Their nature is ‘factual or scientific’, and so they are to be addressed as the Water Act requires for such matters.

That is, both the MDBA and the Minister, who between them are statutorily responsible for making the Basin Plan, ‘must ... act on the basis of the best available scientific knowledge’ (para 21(4)(b)). As appears throughout this report, this is a serious and fundamental requirement that it appears has most regrettably not been consistently obeyed (see Chapters 3, 4, 5, 7, 9 and 10). It is most certainly not some obscure technical point that could excite only administrative lawyers.

To the contrary, the invocation of science, with the strong epithet ‘best’ to qualify it, brings in its train the demanding and self-critical traditions of empirical enquiry. It definitionally recognizes the provisional and improvable quality of the state of art. It proceeds by testing, and thus needs exposure and debate. Above all, it shuns the ipse dixit of unexplained, unattributed, blank assertions, such as too often emanate at crucial junctures from the MDBA.⁶ Perhaps the MDBA was not entirely responsible for this ‘aberration’, as Professor Briscoe described it in his letter to the Senate Committee. He suggested it resulted from the ‘institutional power concentration’ created by the Water Act.

Leaving blame aside, it can be readily accepted that Professor Briscoe described in 2011 what he had experienced, and what has continued far too much and for far too long. That is, the highly secretive ‘we will run the numbers and the science behind closed doors and then tell you the result’ MDBA Basin Plan process that Professor Briscoe scorned as ‘the Commonwealth-bureaucrats-and-scientists-know-better-than-states-and-communities-and-farmers-do model’. He deplored the excessive MDBA ‘confidentiality’ process, which meant ‘there was very little recourse in the process to the immense world-leading knowledge of water management that had developed in Australia during the last 20 years’. He wrote, ‘time and again I heard from professionals, community leaders, farmers and State politicians who had made Australia the widely acknowledged world leaders in arid zone water management that they were excluded from the process’.

Inherent uncertainties and adjustments

As Professor Briscoe pointed out in 2011, the very nature of the task in fixing an ESLT to derive a SDL approaches a paradox: a precise numerical quantum with respect to an always imprecise and uncertain value. But this is not as odd as it may at first seem: it is common in life, and in the common law itself, to posit a standard in evaluative and generic terms which is then applied to particular cases so as to decide on which side of a shadowy line they fall. Reasonableness, in life and the law, is a standard that is used in this fashion day in and day out, without fear of paradox.

So too with the statutory demand for a ‘level’ which sets an enforceable limit on consumptive take — the science weighs all the best approximations, estimates and predictions and supports (as it must, in order to be a legal limit) a single figure, to quantify the volume of acceptable diversion of water. Of course that exercise does not involve the fantastic idea that anyone could pretend to attribute numerically exact values or quanta for these inherently uncertain phenomena — and no-one serious has ever pretended to

do so. But that is no warrant to treat science's best efforts at quantification as amenable to extra nudging or shoving on the grounds of their inherent uncertainty and so as to meet non- (or anti-) scientific pressures such as vested commercial interests or sectional partisan politics.

The principled response to the seeming paradox is the usual scientific and fair-minded one — to re-visit the question sufficiently frequently and with an open mind, so as to update data, embrace fresh insights and weigh up again the many elements in play. The Water Act and Basin Plan do recognize this elementary proposition with fairly elaborate provisions for so-called adjustments (see Chapters 7, 9 and 10). Unfortunately, within their excessively complex procedures is embedded initial modelling, with all its inevitable flaws. The spirit of genuine modelling to be used for real-world dispositions of actual water surely calls for a due modesty and a positive desire to work improvements. One way to help that happen would be full disclosure (and explanation) of the initial modelling itself. Notoriously, the MDBA has not done this, and will not do this.

Because the river systems are not static, and the climate is changing, the need to carry out appropriate adjustments of, say, the ESLT and the SDL, is pressing. The MDBA shows no sign of aligning itself with that clear scientifically mandated course.

Setting the ESLT

As things turned out, the eventual setting of the ESLT in order to produce the SDL was a major failure of process. The MDBA and the Commonwealth Government of the day can be seen not to have followed the plain requirements of the Water Act. Instead of trying to fix the limit beyond which key environmental values would be compromised, they appear to have set out to gauge the limit of sectional or political tolerance for a recovery amount. The story of this cynical disregard for the clear statutory framework for decision-making on this crucial measure is unedifying, to the lasting discredit of all those who manipulated the processes to this end (see Chapters 3, 4 and 5).

The degeneration of the process seems to stem from the harsh and strident denunciation by some of the Guide, that was released in October 2010. As will be seen, it appears that some public figures regard administrative decisions taken eight years ago as too remote to deserve any further concern. The mindless admonitions 'don't look back', and its vacuous corollary 'moving forward', convey the attitudes of some people who should know better.

In principle, as the Water Act and Basin Plan spell out unmistakably, the SDL is the fundamental measure upon which the legislated protection and restoration of the Murray-Darling Basin ecology depend. It is equally beyond question that the SDL is a measure that applies throughout its period of currency, and is thereafter to be adjusted as appropriate, for application in its next period of currency. That is, the SDL governs future conduct on the basis of the quantum of recovery water assessed by environmental science

at an earlier time. Because it applies during a period, or periods, following the time or times in light of which it was set or adjusted, the SDL inherently invites updating and re-consideration.

However, and critically in relation to the unprincipled attitude described above, the SDL is the foundation of the Act's scheme. It is therefore folly, and unlawful, to disregard the validity of the SDL on the absurd basis that 'that was then, and this is now', or some such vulgarity. Every subsequent step based on a false foundation is a misstep.

These are observations about policy, and the fidelity that officials owe to the legal enactment of policy. And the express possibility of adjustment and amendment of the SDL and the Basin Plan, in the Water Act, suffices to indicate how readily repentance and correction can be pursued — if so desired.

The references throughout this report, and in the Commission's hearings and materials, to the ESLT/SDL determinations being 'unlawful' or 'invalid' should be understood in that context. In particular, this Commission, not exercising judicial power but nonetheless capable of forming legal opinions, is not to be taken as encouraging litigation about these issues. There is, emphatically, no recommendation that South Australia should sue the Commonwealth, the MDBA and the other Basin States over the ESLT/SDL determination.

Nor should this report be read as asserting any legal propositions about which aspects of the ESLT/SDL determinations are justiciable at all, let alone as to their merits, or at the suit of any other persons who may or may not have standing to do so. Further and finally as to questions of legal technicality, this Commission is not expressing any legal view as to the so-called *Blue Sky* point,⁷ namely whether the anterior unlawfulness of the ESLT/SDL determination would entail invalidity of all subsequent and dependent steps in the administration of the Water Act and Basin Plan.

These litigious possibilities are inapt for the broader policy issues raised by the Terms of Reference. Pursuit of them would be, in many ways, unworthy of the substantive and national significance of the concerns which this report does express about the ESLT/SDL determination. That is, the law enacted a grand project, that would be a marvel to realize. Officials were and are bound by the law to determine the ESLT/SDL on the basis of the best available science and for the purpose of preventing compromise of the key environmental values pertaining to the Basin water resources. They have not done so, and not inadvertently. They have failed to disclose the justifications, if any, for their ESLT/SDL outcomes, at least in terms that answer an acceptable description of 'best available scientific knowledge'. That conduct is contrary to the letter and spirit of the Water Act, a sorry state of affairs that did not go unremarked at the time. All this can, and should, be rectified. South Australia has an evident interest in that occurring. It is most definitely not merely a superseded detail of pedantic quibbling. Those who think it smart to say so, should reflect on the damage they threaten to a great national environmental asset, the relation of science to policy, and the rule of law.

Against this background, a recent Ministerial statement does warrant specific attention. The Senate has published the proceedings before its Rural and Regional Affairs and Transport Legislation Committee held on 26 October 2018, in the course of which Senator Anne Ruston, representing the Minister for Agriculture and Water Resources, made comments apropos this Commission's Terms of Reference, including the following:

To start re-prosecuting whether the plan was legal, valid or, I suppose, correctly established in the first place certainly was a particularly dangerous thing to be doing six years into the implementation of a 12-year plan.⁸

It is fair to note that these words are selected from ex tempore answers, in discussion, to questions and about topics which are properly political, and none the worse for that. It is also proper to note that the Senator was not specifically addressing the issue of ESLT/SDL determinations and their ongoing functions in the implementation of the Basin Plan. And of course her statement has the protection of parliamentary privilege.⁹

It goes far too far to read those unscripted words as counselling a disregard for the due observance of legal requirements. Ministers do not do that, in common experience. Members, too, can be expected to call for laws to be amended or repealed, rather than flouted. This is not the kind of concern that Senator Ruston's words provoke.

Rather, whatever was meant by describing a course of enquiry as 'dangerous', half-way through the first Basin Plan period, on any view it does matter whether the ESLT/SDL determination satisfied (and thus still satisfies) its legislated purpose of protecting the Basin water resources. If it did, and does, not comply with that part of the law, it is not 'dangerous', in any sense, to say so and then to turn to questions of rectification.

It may be that Senator Ruston was trying to convey that in her opinion, and therefore perhaps in the Government's or the Minister's opinion, there is no substance in doubts about the lawfulness of the ESLT/SDL determination. That would be an important and interesting point to make: it is a pity that neither the MDBA nor the Government has published reasoned and substantiated responses to the detailed issues going to that question which have been raised in this Commission.

One thing should be stated clearly lest Senator Ruston's words, surely without this being intended, be understood by officials responsible for administering the Water Act and the Basin Plan as an encouragement to overlook or disregard a misstep in setting the ESLT. Simply, the rule of law and the environmental protection purpose of the ESLT make that unthinkable.

Adjustment of the SDL and the Northern Basin Review

The inherent uncertainties, the contestable evaluative assessments and, above all, natural variability and climate change combine to render it vital for the fundamental measures by which the Basin Plan operates, to be re-visited, reviewed and adjusted appropriately. It is an aspect, though not completely, of the highly desirable approach of adaptive management that a complex system and scheme such as the Basin and its Basin Plan cry out for. As recorded in this report, it is accordingly of great concern for the future success of the Basin Plan (and thus the Water Act) that two of the supposedly accomplished reviews are so problematical (see Chapters 7 and 10).

The philosophy of the complicated provisions for adjusting the SDL, and also for the much less formal Review of the Northern Basin (**NBR**), is really quite simple. If the recovery amount can be shown to be more than is necessary (so to speak) for the protection and recovery of the Basin ecology, as regulated by the definitions of the ESLT, then the SDL should be increased accordingly. This recognizes that, following that increase, social and economic interests that are required to be optimised or maximised by the Water Act may justify more water for irrigation. Conversely, so the idea continues, if irrigators (say) can use less water to produce crops by reason of so-called efficiencies, then more water can be recovered for enhanced environmental outcomes, thereby decreasing the SDL accordingly.

So far, so good. This concept does, it is true, beneficially embrace adaptive management, albeit in strikingly obscure and dense Australian legislative style. (Anyone reading Chapter 7 and Schedules 5, 6 and 6A of the Basin Plan for rapid enlightenment, or pleasure, will be sorely disappointed.) It is, rather, the implementation of these procedures that is so concerning, again exacerbated by grossly inadequate disclosure, explanation and consultation on the part of the MDBA.

On the policy merits of the adjustments and reviews to date, the report (eg see Chapter 7) sets out the multiple failures to demonstrate cogent reasons to find the requisite equivalent environmental outcomes or neutral socio-economic effects that the Water Act and Basin Plan stipulate as mandatory pre-conditions of adjusting the SDL. Together with its curious proleptic character, these uncertainties appear to have produced an anomalous SDL that avowedly no longer reflects the ESLT. The alphabet soup of SDL and ESLT should not mislead readers into the mistake of treating that conclusion as bland or technical. One cannot overstate the central, solid importance of the amount of consumptive take being reduced to no more than would compromise the Basin's key environmental values.

In both reviews to date, SDL adjustment mechanism and NBR, a chorus of protest from affected communities and concerned scientists (and lawyers), and very prominently from some engaged farmers, united to seek much more and much better information from the MDBA. It scarcely obtained any favourable response. This state of affairs renders

consultation hollow, and tends to lower the quality of decision-making. Something has to be done to change this MDBA habit of conduct.

Politics of SDL adjustment

As explained in this Report, the process of adjusting the SDL is fraught with difficulty and environmental risk, even if the Water Act and Basin Plan are faithfully obeyed, and even if the process involves the proper extent and intensity of expert, scientific and community scrutiny. Its essence is a possible reduction in the amount of water and flow to be recovered for the purpose of avoiding further compromise of the Basin's environmental values, as noted above. The overt aim of some proponents of the currently proposed adjustments is to enable more water to be used consumptively by irrigators. (No-one in officialdom or industry is presently suggesting an adjustment by way of further cuts in permissible irrigation take.) The nature and gravity of the values and interests at stake in a SDL adjustment are therefore obvious. They present another kind of risk to the integrity of the process, and to the lawfulness of its outcome. That risk is political and imminent. It should be publicly described, and then eliminated.

An adjustment to be justified on the hoped for success of so-called supply measures is required to show that a project in this vein will (perhaps in combination and overall together with others) not merely substantiate a reduction in water to be recovered for the environment, so to speak. Each relevant project must also be such that, in sensible prospect, it (perhaps as part of a package of projects) will produce equivalent environmental outcomes compared to the status quo.

The Menindee Lakes Water Savings Project (**Menindee Lakes Project**) under consideration in New South Wales is discussed in detail in this Report. To put it mildly, the evidence before this Commission concerning it makes it very problematical whether that particular project, even viewed as part of a package of projects, could possibly meet this requirement. As a source of sustained low-flows for the imperilled Lower Darling and as a vital fish nursery, to mention the most pressing aspects of the problem, the Menindee Lakes appear most unlikely candidates for a lawful supply measure project.

Supposedly, these matters required by law to be assessed on the basis of the best available science and to be regulated under analogous environmental State laws governing development, will all be taken into account as and when the New South Wales administrators decide whether to approve the Menindee Lakes Project. Thereafter, the MDBA also has a role to play in deciding whether this particular project should count towards an adjustment.

The shocking fish kill in the vicinity that occurred in the second week of January 2019 had, as at the date of writing, yet to be examined as to causes, results, implications and preventability. Charitably, one may not take as a fixed view whatever politicians say, or bluster, in its immediate aftermath. But the statements attributed in news reporting

to New South Wales Minister Blair that have not been disavowed in the days following publication, would (if they are not fake news) display an attitude at the very pinnacle of official responsibility that is in fact grossly irresponsible. They (if they were actually expressed by or on behalf of the Minister) should be rebutted and retracted.

The published accounts attribute to the Minister two egregious propositions. First, he is said to have insisted that the Menindee Lakes Project ‘must’ proceed.¹⁰ How that could be properly asserted before all the various statutory steps and safeguards have been taken and observed beggars the imagination. It threatens a travesty of lawful administrative decision-making, along the lines of ‘the fix is in’.

Second, Minister Blair is also said to have warned that not proceeding with the Menindee Lakes Project will ‘blow up’ the Basin Plan itself.¹¹ The implied position of the New South Wales Government revealed by this crude language is presumably meant to menace the continued co-operative national endeavour to save the Basin from irreparable degradation. It amounts to saying that New South Wales will do what it can to destroy the Plan if this particular highly problematic project is not guaranteed, in advance, to contribute to a reduction in environmental flows and a commensurate increase in irrigation take.

This is antithetical to everything the Act and Plan are intended to achieve. That is, a scientifically assessed limit on such take so as not to compromise the Basin environmental values.

It may be that the Minister has been cruelly misrepresented, in which case an explanation of the true position of his government can then be evaluated on its real merits. But politicians do politics through news reporting, and are fairly open to be judged on reports they leave uncorrected.

It may be that, had time permitted, this Commission could have sought explanation from Minister Blair. It is admittedly difficult to conceive of any satisfactory explanation that did not include complete retraction of the plain meaning of the news reporting. And it must be noted that his government has not exactly been forthcoming on the many previous occasions it has had the opportunity to explain itself to this Commission.

Constraints and land use

The result of river regulation and engineering, and closer settlement and farming (and grazing) of the floodplains, has been to impose some of the most difficult so-called constraints on altering flows (especially by reducing consumptive diversions) so as to benefit the Basin ecology. It is to be recalled that the overall result of using the system to deliver irrigation water when most needed for lucrative plant growth (ie summertime) has been to reverse the normal seasonality of flows — from higher in late winter and early

spring, to higher in high summer. One does not need a doctorate in biology to appreciate the likely effects on the living and breeding conditions for a large array of creatures.

Another obvious introduced parameter is imposed by the decent social reluctance to damage our fellow citizens' or residents' property and enterprise, if we can help it. And by now there has been a mass of development — built and farmed — on land correctly called floodplains. That has been our historical, cultural and social choice, if more by default than design. The consequence is that engineering works (eg dams and weirs, levees and embankments) and sophisticated river operating rules are dedicated, among other purposes, to mitigating (preventing if possible) the property and financial losses that often follow when a person's private land is inundated.

This report's scope does not extend to consider the much larger, and global, question raised by the human use of floodplains, and the social construct by which their very propensity to flood (and thereby sometimes create fertile and watered soils) has become a 'natural disaster' to be resisted.¹² It is enough here to accept that we cannot decently inflict on riparian owners the unfairly concentrated cost of running our rivers high so as to break banks for the benefit of this ecology.

Hence the elaborate, almost poignant, technological efforts to mimic, imperfectly, those 'floods' by pumping and retaining water above stream, so as to give timely soakings for trees, other plants and the myriad of vertebrates and invertebrates that evolved in these floodplains.

The political choice has been made, it seems with broad community support, for us to refrain from deliberately causing over-bank or 'flood' events which would destroy crops, cramp grazing or damage bridges, fences and culverts — at least, ideally to avoid doing so without permission and compensation. The track record in resolving these conflicting imperatives is poor, and the prospects are equally dim (see Chapter 8).

This state of affairs matters because without such constraints being removed or relaxed, many of the supply or efficiency measures proposed in order to adjust the SDL simply cannot occur. There can be no confidence that the MDBA, the Commonwealth or the States will be able in timely and ordered fashion to obtain, say, easements to permit such flooding from all the riparian owners affected by such proposals. The market price, or voluntary negotiation, for such easements is a self-evidently knotty problem.

One principle should continue to govern amidst this mess: it is not socially just (and may not be constitutionally valid) for riparian owners to bear themselves this kind of cost, in order that all of us, the national community, obtain the undoubted environmental benefits of appropriate over-bank watering (ie as in a version of 'nature'). The Water Act and Basin Plan more or less adopt this principle, but in practice it has become an obstacle to achieving the hydrological and hydraulic reforms that the Basin's river systems need.

Another huge issue in this context cannot be addressed by this Commission, given the Terms of Reference and the average human lifespan. That is the perennial tensions between markets and central (ie government) planning, between individual liberty to work and invest as perceived self-interest beckons and social compulsion to observe limits and restrictions for the common good.

The particular inflection of these near universal themes, in this Commission's scope of work, is the question whether we should continue, by and large, to permit farmers (and investors) to decide for themselves what crops to plant. (One can put to one side extreme cases of noxious plantings, such as may constitute an actionable nuisance.) An attractive initial reaction is strongly to prefer freedom, and thus a market. After all, Canberra (or any city of bureaucrats) is rightly not regarded as a sensible nerve-centre or control room for the delicate, difficult, intensely local (and personal) management of agriculture enterprise. Nor are we at war.

Predictably, some generalized concerns have been expressed to the Commission to the effect that some crops are especially unsuitable to be irrigated in the Basin. It has to be said that cotton and rice have almost been demonized, by some, in this regard. The rhetoric of 'thirsty crops' (and 'greedy farmers') hovers in the background. This attitude should be rejected, as so far has been the case in the administration of the Basin water resources.

Cotton growers and rice farmers are acting as we, historically and nowadays, socially value them to do so. We — Australian society and our governments — positively encourage, as we should, the water resources of the Basin, so far as they should be available for irrigation, to be put to their most valuable use. In the main, that means the most efficient watering of the most profitable (lawful) crops. How could a society like ours proceed otherwise? It follows that cotton and rice should not be denigrated in comparison with, say, fodder, cabbages or permanent plantings.

If it is perceived that cotton and rice 'use too much water', the first thing is to check that the overall consumptive take — regardless of the crop or crops — is not excessive. If not, the market does, and probably should continue to, allocate the water to chosen crops.

One of the recurrent themes emerging from community consultations, and also touched on in evidence, was the social changes and disruptions said to be caused by reductions in irrigation water. The program of buybacks was often blamed for the depletion below critical mass of farms in reticulated schemes. Declining production of some annual crops was blamed for job losses.

But, whatever the merits of these complaints, the fact is clear that market forces work through 'creative destruction' in Basin irrigation communities as much as in urban rust belts. There can be no doubt, for example, that the constant progress in mechanization and chemical assistance to agriculture continues to reduce the opportunities for many (especially less skilled) willing workers, whether employed or contracted, permanent

or seasonal. Yet no-one complained about these forces, which explain deserted villages better than the Basin Plan.

Another massive market influence is the pricing of water, following the completion of a national commodification of it, and the creation of sophisticated trading regimes. One of the rationales for this economic revolution is to set the price of water according to the demand. That means that calculations of risk and reward, in a familiar way, inform prospective buyers, who compete with others. In turn, that means that, often, the farmer with the most profitable business plan, or the plan which generates most revenue, will tend to bid higher prices. It is thus in the nature of things that smaller, less ambitious farmers will either suffer large cost increases, or give up irrigated crops. It is to be stressed that this is not an undesirable side-effect of the market — it is the overt intention of those of us who devised and supported it. And this Commission takes these truisms as a premise, and the existence and operation of the water market as givens into which this Commission does not inquire.

To return to the vilified cotton and rice, those crops will, it seems, from time to time be commercially attractive to grow with irrigation. If so, that is the market at work. Unless there is criminal deception, or theft, those farmers will simply be using water bought (or held). The crops themselves do not increase the consumptive take, except in theoretically possible but unrealistic circumstances where no other farmer wants to buy the water. Even then, unless crimes are being committed, no more water should be taken than the applicable SDL would permit.

It may, however, be the case that the impressive skill with which cotton and rice crops are grown in the Basin involves a more efficient use of water, in the specific sense that less of it is returned to the river system. That phenomenon could well reduce environmental water downstream, but only indirectly because of the crops being cotton or rice. It should be addressed, of course, by research and review of SDLs.

Another indirect way in which cotton was criticized in this Commission relates to the huge storages to be seen especially in the Northern Basin, and in particular the extent to which they may be filled not only by permitted pumping but also from so-called floodplain harvesting (see Chapters 9 and 14). Again, unless there is illegal activity, all these uses should be accounted for in a properly conducted SDL process, including reviews. In principle, it follows, it is not the choice of crop that matters — rather, it is the amount of water left (recovered) to flow downstream.

Cotton and rice are annual crops. They lend themselves, given that nature, to much more frequent and flexible choices by the farmers as to whether to plant, how much to plant and when to plant. Adaptation to drought is achieved by such choices. Permanent plantings — vines, other tree fruits, nuts — are in a very much more vulnerable position, because their normal life-cycles are measured in years, sometimes decades. For them, drought is either survived or not. The pressure this places on the prices that growers of

permanent planting crops are prepared to offer, is obvious. Again, it is part of the market design.

The changes that these factors may cause in irrigation communities are yet to play out. Areas planted, say, with almonds have multiplied recently. The market dynamics that will follow may well harm many individuals who are priced out of irrigation water. Again, that is the design of a market for irrigation water. It should go without saying that it is not a detriment brought about by the Basin Plan, in any way.

Whether there should be land use regulation that overtly controls the balance of, say, annual and permanent plantings is a large social and political question. An affirmative answer is not intuitively attractive in a free society. On the other hand, the social and environmental harms that can result from failed agricultural business ventures might well lend themselves to being treated as important negative externalities. As well, irrigation water is a public resource, legally as well as figuratively, as a result of the Australian innovation to make it so, starting in 19th Century Victoria. All these questions, however, are beyond this Commission's remit.

Metering and compliance

The public disquiet about the alleged scandal of water theft for irrigated cotton, that preceded the establishment of this Commission, led to repeated suggestions during community consultations, and in evidence, that all consumptive take for agriculture must be 'metered'. (That expression includes, where appropriate, other means of measurement including by remote observation and calculations.)

Commonly, the enthusiasm for metering was expressly for the purpose of 'stopping the cheats', and saving water. They are certainly sufficient reasons to support 100% metering, if necessary at public expense. It needs to be understood, as in all such precautionary monitoring systems, that its implementation will no doubt lead, in turn, to fresh criminal offending by way of tampering with apparatus or records.

It follows that the integrity of the systems to meter take necessitates substantially greater provision than at present of the kind of local officials who might be regarded as 'water bailiffs', that is representatives of the community with the duty and power to observe, check and correct all private takings from our public resource.

The clear impression gained in the Commission is that there is across-the-board support for these reforms. Unsurprisingly, no-one was so bold as to urge less let alone zero supervision of regulated take. The morale of the system requires proper supervision, and the morale of the system is indispensable to its success.

Floodplain harvesting may present different technical challenges in this regard, but it has not been seriously suggested that it should therefore not be measured. Especially

in the Northern Basin, it is an urgent issue for urgent action. It presently renders administration of the water resources in question a virtually data-free zone. And that precludes administration ‘on the basis of the best available scientific knowledge’.

When crimes such as water theft or meter tampering, and related offences of deception and corruption, are suspected, adequate investigations and prosecutions will be critical to the integrity, effectiveness and morale of the system. Admittedly, this aspect of the system has not uniformly been as it should have been (see Chapter 16). Happily, real improvement can be seen to commence, especially in New South Wales where it needed to do so. It should be borne in mind that more prosecutions and heavier penalties will not always or necessarily demonstrate improvement: ideally, both will eventually decline as compliance improves.

Meantime, consideration should include the routine forfeiture of water rights by offenders who thereby should be seen as unfit to share and steward our vital public resource that is irrigation water. Those forfeitures should accrue, naturally, to statutory environmental water accounts.

Drought and climate change

Drought, in a word, explains so much about the Water Act and the Basin Plan (see Chapter 1). But for its devastating and periodic effects on farming, grazing and human life in the Basin, our history would have been very different.

Climate change is a phrase that comprehends drought, as one of the variable states of the Basin’s climate, but projects it (and the other variable states, such as floods) forward by comparisons with a recent past. The ‘change’ is from an earlier kind of climate. Of course, this is simplistic, not least because climate (like its fleeting manifestation, the weather) is always changing in the sense of exhibiting variance. At least, so much is true in Australia, and the Basin.

However, the force of the phrase ‘climate change’ is in the observation that, beyond normal or historical variability, trends show relevant and material shifts. The science warns against treating our 110 year archive climate/weather records in the Basin as a sound basis for projections or predictions (see Chapter 6).

This report therefore has drought and climate change woven into all its considerations. It should be acknowledged that the MDBA certainly also has drought as a constant concern of its science and administration, and properly and commendably so.

Unfortunately, the same is not true of the MDBA and climate change, which appears to be regarded by the MDBA as a factor to be dealt with by the same mundane operational flexibility as the system always has displayed in order to cope with ‘normal’ variability.

But the warming and drying of the Basin which, overall, is by far the most likely future for our children is something more than that variability.

The Water Act and the Basin Plan expressly mandate dealing with the risk of climate change to the Basin water resources. So far, it seems that the MDBA has done little it would not otherwise or anyhow have done, to this end.

Sustainable river country

It should by this juncture in our history be beyond dispute — scientific, economic, social, political, ethical or spiritual — that the Basin is in danger of being run down. (One heartfelt colloquial response could be, ‘The poor bloody Darling!’.) The threat of its degradation being irreversible is greater than ever. Climate change, alone, has that clear potential. Our exploitation of its water resources magnifies that threat.

That is why, to return to the pair of opposite sentiments that opened this Overview, the Water Act and Basin Plan can be seen as a splendid optimistic venture. It is also why, for the reasons that this report attempts to explain, not much optimism survives a survey of progress and administration to date.

A modest shift in the optimistic direction can be seen, warily, in the gradual fading of former instrumental views of the rivers as little more than sources of industrial/agricultural input. The historical usage of ‘waste’ to describe river water flowing into the sea is now shocking and unacceptable, one may cautiously opine. It is now more likely that warnings are sounded, and heeded, that ‘rivers die from their mouths’.

More prosaically, scientists and farmers and graziers have succeeded in having the constant transport out to sea of antediluvian terrestrial salt by the river system treated, as it always should have been, as a solid reason to maintain river flow for the sake of us human inhabitants of the Basin and the continent. For once, there is synergy between what is good for us and what is good for the rest of creation.

These large considerations were powerfully conveyed by Mr Christopher Bagley, in his evidence to the Commission. He is a mainly dryland farmer at Milang, ‘in the North-West corner of Lake Alexandrina’, with substantial experience in community liaison with water officials. He said:

THE COMMISSIONER: I mean, there’s constant movement of salt naturally.

MR BAGLEY: Yes. That’s where I understand that the river naturally moves two million tonnes a year.

THE COMMISSIONER: That brings me I think to the fourth of the mechanisms, if you reduce the discharge, reduce the flow, then you’re going to reduce its transport capacity.

MR BAGLEY: Absolutely.

THE COMMISSIONER: Which is your point about, in your evidence, casts a curious light on the language of waste to describe river water that goes out to sea.

MR BAGLEY: Yes, I — there is a certain mentality that can look at the Mouth and look at every litre that runs to the ocean and say that's — that's good water wasted. Not only does the water give life and biodiversity throughout the — its entire course but it also gives us that waste discharge.

THE COMMISSIONER: I don't want to demonise salt which is an older part of the earth than we are, but from our point of view the river is necessary to remove a toxin.

MR BAGLEY: Yes.

...

MR BAGLEY: My wife and I spent our working lives up in the city. I picked up the newspaper in 1981 to find that the Mouth had closed, and I thought, well, this is good news because by the time we get back to the farm that will have been — that problem will have been fixed. Obviously been pulling too much water out of the river. We're a sensible people, we will cut back on that, and by the time we're back down on the farm, all will be well. Now, not only did we not cut back, but I think the record shows that allocations have increased by about a third since '81.

I just find that to be bewildering. At last Thursday's CAP meeting, Ken Sumner, the Ngarrindjeri representative presented his meeting report, and he used a — an image that I find useful in a slightly different context. He said that like it or not, his people are in a boat with the rest of us, a boat called Australia. He's angry that his people have been shunted down to the back seat. He said they are sitting down there, and they're yelling out, "This isn't going to work". And all I can say is, and perhaps I'm only a seat or two in front of Ken, but he's right. Can pick up the newspaper from the last few weeks or better still, friends of ours last week came back from Lightning Ridge to Milang. They described bare paddocks, no stock, stock are all in feed lots, just kangaroos in the paddock and on the roads, truck after truck after truck carrying hay.

...

MR BAGLEY: Some of the hay has come from as far away as Western Australia, trying to keep the stock alive until we get can through to the next good season. We've got at least one federal member of Parliament petitioning that water can be borrowed from the Commonwealth Environmental Water Holder

...

MR BAGLEY: and allocated to hay growers so they can grow more hay to keep more stock alive. The Bureau of Meteorology advises that we're in for another three dry months and that the El Niño conditions are strengthening so we're still in the shadows of the Millennium Drought and a prudent farmer would be preparing for another dry period.

...

MR BAGLEY: Now, surely that means we're pushing the system too hard, the country can't take it. But we seem to always be wanting to get through to the next balance sheet or the next election and it's not working.

...

MR BAGLEY: If I could be made dictator of this Commission for a day, perhaps I will tell you what I would do, hoping that that might help. I would compel the Federal Minister for Agriculture to attend. We would assemble for the morning session on Sugars Beach opposite the Mouth where we could overlook Bird Island. See the dredges working. We could see how relatively feeble the outflow is, the fresh water. You could look at the rollers coming in, each one with its load of sand and I would ask — have an expert on hand to run us through what is expected under the — or the orthodox opinion of climate change, that is it's going to be wetter, it's going to be dryer. I think that a 10 per cent drop in rainfall generates something like a 30 per cent drop of stream inflow.

Ocean levels are going to rise and then I would hope that you could step in and ask the Minister whether he or she has confidence that we have the necessary resilience to manage climate change. I would then put the party on to drive across the barrages which in itself would be useful to Raukkan where Ken Sumner and his people could be there to just sketch for the Minister what their traditions tell them about how the river has sustained their people for thousands of years and perhaps offer some opinions of how well Australia has gone in the last 200. And then I would invite — hopefully you would invite the Minister to reassure Ken and his people that all will be well.

We could drive down to Salt Creek Roadhouse for lunch. While everybody is eating their Coorong Mullet Gary Hera-Singh could detail his experiences of the South Lagoon that we could see out the window, some of the catches that he had, some of the bird life that he saw in the 1970s, before the Mouth closed. He could give some idea of why he has continually advised CAP that millions of fingerlings perish each year in the South Lagoon. They spawn in the North Lagoon. Their instinct is to go south to the Ruppia and scary as our average salinity readings for the South Lagoon remain, Gary believes that it carries very many deep pools where for nearly the last 40 years the salt has accumulated and that's what's killing the fish.

...

MR BAGLEY: ... It's the nursery — you could almost characterise that as the centre of our Ramsar agreements and our migratory bird agreements, the South Lagoon and it's virtually a saline desert. That's stretching a point. And then you could step in and invite the Minister to assure Australia that the Basin Plan will work. If a motorist tries to get onto a highway, we all know the sign that's facing the wrong way, go back. Now, I think the Basin Plan as released in the original Guide, gave us a highway, how to live in and manage this Basin. And we got onto the — since then, we got onto the wrong ramp. So I believe I'm speaking for many people around the Lower Lakes and all I can say is wrong way, go back.¹³

South Australia's interest and co-operative federalism

Fostering the river systems of the Basin so that their ecological values may be protected and restored, as intended by the Water Act, is a contemporary concern of South Australia as a polity. It reflects and extends for the State a long-held position from colonial times. Both are the inevitable political demand of the geography of the driest continent on Earth.

The connexions in the system are physical, hydrological and social. Historically, South-Eastern Australia has largely avoided the litigious bitterness and economic strife that can be seen, say, in the water struggle among some of the United States of America. But it would be naïve in the extreme not to acknowledge the continuing upstream-downstream tensions affecting South Australia's place in the present administration and future stewardship of the Basin's water resources.

Because of our Federal constitutional distribution of legislative powers, for better or for worse we have set out to render the project of rehabilitating the Basin's water resources enforceable and thereby effective, by a combination of intergovernmental agreements, Commonwealth external affairs powers and the tightly controlled referral of State powers to the Commonwealth — along with a welter of standing arrangements for inter-jurisdictional liaison and decision-making. In the absence of utterly unrealistic change to our Commonwealth *Constitution* by referendum, this very Australian framework of governance will remain, *faute de mieux*. The cheerful term for it is 'co-operative federalism'. A grimmer view would see it as a cockpit for interstate rivalrous self-interests.

A salient conclusion from this Commission's work is that, so far, the decade since the Water Act commenced has very largely displayed the good side of this multi-government arrangement. A succession of Ministers and Commonwealth and State officials has mostly exceeded what past experience may have produced by way of gloomy expectation of valuable co-operation. That cautiously favourable view is what justifies, on the material this Commission has considered, taking the trouble to improve the system. Without a

modicum of co-operative spirit between the jurisdictions, there would be no point in doing so.

In this setting, it should have always been obvious and accepted that South Australia had and has a substantial interest in examining the state of affairs obtaining in the administration of the Basin water resources. It is not just that South Australia is profoundly affected by how matters are going. It is also that this administration is formally structured so as to involve South Australian regulation, South Australian Ministers and officials, South Australian money — and a South Australian referral of powers to the Commonwealth Parliament.

It was never a kind of institutional impertinence, as some came close to insinuating, for the South Australian Government to commission an executive inquiry into the matters required by this Royal Commission's Terms of Reference. The political science of the Federation justifies unilateral executive action to that end, and there is no sound constitutional reason to erect obstacles in its way. Intergovernmental agreement does not come at the price of stultifying the inherent function (and power) of State Parliaments and executives (such as through a Royal Commission) to scrutinize the efficacy of the policy that has been implemented by intergovernmental agreement. That would be a perverse consequence of the co-operative federalism that most observers regard as a good thing.

Nor will it wash to restrict enquiry and scrutiny to those conducted by the joint exercise of investigative powers by the States and governments whose agreement has produced the policy or system in question. That depends on unanimity, the very condition which will be denied by a delinquent counterparty State, or by States content with a status quo. If, say, Victoria became disgruntled by the conduct of the Basin's water resources administration, it makes no sense to deny it the ability to find out for itself what the facts are, about the issues troubling her Ministers. Why would the *Constitution* be read as depriving a State of the power to inform itself about its position in relation to sister States, in an intergovernmental arrangement?

To borrow from the language of trusts law, as a party to the federally co-operative scheme that is the Water Act and Basin Plan, South Australia has a lively interest, of its own, in the due administration of the scheme. So there should never have been doubts expressed about the propriety of a South Australian Government commissioning an inquiry into the question of how the scheme was progressing.

Early queries were also raised about the capacity of a South Australian Royal Commission to compel evidence from out of the State. Some of them, echoed by bush lawyers, seemed to be based on a very bleak and savage notion of the relationship between the polities that are members of the Federation. Of course, given the received understanding of sec 51(xxiv) (and also sec 118) of the Commonwealth *Constitution*, the provisions of Part 4 Div 4 of the *Service and Execution of Process Act 1992* (Cth) leave no doubt that compulsory processes of this Royal Commission could be enforced in other States and Territories of the Commonwealth. This is no more remarkable than the

effective service of court process, such as a subpoena, requiring a resident of Wodonga to attend court in Albury. Extra-territoriality was never an issue.¹⁴

However, severe issue was taken by the Commonwealth (and the MDBA) with the issue of compulsory process directed to them and their officers, wherever they were. Proceedings were commenced in the High Court of Australia to vindicate this resistance to compelled production or attendance. After it became apparent that this Commission would not be able fairly to use its powers to compel, if the High Court upheld them, given the time limited for this report to be delivered, a request was made to the South Australian Attorney-General to be informed whether an appropriate extension of time would be granted in the event of success in the High Court. The Attorney-General notified the Commissioner of the refusal to assure an extension of time in that contingency, and thus the constitutional litigation became moot. It being wrong for hypothetical and non-concrete matters to be argued in the High Court, the Commission's summonses to the Commonwealth entities were withdrawn and the proceedings discontinued.

The rights and wrongs of this constitutional controversy are therefore matters of informed speculation only. Given the importance of the questions to the making, implementation and continued supervision and review of intergovernmental arrangements by way of so-called co-operative federalism, some tentative observations are here appropriate.

First, the constitutional doctrine invoked by the Commonwealth is not, to put it mildly, thoroughly well worked out in the authorities. Second, its general concern with a kind of immunity of one government from compulsory processes of another government seems to stem from a mutual requirement to refrain from depriving each other of their definitional governmental functionality. Third, that would appear to constrain Commonwealth legislative power as much as it would constrain State legislative power. Fourth, it does appear somewhat over-pitched to suggest that the MDBA's obligation to produce documents and witnesses would somehow impede the Commonwealth Government as such, let alone destroy it. What will they say if their records and officers are subpoenaed for a nuisance or negligence action in a State Supreme Court? Fifth, the Commonwealth position does seem to entail the drastic consequence of reading down or even invalidating its own legislation — sec 6 of the *Service and Execution of Process Act 1992* (Cth), which purports to bind the Crown in all its capacities, to provisions including Div 4 of Part 4 that authorized this Commission's summonses to be served on the MDBA in Canberra. That would be a regrettable regression in nation-building. Sixth, all claims by governments to immunities from suit or from obligations to assist by providing information about their activities are appropriately to be approached with some scepticism, given the notion of equality before the law, and the rule of law. Further, there is merit in all governments proceeding with the benefit of relevant information. Seventh, the operation of secs 127 and 128 of the *Service and Execution Process Act 1992* (Cth), dealing with matters of State and public interest immunity respectively, do somewhat show that the Commonwealth Parliament in 1992 contemplated such weighty

governmental matters being the object of, say, a State Royal Commission's compulsory process — and regarded that as appropriately safeguarded by rights of intervention and argument. Presumably and regrettably for co-operative federalism, those provisions too would go overboard had the Commonwealth succeeded in its arguments.

Had the Commonwealth succeeded in its arguments, an infirmity in our *Constitution* would have emerged, alongside that which sec 100 memorializes. It would counsel reluctance to enter intergovernmental arrangements without explicit agreements of an unusual, and unusually binding, nature, so as to establish adequate modes of investigation of 'co-operative' activities. That seems to be a ponderous way to launch national projects.

'In full and on time'

This empty phrase recurs throughout political statements about the Basin Plan — it will be delivered 'in full and on time'. It is empty because cursory enquiry reveals that the meaning of 'in full' was elastic, so to speak, and the meaning of 'on time' was elusive or illusory. It is a shame that the phrase is still read and heard in government circles, and a pity that it is even to be found in submissions to this Commission.¹⁵

The only serious endpoint (if dynamic river system administration can sensibly have endpoints at all) would be the achievement of the objects of the Water Act. The only serious timeline is that required by the Basin Plan.

There is no sensible prospect whatever of these objects being met by the end of the Basin Plan period. The recommendations made in this report identify that much work is to be done, including to improve the Basin Plan, in order that the objects and purposes of the Act can be achieved. Whilst this work presents a challenge, it is not insurmountable.

References

- ¹ Michael Cathcart, *The Water Dreamers* (Text Publishing, 2009), quoting J A LaNauze, *Alfred Deakin* (Melbourne University Press, 1965) vol 2, 84.
- ² See, eg, *ibid* chapter 14, *passim*.
- ³ cf the discussions of German dam-building in David Blackbourn, *The Conquest of Nature: Water, Landscape and the Making of Modern Germany* (W W Norton, 2006) chapter 4, esp at 182.
- ⁴ Chris Guest, *Sharing the Water: One Hundred Years of River Murray Politics* (MDBA Publication No 43/16, 2016) 33–4.
- ⁵ See, eg, a transitional use of this figure of speech in Don Blackmore, ‘Protecting the Future’ in Daniel Connell (ed), *Uncharted Waters* (Murray-Darling Basin Commission, 2002) 2.
- ⁶ There is nothing really novel in the Water Act’s plain stipulation for science to govern. Perhaps responsible officers in the MDBA should acquaint themselves with the pragmatic ideals of Alexander von Humboldt, to mark the 250th anniversary of his birth. He wrote of the potential for ‘a judicious application of mechanics, chemistry, and other sciences [to be] made conducive to national prosperity’. He invoked Goethe in warning of Nature’s ‘curse on all inaction’, and urged that ‘[t]he propagation of an earnest and sound knowledge of science can therefore alone avert [such] dangers ...’. See Alexander von Humboldt, *Cosmos: A Sketch of a Physical Description of the Universe* (EC Otte trans, Henry G Bohn, 1849) vol 1, 32–4.
- ⁷ *Project Blue Sky v Australian Broadcasting Authority* (1998) 194 CLR 355.
- ⁸ Evidence to Senate Rural and Regional Affairs and Transport Legislation Committee, Parliament of Australia, Canberra, 26 October 2018, 11 (Anne Ruston, Senator) (RCE 971).
- ⁹ My understanding of the practice of the House of Commons in 1900, sec 49 of the Commonwealth *Constitution*, article 9 of the *Bill of Rights* (1689) and sec 16 of the *Parliamentary Privileges Act 1987* (Cth) is that they do not immunize persons, including Members, from comment in public or private on what they have said in Parliamentary proceedings. Such comment is, in the first place, protected by the implied freedom of political communication, which obviously contemplates expressions of agreement or disagreement with, say, a Member’s words in a chamber (or committee). Such comments will often be made in the course of discussion directed ultimately to political judgements that may influence the democratic voting of electors. Second, parliamentary privilege as contemplated in

sec 49 has to be coherent with that freedom. Third, expressions of agreement or disagreement do not call into question, let alone impeach, the freedom of speech and debates or proceedings in Parliament — to the contrary, such articulated comments beneficially treat Parliamentary speech as material appropriately understood as part and parcel of Australian society’s political discourse. Fourth, no-one has ever suggested that an idea could be immune from criticisms by being articulated in Parliamentary proceedings — if anything, the contrary is our common and civilized understanding. Fifth, no-one has, either, ever suggested that only other persons speaking in Parliamentary proceedings are entitled to comment on another’s Parliamentary statements. Sixth, although this Commission is an ‘other place’ within article 9, comment on Senator Ruston’s quoted statement does not, for the reasons given above, call into question (or impeach) her very important freedom of speech. Finally, comment by a Royal Commissioner is no more to be avoided than by a judge in a court of law, who occasionally is bound to consider, say, the appropriateness of a second reading speech’s paraphrase or attempted explanation of the meaning to be given to enacted text — a consideration that does not confine itself to unquestioning agreement.

- 10 Peter Hannam, ‘What Happens When the ‘Last Resort’ on the Darling River Dries Out?’, *The Sydney Morning Herald* (online), 11 January 2019
<<https://www.smh.com.au/environment/conservation/what-happens-when-the-last-resort-on-the-darling-river-dries-out-20190110-p50qo3.html>>.
- 11 Ibid.
- 12 See generally Dilip da Cunha, *The Invention of Rivers: Alexander’s Eye and Ganga’s Descent* (University of Pennsylvania Press, 2018).
- 13 Transcript of Murray-Darling Basin Royal Commission Public Hearings (23 August 2018, C Bagley) 2175–9.
- 14 Except apparently in the mind of the obstreperous Mayor of Renmark, who seemed to regard the Commissioner and staff as foreign intruders anywhere outside South Australia and there bereft of authority. Happily, he was alone in that discourteous error.
- 15 The communique of the Ministerial Council meeting of 14 December 2018 at least acknowledges the current virtual certainty of delay in finalizing proper WRPs, the pointy end of the Basin Plan. It remains a shortcoming in the political and administrative governance of the Water Act and Plan that the slogan is not simply and squarely abandoned.

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Introduction

The Murray-Darling Basin Royal Commission was established by the South Australian Government on 23 January 2018, pursuant to the Terms of Reference set out at the outset of this report.

Whilst the Terms of Reference are addressed in detail throughout the body of the report, abbreviated responses to each of them are set out below, with cross references to the relevant chapters that address those matters in more detail.

The Key Findings outlined below are the Commissioner's findings on matters of central importance to the Terms of Reference, but do not reflect the entirety of the findings in relation to matters inquired into, and are necessarily abbreviated. They are not intended as a substitute to consideration of those findings in full, as set out in each chapter of this report.

The Recommendations are made to the South Australian Government. For the Recommendations to be followed, or adopted, the South Australian Government will have to convince the relevant Commonwealth Minister, or the other Basin State Governments, or in some instances the Murray-Darling Basin Authority (**MDBA**), to take certain action. They include recommendations for amendments to be made to the *Basin Plan 2012* (Cth) (**Basin Plan**) so that it is lawful, and to the *Water Act 2007* (Cth) (**Water Act**).

There are various means by which the Basin Plan can be reviewed. Subsection 50(2) of the Water Act is an example. Either the Commonwealth Minister for Agriculture and Water Resources can request the MDBA to conduct a review, or the Basin States can. The Water Act also provides for the MDBA to recommend an amendment to the Basin Plan, and for the Minister to adopt that amendment: secs 45–48 of the Water Act.

The Recommendations in this report should be read, then, as recommendations to the South Australian Government to seek agreement from, as relevant, the Commonwealth Minister, the Basin States, or the MDBA, to conduct reviews of or make amendment to the Basin Plan.

Abbreviations and commonly used expressions are found in Appendix 1.

Responses to the Terms of Reference

1. *Whether the Water Resource Plans defined by the Act and Basin Plan (which are to include the long-term average sustainable diversion limits for each Basin water resource) will be delivered in full and in a form compliant and consistent with the Basin Plan by 30 June 2019.*

There is no reasonable prospect of all water resource plans (**WRP**) being delivered in full and in a form compliant with a valid Basin Plan — see Chapter 12.

2. *If any Water Resource Plans are unlikely to be delivered in full and in a form compliant and consistent with the Basin Plan, the reasons for this.*

All WRPs were premised on a wrong sustainable diversion limit (**SDL**), and many have been inadequately resourced, particularly in New South Wales — see Chapters 3, 5, 6, 7, 11 and 12.

3. *Whether the Basin Plan in its current form, its implementation, and any proposed amendments to the Plan, are likely to achieve the objects and purposes of the Act and Plan as variously outlined in ss.3, 20, 23 and 28 of the Act, and the ‘enhanced environmental outcomes’ and additional 450 GL provided for in s. 86AA(2) and (3) of the Act, respectively.*

No. See entire report.

4. *Whether the underlying assumptions in the original modelling used to develop the objects and purposes of the Act and the Basin Plan have been sufficiently adjusted for the impact of improved technologies.*

The premises of this question do not permit a plain answer. The assumptions remain obscure. Changes in technology are not obviously relevant to the objects and purposes of the Act.

5. *If the Basin Plan is unlikely to achieve any of the objects and purposes of the Act and Basin Plan and/or the ‘enhanced environmental outcomes’ and the additional 450 GL referred to above, what amendments should be made to the Basin Plan or Act to achieve those objects and purposes, the ‘enhanced environmental outcomes’ and the additional 450 GL?*

There is scope for the following legislative amendments:

- re-determine the environmentally sustainable level of take (**ESLT**), and consequently amend the Basin Plan provisions relating to the Basin-wide and resource unit SDLs, such that the additional 450 GL becomes redundant — see Chapters 5 and 9

- amend the SDL adjustment mechanism (**SDLAM**) set out in Chapter 7 of the Basin Plan — see Chapter 7
 - repeal the current legislative cap on buyback of 1500 GL in sec 85C of the Water Act — see Chapter 9
 - address existing limitations on genuine Aboriginal engagement, including by amending current requirements to ‘have regard to’ and non-compulsory representation on the Board of the MDBA (in secs 21, 22 and 178 of the Water Act and Chapter 10 of the Basin Plan) — see Chapters 11 and 17
 - address lack of recognition of, and insert a requirement for, connectivity between WRP areas in Chapter 10 of the Basin Plan — see Chapter 12
 - insert provisions in the Water Act and Basin Plan requiring real-time data sharing and publication on water extractions — see Chapter 16.
6. *Any legislative or other impediments to achieving any of the objects and purposes of the Act and Basin Plan and/or the ‘enhanced environmental outcomes’ and additional 450 GL referred to above, and any recommendations for legislative or other change if needed.*

The legislative impediments are addressed above. The following other impediments presently exist:

- the fact that implementation of the Basin Plan requires co-operative federalism, and thereby lends itself to conversation among some Basin States regarding their desire to ‘withdraw’ — see Overview and Chapter 2
 - insufficient consideration by the MDBA of proper and lawful administration of the Water Act, particularly in the context of the Basin-wide SDL, climate change and in the context of administrative secrecy — see Chapters 3, 5, 6, 7 and 18
 - failure by the Commonwealth Government to properly resource and build upon the scientific base, including in the context of appropriate metering and monitoring — see Chapters 6, 12, 13, 15 and 16
 - failure to implement appropriate methods to measure and regulate floodplain harvesting — see Chapter 14
 - MDBA failure to progress constraints relaxation proactively, particularly given the distributed responsibilities for compensation — see Chapter 8
 - failure to account in planning development for impacts upon the shared water resource of the Murray-Darling Basin (**Basin**) — see Chapter 15.
7. *The likely impact of alleged illegal take or other forms of non-compliance on achieving any of the objects and purposes of the Act and Basin Plan, and the ‘enhanced environmental outcomes’ and the additional 450 GL, referred to above.*

Unchecked, it brings the law and its administration into disrepute and is likely to hinder its widespread observance. Its largest impact on a Basin-wide scale is on public confidence in the competent management of the Basin's water resources — see Chapters 14 and 16.

8. *In relation to any found instances of illegal take or work, whether appropriate enforcement proceedings have been taken in respect of such matters and if not, why.*

Appropriate enforcement proceedings are only just now underway — see Chapter 16.

9. *Whether, in any event, the enforcement and compliance powers under the Act are adequate to prevent and address non-compliance with the Act and the Basin Plan, and any recommendations for legislative or other change if needed.*

The enforcement and compliance powers under the Act are adequate.

The Water Act should include provisions that mandate proper and real-time metering of all extractive uses of the Basin's water resources — see Chapter 16.

10. *Whether monitoring, metering and access to relevant information (such as usage data) is adequate to achieve the objects and purposes of the Act and Basin Plan and the 'enhanced environmental outcomes' and additional 450 GL referred to above.*

No — see Chapter 16.

11. *Whether water that is purchased by the Commonwealth for the purposes of achieving the objects and purposes of the Act and Basin Plan and/or the 'enhanced environmental outcomes' and the additional 450 GL referred to above will be adequately protected from take for irrigation under water resource plans, and any recommendations for legislative or other change if needed.*

No, insofar as there remain deficiencies in metering and monitoring of extractive uses, particularly in respect of floodplain harvesting, and particularly in the Northern Basin — see Chapters 12, 13 and 14.

There is no indication that environmental water is not adequately protected from take for irrigation in the Southern Basin, however this is dependent on the progress and proper implementation of WRPs that are consistent with the Basin Plan — see Chapters 12 and 13.

12. *Whether the Basin Plan in its current form, its implementation, and any proposed amendments to the Plan, are adequate to achieve the objects and purposes of the Act and Basin Plan, the 'enhanced environmental outcomes' and the additional 450 GL referred to above, taking into account likely, future climate change.*

No. See entire report, and particularly Chapter 6.

13. *Any other related matters.*

There are considerable issues concerning a lack of genuine consultation and openness on the part of the MDBA, Commonwealth Government agencies, and agencies of the Basin States, including in relation to water resource planning and regarding Aboriginal interests and values — see Chapter 11 and entire report.

Key Findings

Chapter 2: Constitutional Basis of the Water Act

- 2.1 The Water Act is primarily a law with respect to external affairs under sec 51(xxix) of the *Constitution*, and is reasonably capable of being considered appropriate and adapted to implementing Australia's treaty obligations under the Ramsar Convention, the Biodiversity Convention, the Climate Change Convention and various bilateral agreements concerning migratory birds. Contrary to a misinformed submission by the Department of Agriculture and Water Resources (under cover of a letter from the current Commonwealth Minister for Agriculture and Water Resources to the South Australian Minister for Environment and Water), the Commissioner does not doubt, and has never doubted, the constitutional validity of the Water Act.
- 2.2 The constitutional validity of the Water Act will not be undermined if the objects of the Act, or the Basin Plan, are not achieved. Genuine attempts to implement the Basin Plan in accordance with the objects and purposes of the Water Act will not render the Water Act invalid even if those efforts result in failure.
- 2.3 A withdrawal of a State from the Basin Plan — as some have threatened — would have no legal effect on the Plan, but an obvious practical effect. No State law can alter, impair or detract from the valid operation of the Water Act and the Basin Plan — sec 109 of the *Constitution*.
- 2.4 Should a Basin State revoke its referral of legislative power to the Commonwealth that in part currently underpins the Water Act and the Basin Plan, it will be a complex constitutional question as to whether all of the Water Act or Basin Plan would continue in force. It is not one that should require an answer, as the reform that is the Water Act clearly calls for and requires a whole of Basin co-operative approach to its regulation.

Chapter 3: ESLT Interpretation

- 3.1 The Water Act requires environmental priorities to be given primacy when determining an ESLT and a SDL. What environmental assets, ecosystem functions or environmental outcomes should be considered 'key' pursuant to the definition of ESLT is a matter for scientific judgement and administrative evaluation.
- 3.2 The term 'compromise' in the definition of ESLT must be interpreted with reference to the fulfilment of Australia's relevant treaty obligations, the requirements of ecologically sustainable development (**ESD**) (in particular the precautionary principle) as that term is defined in the Water Act, and the legislative fact that the Basin is an overallocated water system, and its environment has become degraded, and requires special measures to restore and protect it. The obligation to not compromise involves more than just ensuring that key environmental assets

and ecosystem functions are not endangered or exposed to unacceptable risk — restoration of degradation and protection are also required.

- 3.3 There is no ‘triple bottom line’ legislated in the Water Act concerning the setting of a SDL that must reflect an ESLT, or in the scientific judgement to be made as to what are key environmental assets, ecosystem functions and environmental outcomes. That phrase is an inappropriate figure of speech or political slogan that the MDBA has unwisely adopted. Any optimisation of environmental, social and economic outcomes must come later. In any event, it is not possible to optimise all three simultaneously in determinations such as the setting of an ESLT or SDL.
- 3.4 The determination of an ESLT, and the setting of a SDL that reflects it, do not involve political compromise under the relevant provisions of the Water Act. They are to be based on the ‘best available scientific knowledge’. Socio-economic considerations, ideology and realpolitik are not involved in this process if it is to be lawful. Best available scientific knowledge is neither secret nor classified. It is available to the scientific community, and the broader public. It involves processes and actions that represent science — that is, that are capable of being reviewed, checked and replicated.
- 3.5 Insofar as the MDBA has relied upon the opinion of the Australian Government Solicitor of 25 October 2010 (**AGS Opinion**) to suggest otherwise, such reliance is erroneous.

Chapter 4: Guide to the Proposed Basin Plan

- 4.1 Based on the totality of the evidence before the Commission, the range of water recovery in the Guide to the proposed Basin Plan (**Guide**) — 3980 GL to 6980 GL — most likely is the range that results from a proper construction of the term ESLT in the Water Act, and results in a SDL that reflects an ESLT consistent with relevant provisions of the Water Act, including subsec 23(2).
- 4.2 Whilst the modelling the MDBA employed for the Guide was partially disclosed to the CSIRO and the Goyder Institute for the purposes of review (for South Australia), none of the modelling used to form the basis of the Basin Plan as enacted has been made available to the scientific community, or the wider public. It is likely, but cannot be determined with certainty, that improvements were made to the MDBA modelling following the publication of the Guide in October 2010.

Chapter 5: ESLT Process

- 5.1 Key aspects of the Basin Plan have not been enacted or implemented in accordance with the objects and purposes of the Water Act.

- 5.2 The process for determining the Basin-wide ESLT was undermined by an incorrect construction of the Water Act, in particular the term ESLT. The MDBA has impermissibly adopted a so-called triple bottom line approach.
- 5.3 The MDBA has apparently, since at least 25 October 2010, relied on the AGS Opinion in the construction of certain key provisions of the Water Act, and in particular the definition of ESLT in sec 4. The AGS Opinion is almost certainly inconsistent with prior advice or opinions given to the MDBA or the Commonwealth on the construction issue, albeit they were not made available to this Commission (nor have they been publicly released).
- 5.4 The triple bottom line approach pervades the ESLT methodology and determination and thereby necessarily infects the setting of the Basin-wide SDL. The adoption of a triple bottom line approach resulted in the SDL not reflecting an ESLT, contrary to sec 23 of the Water Act.
- 5.5 In determining the Basin-wide ESLT and then SDL, the MDBA failed to act on the best available scientific knowledge in a number of respects, contrary to para 21(4)(b) of the Water Act, as identified in the following paragraphs:
- a. Science, as that term should be understood, was not used. The MDBA has failed to disclose key matters, such as its modelling. Science is open, available, and can be critiqued and checked. It can be validated or invalidated.
 - b. The MDBA completely ignored climate change projections for the determination of the ESLT and the setting of a Basin-wide SDL that reflects this. That is unlawful. It ignores the best available scientific knowledge. As an administrative decision it is indefensible.
 - c. Politics rather than science ultimately drove the setting of the Basin-wide SDL and the recovery figure of 2750 GL. The recovery amount had to start with a '2'. This was not a scientific determination, but one made by senior management and the Board of the MDBA. It is an unlawful approach. It is maladministration.
 - d. In 2011, management of the MDBA improperly pressured the CSIRO to alter parts of the CSIRO's 'Multiple Benefits' report. This rendered parts of that report misleading, as they no longer reflected the views of, at the very least, Dr Matthew Colloff, who was one of the authors. The CSIRO should not have agreed to the changes that were made. This conduct too represents maladministration.
- 5.6 A Basin-wide SDL that results in a recovery amount of 2750 GL does not reflect an ESLT. Nor does, in the manner currently provided for in the Basin Plan, a Basin-wide SDL that results in a recovery amount of 3200 GL.
- 5.7 This has the capacity to cast doubt on the validity of parts or all of the Basin Plan. This can be remedied if the MDBA is prepared to act lawfully and in accordance with the Water Act. Regrettably, from prior to the time of the enactment of the

Basin Plan, the MDBA has shown itself to be unwilling or incapable of acting lawfully. That state of affairs exists today, and is the principal reason why there are serious doubts whether the current senior management, and Board, of the MDBA are capable of fulfilling their statutory obligations and functions.

Chapter 6: Climate Change

- 6.1 The work done by the CSIRO in its Sustainable Yields Project, and the research conducted by the South Eastern Australian Climate Initiative, was amongst the scientific knowledge at the time of drafting the Basin Plan that constituted the best available scientific knowledge.
- 6.2 Based on the CSIRO Sustainable Yields Project in 2008, climate change projections predict that, at least for the Southern Basin, it will get warmer, and drier, likely resulting in significantly less run-off into the river systems over the 21st Century. There is no proper or rational basis to doubt this. Based on the evidence of climate change experts, these projections are conservative — it is possible the reduction in run-off could be catastrophic.
- 6.3 In 2009, the CSIRO advised the MDBA that for its modelling for the period of implementation of the first Basin Plan (and hence to determine the ESLT and the SDL that must reflect an ESLT), the MDBA should consider the recent climate of the past 10–20 years, and its climate change projections. This advice was ignored by the MDBA. This amounts to negligence, and maladministration.
- 6.4 In the Guide, the determination of the ESLT range was influenced by factoring in a run-off drop of 3%, despite the mean CSIRO projection being 11%. The Commissioner agrees with the view of the CSIRO at the time that limited inclusion of climate change projections was not scientifically defensible.
- 6.5 In the ESLT Report, climate change was not considered or factored into the modelling at all. This decision was unlawful, as it meant the Basin Plan was not based on the best available scientific knowledge, and was done with total disregard for the principle of ESD.
- 6.6 Reliance on the historical climate data from 1895–2009 was not only unlawful and against the advice of the CSIRO in 2009, it was and remains an indefensible decision from a policy perspective.
- 6.7 The assertion by the MDBA that climate change projections could not be incorporated into the modelling because they were too uncertain is rejected. This is contrary to their incorporation in the Guide and the evidence from expert witnesses before this Commission.
- 6.8 Since the enactment of the Basin Plan, the Intergovernmental Panel on Climate Change has published two significant reports in 2014 and 2018. Other climate change research has been published by, amongst others, the Californian Government, the Government of the United States of America, and the Australian Climate Council.

Ongoing work is being conducted by the CSIRO and the Australian Bureau of Meteorology. The best available scientific knowledge developed worldwide continues to point toward significant warming in the Southern Basin to 2030 and beyond, and a significant if not catastrophic reduction in run-off depending on global greenhouse gas emission scenarios.

- 6.9 The MDBA has had seven years since the enactment of the Basin Plan to incorporate climate change projections into a re-determination of the ESLT and a SDL that reflects it. Since that time, the MDBA has, however, not conducted any review of climate change risks to the Basin. This, too, demonstrates ongoing negligence by the MDBA. It is a dereliction of its duties. It is not just indefensible, but incomprehensible. It is in breach of the MDBA's obligation to perform its functions by taking into account the principles of ESD: para 21(4)(a) of the Water Act. It shows a contempt for the principle of inter-generational equity (see the definition of ESD in sec 4 of the Water Act).
- 6.10 Since 2013, research — and peer-reviewed published work — in relation to climate change in Australia has been significantly curtailed, in part at least because of a lack of direction and funding by the Commonwealth Government. This is to the significant detriment of the proper implementation of the Basin Plan. It is against the national interest. A Commonwealth body is urgently required to lead the way in adaptation, and identifying what solutions can be found to such change.
- 6.11 Any assertion by the MDBA that climate change can be incorporated into the Basin Plan modelling at its 10-yearly review, or at some later date, is misplaced. Climate change is happening now, and can occur quickly. Deferral to a later date, or asserting that climate change risk is shared between the environment and licence holders by yearly allocation based on water availability, is nonsensical in a policy sense as well as unlawful.

Chapter 7: The SDL Adjustment Mechanism

- 7.1 The SDLAM, as set out in Chapter 7 and Scheds 6 and 6A of the Basin Plan, is an attempt to put into legislative form a complex, and distinctly imperfect, scientific procedure. The result is almost impenetrable statutory drafting. The risk that these provisions will be misinterpreted, or not applied correctly, is great.
- 7.2 The contribution to the total increase in SDLs as a result of supply measures — defined as the 'supply contribution' in sec 7.15 of the Basin Plan — is inadequately described in that section. First, the supply contribution is to be calculated on the basis of 'a repeat of the historical climate conditions'. This repeats the same error made by the MDBA in its ESLT determination, and the setting of the Basin-wide SDL that reflects it.

- 7.3 Further the term ‘unimplemented policy measures’ has been interpreted inconsistently between the Basin States and the MDBA, and not in accordance with the text of the Basin Plan.
- 7.4 In order to be satisfied that the supply contribution from supply measures ‘achieve equivalent environmental outcomes compared with benchmark environmental outcomes’, the MDBA cannot simply assess modelling results. It requires a substantive assessment. Real environmental outcomes are at stake. Leaving aside the clear text of the Basin Plan, as a matter of policy, modelling should not be preferred over empirical observation. Reliance only on modelling — which is the approach taken by the MDBA — is unlawful and inconsistent with the Basin Plan.
- 7.5 The Ecological Elements Scoring Method in Sched 6 of the Basin Plan, and the modelling undertaken by the MDBA, have alarming shortcomings. These are in part identified in the Ecological Elements Report. The shortcomings of the ‘default method’ are particularly notable in the context of the assessment of floodplain forests and fish species.
- 7.6 The reviews of the MDBA’s SDLAM modelling and the Ecological Elements Scoring Method are highly qualified, are critical of key aspects, and have limited scope. They fall far short of any supposed wholesale endorsement of the approach taken, as claimed by the MDBA. Those reports establish that the Ecological Elements Scoring Method and the modelling behind it is both experimental and unprecedented. There is a great deal of uncertainty in the results produced by the modelling, and consequently there is a substantial ‘error space’ inherent in the modelling. As a consequence, on the evidence before this Commission, the current Ecological Elements Scoring Method and the modelling behind it is inconsistent with the requirement that the MDBA have regard to the principles of ESD. Further, based on the comments by the Independent Reviewers, and by other scientific experts before the Commission, there is real doubt whether the supply measure SDL adjustment process can be considered to be based on ‘the best available scientific knowledge’. At this stage, the supply measure contribution, which can represent up to a 543 GL increase in the Basin-wide SDL, appears to be the result of a highly uncertain experiment with the environment of the Basin. That is not consistent with the requirements of the Water Act.
- 7.7 There is a possibility of serious adverse ecological impacts as a result of supply measures, as detailed by several expert witnesses before the Commission, whose evidence is accepted. Dr Martin Mallen-Cooper identified the risk of increased Carp populations arising from the operation of the Chowilla Creek Environmental Regulator. Associate Professor Jamie Pittock also gave evidence of adverse ecological responses from the operation of supply measures such as regulators, levies and stopbanks. Associate Professor David Paton AM gave evidence concerning risks as a result of the South Australian Government’s South East Flows Restoration Project. This evidence, at a minimum, raises real concerns about the environmental benefits of supply measures, as well as their compliance with the Basin Plan.

- 7.8 Of equal concern is the process adopted in relation to the supply measure contribution. Substantial information, in the form of Business Cases, for each supply measure project, remained secret until their production in the Australian Senate. The reasons given for this secrecy have no substance. The Business Cases involve the functions of government, not private enterprise. There is no aspect of commercial in confidence — whatever that term is intended to mean — about them. They should have been made available to the public in a timely fashion for public scrutiny. The suggestion was made to the Commissioner that one reason for not releasing these documents is that they are ‘technical’ in nature. This claim is deeply unimpressive. It was also suggested that release of the Business Cases might cause ‘confusion and consternation’. This implies that the public — and Australia’s scientific community — is incapable of understanding these documents or that, given that infrastructure projects are involved, there might be subsequent changes to what is proposed. Not only is this attitude towards disclosure condescending, it neatly encapsulates the habit of the MDBA, amongst other government entities, to keep matters that should properly be disclosed to the public, secret.
- 7.9 Many of the Business Cases received into evidence disclose significant shortcomings in the supply measure projects to which they relate, and many are in breach of the Phase 2 Guidelines for Business Cases outlined by the MDBA. The Business Case prepared regarding the Menindee Lakes Water Savings Project contains entirely inadequate content in relation to the identification of ecological risks, as one example. The Jacobs Report (hidden by the Commonwealth Government until its production under freedom of information laws) is scathing in its criticism of it. It states that it ‘does not present an organised, comprehensive, consistent or persuasive case for the project’. On the evidence, this criticism is well-founded.
- 7.10 Both the Basin Officials Committee (**BOC**) and the MDBA conducted analysis of the various Business Cases for supply measures. Documents relating to the analysis conducted by the BOC remain secret. The MDBA analyses were kept secret (along with the Business Cases) until they were produced in the Australian Senate in March 2018. The MDBA analyses of several of the supply measures reveal its deep concerns about ecological risks associated with the supply measures. The risks identified are alarming — see for example the risk to Golden Perch habitat identified in the analysis of the Menindee Lakes Business Case. The content of the Business Cases, and the MDBA analysis of it, are such that several of the supply measures should not have been the subject of a recommendation by the MDBA to adjust the Basin-wide SDL under sec 23A of the Water Act. Its conduct in doing so is negligent.
- 7.11 In the absence of a fully resourced scientific analysis, the full extent of the ecological risks posed to the Menindee Lakes and the Lower Darling from the current operating rules and the Menindee Lakes Water Savings Project are still yet to be realised. This has become an increasingly urgent matter in the context of the significant and continued ecological decline of the Menindee Lakes and the Lower Darling.

- 7.12 Another problematic example of the MDBA's secrecy concerns the SDLAM publications, the Benchmark Model Report and the SDLAM Model Report. No-one reading these reports obtains any assistance from the MDBA as to their specific decision-making processes concerning the SDLAM. The modelling has still not been made available for scientific scrutiny.
- 7.13 The MDBA's consultation with Aboriginal Nations concerning the SDLAM process was inadequate. The Murray Lower Darling Rivers Indigenous Nations (**MLDRIN**) assessed that First Nations were deprived of any opportunity to provide an informed response to the SDLAM as a result of lack of information, inadequate time for consultation, and inadequate provision of information. This is unacceptable.
- 7.14 Even if the original Basin-wide SDL did reflect an ESLT consistent with the Water Act (which it did not), the adjusted SDL arising from the application of the SDLAM is nonetheless inconsistent with the requirement that it also reflects an ESLT. This is because the adjusted SDL is based on assumptions and projected outcomes said to arise from supply measures that have not yet been implemented. Many are still in the concept stage. Leaving aside the real doubts the Commissioner has as to the lawfulness of the environmental scoring method to achieve environmentally equivalent outcomes, an increased Basin-wide SDL that takes into account a supply contribution from supply measures that have not yet even begun to be constructed, or have not yet been put into operation, cannot result in a SDL that reflects an ESLT. To the extent that an amended Basin-wide SDL takes into account increases attributable to supply measure projects not yet complete and operational, it is inconsistent with the requirements of the Water Act and is therefore unlawful.
- 7.15 Insofar as sec 7.20(2) of the Basin Plan purportedly permits the calculation of a SDL that takes into account projected outcomes, this section of the Basin Plan is inconsistent with the requirements of the Water Act and is beyond power.
- 7.16 On 3 May 2018, the MDBA issued a media release arguing against a disallowance of the SDLAM amending instrument in the Australian Senate. That media release stated in part that the MDBA:

stands by the amendments to the Basin Plan, which it recommended based on a rigorous, CSIRO approved methodology, independently reviewed and verified, and in accordance with the requirements set down in the Basin Plan in 2012.

This public statement by the MDBA is both misleading and inaccurate. Such is the evidence before the Commission, including the independent reviews referred to in this media release, that there are grave concerns that the MDBA could even genuinely hold the view outlined in this media release. The decision of the MDBA to issue the 3 May 2018 media release demonstrated deplorable judgement. It is yet another reason why there are serious doubts that the MDBA as currently managed has the capacity to perform its statutory functions capably, and with proper integrity. No reasonable decision-maker:

- a. could be satisfied that in relation to a number of the Business Cases, including Menindee Lakes and Hydro-cues, that the Phase 2 Guidelines were satisfied
- b. could be satisfied that the supply measures are likely to be implemented by 30 June 2024
- c. based on the qualifications in the independent reports referred to above, could consider that the amendments to the Basin Plan proposed through the SDLAM had been ‘independently ... verified’.

To the extent that it is suggested these amendments are based on ‘rigorous CSIRO approved methodology’, it is noteworthy that the Ecological Elements Report states that it is based on a ‘highly simplified hydro-ecological model’ and that it ‘will not adequately represent species or responses at a fine scale’ and is ‘not intended for site-scale planning or assessment of works and measures scenarios’.

Chapter 8: Constraints

- 8.1 Without the removal of constraints to the flow of sufficient water in the river systems, achieving so-called enhanced environmental outcomes will either not happen, or will result in limited outcomes.
- 8.2 As the Productivity Commission noted in its 2018 draft report reviewing the Basin Plan, there can be little confidence that constraints measures proposed will be in place by 30 June 2024. Almost no progress has been made on constraint removal or easing over the past five years.
- 8.3 The impact of removing or easing constraints that have been created by landowners and others who live or work on floodplains is that desirable inundation of those floodplains may from time to time create access difficulties, or may cause damage to agricultural land, built works, and other items of value. The current policy, however, requires the voluntary co-operation of landowners. Easements have to be negotiated, as an example. Landowners might wish to resist co-operation in constraints removal. Many will understandably not be willing participants in constraints removal. In those circumstances, continued attempts with a voluntary scheme may be futile.
- 8.4 Major infrastructure projects often involve the compulsory acquisition of property, on the basis they are one example of government action felt to be in the interest of the public at large. The removal of constraints as part of the implementation of the Basin Plan falls well within any sensible definition of a major infrastructure scheme. For progress to be made with landowners and others who will be impacted by constraint easing or removal, it is likely that the process will have to become compulsory in the national interest. This means, of course, an appropriate acquisition and compensation scheme will need to be put in place. Such a scheme should reflect the well-known concept of ‘just compensation’, and provide for mediated or arbitrated outcomes.

- 8.5 Genuine consultation is essential throughout this process, but has not occurred to date.
- 8.6 Even without an appropriate compulsory compensation/acquisition scheme, the \$200 million set aside by the Commonwealth Government for constraint removal is likely to be inadequate.

Chapter 9: Efficiency Measures & the 450 GL

- 9.1 Without the removal of constraints, enhancement of the environmental outcomes listed in subsec 86AA(3) of the Water Act and Sched 5 of the Basin Plan is unlikely to be achieved, or at least fully achieved. This risks the waste of public funds on efficiency measures.
- 9.2 Recovering water for the environment through ‘buybacks’ is considerably less expensive than through irrigation efficiency upgrades (**efficiency measures**). There would need to be compelling reasons to justify the additional public expense of efficiency measures. There are none.
- 9.3 Buyback was the subject of considerable criticism by some persons and representative bodies during the Commission’s consultations. That criticism is misplaced on the basis of the evidence. In addition to recovering water at much less cost to all taxpayers, there are real benefits to buyback — for example, funds received from the sale of entitlements are usually spent locally, and there are additional economic benefits from debt reduction.
- 9.4 The asserted negative impacts of buyback either do not exist, or have been greatly overstated. Buyback did not cause a mass exodus of people from farming or irrigation — most buyback agreements related to partial sales of entitlements only. The vast majority of those who sold entitlements retained water delivery rights. The so-called ‘Swiss cheese’ effect has been frequently cited, but appears to be more myth than fact.
- 9.5 The impact of water recovery generally in Basin towns and regional centres has been overstated. The reports authored by the MDBA, or commissioned by it, that suggest otherwise are deeply flawed. For example, the notion of some proportional relationship between a reduction in water and a reduction in farm production is rejected. It is accepted that such a relationship could be debunked by an economics undergraduate. There are many other more pertinent, contributing factors to decreases in population or jobs or farm revenue — these include technological change and mechanization, amongst a number of other relevant factors.
- 9.6 Amongst other flaws in the socio-economic impact reports relied upon by the MDBA in relation to water recovery is the total neglect of the non-market benefits of water recovery. The Water Act is an environmental law. At its core is the requirement of setting a Basin-wide SDL such that the key environmental assets and ecosystems of the Basin are restored from ongoing degradation, and protected. They must not

be compromised. Yet the MDBA ignores in any meaningful way the non-market benefits of restoration and protection of the environment.

- 9.7 The evidence about the unreliability of efficiency measures due to ‘return flows’ is accepted. Its impact on the volume of water said to have been recovered to date through efficiency measures is uncertain, but it is likely to have been meaningful, and should have been the subject of urgent research by the MDBA, rather than total neglect.
- 9.8 The efficiency measures schemes to date have involved a lack of disclosure on matters of key importance — who has received funding, how much, for what, to reduce how much water use, and to recover how much water to the Commonwealth?
- 9.9 For a number of years neither the Commonwealth Government, nor New South Wales or Victoria, have had any genuine commitment to recovering the so-called 450 GL of upwater for enhanced environmental outcomes. The ill-informed letter from Mr Barnaby Joyce when he was Water Minister to his South Australian counterpart dated 17 November 2016 — written as though the actual definition of socio-economic impact in the Basin Plan did not exist — is testament to this.
- 9.10 The recent criteria agreed at the Murray-Darling Basin Ministerial Council meeting on 14 December 2018, at the behest of the Victorian and New South Wales Governments, is another example of the lack of commitment by the Commonwealth, New South Wales and Victoria to delivering the 450 GL. The South Australian Government’s agreement to changes to the socio-economic criteria for efficiency measures is antipathetic to the interests of South Australia, and the South Australian environment. It is doubtful that much of the 450 GL of upwater will ever be actually recovered for the environment through efficiency measures, and especially under the new criteria agreed.
- 9.11 In any event, future water recovery, including the 450 GL of upwater, should largely, if entirely, be through buyback. There is no proper justification for the massive additional expenditure on efficiency measures to recover water.

Chapter 10: Northern Basin Review

- 10.1 The Northern Basin Review (**NBR**) is an example of gross maladministration by the MDBA. It is an example of how the current management of the MDBA has shown itself unwilling and incapable of fulfilling their statutory functions and obligations.
- 10.2 The NBR resulted in a 70 GL reduction in the amount of water to be recovered for the environment in the Northern Basin:
 - a. This recommended reduction was in part influenced by the same misconstruction of the Water Act that infected the determination of the ESLT and the setting of a Basin-wide SDL.

- b. To the extent that social and economic factors influenced the NBR, the MDBA has kept this information secret.
 - c. The NBR was not based on the best available scientific knowledge.
 - d. There is no scientific, intelligible or rational justification put forward for the reduction of 70 GL. The obvious inference to be drawn is that political considerations largely drove the NBR, not science. This is not only unlawful, but is deplorable.
 - e. The MDBA ignored ESD in the NBR.
 - f. The MDBA has not made its modelling available for the NBR, and has again demonstrated its desire to keep its work and decision-making processes away from proper scrutiny.
 - g. More water should be recovered for the environment in the Northern Basin to satisfy the requirements of the Water Act, not less. This is demonstrated by the MDBA's own published work, in particular the Environmental Outcomes Report.
 - h. The unchallenged evidence of Professor Richard Kingsford, Professor John Williams and the Wentworth Group of Concerned Scientists is accepted in its entirety on the degraded condition of several key environmental assets in the Northern Basin — such as the Condamine-Balonne, the Macquarie Marshes and the Narran Lakes — and the poor and inadequate understanding of the condition of these assets and their environmental requirements by the MDBA.
- 10.3 The 'toolkit' measures described in the NBR may be sensible matters to implement. They do not justify a reduction in 70 GL.
- 10.4 The socio-economic impact reports prepared by or for the MDBA in relation to the Northern Basin are flawed.
- 10.5 The reduction of the SDL by 70 GL is unlawful. It was not based on the best available scientific knowledge, and will further compromise key environmental assets and ecosystems, contrary to the definition of ESLT.
- 10.6 If the NBR had been conducted lawfully, and based on the best available science, it is almost certain that an increase of water recovery for the environment would be the result, not a decrease. This would mean more water will need to be purchased — through buybacks — in the Northern Basin.

Chapter 11: Aboriginal Engagement

- 11.1 The Water Act and Basin Plan are unclear about the policies underpinning their specific references to matters relevant to Aboriginal people in relation to Basin water resources, despite there being clear obligations in relevant international agreements, and despite developments in native title law. Without precise policy objectives aimed at achieving legal recognition of their cultural needs and interests

in water resources, Aboriginal people rightly feel that their interests have been marginalized.

- 11.2 The Basin Plan and WRPs represent opportunities to provide for appropriate recognition and restoration of the cultural needs and interests of Aboriginal people in Basin water resources, especially where native title law is not well adapted to do so. The Basin States must commit greater effort to understanding and making provision for Aboriginal people to play a more central role in water resource management.
- 11.3 Considerable research has been undertaken by Aboriginal people, academically and in the field, to show the multiple benefits available to traditional owner groups and beyond, of including Aboriginal decision-making in legal and administrative schemes for water management.
- 11.4 In some areas of the Basin, such as the Darling River, the depleted and degraded condition of the river and its ecosystems has had a directly damaging effect on the social and cultural fabric of the lives of its traditional owners, which must be urgently remedied.
- 11.5 A lack of prioritization and commitment of adequate time and resources by some Basin States (in particular New South Wales and Victoria) has resulted in some consultation being procedurally inadequate and culturally inappropriate.

Chapter 12: Water Resource Plans

- 12.1 As found above, the Basin-wide SDL is not lawful. The WRPs are required to incorporate and apply the water resource-specific SDLs specified in the Basin Plan. To the extent that those SDLs were determined using, or on the basis of the Basin-wide determination, and to the extent that WRPs incorporate and adopt those SDLs, the accreditation of those WRPs for the purposes of the Water Act will be unlawful.
- 12.2 It is unlikely all WRPs will be submitted in time for accreditation by 1 July 2019. If they are, their quality is likely to suffer.
- 12.3 WRPs have been delayed as a result of a lack of commitment to the Basin Plan by the States of Victoria and New South Wales, and by a lack of proper resourcing. New South Wales has, in particular, suffered from staff turnover and departmental restructuring. Institutional knowledge and the skills to develop WRPs have been lost.

Chapter 13: Environmental Watering & Outcomes

- 13.1 Environmental watering represents the considered use of recovered water to restore environmental health and therefore environmental water planning and delivery programs are critical to the success of the Basin Plan. Environmental water planning and delivery requires coordination of multiple government agencies and non-government bodies and appropriate resources must be provided to enable

adaptive management of the Basin water resources. This necessarily requires greater application of government funding to support these activities.

- 13.2 It is vital to have a comprehensive Basin-wide environmental monitoring program to monitor the outcomes of the Basin Plan. As identified by the MDBA in its 2017 Evaluation of the Basin, there are several, serious gaps in the scientific understanding of the Basin environment, and in relation to evaluation and monitoring generally. The Commissioner agrees that improvements must be made along the lines the MDBA has suggested in that report.
- 13.3 The main reason for a lack of proper monitoring of the environmental condition of the Basin is a lack of adequate government funding. The discontinuation of the Sustainable Rivers Audit was undesirable and inappropriate.
- 13.4 Although the MDBA is to be commended for producing reports on the environmental condition of the Basin, these reports tend to overstate some environmental outcomes. As an example, the MDBA's 2018 Icon Site Condition Report provides an overall positive message about the achievements of the Basin Plan that is not always reflected by a detailed look at site specific objectives. Scientific reports such as this should not be concerned with publicity-style 'messages'.
- 13.5 Environmental watering can provide positive benefits over time, and it is starting to do so at some sites. However, it appears to be too little — and may be too late — for other sites. A number of important environmental sites, including Ramsar sites, are in an alarmingly critical state of health. In particular, there are serious concerns about the health of the Coorong. Water recovery associated with a recovery target of 2750 GL will not be sufficient to restore it to a sustainable healthy condition. Urgent attention must be given to the protection and restoration of this site and many other sites across the Basin.
- 13.6 On commercial radio on 29 August 2018, Mr Joyce, the Commonwealth Government's Special Drought Envoy — not a member of the Executive Council or a Minister of the State under either secs 62 or 64 of the *Constitution* respectively — suggested that environmental water held by the Commonwealth Environmental Water Holder (CEWH) should be used to 'grow the fodder to keep the cattle alive' during the course of the drought. He suggested that if this was not lawful, then the relevant legislation should be changed. This suggestion is not in the interests of the people who live and work in the Basin, nor in the interests of the broader Australian public, or that of the environment. It is contrary to the objects and purposes of the Water Act and Basin Plan. It is against the national interest. It has been rightly rejected by, amongst others, the MDBA and the CEWH. Adaptation to the challenges of a warmer and drier climate will require a vastly more sophisticated approach. That approach must be based on proper scientific research and analysis, as well as a basic level of common sense.

Chapter 14: Interception Activities

- 14.1 In determining the ESLT, the MDBA did not have or obtain accurate information about either floodplains or floodplain diversions in the Basin. Floodplain diversions have had a significant detrimental impact on the health of many important environmental assets of the Basin. They also have an impact on individuals, as illustrated by the experience of the Lamey family.
- 14.2 Insofar as any further work is being undertaken to determine how much water is extracted from floodplains, there is no evidence that this further work is accompanied by any additional research as to floodplain watering requirements.
- 14.3 Insofar as the MDBA may be proposing to raise SDLs by reference to increases in baseline diversion limits (**BDL**) as a result of new estimates for floodplain diversions, there appears to be no logic to such an approach. Any proposal to do so necessarily assumes that the ESLT can be determined (to increase) by reference to changes in consumptive use. The ESLT must be established independently from consumptive use, not because of it. If there is any logic or proper science to justify an increase to SDLs only by reference to increased BDLs, it has not been disclosed by the MDBA, or anyone else.
- 14.4 The amendments made in October 2012 to the New South Wales Barwon-Darling Water Sharing Plan have almost certainly contributed to decreased flows south of Bourke, and an increase in no flow events, and their duration. Those amendments should be reversed.

Chapter 15: Groundwater

- 15.1 The management of groundwater in the Basin is hydrologically and administratively complex. There are significant knowledge gaps in the relevant science, and groundwater has historically been inadequately managed without appropriate regard to its connexion with surface water resources.
- 15.2 Notwithstanding repeated calls for greater investment in the relevant science base, there remains considerable uncertainty and knowledge gaps in the management of groundwater. Many of the plans managing groundwater resources continue to fail to have appropriate regard to connectivity.
- 15.3 There is insufficient information publicly available to provide any confidence, either to the public or to the scientific community, that the setting of the Basin-wide SDL for groundwater of 3494 GL is based on the best available science. The wide variation in the figures provided by the MDBA during the drafting and subsequent review of the Basin Plan suggests a decision-making process far removed from a reasoned, well-resourced and scientifically-driven approach.
- 15.4 The review conducted by the University of Melbourne in October 2018 does not avail these concerns. It was limited in its scope, and reaffirms the considerable

uncertainty in the scientific understanding of groundwater. It is unacceptable that this uncertainty has persisted for decades without redress through appropriate and adequate investment in greater scientific research.

Chapter 16: Compliance & Enforcement

- 16.1 The compliance and enforcement framework in the Water Act is designed to ensure compliance by Basin States with the Water Act and the Basin Plan through the implementation of WRPs. Properly implemented, the Water Act is suitable to achieve this objective. The use of administrative remedies is appropriate having regard to the nature of intergovernmental agreements and the obligations between governments.
- 16.2 State water legislation generally appears sufficiently robust to provide for a range of enforcement options against individuals for instances of non-compliance, having regard to the circumstances of each matter. There is, however, a high degree of inconsistency between Basin States in relation to matters including the range of offence and penalty provisions, and the use of administrative orders. Basin States may wish to give consideration to whether their respective offence and penalty provisions properly reflect community expectations. Basin States may wish to reflect on the possibility of greater uniformity between their enforcement and compliance frameworks given the national intent of the Water Act and Basin Plan regarding the shared management of Basin water resources. Greater consistency would also provide assistance to courts when considering the treatment of comparable conduct.
- 16.3 The perceived lack of enforcement action has produced considerable mistrust in the law and its administration, as well as within communities and amongst Basin States. The community concern about compliance and enforcement has largely focussed on the operational capacity of States to take appropriate enforcement action, and the role of the MDBA. Following multiple inquiries and investigations, several commitments have been made, particularly by the MDBA, as well as the New South Wales and Queensland Governments, to reform and to improve upon compliance and enforcement outcomes.
- 16.4 A review of the MDBA's current and proposed practices reveals concerns about their genuine commitment to holding Basin States accountable. The Basin Plan includes a register of take. Under those provisions, Basin States will remain compliant with SDLs in circumstances where water taken has actually exceeded water resource SDLs by up to 20% or more, should a 'reasonable excuse' be provided. There is no justification for compliance to be measured against a 20% threshold. That threshold is unnecessarily high. For the purpose of assessing SDL compliance, some Victorian water resource areas will be treated collectively. This ignores the very premises for each water resource area having its own SDL, namely for the achievement of specific environmental outcomes. Further, the MDBA has only committed to auditing no more than two water resource areas per year for the

purpose of assessing SDL compliance. That is unsatisfactory. In theory, it could take up to 11 years or longer for a water resource unit to be audited.

- 16.5 New South Wales and Queensland have begun the process of implementing important reform measures. The creation, operation, and public openness of the Natural Resource Access Regulator, which has already overseen successful prosecutions relating to water theft, is a demonstration of the commitment from New South Wales. Other commitments, however, such as protection of environmental water, metering and real-time monitoring of water extractions and account balances have stalled. Metering is a significant concern, particularly in the Northern Basin, and has been for some time. Inadequate metering adversely impacts the ability of authorities to collect evidence about unlawful behaviour. Further delays to reform in this area will further serve to undermine the public's confidence as to the genuine commitment to reform.

Chapter 17: Governance

- 17.1 The governance framework established by the Water Act in the context of the making and amendment of the Basin Plan is largely sound and effective, insofar as it purports to ensure the MDBA's independence from Ministerial direction on factual and scientific matters.
- 17.2 Sections 23A and 23B of the Water Act, providing for the adjustment of SDLs, are an exception to that proposition, insofar as subsec 23B(6) permits the Minister to determine not to adopt an amendment proposed by the MDBA. This power, in respect of matters that are firmly the subject of science (being the adjustment of the SDLs), likely reflects an inconsistency within the provisions of the Water Act, insofar as it has the exact opposite effect to para 48(3)(b). Absent an amendment to rectify that inconsistency, the provision is open to abuse.
- 17.3 The current governance framework under the Water Act is defective, insofar as it fails to provide Aboriginal people with a central decision-making role on all matters concerning the Basin. It is essential, in the interests of the Basin as a whole, that this situation be urgently rectified.
- 17.4 The National Water Commission (NWC) formed an important part of the governance structure in the Basin's legislative scheme, and since its abolition in 2014, there has been an erosion of the national oversight of water reform in the Basin.
- 17.5 Specifically, on account of the NWC's abolition, the MDBA has, inappropriately, been left marking its own work in respect of the effectiveness of Basin Plan implementation, and compliance with the Plan.
- 17.6 Separating an audit function from the MDBA should ensure the new independent auditors have properly resourced powers to examine all MDBA workings, without exception and including political and legal advice. There should be no diminution

in the current requirements for the MDBA to report on its work, but rather a reinforcement of their temporal and substantive aspects, towards full disclosure.

Chapter 18: Public Disclosure

- 18.1 A number of statutory provisions in the Water Act are consistent with an obligation of full disclosure by the MDBA on matters of science. The obligation of the MDBA to draft a Basin Plan that ensures Australia meets its environmental obligations under various international agreements, as well as setting a Basin-wide SDL that protects and restores the environment of the Basin, is, as a matter of obviousness, a matter of such public and scientific interest that full disclosure is both desirable and necessary.
- 18.2 The Water Act requires that the Basin Plan be based on the best available scientific knowledge, and that the MDBA fulfil all its functions on this basis. ‘Available’ requires knowledge available to all, not kept secret by the MDBA.
- 18.3 Science itself demands disclosure. Research, experimentation and decision-making are not science if they cannot be fully tested, and either validated or invalidated.
- 18.4 The requirement for full disclosure is further derived from Australia’s system of representative and responsible government. The Basin Plan involves huge expenditure of public funds. It has been prepared and is being implemented by the servants of the public. Their work should be available for scrutiny by the public, including the scientific community, who are then able to critique such work, assist in checking it for both scientific validity and lawfulness, and even improve it. There is nothing proper to be gained from secrecy concerning the preparation or implementation of the Basin Plan. Full disclosure is not a hindrance, it provides great assistance.
- 18.5 There is no proper basis for the Commonwealth to refuse to release legal advice (other than the incorrect AGS Opinion) on the Water Act, contrary to the recommendation in 2011 by the Senate Standing Committee on Legal and Constitutional Affairs. The proper construction of the Water Act, and in particular the definition of ESLT, is not a matter that appropriately calls for secrecy, or a claim for legal professional privilege. It is a matter of grave concern that an Australian Government releases one opinion, while keeping secret contrary opinions on the same issue.
- 18.6 The MDBA has only partially made available the modelling that underpinned the Guide, but has not provided the modelling that informed the Basin Plan, not even to the Basin States. It has not made available its processes for iterating the volume of water said to be required to be recovered for the environment as a result of social or economic considerations. This non-disclosure is indefensible.
- 18.7 The MDBA refused to disclose to the CSIRO its approach to constraints for the purposes of the CSIRO’s ‘Multiple Benefits’ Report. This too is indefensible.

- 18.8 The MDBA has not made available its modelling that underpins the NBR. It has not disclosed what volume of the 70 GL reduction in water for the environment is attributable to its (unlawful) consideration of social and economic issues. This too is indefensible.
- 18.9 At the time of announcing the 605 GL adjustment to the Basin-wide SDL under the SDLAM, the MDBA published only limited information in relation to the supply measures said to justify it. The supply measure business cases, and the MDBA's analyses of them, were only made publicly available upon compulsion in the Australian Senate. The modelling underpinning the SDLAM has not been disclosed. These matters, too, are indefensible.
- 18.10 The MDBA's aversion to proper disclosure, and its reluctance to foster scientific scrutiny, is one reason why the objects and purposes of the Water Act and Basin Plan are unlikely to be achieved. It is unacceptable for a publicly funded, science-based authority with the functions of the MDBA to shield itself from external scientific scrutiny.

Recommendations

1. New determinations of the ESLTs, and SDLs for both surface water and groundwater that reflect those ESLTs, should be carried out promptly. Those determinations must be made lawfully — that is, according to the proper construction of the Water Act as outlined in Chapter 3. Those determinations must:
 - a. be made on the basis of a proper construction of the Water Act, rather than using a triple bottom line approach
 - b. ensure that each water resource area’s ESLT is correctly determined based on the best available science, including for floodplains, and accordingly is reflected in the Basin-wide ESLT
 - c. result in an ESLT that ensures Australia fulfils its obligations under the treaties referred to in the Water Act
 - d. ensure there is no ‘compromise’ to the key environmental assets and ecosystem functions of the Basin — it must restore and protect those that are degraded
 - e. be made on the basis of the best available scientific knowledge, and by taking into account ESD, including climate change projections
 - f. be made in such a manner that all of the processes, decision-making and modelling that underpin the determinations are fully disclosed and subject to scientific peer-review and consultation with the broader public.
2. Those determinations will require a greater recovery amount than that which has already been recovered. In order to achieve a higher recovery amount, additional water will need to be purchased by the government and held by the CEWH. That water should be purchased through buybacks.
3. The MDBA — or some other appropriately funded body — should be required to urgently conduct a review of climate change risks to the whole of the Basin, based on the best available scientific knowledge. This should be incorporated into the determination of the ESLT.
4. A Commonwealth Climate Change Research and Adaptation Authority should be established. This Authority must be independent of government. It should be appropriately funded so that it can properly conduct research into climate change, and formulate plans and give guidance on how the Basin (and other) communities can best adapt to climate change.
5. The SDLAM should be modified so that:
 - a. To the extent that it incorporates provisions that are unlawful, those provisions should be repealed. This includes those parts of the Basin Plan that purport to allow adjustments to the SDL arising from unimplemented supply measures, such as sec 7.20(2).

- b. There must be full disclosure in relation to the implementation of supply measures. The MDBA and Basin States should publish all relevant documents in relation to project design, risk assessment and ecological outcomes, and all material relevant to the BOC's oversight of project implementation.
 - c. Any adjustment to the SDL arising from supply measure projects must be based on empirical observation of only those projects that have been completed and implemented. Reliance should not be placed on the highly uncertain Ecological Elements Scoring Method.
 - d. All supply measure projects must be assessed to determine whether they pose any environmental risks. No supply measure project that poses environmental risks should be implemented unless and until those risks are appropriately mitigated having regard to ESD and the precautionary principle. The Basin environment must not be subject to an uncontrolled experiment in order for less water to be recovered for the environment in the short-term.
 - e. Any so-called reconciliation cannot wait until 2024. A review should be conducted immediately with reference to the monitored observations of the impacts of implemented projects and the research of the scientific community. Regard must be had to real-world environmental equivalence to the greatest extent possible, and not be a repeat of the narrow modelling undertaken in 2017.
6. A fully resourced, scientific analysis should be conducted to ascertain the causes, effects and available ecological responses to the continued ecological decline of the Menindee Lakes and the Lower Darling, including a full analysis of current operating rules, and a full analysis of the effects of the Menindee Lakes Water Savings Project.
 7. A properly funded, compulsory scheme for the removal or easing of constraints should be implemented.
 8. Future water recovery for the environment, including the 450 GL, should be purchased through buyback. This requires repeal of the 1500 GL cap on buybacks in sec 85C of the Water Act.
 9. If the Commonwealth program for recovery of water through efficiency measures is nonetheless retained, the recommended further research into return flow outlined in the Groundwater and Return Flow Impacts Report should be immediately undertaken.
 10. The Commonwealth Auditor-General should conduct a review of the Commonwealth's irrigation infrastructure upgrade schemes to date. This review should at least assess the justifications of efficiency measures as a means of recovering water for the environment as against buyback, the probity of the processes involved in the provision of Commonwealth funds, and include an audit of how much water has actually been recovered.

11. If efficiency measures are retained as a means of recovering water for the environment, including the 450 GL, no changes should be made to the test for determining neutral or improved socio-economic outcomes in sec 7.17(2)(b) of the Basin Plan. Insofar as the criteria agreed at the Murray-Darling Basin Ministerial Council meeting on 14 December 2018 alter that test, they should be abandoned as they will likely result in the failure to recover that water.
12. Whichever means are used to recover environmental water, they must be accompanied by complementary investment in Basin communities.
13. The 70 GL reduction in the amount of water to be recovered in the Northern Basin should be immediately repealed.
14. The NBR should be conducted again. The new review should be:
 - a. based on the best available scientific knowledge
 - b. conducted with full public disclosure, including of its modelling.
15. The result of that review is almost certain to show that more than 390 GL needs to be recovered for the environment in the Northern Basin. That water should be purchased through buybacks.
16. Section 21 of the Water Act should be amended to include a provision expressly recognizing the need for special measures for Aboriginal interests in water resources and referring to the relevant obligations of the Biodiversity Convention (art 8(j)) in the manner proposed by the Northern Basin Aboriginal Nations (**NBAN**).
17. Paragraph 22(3)(ca) of the Water Act should be amended to remove the words 'having regard to'.
18. The Basin Plan should be amended to expressly require that consultation for the purposes of Chapter 10 must be conducted in accordance with the Akwé: Kon Guidelines.
19. The MDBA should immediately retract Position Statement 1B.
20. Improved Commonwealth and State funding and support should be provided for the ongoing representative and consultative work of MLDRIN and NBAN, and consideration should be given to the establishment of a separate representative body for the central Western/Darling River region.
21. Increased provision of technical and expert resourcing should be provided to representative bodies to undertake the work, including research, necessary to engage in water resource planning and management activities within the framework of the Water Act and Basin Plan.
22. Sections 177 and/or 178 of the Water Act should be amended in order to mandate at least two Aboriginal representatives on the MDBA Board from peak bodies established for the purpose of representing the interests of traditional owners in relation to water resources in the Basin.

23. Basin States should review and amend their water resource planning and management legislation to expressly recognize and authorize the taking and use of water in exercise of native title rights and interests, whatever they may be determined to be and without additional limitations.
24. A meaningful consultation should now commence between the Basin States, the Commonwealth and the MDBA concerning cultural flow.
25. The final submission of WRPs for accreditation must await the finalization of the newly determined ESLTs. However, that does not mean all work should cease on them. They should continue to be completed as far as possible.
26. There should be no amendment to either the functions of the CEWH as described in subsec 105(3) of the Water Act, or to the provisions for the limitation of disposal of environmental water in sec 106 of the Water Act.
27. A comprehensive Basin-wide environmental monitoring program should be established immediately. This monitoring program can be based on the Sustainable Rivers Audit, but likely needs to be more comprehensive.
28. Any environmental monitoring program must be conducted independent of both government and the MDBA. The MDBA should not mark its own work.
29. Further research must be undertaken to better understand and quantify the environmental requirements of water resource areas that incorporate floodplains, especially in the Northern Basin. The watering requirements for floodplains are necessary to establish the ESLT for those water resource areas.
30. Before any change to SDLs may be lawfully considered, the ESLT must be properly determined based on the watering requirements for floodplains. The MDBA must not rely only upon any change to BDLs proposed by States as a basis to increase SDLs.
31. A licensing and metering regime for floodplain diversions is necessary. New South Wales and Queensland must act on this issue to restore confidence within their own communities and amongst Basin States. The New South Wales Government must work towards addressing the shortcomings identified in its floodplain harvesting policy. Queensland must act to provide further publicly available information as to how it proposes to address floodplain diversions.
32. Greater investment must be made immediately by the MDBA and the Basin States in the scientific understanding of the Basin's groundwater resources. That scientific understanding, including connectivity with surface water resources, must be incorporated in the development of WRPs and environmental watering.
33. Basin States should give consideration to the possibility of greater uniformity between their offence and penalty provisions having regard to community expectations, including consideration of enhancing penalty provisions to provide for the forfeiture of water rights, which accrue to statutory environmental water holders.

34. The Basin Plan should be amended so that the 20% threshold against which SDL compliance is measured in the register of take be reduced to no more than 5%. Further, the Basin Plan should be amended so that SDL compliance for each water resource area is assessed independently.
35. Resourcing must be made available to enable sufficient auditing of Basin State compliance with SDLs for each water resource area. The ceiling that no more than two water resource areas per year be audited should be removed. A clear and defensible auditing policy should be made publicly available to explain the basis upon which water resource areas will be audited, for example, on the basis of risk assessment having regard to compliance history and potential for growth in future use.
36. The comprehensive suite of recommendations made by Mr Ken Matthews AO regarding transparency, including real-time monitoring and publication of consumptive use, should be implemented immediately. There is no basis for these matters to be secret. The approach of Basin States in this regard should be consistent.
37. The provisions in subdivs E and F of the Water Act prescribing the detailed consultation process required in advance of making or amending the Basin Plan should be amended to make it express that all science is to be made available completely and in full, to the scientific community and general public, prior to the MDBA making determinations for the consideration of the Minister.
38. The inconsistency between para 48(3)(b) and subsec 23B(6) of the Water Act should be remedied via legislative amendment, in order to ensure that, in both cases, the MDBA's independence concerning decisions on factual and scientific matters is consistently maintained, by limiting the Ministerial power of direction in both cases.
39. An independent, scientifically astute and experienced body responsible for auditing the effectiveness of the implementation of the Basin Plan, akin to the NWC, should be established.
40. All opinions and advices the MDBA or the Commonwealth have obtained on the construction of the Water Act, the determination of the ESLT, the setting of the Basin-wide SDL, and all aspects of the SDLAM should be released immediately.
41. All modelling and other non-disclosed data used by the MDBA to determine the range of water recovery for the Guide and the ESLT Determination Report should be released immediately.
42. The manner in which the recovery amount of 2750 GL was influenced or adjusted for social and economic outcomes should be fully disclosed.
43. All modelling in relation to the NBR and the supply measure adjustment should be released immediately.
44. The manner in which the 70 GL figure for the NBR was influenced or altered as a result of social and economic factors should be fully disclosed.

1 History

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Introduction

The Murray-Darling Basin (**Basin**) is environmentally, economically and socially important to not only Basin communities, but to the nation as a whole. The Basin is the largest catchment area in Australia, consisting of 23 river valleys and over 77 000 kilometres of watercourses, spanning an area of over a million square kilometres and across four States and the Australian Capital Territory. It is a highly variable system, with average annual inflows of 32 800 GL per year, but which have ranged from 117 907 GL in 1956 to less than 6740 GL in 2006.¹ Within the Basin, there are over 30 000 wetlands, 16 of which are listed as Wetlands of International Importance under the Ramsar Convention. The Basin is home to over 46 species of native fish and 120 species of waterbirds.

Over two million people live in the Basin, and more than three million people in total depend upon it for water.² There are over 40 Aboriginal nations within the Basin,³ who comprise 15% of Australia's population of Aboriginal people.⁴ Forty percent of all farms in Australia are located within the Basin,⁵ and they contribute approximately \$22 billion to the national economy.⁶ Nearly all of Australia's rice and cotton and 80% of Australia's grapes are grown in the Basin.⁷ Tourism contributes a further \$8 billion.⁸ Agricultural industries in the Basin employ 45% of agricultural workers in Australia.⁹

The enquiry required by this Commission's Terms of Reference cannot simply proceed on a snapshot in time, focussing on the 'here and now'.¹⁰ It must necessarily take into account the appropriate legal and historical context in which the *Water Act 2007* (Cth) (**Water Act**) and the *Basin Plan 2012* (Cth) (**Basin Plan**) reside. This is not only because any enquiry will be necessarily informed by that context, but it is that context which must also be taken into account in order for any reasonable, practical and useful recommendations to be made.

Following thousands of years of Aboriginal custodianship, since European settlement, the use and regulation (both legal and physical) of the Basin's water resources has expanded exponentially. This led to growing concerns about the sustainability of that use, particularly in the second half of the 20th Century. The reforms that were developed from the latter decades of the 20th Century and into the 21st Century that ultimately culminated in the Water Act and the Basin Plan are intrinsically linked to, and informed by, the political and legal frameworks developed throughout this expansion in use.

This chapter is not intended to be a comprehensive dissertation of the history of the Basin. That would be an unnecessary replication of the useful texts already written in this area.¹¹ Rather, the intent of this chapter is to identify those key aspects of that history that properly inform this Commission's Terms of Reference and its recommendations. The necessary legal context in which the Water Act and Basin Plan reside is discussed in Chapter 2.

Prior to Federation

Aboriginal Australians have resided within the Basin for over 40 000 years. During this time prior to European settlement, Aboriginal people had used the Basin's water resources in numerous ways. Aboriginal people would catch fish using spears and nets, as well as through the construction of brush and rock weirs, of which the rock weirs near Brewarrina and on the Lower Darling are examples. Other food sources included birds, bird eggs, crayfish and mussels. Aquatic plants were also used as a food source, particularly Cumbungi, but were also used as fibre for the construction of bags and nets.¹²

Aboriginal histories demonstrate that an adaptive and ecologically sustainable approach was taken with respect to Aboriginal use of the Basin's water resources. Aboriginal histories and stories across the Basin emphasize the integrated nature of the Basin's ecology, with Aboriginal people being components of that ecosystem. For example, the Ngarrindjeri use the term 'Ruwe/Ruwar' to denote the connectivity between the land, the waters, the spirit and all living plants and animals.¹³ Aboriginal understanding of the lifecycles of aquatic species is reflected, in part, by the use of different names for different life stages.¹⁴ Further, the connectivity of groundwater and surface water and the importance of aquifer recharge is reflected in the rainbow serpent stories of many Aboriginal Nations in the Basin, such as the Mundaguddah for the Murrawarri people,¹⁵ and the Ngatji for the Barkandji people.¹⁶

As Professor Paul Humphries, river ecologist, explains, by virtue of having exploited the water resources of the Basin for tens of thousands of years, by definition, that use by the Aboriginal people was sustainable. Further, having regard to the adaptive practices implemented by the Aboriginal people, it necessarily follows that Aboriginal Australians would have been 'aware of their own potential impact on aquatic flora and fauna and may have modified their management to ensure it did not result in resource decline'.¹⁷

However, following European settlement, the sustainable practices of the Aboriginal people of the Basin were quickly replaced. Between the middle to late 19th Century, the Basin's Aboriginal population declined substantially, through illness, displacement or forcible removal. European commercial fishing began in 1859, and expanded at such a rate that it only took four years for concerns to be expressed, which ultimately led to a Royal Commission on fisheries that was held in New South Wales between 1894 and 1896 to assess the sustainability of fish stocks and the lack of fishing regulation.¹⁸

Outside of commercial fishing, the use of the waters of the Basin in the latter half of the 19th Century varied amongst the colonies. Average annual diversions from irrigation amongst the colonies around this time ranged from approximately 515 GL in Victoria to 15 GL each in New South Wales and South Australia.¹⁹ The development of irrigation in New South Wales prior to Federation was limited, and was described as 'largely a failure'.²⁰ On the other hand, large-scale irrigation had been developed in Victoria in the 1880s and 1890s, led by the Chaffey brothers in Mildura.²¹ Whilst the Chaffey brothers

influenced irrigation development in Renmark at the same time, the primary use of the waters in South Australia was for navigation by paddle steamers.²²

In the lead up to Federation, these different emphases had materialized into a tense stand-off amongst the colonies about the appropriate regulation and sharing of the watercourses.²³ South Australia's concern to preserve flows for the purposes of navigation was strongly opposed by New South Wales, primarily concerned with its territorial rights to the watercourses,²⁴ and Victoria, primarily concerned with its irrigators' rights to the use and storage of the waters. Several conferences and competing Royal Commissions were held that failed to resolve the dispute.²⁵

The Inter-State Royal Commission

It was during the Federation Drought, when in 1902 flows to the sea fell from an annual average of 14 000 GL to just 1740 GL,²⁶ that the jurisdictions co-operated and established an Inter-State Royal Commission on the River Murray to enquire into the conservation and distribution of the waters of the Basin amongst New South Wales, Victoria and South Australia for the purposes of irrigation and navigation, together with any necessary works and measures for doing so.

The Commission recommended the establishment of a 'Permanent Commission', with representatives from each of the States to administer the rivers, and to construct and operate capital works on the river to manage the river flows. The works recommended by the Commission consisted of an upgrade to Lake Victoria, the construction of a dam near Cumberoona, and the construction of up to 59 locks and weirs to preserve navigation on the Murray, Murrumbidgee and Darling Rivers. The Commission also proposed the preservation of a volumetric entitlement to South Australia.²⁷

River Murray Waters Agreements

Following the Commission's report, a number of agreements were subsequently negotiated and signed between 1903 and 1908 between the States and the Commonwealth, but it was the agreement signed on 9 September 1914 that was first ratified by all Parliaments.²⁸ This agreement, as amended by subsequent agreements, became known as the River Murray Waters Agreement.

The River Murray Commission was established, comprising of Commissioners from each of the jurisdictions. All decisions of the Commission were required to be unanimous.²⁹ The inaugural members of the Commission were senior water administrators, including Victorian Mr John Dethridge, inventor of the Dethridge wheel.³⁰ The original River Murray Waters Agreement provided for the funding of the construction of water storages at Lake Victoria and Cumberoona, together with locks and weirs along the rivers, with a construction timeline of seven years.³¹ In what may be a unique feature amongst

any such agreements worldwide, the River Murray Waters Agreement provided an annual volumetric entitlement to the downstream jurisdiction, South Australia, of 1547 GL per year.³²

Fourteen weirs were constructed on the River Murray, from Lock 1 at Blanchetown, completed in 1922, to the Yarrawonga Weir, completed in 1939. Construction of the storage at Cumberoona, what was to become the Hume Dam, was delayed by war, industrial disputes, cost increases, and disputes about its volume. It was originally proposed by the Inter-State Royal Commission as a storage of 720 GL. This was revised to 1233 GL in 1913, before the volume of 1500 GL was agreed to in 1934, with a contingency for 2500 GL. Construction was complete in 1936. Following the drought during the Second World War, it was agreed in 1948 to activate that contingency, until the final volume of 3000 GL was agreed to in 1954.³³ The upgraded Hume Dam was complete in 1961.

During the second half of the 20th Century, the use and regulation of the watercourses of the Basin saw a significant expansion and transformation. During this period, infrastructure works, and the corresponding irrigation development, expanded rapidly. Between 1956 and 1980, the combined water storage capacity of government dams in Victoria doubled. By the mid-1960s, New South Wales had a 50-year, £700 million plan for dam and weir construction.³⁴ The Keepit Dam on the Namoi River was constructed between the 1940s and 1950s, which, amongst other infrastructure works, fuelled the dramatic increase of cotton plantation — between 1961 and 1969, the area of land growing cotton increased from 38 hectares to 20 000 hectares.³⁵

The River Murray Waters Agreement was tested when, in the 1940s and 1950s, New South Wales and Victoria developed the Snowy Scheme together with the Commonwealth Government, to the exclusion of South Australia. The Snowy Scheme would, amongst other matters, have the effect of diverting additional water into the Murray River. Upon learning of this in 1956, South Australia immediately demanded inclusion in the project's negotiations, and commenced proceedings in the High Court challenging the validity of the enabling Commonwealth legislation.³⁶

Ultimately, amendments to the River Murray Waters Agreement made in 1958 accounted for the additional water, but allowed New South Wales and Victoria to replace any excess water contributed to the Murray and the Murrumbidgee with water from tributaries. This allowed New South Wales, for example, to use the additional water for the irrigation districts in the Murrumbidgee area, and replace it with water from the Darling River, stored at the Menindee Lakes.³⁷ South Australia withdrew its proceedings in 1959.

The experience over the Snowy Scheme prompted the South Australian Playford Government to explore further options to secure South Australia's water entitlement. Originally, an additional storage at Chowilla was proposed and agreed upon by Basin States in 1963. However, when cost estimates grew exponentially and salinity problems plagued the project, the River Murray Commission explored alternative options, ultimately concluding that Dartmouth was a better site to build an additional storage.

In 1970, therefore, works at Dartmouth replaced the proposed works at Chowilla in the River Murray Waters Agreement. For the first and only time during the life of the River Murray Waters Agreements and the subsequent Murray-Darling Basin Agreements, South Australia's annual entitlement increased — from 1547 GL originally agreed upon in 1914 to 1850 GL per year,³⁸ a figure that remains today.³⁹ Successive Parliaments and governments in South Australia grappled with the issue of replacing Chowilla with Dartmouth, until the 1970 Agreement was finally ratified by Parliament under the Dunstan Government in 1971. Construction of the Dartmouth Dam began in 1973 and was completed in 1979.⁴⁰ The completion of the Dartmouth Dam marked the last of the significant storage works constructed in the Basin, with storages on the River Murray now capable of holding almost 9300 GL.⁴¹

During the latter half of the 20th Century, significant changes in the functioning and ecology of the watercourses became apparent, accompanied by a substantial increase in irrigation development. By the late 1960s, irrigation diversions in New South Wales had overtaken Victoria,⁴² and by the 1970s, the combined irrigation diversions from New South Wales, Victoria and South Australia had increased seven-fold since Federation to 3950 GL per year.⁴³

The Basin had historically experienced floods, such as in 1917 and 1931.⁴⁴ However, in 1956, the Basin experienced the biggest flood recorded, affecting a watershed of over 700 000 hectares. Thousands of people were evacuated from regional centres along the Murray River and its tributaries, and significant areas of residential and agricultural development were affected. Initial estimates of the cost of the damage caused by the floods were £5 million, but which were revised to £30 million in a re-assessment conducted in 1997 (calculated to \$840 million in 1997 values).⁴⁵ On the other hand, whilst the Basin had experienced severe drought conditions such as the Federation Drought and the wartime drought of 1944, in 1980 drought conditions substantially worsened, leading to the closing of the Murray Mouth in 1980.⁴⁶

Concerns about the effect the use and diversion of the watercourses was having on the ecology of the Basin were being raised as early as the middle of the 20th Century. The construction of the Burrendong Dam, which commenced in 1946, was met with concern by graziers, who were concerned about the impact it would have on beneficial floods on the Macquarie Marshes which were a valuable food source for grazing stock, and by sugarcane farmers in Queensland, who relied on the Ibis to eat grasshoppers.⁴⁷ In 1958, the River Murray Waters Agreement incorporated, for the first time, provisions to monitor salinity levels, during 'periods of restriction'.

Whilst by the 1960s and 1970s, salinity was becoming recognized as a significant problem in South Australia, this was a one-sided concern, and New South Wales in particular adopted a typically self-interested approach. Whilst South Australia had placed a moratorium on new licences since 1967 and had reduced allocations, New South Wales issued new licences for the Darling and Murrumbidgee Rivers in 1979.⁴⁸ In response to

South Australia's requests for a reduction in irrigation diversions to address salinity, New South Wales officials blamed South Australia and Victoria, and the New South Wales Minister for Water Resources stated '[i]f they expect us to flush clean water down the Murray and deprive our own users, to wash the salt away, then they are expecting a bit much'.⁴⁹ On the initiative of the South Australian Government, the newly elected Whitlam Government quickly convened a meeting in 1972 to discuss water quality and water use in the Basin.⁵⁰ However, even in the apparent face of agreement that there was a Basin-wide need to restore water quality, New South Wales maintained the position that water quality management could be carried out by the States, and that it wished to retain 'total control'.⁵¹

Again, South Australia resorted to the courts. This time, it used the provisions under the *Water Act 1912* (NSW) which allowed anyone to object to a new licence. This quickly produced a substantial backlog, and would have required between 700 to 800 sitting days to deal with the objections lodged by South Australia and downstream irrigators. When the New South Wales Parliament amended the provisions to restrict objections to only those from the local area, South Australia commenced proceedings in the New South Wales Land and Environment Court, alleging a breach of the *Environmental Planning and Assessment Act 1979* (NSW). Eventually, South Australia accepted a commitment by the new Minister for Water Resources in New South Wales that downstream consequences would be considered in the issuing of new licences.

The Murray-Darling Basin Agreement

South Australia's repeated calls for integrated catchment management continued with the worsening drought conditions in the early 1980s. Salinity levels in 1980–81 were the highest ever recorded, and the Murray Mouth closed for the first time in recorded history in April 1980, and remained closed for 10 months. The Senate Standing Committee on Science and the Environment called for a Commission that was 'empowered to undertake an integrated and comprehensive approach to the problems of the River Murray and for a national body to determine water quality standards and guidelines' for development.⁵² This echoed the calls for such a body begun a decade earlier by the then Prime Minister.⁵³

The final River Murray Waters Agreement was finalized in 1982, and empowered the Commission to research, monitor and study water quality matters,⁵⁴ but it was not provided any additional funds to do so, and had only 11 staff members.⁵⁵ Further, the agreement was restrictively interpreted by the New South Wales Government, did not implement an integrated catchment management approach, and failed to confer a regulatory function on the Commission.⁵⁶ By 1985, however, Labor Governments held power in South Australia, New South Wales, Victoria and the Commonwealth. At a summit in Adelaide in November 1985, these States formulated what was known as the 'MDB Initiative',⁵⁷ which was later formalized in the Murray-Darling Basin Agreement (**MDB Agreement**), which established an intergovernmental structure that survives to

date. The rationale behind the structure was ultimately incorporated as the preamble to the MDB Agreement, stating its purpose as:

*to promote and co-ordinate effective planning and management for the equitable efficient and sustainable use of the water, land and environmental resources of the Murray-Darling Basin ...*⁵⁸

The most significant reform implemented by the MDB Agreement was the movement away from management led by the engineers of the River Murray Commission. It was widely held at the Adelaide summit in 1985 that whilst engineers were important, they ‘shouldn’t control the show’.⁵⁹ A Ministerial Council (**MinCo**) was established comprising of up to three Ministers from each jurisdiction with portfolios relating to water, land and the environment.⁶⁰ The River Murray Commission was rebadged as the Murray-Darling Basin Commission (**MDBC**), and was made up of two representatives from each jurisdiction. Whilst MDBC decisions still required unanimity, its advice to the MinCo could consist of majority and minority views.⁶¹

Notably, however, notwithstanding the inclusion of an otherwise comprehensive map of the Basin in a schedule, the MDB Agreement was not yet complete. Until 1989, the Queensland Government had maintained an almost casual indifference to the issues in the Basin, and was even suggested as a ‘neutral’ arbiter in the early drafts of the River Murray Waters Agreement. Queensland public servants were even forbidden to discuss Basin matters with the Commonwealth under the Bjelke-Petersen Government.⁶² Following the election of the Labor Government in 1989, however, Queensland was prepared to join the MDB Agreement on the proviso that this participation was confined to natural resource management, and would not extend to the management, maintenance and renewal of infrastructure of the River Murray. Queensland became a party to the agreement in 1992.⁶³ The Australian Capital Territory became a party in 1998, almost as a matter of completeness.⁶⁴

The core features of the MDB Agreement have remained largely unchanged since 1987, but have been subject to two significant amendments in 1992 and 2008. Importantly, in 1992, clauses 50 and 135 empowered the MinCo to add additional schedules regarding works, programs and the admission of new States to the MDB Agreement without the need for parliamentary approval. In 2008, in addition to the amendments necessary to reflect the creation of the Murray-Darling Basin Authority (**MDBA**), the MDB Agreement also incorporated a storage right for South Australia,⁶⁵ provisions relating to critical human water needs,⁶⁶ and more refined provisions relating to apportionment of costs.⁶⁷

Water quality measures and the cap on diversions

Notwithstanding the continuing increase of irrigation diversions across the Basin, in the early years of the MDB Agreement, little progress was made on reducing water take and addressing the increasingly rapid environmental degradation occurring. During

discussions about refining the approach to water accounting, a New South Wales member of the MDBC indicated that there was strong political pressure for an increase in irrigation diversions of approximately 5 to 10%.⁶⁸

In 1988, Schedule C had been added to the MDB Agreement, which provided a ‘Salinity and Drainage Strategy’, bringing together the separate plans of New South Wales, Victoria and South Australia.⁶⁹ A Natural Resources Management Strategy was adopted by the MinCo in August 1990.⁷⁰ In 1991, a Water Quality Policy was approved by the MinCo.⁷¹ However, little progress was made on the implementation of water quality measures due to the reluctance of New South Wales. Action was finally prompted following the outbreak of the largest ever recorded toxic algal bloom on the Darling and Barwon Rivers in 1991–92. New South Wales officials immediately engaged with the MDBC on water quality matters, with one official from another jurisdiction describing the about-face as New South Wales wanting to ‘bring everyone else in, so the fingerprints weren’t entirely their own on this thing’.⁷²

The pace of development and implementation of environmental measures and strategies began to quickly increase. An ‘Algal Management Strategy’ was implemented arising from the algal bloom,⁷³ and in June 1993 the MinCo approved the first allocation for environmental purposes under the MDB Agreement, by allocating 100 GL to the Barmah-Millewa Forest.⁷⁴

However, the most significant measure developed in the 1990s was the cap on surface water diversions (**Cap**). By the 1990s, it was abundantly clear that the quickly increasing level of irrigation diversions was placing a severe burden on the environmental resources of the Basin. In June 1995, an audit was published which found that irrigation diversions had increased the chances of severe droughts from 5% of years to 61% of years. If irrigation diversions were to increase to the extent of allowable allocations, severe droughts would occur in three out of every four years.⁷⁵

In response, New South Wales, Victoria and South Australia unanimously agreed to implement a cap that would restrict diversions at the levels permitted in 1994.⁷⁶ Queensland agreed to the Cap in principle, but stated that its water allocation management planning was not yet complete in order to implement the Cap.

The implementation of the Cap was immediately met with difficulties that persisted for over a decade. New South Wales officials advised their Minister they would not support the Cap ‘at that time’, because the science wasn’t settled, and questioned whether additional water was necessary for the Lower Lakes, characterizing them as ‘artificial’.⁷⁷ Unsurprisingly, the Cap was unpopular with irrigators, with then Deputy Prime Minister Tim Fischer promising to ‘zap the cap’ in the 1998 Federal election campaign.⁷⁸

An Independent Audit Group (**IAG**) was established in 1996 to assess and monitor the implementation of the Cap in a process that was ultimately formalized in what is now Schedule E of the MDB Agreement. In its first report in November 1996, the IAG

noted the Queensland Government's position regarding the development of its water allocation management planning and that it was expected to be complete by 30 June 1997.⁷⁹ However, this proved to be unduly optimistic, as Queensland's languid pace is evident in subsequent annual audit reports by the IAG. Only some valleys had been implemented by as late as 2006–07,⁸⁰ and Queensland had only fully implemented the cap in 2010–11.⁸¹ Whilst New South Wales had implemented the cap by 1997–98, the IAG repeatedly raised concerns about modelling and monitoring. In its audit of the 1997–98 year, the IAG noted that a 'higher priority must be given to monitoring' compliance with the Cap, further development was required on modelling, and that it was clear that the level of resources allocated was not adequate.⁸² A decade later, the IAG continued to raise concerns about New South Wales' modelling, particularly for the Barwon-Darling.⁸³

In a submission to the MDBC's five-year review of the Cap in 2000, the IAG recommended a number of 'refinements' to the Cap, including the incorporation of groundwater management and improvements in modelling. In subsequent reports, the IAG reported on what has been described elsewhere as 'glacial' progress towards those recommendations.⁸⁴

The reforms of the 21st Century

The Cap was a significant reform, and, in the face of substantial increases throughout the 20th Century and particularly the latter half, it was the first time a Basin-wide strategy contemplated a limitation on diversions for irrigation and consumptive use. However, as the IAG noted in its report on setting the Cap, it was seen as an 'essential first step' towards an integrated catchment management approach, noting:

*The Cap per se, is only a means to an end. It is not the end in itself. The IAG recognises that the overall objectives can be achieved only by identifying environmental water requirements and flow regimes and by establishing a supporting management and institutional framework, including trading of water.*⁸⁵

The early attempts to implement that next step were affected by the lack of a cohesive approach amongst the Basin States, the Commonwealth and the MDBC. In November 2000, COAG finalized a National Action Plan for Salinity and Water Quality (NAP), which committed \$1.4 billion, of which half came from the Commonwealth, to fund 'regional solutions to salinity and water quality problems'.⁸⁶ However, neither the MinCo nor the MDBC were involved in the development of the NAP, and offers to more fully involve the MDBC in its implementation were not taken up.⁸⁷

As a consequence, the attempts at reform by the MinCo and the MDBC quickly faltered. In June 2001, an integrated catchment management policy (ICM Policy) was adopted by the MinCo 'with considerable fanfare'.⁸⁸ It noted the 'significant progress to date', but identified a need to 'accelerate efforts to protect both the landscape and regional communities'.⁸⁹ Noting that past actions had caused the Basin's resources to

degrade, the ICM Policy explained that a fundamental change in the management of the Basin was required. That change required a Basin-wide approach that identified targets and outcomes at a Basin, catchment and sub-catchment scale, whilst at the same time integrating community groups in that process, building capacity where necessary.⁹⁰ However, the ICM Policy was quickly sidelined. By 2004, the MDBC noted in a brief discussion in its annual report that it was ‘not supported by a specific funding program’, and that the progress to date was ‘not necessarily in the direction and in the same way as envisaged under the ICM Policy’.⁹¹

However, the effects of the Millennium Drought between 2001 and 2009 became the backdrop for two significant reforms in the middle of the first decade of the 21st Century that would ultimately become the foundation of the Water Act and the Basin Plan. Described as the worst drought in recorded history, average observed flows between 2001 and 2009 were 2445 GL per year, compared with average reconstructed unimpeded flows for the 20th Century of 13 830 GL, representing an 82% decline.⁹² Importantly a significant factor was the over extraction of the Basin’s water resources, with one study estimating diversions and regulation contributed almost half of the reduction in stream flow.⁹³ The impact on agriculture and the environment was substantial. There was a marked decline in waterbird, fish and aquatic plant populations. Significant numbers of River Red Gums, some as old as several hundred years, died, and 57 000 hectares of planted forest were lost.⁹⁴ Between 2002 and 2009, irrigated rice and cotton production in the Basin fell by 99% and 84% respectively.⁹⁵

The impetus for change again came from South Australia. This time, it was the then Commonwealth Environment Minister, Mr Robert Hill AC, who raised the issue of increasing environmental flows to benefit the Murray Mouth and the Coorong in early 2001. Whilst this was by no means a new topic for the MDBC, this generated significant negotiations amongst the Basin States regarding how much environmental water could be released, and at what cost.⁹⁶ Proposals of between 350 GL and 1500 GL were initially discussed, but by October 2002, the States could only collectively devise an additional 334 GL at a cost of \$445 million.⁹⁷

Ultimately, The Living Murray initiative (**TLM**) was formalized in an intergovernmental agreement signed by the Basin States and the Commonwealth on 25 June 2004. It adopted the proposal originally called for at a forum held in Adelaide in February 2003 for a ‘first step’ recovery of 500 GL over five years.⁹⁸ That delivery of water would be directed towards environmental objectives at ‘six significant ecological assets’, known as Icon Sites, and would be delivered through the use of efficiency measures, river infrastructure and water buybacks.⁹⁹ In a departure from previous intergovernmental agreements, funding was not split equally, with the \$500 million being comprised of \$200 million from the Commonwealth, \$115 million each from New South Wales and Victoria, \$65 million from South Australia and \$5 million from the Australian Capital Territory.¹⁰⁰

TLM is particularly notable for this Commission's enquiry in two respects. First, as the Water Act would state as a legislative fact, it explicitly notes and recognizes the problem of the overallocation of water resources in the Basin.¹⁰¹ This admission by the Basin States and the Commonwealth provides a critically important starting point for further reform measures. Second, in an almost world-first,¹⁰² it represented a formal return of water to the environment.

On the same day that the Basin States and the Commonwealth finalized TLM, COAG also finalized the National Water Initiative (NWI). Extending beyond the Basin, the NWI set the goal of sustainable water in all catchments in Australia for all Australian jurisdictions. As discussed in Chapter 2, a newly established Commonwealth agency, the National Water Commission, oversaw the implementation of the NWI, at least until its abolition in 2014.

The NWI is notable in its identification of what would become significant issues for the implementation of the Water Act and the Basin Plan, and have been the subject of considerable discussion before this Commission. Recognizing that earlier efforts were substantially only directed towards surface water, the NWI envisaged a comprehensive regulatory framework for managing both surface and groundwater using an approach that 'optimises economic, social and environmental outcomes'.¹⁰³ It required governments to use judgements 'informed by best available science, socio-economic analysis and community input'.¹⁰⁴ It required governments to provide Aboriginal access to water resources through the inclusion of Aboriginal representation in water planning and by water plans that incorporate Aboriginal 'social, spiritual and customary objectives'.¹⁰⁵ It recognized that land use activities, including the 'intercepting and storing of overland flows' could intercept 'significant volumes of surface and/or groundwater' and that a failure to integrate such activities in water planning would 'present a risk to the future integrity of water access entitlements and the achievement of environmental objectives for water systems'.¹⁰⁶ Finally it provided for the assignment of risk upon water access entitlement holders for reduced or less reliable allocations arising from, amongst other things, climate change.¹⁰⁷

Water Act 2007

Notwithstanding the significant gains represented by the finalization of TLM and the NWI in 2004, it was still apparent, particularly to the South Australian Government, that more was needed. By 2005, it was apparent that progress was slow in implementing TLM, and with respect to the NWI, 'not very much was happening'.¹⁰⁸ The drought continued to worsen, with inflows into the River Murray between June and November 2006 just 610 GL, or approximately half the previously recorded low in 1902.¹⁰⁹ By October 2006, water access entitlements in New South Wales were being suspended.¹¹⁰ At a meeting on Melbourne Cup Day in November 2006, the Premiers of the Basin States and the Prime Minister agreed on the 'need for an informed whole-of-basin approach to be developed

collaboratively, not by jurisdictions acting without regard to the consequences for other states'.¹¹¹ By 22 January 2007, the then Leader of the Federal Opposition, Mr Kevin Rudd, was reported to have secured the support of the Basin States for a national water authority to manage the Basin's water resources.¹¹²

On 25 January 2007, then Prime Minister John Howard announced a \$10 billion, '10 point plan' to address overallocation of water in rural Australia, and particularly in the Basin.¹¹³ Calling himself a 'climate change realist', Mr Howard noted the 'contraction' of water availability in the Southern Basin in particular, and the estimates of further decline forecast by CSIRO by 2020. As a result, Mr Howard described the operation of the River Murray as being on a 'knife-edge'. In response, Mr Howard proposed a comprehensive and 'complete overhaul of the Murray-Darling Basin's governance arrangements', which required 'an end to the parochial pursuit of state interests'. Those new arrangements would address 'once and for all' overallocation and the establishing of a 'sustainable cap on surface and groundwater use in the Basin'. This required significant investment in efficiencies and river infrastructure, and required a comprehensive metering and monitoring regime, as Mr Howard explained, 'you cannot manage what you cannot measure'.

Such a complete overhaul would only work, Mr Howard explained, if those governance arrangements were 'placed on a proper national footing', and accordingly stated that these reforms were conditional on a referral of power from the Basin States of their legislative powers of water management in the Basin. As discussed in Chapter 2, however, such a comprehensive referral was ultimately not forthcoming.

Conclusion

It was Spanish-American philosopher, George Santayana who first wrote '[t]hose who cannot remember the past are condemned to repeat it'.¹¹⁴ This aphorism is no less true for the management of the Basin.

The history of the management of the Basin since the mid-19th Century has been characterized by self-interested and short-sighted regulation, allowing for exponential expansion of extractive uses that has wreaked a considerable cost to the Basin's natural ecosystem. This complacency has only been replaced by significant and constructive reform when severe environmental conditions made it abundantly clear that nothing short of action was viable. The River Murray Waters Agreement arose out of the Federation Drought. The significant ecological decline observed by the 1980s and the 1990s produced the MDB Agreement and the cap on diversions. The Millennium Drought generated TLM, the NWI and ultimately the Water Act and the Basin Plan.

It is trite to say that it is imperative that cohesive, long-term regulation of the Basin is developed, not only in times of extreme urgency. Parliaments and governments should

not be stirred into action only when it is critically necessary. As the balance of this report makes clear, it is obvious that something more, something better, must be done.

It is not sufficient to make broad comments and recommendations about what should be fixed without recognizing and taking into account why and how such matters got to the stage of needing to be fixed. For example, it is clear that the management of the Basin's water resources in a complex multi-jurisdictional environment requires better co-operation amongst the Basin States and the Commonwealth. However, it is manifestly inadequate to simply recommend that these jurisdictions should 'collaborate' and 'take joint responsibility', without also taking into account and considering the historical context of why those jurisdictions failed to collaborate and take joint responsibility. A problem can only be solved completely by understanding its underlying cause. Otherwise, any purported solutions will only, at best, address its symptoms.

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Introduction

The legal regulation of the water resources of the Murray-Darling Basin (**the Basin**), and related land use issues, has been principally the domain of the legislatures of the colonies, and then the States upon Federation. Despite several historic attempts to enlarge Commonwealth legislative power and regulatory involvement in this area, starting from the Federation Debates, and subsequently regarding referrals of State legislative power, the Commonwealth Parliament nonetheless lacks a comprehensive power to make laws with respect to the Basin.

The *Water Act 2007* (Cth) (**Water Act**) may be viewed as only an illusory comprehensive enactment by the Commonwealth Parliament concerning the regulation of the water resources of the Basin. Subject to certain other matters, the primary source of legislative power exerted by the Water Act is the power of the Commonwealth Parliament to make laws with respect to external affairs, in sec 51(xxix) of the *Constitution*, through the implementation of Australia's treaty obligations.

The characterization of the Water Act, and by extension the *Basin Plan 2012* (Cth) (**Basin Plan**), as largely a law with respect to external affairs has two important consequences. First, that head of power is a criterion of validity: in the case of the Water Act, its constitutional validity; in the case of the Basin Plan, whether it is authorized by the Water Act. Second, it is critical to the question of statutory construction, including the Water Act's objects and purposes, which is discussed in Chapter 3.

Finally, the place that the Water Act, and by extension the Basin Plan, has in the constitutional framework of Australia is important in order to understand the recent political statements made on behalf of the New South Wales and Victorian Governments regarding the prospects of those jurisdictions 'withdrawing' from the Basin Plan.

Prior to Federation

Upon European settlement, common law riparian rights regulated the use and storage of water from the Basin. At common law, owners of property through which watercourses ran were entitled to full natural flow of the water and to its use as those property owners pleased, subject to the riparian rights of the adjoining properties.¹

Following the increased development of irrigation in the late 19th Century, however, this common law position was gradually replaced by statute. In 1886, the right to the use, flow and storage of water in the watercourses in Victoria was vested in the Crown, subject to limited domestic and stock purposes,² and a system of licensing for the construction and use of irrigation and storages was established. This made Victoria the first common law jurisdiction in the world to fundamentally alter riparian rights in this way. New South Wales followed suit in 1896.³ Similar vesting of such rights in the Crown did not occur in South Australia or Queensland until 1919 and 1910 respectively.⁴ Until then, from 1886

in South Australia, and from 1891 in Queensland, control of the use and distribution of surface water was vested in local authorities in proclaimed 'water districts' or 'irrigation areas' respectively.⁵ Each jurisdiction has comprehensive statutory licensing regimes, most of which continue to vest the right to the use, flow and storage of water in the watercourses in the Crown.⁶

Federation Debates

The debate over what Quick and Garran describe as the 'river question' was a contentious and lengthy one during the Federal Convention Debates, particularly during the Adelaide and Melbourne sessions of 1897 and 1898.⁷ The South Australian delegates made repeated attempts to vest legislative power over the control and regulation of the River Murray in Commonwealth Parliament. South Australia's argument had two bases. First, the South Australian delegates argued that the inter-jurisdictional nature of the river system rendered their regulation a particularly Federal concern, so as to ensure fair and equitable regulation across the prospective States. In making this argument, delegates referred to the chequered recent history of attempted co-operation, and repeatedly emphasized the common property of the waters within all three colonies, and the connectivity of the river system.⁸ Mr John Gordon attempted to explain it in the following way:

*If the honourable member got into a canoe at the head of any of those rivers, and has not after a long political career lost the art of steering straight, he would at the end of his journey find himself at the mouth of the Murray, and in South Australia. All these rivers are part of one great system.*⁹

Second, the South Australian argument rested on an assertion of riparian rights, based both on common law and international law, the preservation of which required Federal intervention and determination.¹⁰ South Australia's reliance on riparian rights was swiftly rejected by New South Wales and Victoria alike.¹¹ Mr Justice Isaacs, who had been a Victorian delegate, would later describe the notion of extending the jurisdiction of the High Court to determine disputes between the States by reference to international law as 'outside the pale of sober thought'.¹²

With respect to South Australia's first argument, New South Wales' delegates conceded that to the extent that the river system crossed borders, Commonwealth regulation for navigation was appropriate. However, New South Wales' delegates repeatedly insisted that the rivers that were wholly within the colony, referring in particular to the Darling River, were a valuable resource, and should remain the domain of the colony and its inhabitants, and that New South Wales communities should not be asked to suffer purely for the benefit of South Australia.¹³ On the other hand, notwithstanding its comparably greater irrigation development, Victoria's delegates provided qualified support for South Australia's position, and attempted, led primarily by Mr Alfred Deakin, to work on a compromise position that would satisfy both South Australia and New South Wales.¹⁴

Ultimately, South Australia's attempts for an explicit and specific legislative power over the Murray vested in the Commonwealth Parliament under sec 51 of the *Constitution* failed. Instead, the Commonwealth Parliament was relevantly left with the power to make laws with respect to trade and among the States under sec 51(i), with the clarification in sec 98 that this power extended to navigation and shipping. Section 100 was the compromise which protected the interests which the New South Wales' delegates sought to guard. The insertion of 'reasonable' to qualify the use referred to in sec 100 was at the suggestion of South Australian delegate, Mr John Downer.¹⁵ Whilst New South Wales' delegate Mr George Reid questioned the utility of such a qualification, arguing that reasonableness would be implicit,¹⁶ Mr Isaac Isaacs described the word's effect in the following way:

*it would restrain New South Wales, for example, from making an unreasonable use of the waters of its rivers for conservation and irrigation. But, I would ask, what is to be the standard of reasonableness? It would be reasonableness as between the necessities of irrigation and conservation, and the necessities of navigation. The question would not be asked as to the reasonableness of the use as affecting the rights of two states.*¹⁷

Federation

Upon Federation, therefore, the Commonwealth Parliament had a distinctly abridged power to legislate so as to affect the water resources of the Basin, and consequently their regulation remained subject to the States. South Australia had failed to achieve the desirable national character of the Basin's regulation as a topic for the national legislature; Victoria and New South Wales had succeeded in placing their local interests ahead of a national significance of the Basin.

The topic of expanded Commonwealth legislative power was nonetheless revisited early after Federation. During the Federation Drought, in 1902, 56 delegates from New South Wales, Victoria and South Australia attended a conference at Corowa, New South Wales. The Inter-State Royal Commission was the outcome of that conference. Early calls for the Commonwealth to 'take over' were made, and for the Basin to be treated as a 'national concern'. However, this was abandoned following Prime Minister Edmund Barton noting that if the States did desire Commonwealth intervention, they would also need to 'remit their authority respecting irrigation to the Commonwealth'.¹⁸ The States declined to comprehensively cede such substantive regulatory powers to such a new government.

Inter-State Commission

An Inter-State Commission, however, was provided for under sec 101 of the *Constitution*. There is little detail arising from the Federal Convention Debates about its

purpose, however Quick and Garran note it was at least intended to be modelled on the Inter-State Commerce Commission established in the United States in 1887.¹⁹ High hopes were attributed to its prospects by then Leader of the Opposition, Mr Alfred Deakin, when the Bill that became the *Inter-State Commission Act 1912* (Cth) was introduced. Referring to the ‘undesirable friction and suspicion’ amongst the States that arose in connection with ‘the series of questions that arose out of the river problem’, Mr Deakin described the Inter-State Commission as:

*a body of experts, called upon, after personal investigation of a searching and scientific character, to lay before the States interested all the facts as to the possibilities of the development of the water resources of Australia.*²⁰

Referring to the various proposals sought to address the management and regulation of the River Murray, particularly the Lower Murray, Mr Deakin further noted:

*Progress in these schemes has been delayed year after year owing to the existence of jealousies sometimes based upon misunderstandings – misunderstandings which are perfectly capable of being removed, but which can only be removed by a thoroughly scientific study of the circumstances of this great water basin, and by the application of the latest scientific methods to the utilization to the best advantage of the water to be stored.*²¹

Ultimately, however, the Inter-State Commission was short-lived and ineffectual. The provisions of the *Inter-State Commission Act 1912* (Cth) which purported to vest it with judicial powers were held to be invalid, as being an impermissible vesting of Federal judicial power in an entity other than a court established under Chapter III of the *Constitution*.²² Whilst this left the Commission’s investigative powers untouched, these largely fell into disuse, until all of its members’ appointments had expired by 1920, and no new members were subsequently appointed until its abolition in 1950.²³ An attempt to revive the Inter-State Commission was made by the enactment of the *Inter-State Commission Act 1975* (Cth) by the Whitlam Government, but was only proclaimed under the Hawke Government in 1983. This iteration was similarly short-lived, and its investigatory functions were eventually replaced by the newly created Industry Commission in 1989.²⁴ The Industry Commission, in turn, was one of the bodies that was replaced in 1998 by the Productivity Commission.²⁵

Reflecting the political settlement upon Federation that denied the Commonwealth plenary power to regulate the Basin, even the broadly expressed sec 101 of the *Constitution* probably failed to encompass comprehensive regulation of the Basin. The Inter-State Commission’s intended powers of ‘adjudication and administration’ extended to the *Constitution’s* trade and commerce provisions and ‘all laws made thereunder’. No doubt a deal of irrigation enterprise had connexions with interstate and overseas trade and commerce, but a great deal did not. That intrastate enterprise would almost certainly lie outside the reach of Commonwealth power. Thus the critical role of stewarding the Basin water resources was given to no one authority.

The imperative thus became political agreement, in the absence of national power. The Water Act is the very considerable achievement of generations of such agreements.

Intergovernmental Agreements

For the 90 years between 1914 and 2004, Commonwealth participation in the management of the water resources of the Basin consisted primarily of funding contributions and representation on the River Murray Commission and Murray-Darling Basin Commission under the River Murray Waters Agreements, and subsequently the Murray-Darling Basin Agreement.

It was again during severe drought, this time the Millennium Drought, that greater Commonwealth involvement in the Basin was again raised. On 25 June 2004, all Australian jurisdictions agreed to the National Water Initiative (NWI), whose objective was to implement a ‘nationally-compatible, market, regulatory and planning based system of managing surface and groundwater resources for rural and urban use that optimises economic, social and environmental outcomes’.²⁶ The NWI built on earlier commitments to reform made in the 1990s, and explicitly referred to the commitment to address overallocation through the use of water planning regimes and volumetrically limited and tradeable water access licences. However, under the NWI, the Commonwealth was to have a much greater involvement in water reform than it had previously.

The implementation of the NWI was overseen by the newly created National Water Commission (NWC). Section 40 of the *National Water Commission Act 2004* (Cth) established the Australian Water Fund Account, under which the NWC entered into funding agreements with the States to implement the provisions of the NWI. This followed a familiar model of Commonwealth involvement in national reforms in which it lacked specific legislative power, where policy outcomes are linked to the provision of Commonwealth funding through the use of the tied grants power under sec 96. Whilst sec 96 is necessarily subject to the provisions of the *Constitution*, the Commonwealth is not limited as to the subjects, even beyond those with respect to which it lacks direct legislative power, to which tied grants can be applied.

As these funding agreements invariably involved the replacement of older statutory licensing schemes with newer, volumetrically limited licensing schemes, they inevitably involved the replacement of statutory rights with lesser statutory rights, accompanied by compensation called ‘structural adjustment payments’. In 2009, the High Court considered two of these schemes as it related to the replacement of bore licences issued under the *Water Act 1912* (NSW) with aquifer access licences under the *Water Management Act 2000* (NSW) in the Lower Lachlan Groundwater System and the Lower Murray Groundwater System.²⁷ Whilst a majority of the High Court affirmed that the Commonwealth could not use sec 96 to require a State to acquire property on otherwise than just terms, a greater majority nonetheless held that the replacement of the statutory based rights in question did not constitute an acquisition of property within the meaning

of sec 51(xxxi). This conclusion was reached on two bases. First, the statutory rights in question were inherently susceptible to statutory modification and alteration. Second, even if it could be said to be a deprivation of property rights, none were acquired by either the State or the Commonwealth. The schemes for replacing the access licences which were underpinned by the Commonwealth funding agreements survived.

Water Act

Following the more involved role adopted by the Commonwealth during the Millennium Drought through the use of the tied grants power under sec 96, the Water Act represents a significant legislative intervention into the management of the Basin. In introducing the Bill, and calling for the Basin to be recognized as one of national significance, the then Minister for Environment and Water Resources, Mr Malcolm Turnbull, noted that:

Federal management of the Murray River was called for in the 1890s, but the vested interests of the states prevailed. Over the years different forms of collaborative management have been undertaken, but neglected infrastructure, overallocation and diversion caps routinely ignored testify to the need for a different approach.²⁸

The former Minister further referred to the ‘massive agricultural development’, and directly linked the increase in water use to the ‘marked decline in the basin’s environmental health’. This overallocation and overuse of water resources was described as being exacerbated by climate change, as the former Minister noted CSIRO estimates that by 2020 average annual flows could decline by 15%.²⁹ Having regard to the evidence discussed in Chapter 6, it would appear that these estimates are well on their way to being vindicated.

Attempted referral of power

In his second reading speech, the former Minister referred to an ‘absence of cooperation from the Victorian Labor Government’.³⁰ In his speech to the National Press Club on 25 January 2007, the former Prime Minister Mr John Howard indicated he would be ‘writing to all relevant State and Territory Leaders requesting that they refer to the Commonwealth their powers of water management over the Murray-Darling Basin’.³¹

The very next day, the Premier of New South Wales announced that he was ‘100% in favour of a national approach to water’.³² After further details of the national reform were discussed and clarified, Queensland and South Australia were also supportive of the national approach. However, Victoria refused to refer legislative powers, with members of the Victorian Parliament insisting that, at a minimum, ‘nobody in Victoria should be worse off as a consequence’.³³ As a result, the Water Act does not have the wide scope

envisaged by the former Prime Minister's speech, and only partially relies upon a limited referral, discussed below.

External affairs

Relevant treaties

As a result, the Water Act is primarily a law with respect to external affairs, insofar as it implements the obligations in certain treaties.

The Convention on Biological Diversity (**the Biodiversity Convention**)³⁴ and the Ramsar Convention on Wetlands (**the Ramsar Convention**)³⁵ were explicitly mentioned by the Minister in introducing the Water Act. The Desertification Convention,³⁶ the Bonn Convention,³⁷ CAMBA,³⁸ JAMBA,³⁹ ROKAMBA⁴⁰ and the Climate Change Convention⁴¹ are additionally all mentioned as 'relevant international agreements' under sec 4.

Of those treaties listed, the Biodiversity Convention and the Ramsar Convention in particular contain obligations that are expressed in sufficiently precise terms so as to enliven the external affairs power under sec 51(xxix).⁴²

The Ramsar Convention requires jurisdictions to include in a List of Wetlands of International Importance, wetlands that are of international significance in terms of 'ecology, botany, zoology, limnology or hydrology'.⁴³ Jurisdictions are then required to implement planning so as to promote the conservation of those wetlands and their 'wise use'.⁴⁴ In addition, nations are required to establish nature reserves on wetlands, whether listed or not, to promote the conservation of those wetlands and waterfowl. Whilst 'wise use' is not defined by the Ramsar Convention, this language is not too aspirational so as not to enliven the external affairs power. Similarly broad language in the Convention for the Protection of World Cultural and Natural Heritage was held to enliven the external affairs power in the *Tasmanian Dams* case.⁴⁵

The Biodiversity Convention requires nations to develop strategies, plans or programs for the conservation and sustainable use of biological diversity, and to integrate conservation and sustainable use of biological diversity into pre-existing plans.⁴⁶ Jurisdictions are required to establish a series of protected areas for 'in-situ conservation', as well as measures for 'ex-situ conservation'.⁴⁷ Further, jurisdictions are required to implement and integrate specified principles of sustainable use of components of biological diversity in decision-making, planning and other actions.⁴⁸

The other treaties listed contain obligations which are complementary to the broader management obligations to be found in the Ramsar and Biodiversity Conventions.

The Bonn Convention requires jurisdictions to 'endeavour to provide immediate protection for migratory species' specified in the appendix, and to 'conclude agreements covering the conservation and management of migratory species'.⁴⁹ The CAMBA,

JAMBA and ROKAMBA are all agreements made with China, Japan and the Republic of Korea respectively under that provision. Relevantly, each of these agreements requires jurisdictions to establish sanctuaries to protect migratory birds and their environment, and to take appropriate measures to preserve and enhance the environment of migratory birds.⁵⁰ These obligations are complementary to the broader management obligations contained in the Biodiversity Convention in particular.

The Desertification Convention expressly notes that it should be read as part of a framework of treaties, including the Biodiversity Convention.⁵¹ Relevantly, however, it requires jurisdictions to adopt an integrated approach to address the physical, biological and socio-economic aspects of the processes of drought.⁵²

The Climate Change Convention relevantly requires jurisdictions to take climate change considerations into account ‘to the extent feasible’ in ‘relevant social, economic and environmental policies and actions’, and to take relevant measures, such as impact assessments, to minimise the effect of climate change.⁵³

Section 4 also refers to ‘any other international convention’ to which Australia is a party that is relevant to the use and management of the Basin water resources and is prescribed by the regulations — so far, no additional conventions are prescribed. Accordingly, whilst the Climate Change Convention is specifically listed in sec 4, the same is not true for agreements made under that convention, such as the Kyoto Protocol⁵⁴ or the Paris Agreement.⁵⁵ The Kyoto Protocol requires jurisdictions to promote sustainable forms of agriculture in light of climate change considerations, whilst the Paris Agreement requires jurisdictions to implement adaptive management practices to assess climate change impacts and vulnerability, undertake monitoring and evaluation, and to build resilience of socio-economic and ecological systems through diversification and sustainable management of natural resources.⁵⁶

It remains to be seen as to what is the effect of the Commonwealth Parliament ostensibly failing to rely on aspects of a head of power, by failing to refer to the Kyoto Protocol or the Paris Agreement under sec 4 or by way of regulation, whilst at the same time expressly referring to other aspects of that head of power. As it is a settled principle of constitutional law that the Commonwealth Parliament cannot ‘recite itself into power’,⁵⁷ it would arguably follow that the Parliament could neither recite itself out of power, such that the failure to refer to these additional agreements may not necessarily preclude the Water Act as being characterized as a law with respect to their implementation. In any event, it is unnecessary to resolve this issue, as the integration of climate change science into planning and decision-making frameworks, as discussed in Chapter 3, is adequately conveyed by the relevant provisions of the Biodiversity Convention, the Ramsar Convention, and para 21(4)(b) of the Water Act.

In its submission to the Senate Standing Committee on Legal and Constitutional Affairs regarding the inquiry into provisions of the Water Act, the Law Society of New South Wales argued that the Food Aid Convention⁵⁸ could also be used to support the

provisions of the Water Act.⁵⁹ That treaty requires, as the name suggests, jurisdictions to provide certain quantities of food aid to certain eligible countries.⁶⁰ It is thus not relevant to a legislated water management framework for the Basin, given the remote and oblique way that such management may conceivably affect Australia's ability to comply with its obligations under that treaty.

Appropriate and adapted

The Water Act is plainly a law that is reasonably capable of being considered appropriate and adapted to, at least partially, implementing the treaties listed in sec 4.⁶¹ Subsection 21(1) explicitly requires the Basin Plan to implement the relevant international conventions. As discussed in Chapter 3, the language of the Biodiversity Convention is picked up in subsec (2), and the language of the Ramsar Convention, including the concept of 'wise use', is picked up in subsec (3).

As discussed in Chapter 3, the construction of the specific provisions of the Water Act then becomes more a question of statutory interpretation rather than a question of constitutional validity. The two are related, not least because where possible an enactment must be interpreted to fit within constitutional limits.

The Water Act does not purport to implement, in full, the provisions of those treaties; it is limited to those aspects of the treaties that deal with water resources. With respect to the Biodiversity Convention, for example, a key legislative implementation of its broader obligations finds expression in the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

Nor does the Water Act purport to implement the Biodiversity Convention, for example, on its own; it establishes the framework by which the Basin Plan will substantively do so. Accordingly, insofar as it does establish such a framework, it would appear to be a 'national strategy' consistent with the meaning of art 6(a) of the Biodiversity Convention.

On its face, having regard to merely its terms, the Basin Plan would similarly appear to be capable of being characterized as a 'national strategy' within the meaning of that article. More particularly, however, the Basin Plan would be characterized as regulating and managing a biological resource, namely water, within the Basin, consistent with the 'in-situ conservation' provisions in art 8 of the Biodiversity Convention. However, the question of whether the adopted form of the Basin Plan is authorized by the Water Act is a question that requires a more substantive analysis of the provisions of both the Water Act and the Basin Plan, having regard to its terms, operation and effect.

It should be remembered that the Basin Plan will not necessarily be invalid, as not being authorized by a law with respect to external affairs, if the environmental outcomes or goals required by the relevant treaties fail to be achieved. The analysis required by sec 51(xxix) is one whether the relevant law is 'reasonably capable of being considered appropriate and adapted to implementing the treaty'. Put another way, the Basin Plan

may be considered appropriate and adapted for the purposes of sec 51(xxix), even if it ultimately fails to achieve the stated goals, if it is nonetheless appropriately designed to achieve them. Genuine attempts are not rendered invalid by eventual failure.

For these reasons, the whole of the Water Act can be properly characterized as a law with respect to external affairs, by implementing the listed treaties, but particularly the Biodiversity Convention and the Ramsar Convention. Although these treaties do not explicitly mention any powers of enforcement, the powers in Part 8 of the Water Act, together with sec 35, are undoubtedly part of a ‘national strategy’ for the conservation and sustainable use of biological diversity, and such powers would relevantly be ‘measures relating to the use of biological resources to avoid or minimise adverse impacts on biological diversity’ within the meaning of art 10(b) of the Biodiversity Convention.

Other sources of power

Whilst aspects of the Water Act are capable of being characterized under other heads of legislative power, only the external affairs power is capable of supporting the full text of the Water Act, including core features, such as Part 2, Part 6 and Part 8.

With respect to other heads of power, sec 9 follows a legislative drafting practice in the Commonwealth, the utility and effect of which is perhaps dubious, of attempting to enumerate the legislative heads of power on which reliance is made for the Water Act.

Whilst a comprehensive referral of powers did not eventuate, a limited referral of power under sec 51(xxxvii) from New South Wales, Queensland, South Australia and Victoria (**the Basin States**) was nonetheless achieved. Each jurisdiction passed a text-based referral by reference to the *Water Amendment Act 2008* (Cth), which inserted or amended Parts 1A, 2A, 4, 4A, 10A and 11A into the Water Act.⁶² Accompanying that text-based referral was a subject matter referral allowing for the subsequent amendments of those Parts from time to time.⁶³ Each referral Act expressly reserves the ability of each Basin State to terminate its referral, by way of a proclamation from the relevant Governor.⁶⁴

However, key parts of the Water Act that relate to the management of the Basin, including Part 2, Part 6 and Part 8, are not the subject of referrals of legislative power.

Insofar as the enforcement powers in Part 8 are imposed on trading and financial corporations, those provisions would be capable of being characterized as a law with respect to trading and financial corporations within the meaning of sec 51(xx).⁶⁵ Section 9 of the Water Act also refers to the power to make laws with respect to census and statistics, sec 51(xi), and the power to make laws with respect to weights and measures, sec 51(xv). Part 7 of the Water Act would be capable of being characterized as a law with respect to either paragraph. Section 9 also refers to the power to make laws with respect to postal, telegraphic and other like services. It is not readily apparent what relevance this head of power has with respect to the Water Act.

Where payments are made to the Basin States, payments made out of the Water for the Environment Special Account under Part 2AA are capable of being characterized as payments made under sec 96. For other payments, however, it would be necessary to characterize the payment as being within the heads of legislative power discussed.⁶⁶

Finally, the power to make laws with respect to trade and commerce among the States under sec 51(i) would support the enactment of Part 4. Insofar as it is necessary, and beyond the incidental aspect of sec 51(i), Part 4 is also supported by the referral by the Basin States, to regulate intrastate trade.⁶⁷

Section 51(i), however, does not lend its support to the Water Act as a whole. The Full Court of the Federal Court rejected an argument that the Water Act is a law with respect to interstate trade and commerce by its effect on regulating water entitlements in a watercourse that conveys the substance water, which may be seen as an interstate commodity. In essence, the Court held that the vague and indirect economic effect on trade and commerce that the provisions of the Water Act may have is insufficient for those provisions to be characterized as laws with respect to trade and commerce.⁶⁸

Another possible argument would urge the characterization of the Basin as a vital economic asset, such that the law that preserves its natural resources is capable of being characterized as a law with respect to interstate trade and commerce.

However, that argument is highly problematic for two reasons. First, such a law would clearly be vulnerable to running foul of sec 100, discussed below. Second, such a characterization would require an express reversal of the emphases and the priorities discussed in Chapter 3. If primacy is given to the character of the water resources of the Basin as an economic asset to be exploited, with environmental outcomes designed to facilitate that exploitation, the argument may cause a substantial distortion of the Water Act's critical provisions.

Section 100

As discussed above, sec 100 was the product of the compromise between the South Australian and New South Wales delegates, and was intended to address the concerns of the latter regarding the Commonwealth's paramount powers with respect to navigation in its power to make laws with respect to interstate trade and commerce. It is first important to note that the term 'conservation' used in that section refers to the storage of water for principally consumptive use, along with flood mitigation and navigation provision, rather than the protective environmental connotations that the term now conveys.

Section 100 is, however, quite limited in its operation. It only operates to limit laws of the Commonwealth Parliament that can be characterized as laws of trade and commerce within the meaning of sec 51(i).⁶⁹ For example, it does not limit any Commonwealth laws that may merely affect trade or commerce, such as the construction of a dam or wartime rationing. Further, sec 100 does not apply to groundwater, as the limitation is expressly

linked to the Commonwealth's powers over navigation, therefore necessarily relating to navigable surface water.⁷⁰ Finally, as a limitation solely on Commonwealth legislative power, sec 100 clearly has no application with respect to any abridgement that may arise from laws or regulations from the Basin States.

Except for any possible application with respect to the market regulation provided in Part 4 of the Water Act, where the operation of the qualifier 'reasonable' may have work to do, sec 100 has little application with respect to the operation of the Water Act or the Basin Plan.

Withdrawing from the Basin Plan

The legal history of the regulation of watercourses across the world that intersect multiple jurisdictions is replete with tension, disagreement, and litigation. That the watercourses of the Basin have been the subject of civil negotiation and complex agreement for over a century stands as a testament to the co-operative, if nonetheless competitive, spirit of the Basin States and the Commonwealth.

This long history of co-operation cannot disguise the constant strain of controversy and disagreement. Prior to Federation, the colonies of New South Wales and Victoria each held royal commissions that declined to include South Australia and which agreed to share the water resources amongst just those two colonies — a slight the memory of which South Australian delegates brought with them to the Federation Debates. In the 1950s, New South Wales and Victoria again undertook negotiations that excluded South Australia, this time with respect to the additional diversions arising from the Snowy Scheme. This prompted South Australia to commence proceedings in the High Court before it was eventually included in the negotiations.

More recently, in 2016 the then Deputy Director-General of Water in New South Wales, Mr Gavin Hanlon, indicated to irrigators in a now notorious teleconference that his State had a 'Plan B' to withdraw from the Basin Plan.⁷¹ However, the rhetoric of New South Wales and Victoria 'withdrawing' from the Basin Plan reached a peak at the time the Australian Senate was scheduled to debate the motion to disallow the amendments to the Basin Plan arising from the Northern Basin Review.

In a press release issued the day before the disallowance motion was debated, the New South Wales Minister for Regional Water, Mr Niall Blair, was quoted as saying that it would be 'a vote to kill off the plan', and that if successful 'NSW will need to seek a new agreement directly with Victoria'.⁷² The Victorian Minister for Water, Ms Lisa Neville, described the motion as raising 'serious concerns about the future of the Murray-Darling Basin Plan'.⁷³ Following the disallowance, Minister Blair was quoted as saying that it made 'the Basin Plan untenable', and that New South Wales would 'start the process of withdrawing' from it.⁷⁴ Minister Neville was quoted as saying that Victoria was

discussing with New South Wales as to ‘alternative arrangements’, including the option of a ‘tripartite agreement’ between the Commonwealth, New South Wales and Victoria.⁷⁵

Eventually, as discussed in Chapter 10, those amendments were passed, as were the amendments relating to the sustainable diversion limit adjustment mechanism (**SDLAM**), discussed in Chapter 7. For now, at least, the relevant Ministers from New South Wales and Victoria have staunchly defended their rhetoric of the Basin Plan being the subject of ‘sabotage’. However, it would be naïve to think that an appropriate implementation of the reforms envisaged by the objects and purposes of the Water Act will not lead to further tension and disagreement.

It is accordingly useful to briefly explore such a ‘withdrawal’ and its potential legal and practical effects, in the context of the Basin Plan, the various intergovernmental agreements affecting the Basin, and the referral of legislative powers under sec 51(xxxvii) of the *Constitution*.

The Basin Plan

The Basin Plan is a Commonwealth legislative instrument given effect by legislation passed by the Commonwealth Parliament. Except insofar as it may be reliant on a referral of legislative power under sec 51(xxxvii) of the *Constitution*, it does not depend on the Basin States for its legal operation or effect. Any purported ‘withdrawal’ by a Basin State would have no legal effect on the Basin Plan. Nor could State legislation impair or undermine the Water Act’s authorization of the Basin Plan in its imposition of obligations on the States: sec 109 of the *Constitution*.

However, as many of this Commission’s terms of reference make clear, much of the practical operation of the Basin Plan is substantially or wholly dependent on the co-operation and actions of the Basin States. This is perhaps most explicit in respect of the development of water resource plans (**WRPs**), which is the responsibility of the Basin States, subject to the important ‘step in’ power of the Murray-Darling Basin Authority (**MDBA**) upon State default. Other matters which require the Basin States’ co-operation include the preparation of environmental watering plans,⁷⁶ and the compliance regime established by the register of take in Chapter 6 of the Basin Plan.

Section 35 of the Water Act relevantly prohibits an ‘agency of a Basin State’, amongst others, from either acting in contravention of the Basin Plan, or failing to act consistently with the Basin Plan. Whilst sec 35 does not, on its face, place a particular burden or disability on a Basin State, it would nonetheless be necessary to consider the individual circumstances of a particular act or omission to which the section may apply to ascertain whether it can validly apply to the actions of a State.⁷⁷ Such an assessment would also inevitably be affected by some forensic difficulty, through enforcing a broadly stated prohibition with respect to a complex regulatory regime.

More broadly, however, insofar as the Parliament of a Basin State sought to regulate and manage its water resources in a manner that was inconsistent with the Water Act, the Basin Plan or any WRPs prepared by the MDBA, it would necessarily be invalid to the extent of any such inconsistency, under sec 109 of the *Constitution*.

In those circumstances, it would be necessary to properly construe the terms, operation and effect of both the Water Act and the law of the Basin State. Here, it is important to note that notwithstanding its comprehensive terms, the Water Act does not ‘cover the field’ as that phrase is used in sec 109 jurisprudence — in that it does not purport to comprehensively or exclusively regulate the use and maintenance of the water resources of the Murray-Darling Basin. Importantly, it is premised upon, and necessarily leaves for the Parliaments of the Basin States, the separate provision of a licensing regime for consumptive use. This deliberate lacuna perhaps reflects two important features of the Australian Federation. First, it preserves the rights vested in each of the Basin States in the watercourses within each Basin State, as discussed above. Second, as the vain attempts for a broader referral would suggest, it avoids the possibility of the Water Act purporting to extend beyond the external affairs power, and consequently beyond Commonwealth legislative power.

Therefore, in those circumstances, in order to determine the extent of any potential inconsistency, it would be necessary to determine, at least in relevant part, the regulatory scope of the Water Act and the Basin Plan. This task is impossible to perform in the abstract and would necessarily depend on the terms of any potentially inconsistent Basin State regulation.

However, no such inconsistency would arise in respect of entirely voluntary or discretionary aspects of the Basin Plan, except in the circumstances where the law of a Basin State were to operate prohibitively. For example, a law of the Basin State that prohibited the notification of efficiency measure projects would undoubtedly be inconsistent with sec 7.12(2) of the Basin Plan. However, it is of course not incumbent on a Basin State to proactively develop and notify such projects for the purposes of the SDLAM. This is further discussed in Chapter 9.

Intergovernmental agreements

Reflecting the Federation, water reform generally, and particularly in respect of the Basin, has been the subject of a series of interacting and overlapping intergovernmental agreements. As discussed in Chapter 1, significant agreements include the agreements leading to the Living Murray Initiative and the NWI in 2004, and the Agreement on Murray-Darling Basin Reform in 2008, which led to certain amendments to the Water Act and the Murray-Darling Basin Agreement.

However, for the purposes of scrutinizing the rhetoric about ‘leaving the plan’, three main intergovernmental agreements that govern the regulation and the operation

of the Basin's water resources are relevant. The primary substantive agreement is the Murray-Darling Basin Agreement (**MDB Agreement**), which, as discussed in Chapter 1, is the successor to the River Murray Waters Agreements. It is the primary agreement affecting river operations in the Basin. It is often referred to by Basin officials as the 'joint venture', which perhaps reflects its operational nature, even if this misappropriates a more commercial term. Like its predecessors, it does not contain any provision for contracting governments to withdraw; however unlike its predecessors,⁷⁸ it also does not contain any general dispute resolution clause, with only disputes amongst the Basin Officials Committee referable to arbitration.⁷⁹

Consistent with cl 6 of the MDB Agreement, and as with previous River Murray Waters Agreements, the Parliaments of each of the contracting governments passed enabling legislation, authorizing the agreement and any relevant works and operations under it.⁸⁰ On the passage of the Water Act, the Parliaments of Queensland and the Australian Capital Territory repealed their relevant ratification legislation,⁸¹ presumably on the basis that no relevant works and operations needed continued approval in their jurisdictions.

However, the MDB Agreement governs the operations of significant river infrastructure, such as locks, weirs and storages, as well as containing complex rules and procedures for the management of the Basin, and enshrines South Australia's volumetric entitlement. Consequently, there would be significant consequences for the management of the Basin's water resources if, in the absence of a replacement agreement, Parliaments of some of the other Basin States were to repeal or revoke the statutory basis for the MDB Agreement.

The 'National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin' (**National Partnership Agreement**) is the primary financial intergovernmental agreement affecting the Water Act and the Basin Plan. The National Partnership Agreement is a grant of financial assistance under sec 96 of the *Constitution*, in accordance with sec 16 of the *Federal Financial Relations Act 2009* (Cth). Basin States are allocated payments from 2012–13 through to 2019–20, which are authorized by the relevant Commonwealth Minister having regard to specified 'Project Milestones'. Accordingly, if a Basin State were to fail to meet those milestones, whether by inaction or a positive 'withdrawal', it would be possible for the relevant Commonwealth Minister, under cl 25, to withhold payment under the National Partnership Agreement. It is important, however, to note that this function is discretionary — payment can still be made notwithstanding failure to achieve specified milestones.

Finally, the Basin States and the Commonwealth entered into an 'Implementation Agreement', finalized on 7 August 2013. Such an agreement is explicitly envisaged by sec 1.12 of the Basin Plan, and provides further detail on how certain reforms in the Basin Plan will be implemented by the contracting governments. However, the language of the Implementation Agreement is broad and aspirational, and is better characterized as

a statement of principles, rather than an agreement with binding obligations. It outlines how Basin States will comply with their obligations under the Water Act and the Basin Plan, rather than imposing separate or distinct obligations. Accordingly, whilst the Implementation Agreement no doubt usefully facilitates the implementation of the Basin Plan, it is not a condition precedent. The absence of an Implementation Agreement, or the withdrawal from it by a Basin State, would not appear, on its own, to be capable of having much substantive effect.

With respect to the possible legal ramifications, the High Court has not recently had cause to enquire into the enforceability of intergovernmental agreements, and particularly not yet in the context of the increase of ‘co-operative Federalism’ notably championed by the Commonwealth Government since 2008. It is to be doubted whether general or universal answers are even in theory likely to be available concerning this putative intersection of politics and contract law.

In 1962, the High Court considered the enforceability of an agreement between South Australia and the Commonwealth for the latter to construct and upgrade the railway between Darwin and Port Augusta in return for the former’s relinquishment of the Northern Territory.⁸² Ultimately, the Court held there was no breach of the agreement by the Commonwealth, notwithstanding its languid pace.⁸³ However, in particular by referring to parliamentary control of the executive, Dixon CJ cast doubt on whether it was even possible for an intergovernmental agreement to be binding in the ordinary contractual sense.⁸⁴

Referral

Parts 1A, 2A, 4, 4A, 10A and 11A of the Water Act are subject to the referral of legislative power by the Parliaments of the Basin States under section 51(xxxvii) of the *Constitution*. As discussed above, each referral contains an express power to revoke the referral by the relevant Governor. Further, as confirmed by the High Court on several occasions, it is clearly within the competence of Parliaments of referring States to simply repeal the relevant referral Act.⁸⁵

It remains to be seen what effect a revocation of a referral has on a Commonwealth law which depends upon that referral for validity. In the context of a broad referral of power that is subsequently revoked, it has been suggested the Commonwealth law would continue in force.⁸⁶ This is a very contestable position. However, the referral of power from the Basin States with respect to the Water Act may more appropriately be described as supplementary or ancillary in nature. If a Basin State were to revoke its referral of power, therefore, it may depend on the extent to which the other heads of legislative power otherwise support the Act.

In turn, that enquiry may direct attention to aspects or discrete parts of the Act, as not in themselves easily characterized as supportable exercises of the external affairs

head of Commonwealth legislative power. A possible example would be the trading rules provisions in Part 4 and 4A, insofar as they regulate intrastate trade and commerce.

Some difficult constitutional argument can be envisaged, and this Commissioner has no desire to use a crystal ball, or any other way of pretending to an unattainable certainty, or even confidence. But it can be imagined that the familiar topic of severability might arise, in the form of an issue whether only parts of the Water Act would be bad if a State withdrawal affected its valid enactment. The more persuasively a supposed bad bit was said to be integral or indispensable to the whole scheme of the Act, of course, the more cogently it might thus be seen as an element in a national strategy open to be legislated by the Commonwealth in discharge of its international obligations — and so not bad at all.

If, on the other hand, substantial portions of the provisions were found to be lacking legislative power following the revocation of a Basin State's referral, insofar as they apply in that Basin State, it would be likely the operation of the Water Act and the Basin Plan would be significantly problematic. One of the core features of the reforms in the Water Act is a whole-of-Basin approach to its regulation.

Conclusion

The Water Act is a compelling example of legislation passed in the national interest that recognizes that the sustainable use of a valuable and scarce resource such as water must be premised on the protection and restoration of water dependent ecosystems. In this instance, the Water Act is a remarkable departure from the jealousies and 'undesirable friction' that characterized the discourse amongst the Basin jurisdictions in the late 19th Century and early 20th Century, and is an excellent example of the progress that co-operative Federalism in the Australian context can achieve.

The complex combination of various heads of Commonwealth legislative power, Basin State legislative regimes and referrals of legislative power, and intergovernmental agreements that underpin the Water Act, is an example of our peculiar Australian Federal system, and is a demonstration of the complex issue that has been the regulation of the Basin's water resources. That the Water Act depends on such a combination of sources for its validity is not intrinsically a weakness of that Federal system. As with an orchestra, under appropriate stewardship, these disparate sources of regulation can form together to produce a symphony of co-operative Federalism, and are capable of regulating the Basin's water resources in the national public interest.

However, it is when the Basin States and the Commonwealth allow that symphony to become a cacophony of short-sighted, vested self-interests, that the objects and purposes of the Water Act become drowned out. The recent rhetoric on 'withdrawing' from the Basin Plan is an example of this. It is manifestly short-sighted and erroneous for a Basin State to consider it would be in its best interests to exercise such a destructive option,

and somehow regulate its part of the Basin's water resources outside of the framework of the Water Act or the Basin Plan. It is similarly short-sighted for a Basin State to consider that its regulation can be conducted in a manner that is inconsistent with the Water Act's objects and purposes.

Rather, it is in each Basin State's interest to ensure that the Water Act and the Basin Plan are implemented in a manner that is consistent with those objects and purposes. It is therefore necessary that the mandate of the particular brand of co-operative Federalism that underpins the Water Act be necessarily focussed on the protection and restoration of the Basin's degraded systems. This is not only in the national interest, and in the interest of each Basin State, but it is the very foundation of the Water Act.

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- 3 *Water Rights Act 1896* (NSW) secs 1–2.
- 4 *Control of Waters Act 1919* (SA) sec 4; *Rights in Water and Water Conservation and Utilization Act 1910* (Qld) sec 5.
- 5 *Water Conservation Act 1886* (SA); *Water Authorities Act 1891* (Qld).
- 6 *Water Management Act 2000* (NSW) secs 392–3; *Water Act 2000* (Qld) sec 26; *Water Act 1989* (Vic) sec 7. Whilst subsec 124(8) of the *Natural Resources Management Act 2004* (SA) abolishes riparian rights and provides for a statutory replacement, it falls short of vesting the use, flow and control of all water in the Crown.
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The need for an ESLT

The clear and central purpose of the Commonwealth legislative scheme of the *Water Act 2007* (Cth) (**Water Act**) and *Basin Plan 2012* (Cth) (**Basin Plan**) is to address the mischief of the over extraction of water resources in the Murray-Darling Basin (**the Basin**) and to return extraction to an environmentally sustainable level of take (**ESLT**).

The problem of the over exploitation and degradation of natural resources began to be widely acknowledged in the latter part of the 20th Century. Serious environmental problems were starting to be acknowledged, both abroad and within Australia, in the 1970s and 1980s.

Australia was at the forefront of international action, helping to develop and becoming signatory to a range of environmental treaties. In line with the focus of the treaties over time, Federal and State government action within Australia produced policies and laws that initially focussed on pollution and the protection of endangered species and habitats, but gradually moved towards broader ecosystem and landscape-based approaches to environment conservation.

A fundamental feature of the natural environments of the Basin is its surface water and groundwater systems. It became increasingly clear by the 1980s that these systems, and their connected, dependent ecosystems were being damaged. Salinity problems due to irrigation and land clearance began to manifest as early as the 1960s and worsened to a point where the Ministerial Council adopted the 1988 Salinity and Drainage Strategy as part of the Murray-Darling Basin Agreement. The Basin's riverine environments were deteriorating, and the huge algal bloom that appeared in the Darling River in 1991–92, extending for more than 1000 kilometres, was seen as a symptom.¹

Action to protect Basin water resources was slow — they were in the joint and several control of the States and were vital resources for 'use'. Gradually, however, over extraction was acknowledged as a real problem by the States and the Commonwealth in a series of COAG agreements. The 2004 Intergovernmental Agreement on a National Water Initiative (**NWI**) included in its 10 key objectives one to 'complete the return of all currently overallocated or overused systems to environmentally sustainable levels of extraction'.²

That the States had been too slow to address these problems effectively and lacked commitment to work together became obvious in the Millennium Drought of the 2000s. The drought brought two facts into stark focus — the Basin's water resources were overallocated and overused and, as a result, the degraded state of the Basin's natural environment meant that the drought threatened irreversible damage to some ecosystems such as the Coorong.

These are the facts that, unusually for Australian law, have been explicitly asserted, in terms and as such, in the Water Act as the basis for setting sustainable diversion limits reflecting an ESLT.³

In the midst of the Millennium Drought, in January 2007, the Prime Minister announced A National Plan for Water Security,⁴ proposing 10 actions. Several were specific to the Basin, including addressing ‘once and for all’ the overallocation of water and setting ‘a sustainable cap on surface and groundwater use’.

Six months later the Commonwealth Government introduced the *Water Bill 2007* (Cth). The Second Reading Speech by the Minister for the Environment and Water Resources, Mr Malcolm Turnbull, cited ‘overallocation and diversion caps routinely ignored’ with the attendant problems of environmental degradation as a central reason for the new legislative scheme. After describing the huge increase in extraction of water from the Basin (approximately fivefold in 80 years), and the finding in 2001 that ‘more than 95 per cent of the river length examined was in a degraded environmental condition’, the Minister referred to the added threat of declining flows in the Basin’s rivers due to climate change, bushfire, increased groundwater use, and expansion of farm dams and forest plantations. The mechanism to address these threats would be the Basin Plan, of which the Minister said the ‘central element’ would be a sustainable and integrated cap on all diversions.⁵

The objects of the Water Act

The Water Act establishes a set of interlocking objects. The first four connect the aim of giving effect to specified international agreements with the need for special measures to return the extraction of water in the Basin to an ‘environmentally sustainable level’.

The main special measure by which the objects are to be achieved is the Basin Plan, prepared by the Murray-Darling Basin Authority (**MDBA**), which must set a sustainable diversion limit (**SDL**) for the Basin as a whole and for every Basin water resource (or particular parts thereof),⁶ each of which must reflect an ESLT.⁷

The first four objects of the Water Act, set out in sec 3, are:

(a) to enable the Commonwealth, in conjunction with the Basin States, to manage the Basin water resources in the national interest; and

(b) to give effect to relevant international agreements (to the extent to which those agreements are relevant to the use and management of the Basin water resources) and, in particular, to provide for special measures, in accordance with those agreements, to address the threats to the Basin water resources; and

(c) in giving effect to those agreements, to promote the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes; and

(d) without limiting paragraph (b) or (c):

(i) to ensure the return to environmentally sustainable levels of extraction for water resources that are overallocated or overused; and

(ii) to protect, restore and provide for the ecological values and ecosystem services of the Murray-Darling Basin (taking into account, in particular, the impact that the taking of water has on the watercourses, lakes, wetlands, ground water and water-dependent ecosystems that are part of the Basin water resources and on associated biodiversity); and

(iii) subject to subparagraphs (i) and (ii)—to maximise the net economic returns to the Australian community from the use and management of the Basin water resources; ...

When the objects are read together, three essential actions emerge which identify a number of core ecological aims:

- the use of special measures to address the threats posed by overallocation and overuse of Basin water resources to the ‘ecosystems that are part of’ those water resources and their ‘associated biodiversity’
- the return of extraction to ‘ecologically sustainable levels’, and
- the protection and restoration of, and provision for, the ecological values and ecosystem services of the Basin.

The remaining objects depend upon, and gain meaning from, these core ecological aims. In particular, the object in para 3(a) of enabling the Commonwealth to manage Basin water resources, together with the States, in the national interest, cannot stand alone without the constitutional basis lent to it by the external affairs power and the related object in para 3(b) of giving effect to relevant international agreements. Therefore, the meaning of the phrase ‘in the national interest’ needs to be considered in light of the obligations in the relevant international agreements to which the Water Act seeks to give effect. As discussed in more detail below, they are essentially concerned with ‘ecologically sustainable development’ (**ESD**).

The object in para 3(c), of promoting the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes, is qualified by the first part of the provision. This makes the exercise of optimising outcomes a step that follows on from the primary process of ‘giving effect to relevant international agreements’. As discussed later in this chapter, the relevant obligations in those agreements are concerned with addressing threats to ecosystems and biodiversity and taking action

to achieve ESD. Accordingly, these purposes must be achieved first, before the task of optimising the various outcomes arises. Similarly, the object in subpara 3(d)(iii) of maximising net returns to the Australian community is also expressly made 'subject to' the stated ecological aims, so that achieving those aims takes priority.

Relevant international agreements

As explained in Chapter 2, the Water Act requires relevant international agreements to be given effect 'to the extent to which those agreements are relevant to the use and management of the Basin water resources'.⁸ The relevant international agreements are:

- (a) the Ramsar Convention
- (b) the Biodiversity Convention
- (c) the Desertification Convention
- (d) the Bonn Convention
- (e) CAMBA
- (f) JAMBA
- (g) ROKAMBA
- (h) the Climate Change Convention
- (i) any other international convention to which Australia is a party and that is:
 - (i) relevant to the use and management of the Basin water resources, and
 - (ii) prescribed by the regulations for the purposes of this paragraph.

(No other international agreements have been prescribed to date.)

The obligations in the listed relevant agreements, insofar as they are relevant to Basin water resources, provide an important constitutional basis for the Water Act, as explained in Chapter 2.

In particular, the Ramsar Convention and the Biodiversity Convention provide the strongest and most specific bases for enlivening the external affairs power and supporting the special measures of the ESLT. They are also both given special attention by the Water Act, which specifically and expressly requires the Basin Plan to give effect to certain of their obligations.

Both conventions also add context and provide further meaning to key concepts associated with the ESLT, only some of which are expressly defined in the Water Act.

Ramsar Convention

The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat⁹ (**Ramsar Convention**) is a relatively early environmental treaty. It is concerned with wetlands and their ecological significance as 'regulators of water regimes and as habitats supporting a characteristic flora and fauna, especially waterfowl'.¹⁰ The

obligations imposed are essentially concerned with the identification and conservation of wetlands of international importance and their ‘wise use’.

Article 2 requires each contracting party to ‘designate suitable wetlands within its territory for inclusion in a List of Wetlands of International Importance, hereinafter referred to as “the List” which is maintained by the Ramsar Bureau established under Article 8 ...’. There are now 16 Ramsar-listed wetlands in the Basin.

Article 3 requires the parties to ‘formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory ...’.

At a Conference of the Parties in 1987, the following definitions were agreed:

The wise use of wetlands is their sustainable utilization for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem.

Further clarification is provided with two further definitions. ‘Sustainable utilization’ — which may be read as ‘sustainable use’ — is given the meaning:

human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations.

‘Natural properties of the ecosystem’ are defined as:

those physical, biological or chemical components, such as soil, water, plants, animals and nutrients, and the interactions between them.¹¹

In reflecting the Ramsar Convention, the Water Act requires that the Basin Plan must promote the ‘wise use’ of all the Basin water resources as well as the conservation of Ramsar wetlands in the Basin, and take account of the ecological character descriptions of not only all Ramsar wetlands in the Basin but also all other ‘key environmental sites’ in the Basin.¹² The term key environmental sites is not defined in the Water Act, but ‘environmental assets’ are defined to include ‘water-dependent ecosystems’, ‘ecosystem services’ and ‘sites with ecological significance’.¹³ If ‘key’ is considered as being of the same order as ‘significant’, then the Basin Plan must account for the ecological character descriptions of ‘sites with ecological significance’ in the Basin, whether or not they are Ramsar-listed wetlands.

In 2002 the Ramsar Parties instigated the review and update of its definitions, and the Conference of Parties in 2005 adopted the resulting ‘Handbook 1: Wise Use of Wetlands’.¹⁴ The Handbook sets out discussion and guidance on key concepts, including ‘wise use’, referring to the concepts of ecosystem approaches and sustainable development adopted under the Biodiversity Convention.

Biodiversity Convention

The Convention on Biological Diversity (**Biodiversity Convention**)¹⁵ relates to the use and management of water resources, and thereby the concept of an ESLT, in a more comprehensive way than the other ‘relevant international agreements’. This is essentially because of the breadth of its core subject — the protection of biological diversity, or biodiversity.

The Biodiversity Convention contains three important definitions of terms that are also used in the Water Act, and are of particular relevance to the concept of ESLT:

‘Biological diversity’ means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

‘Ecosystem’ means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

‘Sustainable use’ means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.¹⁶

The term ‘biological resources’ is also used in the Biodiversity Convention, but it is defined as a distinct and specific sub-set of biodiversity. It is defined as comprising only the living (biotic) components of ecosystems that have actual or potential use or value for humans. It does not include the non-living components of ecosystems, and thereby biodiversity, such as water systems. For this reason, the obligations in the Biodiversity Convention relating only to biological resources (eg in art 10) are not considered to be enlivened by the external affairs power for the purposes of the Water Act and the Water Act does not use the term.

The Water Act contains a definition of biodiversity¹⁷ that is almost identical to that provided in the Biodiversity Convention:

***biodiversity** means the variability among living organisms from all sources (including terrestrial, marine and aquatic ecosystems and the ecological complexes of which they are a part) and includes:*

(a) diversity within species and between species; and

(b) diversity of ecosystems.

An understanding of the concept of biodiversity, and why water resources are intrinsic to its protection, is fundamental to a proper interpretation of the Water Act. A helpful

explanation of the concept is provided in the CSIRO's 2014 publication *Biodiversity: Science and Solutions for Australia*, in which it is emphasized that biodiversity comprises not only the variety of all living organisms on Earth, but also all the many functions and processes that maintain life, including evolutionary:

*the scientific definition of biodiversity includes ... the diversity of the genetic material within each species and the diversity of ecosystems that those species make up, as well the ecological and evolutionary processes that keep them functioning and adapting. Biodiversity is not simply a list of species, therefore. It includes the genetic and functional operations that keep the living world working, so emphasising the inter-dependence of the elements of nature.*¹⁸

The Water Act does not define ecosystem or sustainable use, despite using those terms. Their meaning should be understood from the Biodiversity and Ramsar Conventions.

Significantly, the definitions in both the Biodiversity and Ramsar Conventions make clear that 'ecosystem' includes the non-living environment with which a complex of living communities interact as a functioning unit. The natural surface and groundwater systems of the Basin sustain terrestrial, amphibian and aquatic forms of life, all of which comprise the ecosystems of the Basin which, in turn, form part of the overall biodiversity of the Basin.

The objectives of the Biodiversity Convention are set out in art 1:

- the conservation of biological diversity
- the sustainable use of the components of biological diversity, and
- the equitable sharing of the benefits of the genetic resources of biological diversity.

The conservation and sustainable use of biodiversity are referred to in the Water Act as matters that the Basin Plan must address through special measures (subpara 21(2)(a)(ii)) and generally promote (para 21(2)(b)).

Article 7 is concerned with identifying threats to biodiversity. Its requirements include the identification of the processes and activities that have or are likely to have an adverse impact on conservation and sustainable use of biodiversity. The Water Act directly responds to this in subsec 21(2). By necessary implication, Basin water resources are identified as important to biodiversity conservation. Accordingly, para 21(2)(a) asserts that the use of those water resources, which may be read as a 'category of activities' within the meaning of art 7(c), 'has had, and is likely to have significant adverse impacts on the conservation and sustainable use of biodiversity' and that, as a result, special measures to manage that use are required.

Continuing to reflect the objectives of the Biodiversity Convention, para 21(2)(b) of the Water Act provides that the Basin Plan must 'promote sustainable use of Basin

water resources to protect and restore the ecosystems, natural habitats and species that are reliant on the Basin water resources and to conserve biodiversity' (subsec 21(2)).

Article 8 sets out what the parties must do ('as far as possible and appropriate') to conserve biodiversity 'in-situ' ie in its natural situation. Three actions are especially relevant to Basin water resources, noting the intrinsic role of water resources in the functioning of Basin ecosystems:

- promoting the protection of ecosystems, natural habitats and viable populations of species (8(d))
- rehabilitating and restoring degraded ecosystems and promoting the recovery of threatened species (8(f)), and
- where a significant threat to biodiversity has been identified pursuant to art 7, regulating or managing the relevant processes and categories of activities (8(l)).

Although the parties are obliged by the 'in-situ' conservation provisions in 8(a) to establish a system of protected areas or areas where special measures need to be taken, the conservation actions subsequently specified are not restricted to such areas. In any event, the specification in the Water Act of the water resources of the Basin as needing special measures for conservation may be seen as a designation of the Basin as an 'area' for this purpose.

The action called for by art 8 of the Biodiversity Convention, to address the significant existing (and likely future) adverse effects on biodiversity identified in accordance with art 7 as resulting from the overuse of Basin water resources, is taken up in the Water Act in the provisions requiring the Basin Plan to set 'environmentally sustainable limits' on the quantities of water that may be taken.¹⁹

The obligation in art 8(f) to provide for rehabilitation and restoration of degraded ecosystems and promote the recovery of threatened species indicates the need to place a limit on levels of extraction that not only halts decline but makes some provision for restoration and recovery.

In 2000, the Biodiversity Convention's Conference of Parties adopted its 'Ecosystem approach', defined as 'a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way'.²⁰ It is particularly helpful in understanding the Water Act's scheme for an ESLT, as discussed later in this chapter.

What does the Water Act mean by 'sustainable use'?

The Basin Plan 'must ... promote sustainable use of the Basin water resources'.²¹ The notions of sustainable use, and a sustainable basis for the exploitation of the Basin

water resources, are at the heart of the Water Act's reform of the nation's stewardship of the Basin.²²

Interpretations have been suggested for 'sustainable use' that assume, or imply, that it requires a balancing of human interests — generically described as 'economic and social' interests — in the use of water, against the environmental or ecological role of water. One element of the various interpretations is the idea of a trade-off or compromise, whereby human interests may reduce what science would otherwise regard as necessary or proper for the environment. To understand how these interpretations have come about it is helpful to briefly review the history of the concept of sustainable use, and the related but distinct concepts of 'sustainability', 'sustainable development', the 'triple bottom line' and ESD.

Sustainability

The knowledge that the natural resources of the earth are not unlimited, and that the natural environment is a complex web of interactions on which all life depends, is not new. It has been part of many cultures from ancient times and in some communities it continues. Aboriginal Australians still maintain a deep connexion with their country. Their relationship with the natural landscape, one of spiritual connexion, custodianship and responsibility, easily encompasses concepts of 'sustainability'.²³

The western view of nature brought to Australia with European settlement was dominated by the demands of increasing agriculture and grazing, industrialization, urbanization, and trade. Yet even in the 18th and 19th Centuries there were some who noticed the effects of unhindered exploitation of natural resources, especially of forests. Their arguments for restraint and even replenishment were effectively the beginnings of the current concept of 'sustainability'.²⁴ Alexander von Humboldt was particularly influential. By the early part of the 19th Century, he had developed a holistic idea of the natural world as a unified complex of organisms and systems. His extensive travels in the New World and his published observations of the huge changes to the natural landscapes of both South America and North America from deforestation and the unchecked use of natural resources were noted across the world.²⁵ His ideas influenced the South American revolutionary leader, Simon Bolivar, who enacted the first laws to reflect the idea of sustainability and 'wise use'. In 1825, Bolivar issued a decree requiring the Bolivian Government to plant one million trees, and in 1829 he ordered 'Measures for the Protection and Wise Use of the Natural Forests' in Colombia. The same ideas were taken up a little later in the United States, towards the end of the 19th Century, by people such as the first Chief of the United States Forest Service, Gifford Pinchot and John Muir, the 'father of the National Parks'.²⁶

These early arguments for the sustainable use of natural resources were largely obscured in the 20th Century by economic and geopolitical developments. The upheaval of two World Wars was followed by an intense period of recovery, population growth

and economic development. In Australia, the river systems of the Basin were the focus of huge efforts to develop the national economy, increase the population and create jobs through the construction of the Snowy Scheme. The use of the resulting storages and the ability to regulate the flow of water enabled the development of irrigated agriculture which, over the past 50 years, has become by far the greatest user of its water resources.

It was not long, however, before the effects of depleting natural resources started to become obvious around the world, especially through the unmistakable signs of degraded environments, species and habitat loss.

Sustainable development

Calls by scientists grew, among them that of marine biologist Rachel Carson who drew worldwide attention to the problem with her critical work 'Silent Spring' in 1962.²⁷ Public awareness grew, and renewed attention was given to the idea of sustainability. In 1972, a group of scientists and other experts from the Massachusetts Institute of Technology in the United States produced a report called 'Limits to Growth' in which they said:

We are searching for a model output that represents a world system that is:
1. sustainable without sudden and uncontrollable collapse; and
*2. capable of satisfying the basic material requirements of all of its people.*²⁸

The subject became a focus of the United Nations, with the General Assembly adopting its World Charter for Nature in 1982. The Charter sets out five key principles calling for international and national action to conserve and protect nature, and to ensure that its use is sustainable. Principle 4 states:

*4. Ecosystems and organisms, as well as the land, marine and atmospheric resources that are utilized by man, shall be managed to achieve and maintain optimum sustainable productivity, but not in such a way as to endanger the integrity of those other ecosystems or species with which they coexist.*²⁹

However, growing populations and world poverty demanded that attention be given also to social and economic needs in the argument for sustainability. In 1983 the United Nations commissioned an investigation into long-term strategies for achieving 'sustainable development'. The result was the Brundtland Commission's 1987 'Report of the World Commission on Environment and Development: Our Common Future'. It described development as sustainable if it can:

*ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.*³⁰

This is the most well-known expression of sustainable development and continues to be relied on, but its aspirational nature and sheer generality has meant it has been of

limited practical use. It creates a single goal of achieving development in a sustainable way that addresses all present and future ‘needs’ — economic, social and environmental. However, it does not attempt to differentiate between or prioritize them, thereby requiring consensus about the trade-offs involved.

At the Earth Summit in Rio de Janeiro in 1992, the theme of balancing interests was enshrined in the Rio Declaration on Environment and Development and the comprehensive program of work designed to achieve sustainable development, Agenda 21.³¹ Despite its vast coverage of actions needed in four main areas: social and economic issues (eg poverty, human health, population growth); conservation and resource management (eg deforestation, desertification, biodiversity loss); strengthening the role of all social groups (eg women; Indigenous peoples); and methods of implementation (eg finance, technology transfer, science and education), the Agenda treats the areas of action as separate, and does not attempt to reconcile or prioritize different and competing interests involved.

The Biodiversity Convention is the result of commitments in Agenda 21 to take action in the area of conservation and resource management. Reflecting Agenda 21’s language of broad inclusiveness, the Convention’s Preamble acknowledges the many different values and interests in relation to biodiversity and ecosystems, but the substantive obligations do not seek to balance any one against another. They simply direct action towards the conservation of biodiversity and, where appropriate, the rehabilitation of ecosystems.

The inclusiveness and generality of the idea of sustainable development described in the Brundtland Report and the Rio Declaration left open the question of how competing interests should be managed, and economic arguments were influential in filling the gap. In the 1990s a market-centric view of sustainable development emerged that focussed on improvements in technology and international trade as ways to meet the carrying capacity of the Earth’s ecosystems. This view emphasizes action to improve the environment’s ‘supply’ side, rather than to limit levels of human use on the ‘demand’ side.³²

The triple bottom line

In addition to this broad market-based approach, an idea emerged from the world of business and economics that has tended to become conflated with the idea of sustainable development. The triple bottom line was proposed by author and entrepreneur John Elkington in 1994 as a method for measuring corporate performance, not only against the traditional yardstick of profitability but also against increasing expectations of social and environmental responsibility.³³

In its origin, triple bottom line was a figure of speech seeking to render more socially responsible the accounts used to measure the performance and ‘success’ or otherwise of trading corporations. It recognizes but does not focus on the ultimate goal

of the sustainability of human activity. Fortunately, the balancing exercise by which a company chooses the value it places on its non-financial responsibilities relative to its economic goals, and the actions it chooses to take as a result, has been seen to involve similar thinking as that required to work towards sustainable development. The analogy is more readily drawn if one takes the market-centric view of sustainability that has gained currency since the 1990s. As first used in relation to the management of the Basin water resources,³⁴ this rhetorical phrase usefully emphasized the relation of inter-dependence between economic and environmental considerations, in an overall social context. Over time, and under the influence of unmeritorious political doublespeak, the triple bottom line has perversely been used to lessen the importance of environmental considerations as one of the three measures of achievement. A figure of speech devised to equalize the importance of environmental considerations is now used by supporters of a reduced ESLT as a justification for neglecting them by a deliberate discounting.

Nevertheless, the triple bottom line is simply an auditing tool. It does not impose any particular weighting on the three elements to be measured, although it is hard to avoid the implicit primacy of the financial bottom line when it is used in the corporate context for which it was designed. Nor does the triple bottom line demand any ultimate result. It is notable that the use of triple bottom line as a cypher for the means of achieving sustainability has persisted, including in debate about the Water Act and the ESLT, referred to later in this chapter.

Yet ideas about sustainable development have in fact evolved further.

Ecologically sustainable development

In the late 1990s and early 2000s, discourse about sustainable development noted the inherent difficulty in trying to balance all interests, and the fact that economic interests tend to win out. Placing ecological, economic and social considerations on an equal footing within a single scheme or concept for sustainability is problematic, if not misconceived, because of the inevitable competition between them. The concept of ‘ecological sustainability’ emerged, advocating the primacy of the need to operate within the ecological carrying capacity of the Earth and asserting the need for a ‘strong moral and legal normative framework’ to ensure this informs relevant decision-making.³⁵

In Australia, ESD has been adopted as a legal principle, or set of principles, in many Commonwealth and State laws, where it is sometimes defined broadly and sometimes with more particularity.

The body of jurisprudence on ESD is growing in Australia, and is helpful in understanding the interplay between the component principles, what the principles mean in practice and the scope of the discretions left open to decision-makers. However, caution should be applied in drawing on judicial interpretations of ESD principles that are often defined slightly differently in different legislative schemes,³⁶ and when the scheme

in question (such as the Water Act) provides its own detailed definitions. Also relevant is that other legislative schemes involving an interaction of environmental protection and development interests do not always provide for the required measure or action for protecting the environment in as focussed and prescriptive a way as the ESLT in the Water Act.

Relevantly, the Water Act places ‘sustainable use’, informed by ESD principles, at the core of its scheme, and defines ESD with some specificity in subsec 4(2):

*The following principles are **principles of ecologically sustainable development**:*

(a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;

(b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;

(c) the principle of inter-generational equity—that the present generation should ensure that the health, biodiversity and productivity of the environment is maintained or enhanced for the benefit of future generations;

(d) the conservation of biodiversity and ecological integrity should be a fundamental consideration in decision-making;

(e) improved valuation, pricing and incentive mechanisms should be promoted.

The first principle requires that relevant decision-making integrates consideration of all interests — economic, environmental, social and equitable. This might appear to some to invoke the impossible ‘balancing’ task invoked by the all-encompassing formulations of sustainable development of the Bruntland Report, Rio Declaration and Agenda 21, but when the principles are read together, it does not. The four considerations must be considered in the context of the other principles, which require: the precautionary avoidance of serious or irreversible environmental degradation, inter-generational equity, the fundamental consideration of biodiversity and ecological integrity, and the promotion of improved financial mechanisms. In other words, these principles must work together, and they do not invite or require decision-making to give all interests equal weight or attention. Moreover, they must be used to support the objects of the legislation generally and its specific requirements in particular.

When ESD is treated as a normative principle, as it is by incorporation into the legislative scheme of the Water Act, the requirement to ensure inter-generational equity reveals that decisions about sustainable use and conservation of biodiversity and natural resources involve questions of distributive justice between the present generation, future generations and, arguably, nature itself (also referred to as intra-generational, inter-generational and inter-species equity). However, the ultimate measure of achieving this

multi-dimensional equity is still the environment itself — its health, biodiversity and productivity.³⁷ When read in light of this examination of ESD, the Water Act sets out a clear process aimed towards achieving a level of distributive justice in the particular realm of Basin water resources.

Subsection 21(4) provides that, subject to the requirements of subsecs 24(1), (2) and (3) concerning the giving of effect to relevant international agreements (discussed above), the MDBA and the Minister must take into account the principles of ESD in exercising any of their powers and performing any of their functions in relation to making, reviewing and amending the Basin Plan. This includes the powers and functions involved in ensuring that the SDLs reflect an ESLT.

The overarching purposes of the Water Act, read in light of the objects and the legislated ‘facts’ in sec 21, are to address overallocation, protect water-dependent ecosystems and restore degraded ones. Any application of the principles of ESD must give primacy to these aims.

The ESD principle that conservation of biodiversity and ecological integrity ‘should be fundamental in decision-making’ supports the rejection of arguments that the determination of an ESLT, discussed below, may warrant less water for the environment than sustainability would require, in order to bestow a greater consumptive resource for irrigation farming. Sometimes advanced under the slogan of ‘triple bottom line’, that kind of argument is contrary to the statutory enactment of internationally binding, ecological principles.

The statutory mechanism — the SDL / ESLT

At the heart of the Water Act is the object of ensuring the return of overallocated or overused water resources in the Basin to ‘environmentally sustainable levels’ of extraction. The method for achieving this is the Basin Plan, which requires the determination of an ESLT for every water resource in the Basin, and the observance of ESLTs in the SDLs.

The purposes of the Basin Plan (sec 20) and the basis upon which it is to be prepared (sec 21), are based on an ecological systems approach.

Sustainable diversion limits reflecting an ESLT

Section 22 of the Water Act sets out the mandatory content of the Basin Plan (guided by the matters in sec 21), including in subsec 22(1) that the Basin Plan must set SDLs, the full description of which is set out in Item 6:

The maximum long-term annual average quantities of water that can be taken, on a sustainable basis, from:

(a) the Basin water resources as a whole; and

(b) the water resources, or particular parts of the water resources, of each water resource plan area.

The SDLs ‘must reflect’ an ESLT (sec 23). This applies not only to the Basin-wide SDL but also to the SDL for each water resource. (Whether the requirement is constant, in the sense of continuously applying, is not so clear, and is discussed further below.)

‘Water that can be taken’ must be understood by reference to the definition in sec 4, which defines the action of ‘take’ by reference to the various ways in which humans may remove water from, or reduce the flow of water in or into a water resource, including by removal in the form of pumping and siphoning, reducing flow by stopping, impeding or diverting water, releasing water from a wetland or lake, and permitting water to flow from a well or a watercourse. It includes storing water if ancillary to any of those activities.

The taking of water for the purposes of the SDL and ESLT is not defined by reference to any purpose. It should be noted, however, that according to the definition, water held and used for environmental purposes under a ‘water access right’ is not ‘taken’ for the purposes of the SDL when it is applied to those purposes. Water is ‘taken’ when it is extracted or diverted for human consumptive use. In the Basin, the greatest proportion of water taken is for irrigation, with much smaller proportions being for other industrial purposes, and for critical human water needs. The National Water Account, published by the Bureau of Meteorology for the period 2016–17, summarizes all legal entitlements to take water in the Basin and reports that ‘water supplied’, meaning water subject to legal entitlements, comprises 80% for individual users (irrigation, industry and other uses), 2% for urban water use, and 18% for the environment.³⁸

The SDL is defined as a maximum quantity and, as such, it must be a specified volume. (Ranges do not impose limits — only their extremities can do so.)

The expression of the SDL as a ‘long-term average’ annual quantity does not envisage a calculation based only on past data relating to what quantities were taken and what was considered sustainable. It is a long-term average annual quantity for the future, based on what is considered will be sustainable in the future — at least for the period of the Basin Plan. The guiding principles of sec 21 inform the meaning of ‘sustainable’ in this context. They require reference to relevant international agreements, especially the Biodiversity Convention and the meaning it gives to ‘sustainable use’. The guiding principles also require that, in setting the SDLs, the decisions of the MDBA and the Minister must take account of the principles of ESD, and be based on the best available science³⁹ (the meaning of which is discussed later in this chapter).

The Commissioner received evidence that setting a fixed volume based on a long-term average is inherently problematic due to the obvious uncertainty of future availability of water. This is so, even when the determination is based on the best available science

(including an accurate assessment of the past long-term average availability of water appropriately adjusted for the best available science regarding future impacts such as climate change). Any inaccuracy in an assessment based on a fixed long-term average annual quantity that is borne out in later experience will (unless adjusted) be fixed for the life of the particular SDL. Although holders of water access rights are currently used to a system based on fixed maximum entitlements to which variable seasonal allocations are made that may be less than the maximum, a fixed SDL would perpetuate the uncertainties of these future variations. It was suggested in evidence⁴⁰ that a more sophisticated method would be to define the Basin-wide and water resource specific SDLs by reference to a proportion of the total quantity available from time to time. This would require that the States' water access regimes reflect this by ensuring that all water access entitlements are expressed as shares of a defined but unquantified 'consumptive pool' for the relevant water resource. This method for defining SDLs would more accurately reflect the reality of (increasing) variability in the availability of water, reduce the need for future SDL adjustments and possibly engender greater appreciation in the community of the inherent variability of the system.

'Sustainable' implies the SDL must be able to cope with variability, seasonality, and a measure of resilience in ecosystems and biota to ensure that a specified level of take can continue. Ensuring that no more than sustainable use (ie take) is achieved by the SDL is the role of the ESLT.

While resilience must be considered, the precautionary principle tends against a level of use that takes an artificially maximum advantage of the fact that ecosystems may be resilient. Given the lack of full scientific knowledge⁴¹ about many (if not all) of the ecosystems of the Basin and their resilience, the precautionary principle requires some form of 'buffer'.

In addition, para 21(2)(a) refers to the need to 'conserve biodiversity' and para 21(2)(b) adds the need to 'protect and restore', echoing the obligation in the Biodiversity Convention to develop plans or strategies to, as far as possible and appropriate, rehabilitate and restore.

The meaning of ESLT and how it must be determined

The definition of ESLT⁴² is:

environmentally sustainable level of take for a water resource means the level at which water can be taken from that water resource which, if exceeded, would compromise:

- (a) key environmental assets of the water resource; or*
- (b) key ecosystem functions of the water resource; or*
- (c) the productive base of the water resource; or*

(d) key environmental outcomes for the water resource.

Two of the features in this definition are also defined.

environmental assets includes:

- (a) water-dependent ecosystems; and*
- (b) ecosystem services; and*
- (c) sites with ecological significance.*

environmental outcomes includes:

- (a) ecosystem function; and*
- (b) biodiversity; and*
- (c) water quality; and*
- (d) water resource health.*

A scientific test

‘Ecosystem function’ is not defined, but evidence received by the Commission is that it represents the processes, including biological and biochemical, that occur within the ecosystem and by which it is supported, such as germination, spawning and feeding.⁴³

‘Productive base’ is also not defined, but the consensus of evidence to the Commission by scientific witnesses is that it refers to the processes that maintain the functioning of the ecosystem and sustain its biota eg nutrient cycling, energy flows, photosynthesis, metabolism and decomposition.⁴⁴

The MDBA has expressed a view that accords with this. In evidence heard by the Senate Standing Committee on Legal and Constitutional Affairs in its 2011 inquiry into certain provisions of the Water Act, Mr Rob Freeman, then Chief Executive of the MDBA, informed the Committee of the MDBA’s view of the ‘productive base of the water resource’. He said:

The legal advice that we have is very clear that the productive base is not the economic base of that water resource but actually the broader productive base in both an economic and environmental sense.⁴⁵

In summary, it is clear that all the features in the definition of ESLT are real, measurable components or phenomena of the natural environment. The definition of ESLT requires assessments of the condition of water resources and their ecosystems, and the nature and extent of any adverse impacts to them caused by diversions ie compromise as well as the risk of future impacts, and the reduction in diversions necessary to address this.

The Water Act does not define ‘key’ for the purposes of the ESLT definition. It is readily understandable in colloquial English: qualities of importance and essentiality are conveyed. Its statutory meaning can be inferred from the objects in sec 3, the relevant international agreements, and the guiding principles in sec 21, including ESD. According to the relevant definitions the Basin ecosystems should be considered as inter-connected and inter-dependent components of the Basin’s biodiversity. The Commissioner heard from various scientific experts about aspects of these connexions and inter-dependencies.⁴⁶ The Water Act as a scheme requires that special measures be taken to protect each ecosystem, and the Basin’s biodiversity as a whole, from ‘compromise’. Ecosystem assets, ecosystem functions and environmental outcomes must be considered through this lens. Thus, at the very least they must be considered ‘key’ if the loss of one component eg an ecosystem function would result in ‘compromise’ to any other component eg an ecosystem asset. This is again a matter for scientific assessment and judgement, and administrative evaluation.

Additional guidance is gained from the relevant international agreements. The Ramsar Convention imposes obligations with respect to declared wetlands — as such, they must be considered ‘key’ ecological assets. Also helpful is the Biodiversity Convention’s ‘Ecosystem approach’. The description of the approach includes the following:

An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems.

This focus on structure, processes, functions and interactions is consistent with the definition of “ecosystem” provided in Article 2 of the Convention on Biological Diversity: “‘Ecosystem’ means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.” This definition does not specify any particular spatial unit or scale, in contrast to the Convention definition of “habitat”. Thus, the term “ecosystem” does not, necessarily, correspond to the terms “biome” or “ecological zone”, but can refer to any functioning unit at any scale. Indeed, the scale of analysis and action should be determined by the problem being addressed. It could, for example, be a grain of soil, a pond, a forest, a biome or the entire biosphere.

The approach sets out 12 principles of which principle 5 illustrates the importance of understanding the inter-connected nature of ecosystems and their various elements:

Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach. Ecosystem functioning and resilience depends on a dynamic relationship within species, among species and between species and their abiotic environment, as well as the physical and chemical interactions within the environment. The conservation and, where appropriate, restoration of these interactions and processes is of greater

*significance for the long-term maintenance of biological diversity than simply protection of species.*⁴⁷

The Water Act also does not define ‘compromise’, another well understood ordinary English word. However, para 21(2)(a) stipulates that the Basin Plan is intended to address the kinds of significant adverse impacts that require special measures. The ESD principles stated in subsec 4(2) of the Water Act include a formulation of the precautionary principle that is aimed at avoiding the risk of ‘serious or irreversible environmental damage’.

These concepts are not, themselves, explanations of what it means to perceive that the key environmental values of the Basin would be compromised by taking more than a specified volume of water for consumptive use. But they do inform, purposively, the aim of this somewhat crude — perhaps necessarily so — test to control the scale of our diminution of the water available to the Basin rivers’ environment.

At a minimum, then, compromise should mean the infliction of, or unacceptable risk of, material damage. This is something that exists well before the extreme result of ‘irreversible damage’ that would overcome an ecosystem’s resilience ie its ability to recover, such as discussed in the evidence of Professor Richard Kingsford in relation to Northern Basin wetlands.⁴⁸

In requiring the Basin Plan to promote the sustainable use of the Basin water resources, including in order to conserve biodiversity, para 21(2)(b) of the Water Act expresses the statutory aim that the Basin Plan thereby should ‘protect and restore’ the Basin’s ecosystems. The word ‘restore’ recognizes the actual degradation that has occurred. As in human disease, a chronic ill health of ecosystems will compromise their environmental values every bit as gravely as acute trauma. Thus, the avoidance of compromise must involve setting a SDL, by way of an ESLT, that has realistic prospects of adequately improving the position — not merely holding it in an admittedly degraded state.

The factors involved in the judgement about the risk of compromise, and how and by whom the judgement should be made, must be addressed by reference to the definition of ESLT, the objects of the Water Act and the mandatory considerations in sec 21 — and especially ESD. The precautionary principle requires a prudent or conservative approach in light of the evident lack of full scientific knowledge about the Basin’s ecosystem resilience and the strong likelihood that resilience will be reduced by climate change.

The provisions clearly indicate that what is required are scientific — especially biological, hydrological, hydraulic and ecological — assessments of the condition and functioning requirements of certain environmental features of the Basin’s ecosystems and biodiversity, and the levels of compromise those features face in relation to their water requirements. Moreover, the MDBA must ensure that the assessments are based on the ‘best available science’.

Due to the factual and scientific nature of the assessments and judgements required to determine the SDLs and ESLT for the Basin Plan, the Minister may not direct the MDBA to modify those aspects of the Basin Plan when it is provided to the Minister for review and adoption.⁴⁹ Parliament has tellingly removed these assessments from the realm of political arbitrage. It is not a topic to be decided by triple bottom line trade-offs.

A maximum level in practice

While the definition does not explicitly stipulate that a maximum volume be determined, it follows from the requirement that a certain result is achieved (the avoidance of ‘compromise’), that in practical terms a maximum must result. Even if, as common sense and the nature of things would compel, a range of risks to the environment is determined, depending on different levels of extraction, there must be an upper limit, or maximum, beyond which the risk of ‘compromise’ to key ecological features is too high. The definition of ESLT posits a ‘level’ which ‘if exceeded’, would compromise the specified environmental values. Determining that level will involve steps in the process that are unavoidably approximate in their conclusion, but in the end a single figure is the only way a limit can operate as such.

Avoidance of compromise and the need for a buffer

The ESLT thus builds in the concept of the avoidance of unacceptable risk and compromise to the four key ecological features of water resources. It is the level beyond which ‘compromise’ will occur. Of course, implicit in this understanding of that which would ‘compromise’ are qualities of uncertainty and hence debatable evaluative assessments, sometimes called discretions.

The requirement that a SDL must ‘reflect’ an ESLT allows for the possibility of a SDL that is more generous to the environment ie a SDL lower than the ESLT maximum. In theory, better restoring of biodiversity could occur within a gap between the ESLT (the maximum that may be taken before compromise to the environment) and a lower SDL for consumptive take — but this is not mandatory. What is clear to demonstration, conversely, is that a SDL cannot permit take that would compromise the environmental values, say, in order to be more generous to the demands for irrigation water.

The tension between the needs of the environment for water and the competing interests of extractive uses has, perhaps inevitably, minimised or even eliminated any margin favouring the environment. The SDLs have been set at levels that also represent the ESLTs, as determined. This places greater importance on the incorporation of a buffer into the ESLT itself, to ensure a reasonable level of confidence that the SDL/ESLT will achieve the aim of avoiding ‘compromise’ in the sense of ensuring the ‘protect and restore’ aim (as explained above). Chapters 4 and 5 examine whether that has occurred as it should have occurred.

An observation about the English word ‘compromise’ is appropriate given some of the material received by the Commission. In the definitions of ESLT, as discussed above, it has nothing to do with give-and-take, splitting the difference or reconciling competing interests by giving neither of them their full measure of what is due to them. Those other colloquial meanings of ‘compromise’ are a fair description of the Water Act as a political artefact, but not of ESLT as a parameter to be fixed and enforced.

An ongoing requirement at the water resource level

The determination of the ESLT could not be a set and forget exercise. As a matter of sound policy, SDLs should always reflect an ESLT, and must always be guided by the requirements of sec 21, on the basis that the best available science will continually evolve. The MDBA must prepare the Basin Plan but also must occasionally review it and may amend it. By necessary implication, any amended Plan must contain SDLs reflecting an ESLT. The provisions comprising the SDL adjustment mechanism do not derogate from this requirement, but rather reinforce it.⁵⁰

It is also significant that the ESLT is not just for the Basin as a whole. Every water resource or part of a water resource in a water resource plan area must have a SDL that reflects an ESLT. This implies an ongoing process of assessment, for every water resource (or part thereof) in a water resource area, of all the matters called up by the definition of ESLT, including an assessment of ‘key’ environmental features and of threatened ‘compromise’ of them.

Related to this is the requirement that the MDBA assess and accredit water resource area plans for conformity with key requirements in the Basin Plan⁵¹ (including the requirement for SDLs that reflect ESLTs). The assessment decisions involved must also be guided by sec 21, including the need for special measures and the aims of ‘sustainable use’ and ‘wise use’ in the Biodiversity and Ramsar Conventions.

Adaptive management

The continuing requirement that every SDL must reflect an ESLT points directly to the need for a program of adaptive management.

In addition to improvements in knowledge about the ecosystems of the Basin, general conditions in the Basin must be expected to change, including as a result of climate variability, climate change, phenomena such as bushfire and the spread of non-endemic species into new areas, and, of course, variations in human use and activity. That such changes will occur is recognized by the Water Act. For example, sec 75 requires that, if the SDL for a water resource area (or the long-term average limit on take under a transitional water resource plan) is reduced, the Basin Plan must specify how much of that reduction is attributable to ‘improvements in knowledge’ about the ESLT.

The Basin Plan explicitly aims ‘to provide a sustainable and long-term adaptive management framework for the Basin water resources that takes into account the broader management of natural resources in the Murray-Darling Basin’,⁵² and requires adaptive management to be applied in the planning, prioritization and use of environmental water.⁵³ The Basin Plan provides this definition:

adaptive management is taken to include the following steps:

- (a) setting clear objectives;*
- (b) linking knowledge (including local knowledge), management, evaluation and feedback over a period of time;*
- (c) identifying and testing uncertainties;*
- (d) using management as a tool to learn about the relevant system and change its management;*
- (e) improving knowledge;*
- (f) having regard to the social, economic and technical aspects of management.⁵⁴*

The ESLT is an objective, not a permanent setting. Its determination for each specified water resource in the Basin Plan is therefore a matter of experimentation, subject to testing against ecological responses, condition changes and new information over time. The Water Act envisages this, and that changes to ESLTs and SDLs will be made.

Best available science

A review of Australian case law indicates no substantive legal consideration or attempt to define the phrase ‘best available science’, but case law in the United States provides some useful guidance. Again, an ordinary English reading is not elusive.

The United States’ Federal *Endangered Species Act of 1973*⁵⁵ (**ESA**) has given rise to a significant body of case law concerning the meaning of the phrase ‘best scientific and commercial data available’. Commonly recognized by academics as the ‘best available science mandate’, it has given rise to consideration of what constitutes ‘best available science’.⁵⁶

Relevant cases involve judicial administrative review of federal agency decisions made under the ESA. The ESA requires the relevant agencies to list certain species as threatened or endangered and protect their habitat (often large areas) on the basis of the best scientific data available and other factors, which may result in adverse economic effects on landholders. The courts have largely refrained from attempting a complete and generally applicable definition of ‘best scientific and commercial data available’, but have considered the meaning of the phrase in the specific context of each case.

In *San Luis & Delta Mendota Water Authority v Jewell*,⁵⁷ the United States Court of Appeals for the Ninth Circuit noted that whilst courts must defer to the assumed expertise of a relevant agency to determine what is the ‘best scientific data available’, the agency must not disregard available scientific evidence that is ‘in some way better’ than the evidence it relies on. The court also observed that where information is not readily available, the court cannot insist on perfection.

In *Daubert v Merrell Dow Pharmaceuticals Inc*, and in the context of the admissibility of evidence, the United States Supreme Court had to consider whether an expert opinion was based on a scientific technique that was ‘generally accepted’. The Court found that:

*Faced with a proffer of expert scientific testimony...[one] must make a preliminary assessment of whether the testimony's underlying reasoning or methodology is scientifically valid and properly can be applied to the facts at issue. Many considerations will bear on the inquiry, including whether the theory or technique in question can be (and has been) tested, whether it has been subjected to peer review and publication, its known or potential error rate and the existence and maintenance of standards controlling its operation, and whether it has attracted widespread acceptance within a relevant scientific community.*⁵⁸

Academic analyses of the ‘best available science mandate’ in the United States include that:

- The usual scientific process involves: a clear statement of objectives; a conceptual model; a method for collecting data; sound logic for analysis and interpretation; clear documentation of methods, results and conclusions, and peer-review. This makes science verifiable and thus different to other methods of interpretation.⁵⁹
- It is important to properly define the problem to be solved, which is a political rather than scientific decision. Once the problem(s) has been identified, science may be applied to assist in working out the solution.⁶⁰

In the context of the Water Act, the problem of overallocation has been identified, and a solution determined by the requirement for an ESLT — these matters, at least, have been legislated. The problem of determining the ESLT also has a number of legislated requirements to guide the use of science eg the water requirements of key ecosystem functions.

- There is a need for credibility in the use of science in decision-making. In the United States, ‘the current treatment of science, hiding uncertainties and non-scientific decisions, is not building credibility. More transparent decision-making, a commitment to continually increasing knowledge, appropriate use of outside peer review, and a demonstrated willingness to pursue all responsible parties could help provide the necessary credibility’.⁶¹

- The language of ‘best available’ implicitly acknowledges that determinations will sometimes be based upon weak or incomplete evidence. Depending on the context, this may call for the application of the precautionary principle.⁶²

This approach is particularly relevant in relation to the determination of the ESLT, where scientific knowledge about, and data pertaining to the ecosystems of the Basin and their water requirements is incomplete.

Although substantive consideration of the meaning of ‘best available science’ has necessarily been confined to the factual context, judicial commentary and approaches make clear that ‘best available science’ includes widely accepted hallmarks of good science such as peer-review, replication, and a thorough literature review.⁶³

In Australia, a thoughtful methodological discussion is found in the article titled ‘Defining and using “best available science”: a policy conundrum for the management of aquatic ecosystems’ published by Australia’s leading scientific organisation, the CSIRO.⁶⁴ The article does not attempt to define ‘best available science’ but discusses some practical aspects of the task of seeking to use ‘best available science’ in decision-making. The context of the article — aquatic ecosystems — is particularly relevant to decisions about the ESLT. Key relevant points are:

- ‘Best’ science generally takes the form of peer-reviewed or published literature, expert advice and, importantly, an acknowledgement that revision is necessary as uncertainties, limitations and inconsistencies are to be addressed over time.

The Commissioner heard from a number of scientific experts whose views align with this formulation (see Chapter 5).

- Science is a self-correcting process, with incorrect information revealed and uncertainty reduced over time.
- An adaptive management framework is essential for identifying research questions, cataloguing available information and facilitating the incorporation of new scientific information as it becomes available.
- Different types of scientific inquiries may be undertaken in different ways but all should be open to interrogation and interpretation.
- There is often a need to apply a multi-disciplinary approach to the use of science, where different sciences may inform a specific policy area of interest.
- When scientific information is limited and levels of uncertainty are expressed, non-scientists may view this as not scientific. There is, therefore, a tension between the need to provide objectivity to decisions and the need to be transparent about any limitations or uncertainty involved.

In the context of the ESLT and the Water Act, such tension should be overcome by a transparent application of the precautionary principle. Nothing beneficial can be gained from mere assertion without disclosed reasoning.

The Australian Government Solicitor's opinion

The Water Act is to be read as a whole. The objects set out in sec 3 are part of the text that produces the meaning of all its specific provisions. As it happens, none of the ESLT provisions is discordant with the objects of the Water Act — rather, to the contrary, as one would hope and expect. In particular, the objects of the Water Act neither contradict nor derogate from the specific requirement to ensure the ESLT is set so as to avoid ‘compromise’ of environmental values, consistently with the international obligation to address ‘threats to the Basin water resources’, stipulated in para 3(b).

The qualified object in para 3(c) of optimising economic, social, and environmental outcomes seems to have produced the much repeated trope of a triple bottom line exercise to determine an ESLT and thus a SDL. One version of the triple bottom line with its nebulous ‘balancing’ exercise can be seen in the only publicly available legal advice to, and of, the Australian Government about the role of social and economic factors in the preparation of the scientifically based aspects of the Basin Plan.

The Australian Government Solicitor's Opinion ‘The Role of Social and Economic Factors in the Basin Plan’ dated 25 October 2010 (**AGS Opinion**) was tabled in the House of Representatives by the then Minister for Sustainability, Environment, Water, Population and Communities, Mr Tony Burke.⁶⁵

The AGS Opinion contains a number of dubious propositions about the meaning and effect of particular provisions in the Water Act and relevant international conventions, and an unlikely and incorrect conclusion about the role of economic and social considerations in determining the ESLT:

- In para 3, the AGS Opinion asserts that the relevant international agreements to be given effect (para 3(b) of the Water Act) ‘themselves recognise economic and social factors, and their relevance to decision-making’. A similar assertion is made in para 23. These statements are misleading. Economic and social considerations are not the subject of any substantive obligation in the Ramsar Convention, and are expressly mentioned only in two Biodiversity Convention obligations.

In the Biodiversity Convention the first relevant reference is in the requirement to adopt economically and socially sound measures as incentives for the conservation and the sustainable use of the components of biological diversity.⁶⁶ The incentive is directed at achieving environmental outcomes to be determined without reduction by reference to social or economic considerations.

The second reference is in the context of the commitment of developed countries to provide financial resources to assist developing countries to assist the latter to meet their Convention obligations. The relevant provision notes that the extent to which the developing countries are able to meet their obligations is subject to the assistance they receive and ‘will take fully into account the fact that economic and

social development and eradication of poverty are the first and overriding priorities of the developing country Parties’.

Clearly, neither of these references give any support to a reading of the Water Act that somehow increases an ESLT above the level of a scientifically-based assessment of compromised environmental values, if that increase would ‘optimise’ an economic outcome.

- In para 4, the AGS Opinion says that ‘in giving effect to those agreements the Plan needs to optimise economic, social and environmental outcomes’. This is an incorrect paraphrasing of the object in para 3(c) of the Water Act which is: ‘in giving effect to those agreements, to promote the use and management of Basin water resources in a way that optimises economic, social and environmental outcomes’. In other words, the optimising exercise relates to the use and management of water, which starts with the prior determination of the ESLT. Use and management of water occurs after a determination of the quantity of water that may be taken, and that process must involve giving effect to relevant international agreements. The optimising does not detract from the constitutionally necessary obligation to comply with them, as the AGS Opinion may be taken to imply.
- Paragraph 4 states ‘where a discretionary choice must be made between a number of options the decision-maker should, having considered the economic, social and environmental impacts, choose the option which optimises those outcomes’. This suggests that a consideration of economic, social and environmental impacts and how to deal with them dictates how a primary decision, such as determining the ESLT, should be made. As discussed in the interpretation of the objects of the Water Act earlier in this chapter, this is a fundamentally incorrect reading of para 3(c) of the Water Act. It ignores the grammar and syntax of the provision, as well as other basic principles of statutory construction — in particular ignoring a purposive approach. The result is a reading that not only undermines the key substantive objects of the Water Act, but one that creates a virtually impossible task. How is it possible to ‘optimise’ all competing interests in a decision specifically designed to protect one of those interests in a specified way? And why would environmental values, for which outcomes are also to be optimised, yield to economic and social outcomes?
- Paragraph 12 repeats the statement in para 4 and adds the vague statement that decision-making in relation to the Basin Plan involves ‘the application of broad concepts’ which therefore provides substantial scope in deciding how economic, social and environmental outcomes should be optimised. This is not the case. While certain concepts in the Water Act are, as discussed above, in principle quite broad, the Water Act and Basin Plan set out a detailed and prescriptive process for achieving specific objects, in particular for determining an ESLT and setting SDLs. There is no scope for including the optimisation exercise in that process. Nor would

that accord with the compulsory basis of the best available science in relation to an ESLT determination.

- Paragraph 24 asserts that the general and high level nature of the obligations in the Conventions allow significant room for discretionary judgement in key provisions concerning sustainable use, wise use and overallocation and further, that those judgements should optimise economic, social and environmental outcomes.

Again, this is simply not correct. The Ramsar Convention and Biodiversity Convention both contain relatively specific obligations concerning the achievement of environmental objectives. Neither contains any specific social or economic objectives and neither refers to social or economic interests or considerations to be accounted for in the way in which, or extent to which, the environmental objectives are to be achieved, as noted above in relation to the two passages in the Biodiversity Convention.

- Paragraph 28 asserts that the object in para 3(c) of the Water Act — already misconstrued in the AGS Opinion — ‘affect the scope of what the MDBA and the Minister could identify as key environmental assets. For example, the MDBA and the Minister could not identify an environmental asset as key if this was not necessary to achieve the specific requirements of the Water Act (such as those under sec 21) and would have significant negative social and economic effects’.

This is a straw man, that might lead to error. ‘Key’ is a qualification that is not defined, but (as discussed earlier in this chapter) the implicit judgements called for by it are guided by the various Water Act provisions relevant to the ESLT (definitions, objects, sec 21, and the ESD principles) and by reference to the relevant international agreements, all of which involve essentially scientific judgements. An environmental asset not considered in this light to be necessary for compliance with the Water Act would, naturally enough, not be ‘key’. What is not permitted is the slide towards undervaluing environmental outcomes, and so the threat of their being compromised, in order to aggrandize economic and social outcomes.

In any event, and as emphasized by Australia’s international obligations implemented by the Water Act, it is wrong to approach the three categories of outcomes to be optimised as if they were quite separate from, or always opposed to, each other. Obviously, they overlap. Significantly, environmental degradation of the Basin water resources is clearly to be regarded as a threat not only to environmental outcomes but also to economic and social outcomes. Sustainability relates all three concepts, together, as fostering a future stewardship of the Basin water resources for the combined social good of environmental and economic long-term prospects.

The AGS Opinion was central to the issues considered by the Senate’s Legal and Constitutional Affairs References Committee in its report ‘A Balancing Act: Provisions of the Water Act 2007’, of June 2011. That report sets out in considerable detail the competing interpretations of the statutory provisions discussed above, and is now a

convenient historical record of legal and political differences that need not be elaborated in this Commission. It is enough to note that some opinions, more or less in accord with this Commission's conclusions expressed above, were evidently advanced to the Committee as a reason for urgent amendments to be made to the Water Act.

As discussed in Chapter 5, a wide range of opinion, legal and scientific, preceded and informed the difficult task of setting an ESLT. To the extent that the AGS Opinion intends to convey support for a triple bottom line approach (in the perverse sense of an authority to discount environmental matters), it appears to be an outlier. Moreover, to the extent that the AGS Opinion has been relied on to interpret what is meant by the ESLT and how it should be determined, it has resulted in unlawful conduct.

At the time, the Guide to the proposed Basin Plan had elicited heated opposition in some quarters, and a general point of argument was that the environment should not have been prioritized, so to speak, as some submitted the Water Act had required. History shows that no such amendment ensued. In the upshot, the optimising of economic and social outcomes as part of an administrative assessment process was regarded as presenting a number of aspects, all recognized (if not all approved as policy) by the various views of the Committee members in their report.

First, the setting of a SDL by reference to an ESLT simply did not accommodate some trade-off with economic and social considerations so as to increase what science would assess to be the limit beyond which environmental values would be compromised. Second, the very nature of the logically anterior step of setting an ESLT would always involve matters of evaluative assessment, with reasonably arguable different views, of a kind that has sometimes been called discretionary. Third, the optimising of economic and social outcomes might involve setting levels of take as high as a SDL would permit — thereby recognizing the abiding feature of the Water Act that it is premised on very substantial consumptive take continuing, with no notion of an impossible return to pre-development so-called natural conditions.

(It is also in this Committee's report that the majority called for the release of other Commonwealth or MDBA legal advice, in vain; a matter taken up in Chapter 5).

As explained in Chapter 5, notwithstanding the Senate Committee's understanding of the statutory significance of 'E' standing for 'environmental' in 'ESLT', the MDBA appears to have proceeded on an opposite tack. In doing so, it not only departed from what may be inferred to have been respectable previous legal advice, it also proceeded unlawfully.

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Introduction

The ‘Guide to the proposed Basin Plan’ (**Guide**), released on 8 October 2010, was one of the first significant pieces of work published by the Murray-Darling Basin Authority (**MDBA**) since its establishment under the *Water Act 2007* (Cth) (**Water Act**). The result of 18 months of development, the Guide’s stated purpose was to provide an overview for the public to understand the basis for the proposed Basin Plan, together with supporting technical documents, so that a properly informed public could be consulted.

The Guide set out the hydrological and scientific analysis underpinning the ecosystem assessments and their watering requirements, together with detailed social and economic analysis outlining the potential impacts of the then proposed Basin Plan. The Guide stated the approach taken by the MDBA was nationally and internationally peer-reviewed, and was ‘robust and represent[ed] the application of the best available science as required by the Water Act’.¹ The views of both the general public and the scientific community were sought.

Notoriously, the release of the Guide caused a highly negative and hostile reaction amongst the community. This is notable in itself. What was particularly conspicuous however was the swift steps taken by both the then Commonwealth Minister and the MDBA to publicly distance both institutions from the Guide and the detailed scientific discussion therein. By the middle of 2011, the Guide was effectively treated by the MDBA as obsolete and irrelevant.

Whilst a significant body of work and discussion has followed the publication of the Guide in late 2010, it remains necessary to include its review in any analysis of the *Basin Plan 2012* (Cth) (**Basin Plan**) — and to properly report on several of the Commission’s Terms of Reference — for four key reasons. First, it is arguably the most comprehensive, scientifically-based, open and transparent publication produced by the MDBA to date. The extent to which the Guide was subject to scientific and public scrutiny and review far exceeds any subsequent work that has been produced by the MDBA. Secondly, the hostile reaction to the Guide, and the subsequent rapid back-peddalling away from it by the MDBA, is symptomatic of the MDBA’s reactionary approach to scrutiny from both the public and the scientific community since its inception. Thirdly, it remains regarded by much of the scientific community as the best evidence of a sustainable diversion limit (**SDL**) that reflects an environmentally sustainable level of take (**ESLT**). Fourthly, as the discussion in Chapter 5 will demonstrate, the reactionary and politically-focussed approach taken by the MDBA following the poor reception of the Guide by a vocal minority has proceeded on a fundamental misinterpretation and misapplication of the requirements of the Water Act, and has come at the cost of not acting on the best available scientific information.

Overview of the Guide

The Guide is comprised of two volumes. Volume 1 provides an extensive overview and rationale behind the scenarios proposed by the MDBA for an ESLT, the expected environmental, social and economic outcomes for the Murray-Darling Basin (**Basin**) of those scenarios, and the manner in which the MDBA proposed to implement the Basin Plan. Volume 2 is an extensive and technical exposition of the matters discussed in Volume 1, and is described as a supporting document. The discussion in this chapter covers the first two aspects of the Guide: the MDBA's proposed ESLT and the expected environmental, social and economic outcomes for the Basin.

Determining an ESLT and SDL

In Chapter 6 of Volume 1 and Chapter 4 of Volume 2 of the Guide, the MDBA set out how it determined the environmental water needs of the Basin, having regard to the statutory definition of ESLT in the Water Act.

Identification of elements that cannot be compromised

The MDBA first identified four Basin-wide 'key ecosystem functions' and, from a shortlist of 20 000 'potential assets', 2442 'key environmental assets' of the Basin. Consistent with the proper interpretation of the Water Act, as outlined in Chapter 3, the MDBA selected assets as 'key' that satisfied one or more ecologically-based criteria.² These 'key environmental assets' are comprehensively listed in an appendix to Volume 2 of the Guide.³

Modelling approach

The MDBA undertook its modelling exercise by first establishing two starting points or baselines. First, the MDBA determined a 'without development flow condition', which determined flows with consumptive use and river infrastructure (such as dams or weirs) removed. Using the CSIRO models from the Sustainable Yields Project, the MDBA determined the long-term annual average yearly flows in the Basin were 23 313 GL.⁴ Second, the MDBA determined the level of diversions as at 2009. For surface water, using a combination of models developed for the purposes of the cap on diversions and additional analyses, the MDBA estimated that the Basin-wide annual diversions were 13 677 GL per year. For groundwater, annual average diversions were estimated as 1786 GL, based on a combination of data from metered resources and estimates from unmetered resources.⁵

The MDBA then assessed the surface water requirements of those using an 'end-of-system flow' analysis. This required the assessment of the current flow regime of each interconnected system, and the assessment of the health of that system based on the flow that reached the end of each catchment. This again drew upon previous work conducted

by various research bodies, including the Sustainable Yields Project conducted by the CSIRO.⁶

Rather than assess flow requirements against the identified 2442 key environmental assets, a task that the MDBA argued would be overly time consuming and unnecessary, the MDBA assessed additional flow requirements against an identified set of 106 hydrological indicator sites, comprising 88 sites representing key ecosystem functions, and 18 sites representing key environmental assets. The MDBA then converted those assessed flow regimes into catchment-scale volumes of additional environmental water, whilst assessing the adequacy of that distribution based on consumptive use and environmental use.⁷

The hydrological indicator sites and their description, including a comprehensive justification for their selection and environmental watering targets, are methodically set out in an appendix to Volume 2 of the Guide.⁸ This approach operated under the assumption that by meeting the environmental water requirements for the key ecosystem functions and the key environmental assets, the water requirements to support the productive base and environmental outcomes would also be met.

The Guide explains that the modelling exercise for groundwater was faced with much greater difficulty and uncertainty arising from the disparity in regulation. As the Guide explains, a large area of the groundwater resources in the Basin were ‘unincorporated’; that is, not covered by an existing groundwater management plan.⁹

In those circumstances, using ‘groundwater recharge modelling’, the MDBA conducted a ‘recharge risk assessment’ to ascertain an ESLT for the groundwater resources of the Basin. This involved modelling the recharge of the groundwater resource to which a ‘sustainability factor’ was applied to ascertain the ESLT from that resource. The ‘sustainability factor’ was based on a risk assessment of the impact that groundwater extraction would have on the key environmental assets, key ecosystem functions, productive base and key environmental outcomes of the groundwater resource in question. In particular, this risk assessment would take into account the reliance those ecological elements had on groundwater recharge, including connectivity with surface water.¹⁰

The environmentally sustainable level of take

Using the above approach, the MDBA determined that the level of Basin-wide diversions that represented an ESLT fell within a range. From the starting point of Basin-wide diversions as 13 677 GL, this is expressed as a water recovery amount for the environment, which correspondingly relates to a reduction in diversions for consumptive use. Accordingly, at the lower end of the determined range, the MDBA assessed that a water recovery amount of 3856 GL, representing a diversion limit of 9821 GL, would achieve the environmental watering requirements of the Basin with a ‘high level of uncertainty’. At the higher end of the range, the MDBA assessed that a water recovery amount of 6983 GL, or a diversion limit of 6694 GL, would achieve the environmental watering requirements of the Basin with a ‘low level of uncertainty’.¹¹

The Guide further qualifies these figures through the use of confidence limits, which are explained as representing the ‘inherent uncertainties’ with measurement, together with expected ‘operational efficiencies’. At the lower end of this range, therefore, the MDBA determined that, applying a 20% confidence band, the Basin’s environmental watering requirements can be achieved with a ‘high level of uncertainty’ with a water recovery amount of 3000 GL, representing a Basin-wide diversion limit of 10 677 GL. At the higher end of this range, applying a 10% confidence band, the MDBA determined that the Basin’s environmental watering requirements can be achieved with a ‘low level of uncertainty’ with a water recovery amount of 7600 GL, representing a Basin-wide diversion limit of 6077 GL.

Notwithstanding the otherwise comprehensive nature of the Guide, there is no assistance provided to explain what is meant by the ungainly and self-contradictory phrase that environmental watering requirements ‘can be achieved with a high level of uncertainty’.

Associate Professor Jamie Pittock of the Wentworth Group of Concerned Scientists (**Wentworth Group**) explained that the use of ‘uncertainty’ reflected a common academic practice of expressing expert opinion on a qualitative matter, and referred to the work of the Intergovernmental Panel on Climate Change (**IPCC**) by way of example.¹² However, whilst the most recent IPCC Report provides helpful guidance on quantifying such terms,¹³ no equivalent assistance is provided in the Guide or in any subsequent materials produced by the MDBA. Noting that, in response to questions posed by the Commissioner, the South Australian Government explained that:

*the uncertainty being discussed is the confidence that the ecological target will be met. In this case low uncertainty means that there is a high confidence that the ecological target will be met and high uncertainty means that there is a much lower confidence that the ecological target will be met.*¹⁴

The evidence heard by the Commissioner was consistent with this explanation with respect to ‘low uncertainty’.¹⁵ However, several expert witnesses provided additional guidance on how much ‘lower confidence’ was meant by ‘high uncertainty’. A/Professor Pittock agreed that ‘high uncertainty’ meant that it was possible to meet the environmental watering requirements, but not probable,¹⁶ whilst Dr Matthew Colloff, formerly of the CSIRO, agreed that it could be translated as a ‘low prospect of it achieving the environmental outcomes required’.¹⁷ Similarly, Associate Professor Rebecca Lester considered it meant that it was possible to meet the requirements, but in many years they will not be met.¹⁸ Mr Bill Johnson considered that it was probable that environmental assets would be compromised given the rating of ‘high uncertainty’,¹⁹ whilst Professor John Williams interpreted a ‘high level of uncertainty’ as ‘[t]hat means you have got Buckley’s ... a high level of uncertainty means that you have probably got very little chance of success’.²⁰

The MDBA similarly expressed the reduction in groundwater diversions required to achieve an ESLT in a range: between a ‘high risk’ reduction scenario of 99 GL and a ‘low risk’ reduction scenario of 227 GL. This reflected an assessment that the diversion limits of 67 groundwater systems represented an ESLT, that the actual take of an additional four groundwater systems represented an ESLT where the diversion limits did not, and a remaining seven groundwater systems had diversion limits that exceeded an ESLT.²¹ Whilst the risk ratings used in these scenarios reflect the risk assessment discussed above, no quantitative assistance is given to interpret these terms in the Guide.

Climate change

As discussed more comprehensively in Chapter 6, as at 2010 the MDBA had the benefit of the substantial research into the effects of climate change on the Basin’s water resources conducted by the CSIRO in the Sustainable Yields Project, and the South Eastern Australia Climate Initiative. Further, the CSIRO provided direct advice on climate scenarios in Basin modelling in July 2009.²²

The Guide’s discussion on incorporating climate change in the Basin Plan reflects the MDBA’s receipt and consideration of this research. This is in distinct contrast with subsequent materials, as discussed in Chapter 6. In particular, the Guide incorporates the CSIRO’s advice that whilst historical records can provide a useful baseline, they are ‘no longer sufficiently robust for long-term planning’ and as a result, the past 10 years’ climate data should be used ‘for conservative risk-based considerations’.²³

The Guide notes that the Sustainable Yields Project in 2008 projected that average surface water availability would fall in a median climate scenario by 11% by 2030.²⁴ The Guide later uses the figure of 10% for this scenario, which it cites as an ‘updated figure’ from the CSIRO Sustainable Yields Project, although the provenance of this ‘update’ is not apparent.²⁵ On the basis that the Basin Plan would commence between 2012 and 2019, and would be subject to review by 2021 at the latest, the MDBA determined that it would be unnecessary to incorporate the full effect of the 11% predicted decline in surface water availability in the ‘first Basin Plan’. Accordingly, the MDBA ‘determined that 3% is an appropriate allowance to account for the effect of climate change in the proposed Basin Plan’.²⁶

The Guide appears to convey that this 3% has been included in the determination of the reduction figures of 3856 GL/3000 GL to 6983 GL/7600 GL, discussed above, where it states that ‘the reduction being considered necessary to achieve an environmentally sustainable level of take includes a 3% allowance in the SDL proposals’.²⁷ However, the manner in which that allowance has been incorporated is far from clear, and was not clear for a number of expert witnesses who gave evidence before the Commissioner.

No reduction was incorporated for groundwater diversions, as the MDBA stated that ‘no strong deviation from historical median recharge’ was projected by 2030 in the median climate change model.²⁸

Sustainable diversion limits

As discussed above, the MDBA determined that a Basin-wide reduction of diversions between 3000 GL to 7600 GL for surface water and between 99 GL to 227 GL for groundwater would be necessary to represent an ESLT.

For surface water, the MDBA then proposed three modelled scenarios for the purposes of both a Basin-wide SDL and individual resource unit SDLs which represented a Basin-wide reduction of diversions of 3000 GL, 3500 GL and 4000 GL.²⁹ In proposing these scenarios, the MDBA explained that it ‘focussed on three critical matters’, namely the fundamental obligations of the Water Act to determine an ESLT based on the best available science, the need to optimise economic, environmental and social outcomes, and the need to take into account the Basin’s physical constraints. In particular, the MDBA explained that, based on its social and economic research, any scenarios that exceeded 4000 GL would be inconsistent with its obligations under the Water Act to optimise economic, social and environmental outcomes.³⁰

For groundwater, the MDBA explained that it had optimised social, economic and environmental outcomes in a number of ways, including by protecting against continued drawdown of groundwater levels so that they are stabilized within a 50 year timeframe, limiting reductions to no more than 40%, and ensuring groundwater take does not compromise the ecological needs of the Basin, including protection against salinity.³¹ As a result, the MDBA proposed one scenario for groundwater, which represented a Basin-wide reduction of approximately 185 GL.³² This figure represented no reductions in the 67 groundwater systems previously determined to reflect an ESLT, reductions representing current but not permitted take in four groundwater systems, and reductions, making up the majority of the reduction figure, namely 126 GL, in the seven groundwater systems that were determined to have exceeded an ESLT.³³

In respect of both surface water and groundwater, the MDBA set out, in detailed tabulated form, the individual SDLs for each SDL resource area for each of the 3000 GL, 3500 GL and 4000 GL water recovery scenarios, including volumetric and percentage representations of the extent of the reduction in diversions under each scenario.³⁴

Social and economic impacts

As indicated above, the MDBA decided only to model scenarios of water recovery amounts of 3000 GL, 3500 GL and 4000 GL on the basis that ‘escalating social and economic effects are likely to outweigh the additional environmental benefits’ beyond a scenario of 4000 GL.³⁵ Drawing on work conducted by the Australian Bureau of Agricultural and Resource Economics (**ABARE**), within the range of 3000 GL to 4000 GL, the MDBA estimated this would result in a reduction in gross value of irrigated agricultural production of between 13–17%, or \$800 million to \$1.1 billion, per year.³⁶

At a national level, this represented a reduction of between 0.11–0.15% in national gross domestic product (**GDP**).³⁷

Unsurprisingly, the MDBA identified that, on a regional scale, the impacts were estimated to be greater in smaller towns dependent on irrigated agriculture, than in larger towns with more diversified and adaptable economies.³⁸ A detailed social and economic summary and analysis for each of the regions in the Basin is contained in an appendix to Volume 2 of the Guide.³⁹

Further work commissioned by the MDBA conducted by Professor Glyn Wittwer, then of Monash University, suggested that the water recovery scenarios would have a lesser impact. For example, in the 3500 GL scenario, ABARE estimated a decline in Basin GDP of 1.3%, whereas Professor Wittwer estimated a decline in Basin GDP of only 0.12%. In the Guide, the MDBA explains that the difference arises because Professor Wittwer's models assume that factors of production — land, labour and capital — are highly mobile amongst sectors of the economy, and are therefore more adaptable to declines in particular sectors, such as irrigated agriculture.⁴⁰

Based on the ABARE analysis, the MDBA estimated that the impact on employment within the Basin arising from the modelled scenarios would be approximately 800–1000 full time jobs, or an approximate decline in employment of 0.1% Basin-wide.⁴¹

Finally, the MDBA identified that further research and analysis was required in two areas relevant to the social and economic impacts of the modelled scenarios. First, the MDBA identified that further work was necessary to assess the economic value of the environmental benefits of increased environmental watering, particularly in the context of environment-based tourism, floodplain grazing and commercial fishing.⁴² Second, notwithstanding that 15% of Australia's Aboriginal population lives within the Basin, the MDBA identified a lack of research and analysis of the social, cultural and economic impact of water recovery on Aboriginal Nations.⁴³

Reaction to the Guide

Public reaction and the MDBA's response

Prior to the publication of the Guide, the MDBA published a Stakeholder Engagement Strategy.⁴⁴ In that high-level, nine page document, the MDBA envisaged that stakeholders would be engaged throughout 2009 through the Basin Officials Committee, the Basin Community Committee, stakeholder meetings, public forums and regional engagement activities, until a projected release of a proposed Basin Plan in July 2010. More extensive consultation was proposed following that release.

Little detail is provided in the Guide as to those consultation efforts. However, given the apparent shock and disbelief amongst members of Basin communities following

the publication of the Guide, it is reasonable to infer that insufficient consultation was conducted to forewarn and inform those communities of its contents.

The MDBA described the Guide on its release on 8 October 2010 as a ‘landmark first-stage document’ that included ‘an assessment, using the best available science, of the amount of water that represents an environmentally sustainable level of take for consumptive uses’.⁴⁵ A series of ‘public information sessions’ was announced across the Basin in October and November 2010.

However, within a week of its publication, in mid-October 2010, copies of the Guide were burnt amongst signs stating, with no apparent sense of irony or propriety, ‘Is Hitler Reborn?’.⁴⁶ The President of the Victorian Farmers Federation described the Guide as proposing a ‘legislated drought’.⁴⁷ It would be very unsafe to regard this conduct and rhetoric as necessarily representing a truly grassroots reaction. It could be that this reaction was a media-savvy (but tasteless) campaign by pro-irrigation groups more intent on political lobbying than on informed consultative debate.⁴⁸

Following this reaction, the MDBA and the Commonwealth Minister swiftly and publicly distanced themselves from the Guide. By 25 October 2010, the Commonwealth Minister released a lengthy media release, and emphasized that the Guide did not represent Commonwealth Government policy.⁴⁹ The next day, on 26 October 2010, whilst noting that the Guide was prepared with the assistance of legal advice, the MDBA nonetheless ‘welcomed’ the Minister’s statement, and explained that the Guide’s purpose was ‘to elicit feedback to ensure that all relevant information’ was taken into account.⁵⁰

By mid-December 2010, public references to the Guide were only obliquely made. Reporting on a Ministerial Council meeting on 17 December 2010, the MDBA noted the ‘concerns of Basin communities about the guide to the proposed Basin Plan’, in the context of a ‘new process’ that required the ‘scientific basis and environmental benefits of the proposed Basin Plan to be presented fully and clearly and in a way that allows for proper external analysis and scrutiny, and community engagement’.⁵¹

By April 2011, following the December 2010 resignation of the Chair of the MDBA, Mr Michael Taylor AO, the MDBA’s public position on the Guide transformed from detachment to outright hostility. At a community meeting in Narrabri, the newly appointed Chair, Mr Craig Knowles AM, said that it was ‘no secret’ that he had a ‘poor opinion’ of the Guide, that he did not have a ‘high degree of ownership’ of it, and that it was ‘time to move on’.⁵²

Unsurprisingly, such a hostile public reaction, coupled with the rapid about-face performed by the MDBA within the timeframe of a few months, provoked substantial concern amongst staff. Witnesses described the mood amongst staff as shocked, jaundiced, chaotic and traumatic.⁵³

Scientific analysis

In addition to this sectional lay hostility, the Guide was subject to extensive comment, analysis and peer-review by the broader scientific community.

CSIRO submission to the MDBA

On 17 December 2010, the CSIRO provided a submission on the Guide outlining eight technical areas of concern. These areas of concern largely related to a lack of transparency and detail regarding how certain matters were determined in the Guide, as well as certain expressions of concern regarding how the CSIRO's research and analysis was presented in the Guide.⁵⁴

For example, the CSIRO stated that its most important concern related to the lack of transparency regarding how environmental assets, outcomes and flows were determined. Lack of transparency was also a concern with respect to why social and economic considerations apparently prevented modelling recovery targets above 4000 GL, the placing of upper limits on reduction of diversions, and the use of what otherwise appeared to be arbitrary 'confidence limits' in achieving environmental outcomes. The CSIRO also raised concerns about the misuse of its research on intercepting activities, and the overestimates of inflows, largely arising out of the way that intercepting water uses were treated.

Finally, the CSIRO expressed concern about how climate change was incorporated into the Guide. The CSIRO noted that the MDBA attempted in the Guide to justify why climate projections to 2030 were not fully included, and argued that this justification 'does not appear correct or defensible'.⁵⁵ The CSIRO noted that there were flaws in the reasoning for only incorporating a 3% reduction to account for decreases in inflows by 2030, and that the reasoning in the Guide was 'certainly not based on CSIRO science or advice'.⁵⁶ Further, the CSIRO submitted that the proposal for regional water resource plans to accommodate variations arising from climate change was in fundamental conflict with other objects of such plans, explaining:

The conflict arises because it is impossible to tell in advance if reduced inflows are the result of climate variability (a short-term drought) or climate change. The requirement in the guide would mean that if during the life of the plan, below average inflows were experienced then reduced allocations would have to be given to all users just in case these inflows were never balanced in future by higher than average flows. This is fundamentally in conflict with the purpose of using reservoirs and water plans to provide a reliable supply under a variable climate.

The solution is to either prove that there are ways of avoiding this fundamental conflict in regional water plans; or include the best estimate of climate in advance by setting SDLs using projected climate change; or acknowledge that climate

*change will not be dealt with until subsequent plans when we have a better ... understanding of whether inflows are reducing.*⁵⁷

CSIRO and Goyder reviews for South Australia

In early 2011 the Goyder Institute for Water Research in conjunction with the CSIRO produced five reports reviewing and analysing the Guide on behalf of the South Australian Government regarding its ecological and socio-economic analysis.⁵⁸ The CSIRO's ecological analysis was peer-reviewed by Professor Ed Maltby of the University of Liverpool.⁵⁹

For the purposes of its ecological science review, the CSIRO analysed the modelled scenarios relating to the recovery targets of 3000 GL, 3500 GL and 4000 GL for the two key environmental assets within those models, namely Riverland-Chowilla and the Coorong, Lower Lakes and Murray Mouth (**CLLMM**). For the purposes of this analysis, the CSIRO was provided with access to those models by the MDBA that represented the South Australian region. Access was not granted to any Basin-wide model, nor was access granted to the model representing the 7600 GL, 'low uncertainty' water recovery scenario.⁶⁰

The CSIRO concluded that 'some' of the environmental water requirements (**EWR**) for the CLLMM were met 'some of the time' under all scenarios, whilst there was 'potentially sufficient average annual volume' of environmental water to meet the EWRs for the Riverland-Chowilla in the 3500 GL and the 4000 GL scenarios, but not the 3000 GL scenario.⁶¹ If, however, flows were optimised by retaining reserves in excess of 4000 GL, the CSIRO found that in all but one modelled year the EWRs for both the Riverland-Chowilla and the CLLMM were met in a 4000 GL 'optimised' scenario.⁶²

The CSIRO also reviewed the Guide's incorporation of 3% impact on flows arising from climate change. Whilst the median climate change scenario in the Sustainable Yields Project projected a Basin-wide reduction in flows of 11% by 2030, the CSIRO noted that this scenario predicted a 17% reduction in flows by 2030 for the Southern Basin.⁶³ As a result, the CSIRO concluded:

*climate change presents a significant risk given that all of the SA EWRs are not met under the Guide scenarios, and this will be exacerbated with between 3–17% less water. Shortfalls would be significantly larger and more frequent.*⁶⁴

The CSIRO's economic analysis demonstrated an estimated cost in South Australia between 4% and 6.4% of annual baseline irrigation revenue, or between \$27 million and \$44 million, under the 3000 GL to 4000 GL recovery target scenarios.⁶⁵ If the reduction in diversions was shared between municipal, industrial and irrigation uses, the CSIRO estimated the expected costs for South Australia would range between \$26 million and \$58 million annually.⁶⁶

Peer-review

During its preparation, the MDBA engaged a number of experts across Australia and internationally to conduct a peer-review on all aspects of the Guide. Experts ranging in ecology, hydrology, environmental management, economics and sociology were engaged to review matters ranging from core methods and approaches, social and economic modelling, and assessment of EWR. Shortly after the publication of the Guide, the MDBA published a consolidated volume of these reviews.⁶⁷ These reviews are voluminous and highly detailed. Key aspects of some of those reviews warrant elucidation here.

The principal review of the Guide's 'overall approach' was conducted by an international panel of experts (**the Review Panel**). The Review Panel were left 'deeply impressed' after reviewing a draft version of the Guide in May 2010 and engaging with MDBA staff.⁶⁸ The Review Panel endorsed the MDBA's approach of identifying a set of environmental outcomes and developing a plan to achieve those outcomes, noting that 'the empirical challenges, however, are formidable and the uncertainties are enormous'.⁶⁹ The Review Panel recommended the MDBA outline in detail how the outcomes were chosen and assessed, explain in detail the great scientific uncertainties, and 'present a range of options for long-term average sustainable diversion limits ..., described in both ecological and socioeconomic terms with the associated risks involved'.⁷⁰

The Review Panel, in particular, commented on the interaction between scientific analysis and knowledge and its implementation by policy makers, particularly in the context of the Water Act, noting:

Far from being 'value neutral', a set of value judgements are fundamental to the aspirations of all Acts, including the Water Act. The driving value of the Water Act is that a triple-bottom-line approach (environment, economic, social) is replaced by one in which environment becomes the overriding objective, with the social and economic spheres required to 'do the best they can' with whatever is left once environmental needs are addressed.⁷¹

In that context, and arising from their review, the Review Panel then elaborated what would ultimately become a highly prescient concern:

It is a fundamental tenet of good governance that the scientists produce facts and the government decides on values and makes choices. We are concerned that scientists in MDBA, who are working to develop 'the facts', may feel that they are expected to trim those so that 'the sustainable diversion limit' will be one that is politically acceptable. We strongly believe that this is not only inconsistent with the basic tenets of good governance, but that it is not consistent with the letter of the Water Act. We equally strongly believe that government needs to make the necessary trade-offs and value judgements, and needs to be explicit about these, assume responsibility, and make the rationale behind those judgements transparent to the public.⁷²

This eloquent defence of integrity in scientifically informed government policy and administration has the highest prominence in this Commission's assessment of how things should have been done.

Mr Drew Bewsher reviewed the surface water modelling methods used in the Guide, and whilst he found them necessarily simplistic given the very tight timeframes, he nonetheless considered they were 'technically robust and fit for purpose'.⁷³ Similarly, a panel reviewed the groundwater modelling methods and found them to be 'reasonable and credible', but noted that the task was 'extremely complex' with a very short timeframe.⁷⁴

Professor Quentin Grafton, Australian National University, Dr Jeff Connor, CSIRO, and Mr Drew Collins, BDA Group each provided a peer-review of the socio-economic analysis contained in the Guide. In summary, the reviewers found the analysis to be generally sound, with some limitations or deficiencies identified for further improvement.⁷⁵

Other analyses

The Commissioner heard evidence and received submissions from many expert witnesses who all provided qualified support for the scientific basis for the Guide. Those qualifications did not impugn the overall science underpinning the Guide, but rather largely related to queries about how, and on what data and assumptions, the MDBA had calculated or determined certain aspects of the Guide.

For example, when discussing the MDBA's determination of reduction targets that could achieve environmental outcomes with a high level of uncertainty, Dr Colloff explained that he would want the basis for the MDBA's assessment of confidence more fully explained.⁷⁶ Mr Andrew Close, former MDBA modeller, explained that the models were developed in a rush, and did not build in the necessary processes that environmental managers needed to allocate water, but that this did not make a significant difference in the results expressed in the Guide.⁷⁷ The Wentworth Group submitted to the Commission that:

*Without the release of any new independently reviewed scientific information, the Guide still represents the best publicly available science to establish what is needed to restore the Basin to health.*⁷⁸

Analysis

The publication of the Guide in 2010 marked a crucial turning point in the development of the Basin Plan. The Guide contained a comprehensive, technically detailed, scientifically literate, scientifically based, independently and comprehensively peer-reviewed explanation and rationale for a proposed Basin Plan designed to achieve the objects and purposes of the Water Act. In every aspect of this description, the Guide stands virtually unique amongst the numerous publications promulgated by the MDBA since.

The Commissioner accepts that hydrological modelling, as well as our general scientific understanding of the ecology of the Basin, has no doubt substantively improved since the promulgation of the Guide in 2010. To that extent, it is correct to say that the conclusions in the Guide are obsolete and superseded.

However, the MDBA's approach to determining an ESLT in the Guide was nonetheless largely consistent with the requirements of the Water Act. The determination of an ESLT was solely based on an environmental assessment of the level of consumptive take from the Basin that, if exceeded, would compromise the key environmental assets, the key ecosystem functions, the productive base, or the key environmental outcomes of the Basin. The MDBA determined that the ESLT fell within a range. By selecting proposed SDL scenarios within that range, the MDBA ensured that the SDL reflected an ESLT consistent with subsec 23(1) of the Water Act.

Where the MDBA erred, however, was by reasoning that the selection of these scenarios arose out of an available so-called optimisation of economic, social and environmental outcomes. As shown in Chapter 3, the determination of an ESLT and SDL is not governed by a supposed triple bottom line approach. A SDL must be set as a determined limit, beyond which 'compromise' will occur. Therefore, the selection of scenarios that range from the lowest extent of the determined ESLT range is more appropriately characterized as testing whether a 'buffer' above that limit may have been necessary so as to incorporate the precautionary principle.

Accordingly, the error of referring to a so-called optimisation of social, economic and environmental outcomes may not have had a substantive effect on the conclusions reached in the Guide. However, as Chapter 5 will discuss, the infection of the erroneous triple bottom line approach spread further into scientifically mandated processes following the Guide, and into the determination of the ESLT itself.

The Guide was subject to extensive and comprehensive international and national peer-review on all aspects of environmental, social and economic science and analysis. Critical analysis and review was sought from numerous expert panels on broad and flexible terms of reference. Access to information and materials, including modelling, was provided for independent review.

As the later chapters in this report will explore, this approach stands in stark contrast to the approach undertaken by the MDBA following the publication of the Guide. Subsequent reports are more properly characterized as vague, incoherent and unhelpful. Independent reviews of the MDBA's subsequent work have been unusefully limited in scope and provided with limited access to information and materials.

It is readily apparent that the hostile reaction to the Guide arose out of a failure by the MDBA, and governments, to adequately consult and engage communities during its development and before its promulgation. No-one could properly condone such inauspicious actions as the burning of books. However, it is nonetheless understandable

that affected communities were highly concerned about the receipt of a lengthy, complex and highly technical government document containing figures which, at the highest end, extended to a threatened halving of the current consumptive take of water in the Basin — and this during the worst drought on record.

As Professor Petra Tschakert explained in her evidence, it should not have come as a shock that such a negative reaction would be the result of the publication of the Guide. As found in Chapter 6, the MDBA manifestly failed to adequately apply a collaborative pathway approach to environmental resource management in the Guide's development and subsequent publication.

However, rather than responding to such a failure with the adoption of an appropriate adaptation pathway in subsequent actions, the MDBA instead turned to attempted appeasement of irrigation communities and vested political interests. In doing so it has simultaneously failed to address the manifest lack of trust amongst Basin communities, and manufactured a new field of mistrust by marginalizing the scientific community. In its post-Guide approach, the MDBA has ignored and abandoned the substantial work that formed the Guide, and instead has adopted an approach that is fundamentally inconsistent with the requirements of the Water Act and the best available scientific knowledge.

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5 **ESLT Process**

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Introduction

The task of setting the environmentally sustainable level of take (ESLT) lies at the heart of achieving the objects and purposes of the *Water Act 2007* (Cth) (**Water Act**) in order to restore Basin water resources to environmentally sustainable levels of extraction.¹ The *Basin Plan 2012* (Cth) (**Basin Plan**) is the mechanism for achieving this and in particular, through the determination of an ESLT, an annual long-term average sustainable diversion limit for the entire Basin (**SDL**), and for every water resource area.² Those SDLs must reflect an ESLT.³

The setting of the SDL necessarily identifies the volume of water by which Basin-wide diversions need to be reduced in order to achieve the SDL. Put another way, it identifies the volume of water aimed to be recovered Basin-wide and annually for the environment (**recovery amount**). That recovery amount is calculated as the difference between the June 2009 baseline and the SDL.

The Basin Plan was legislated in November 2012 and set the SDL at 10 873 GL per year, producing a recovery amount of 2750 GL.⁴ As discussed in Chapter 3, whilst the Water Act requires that the SDL ‘must reflect’ an ESLT, theoretically, it may not always equal it.⁵ As at 2012, however, the SDL was struck at a level that did, in fact, equal the ESLT.

This chapter focusses on the process adopted by the Murray-Darling Basin Authority (**MDBA**) to reach its original determination of the ESLT, SDL and recovery amount. These tasks were instrumental in setting the pathway for the implementation of the Basin Plan and have wide-reaching, and long-term consequences. Despite the passage of time, and given the seminal and underpinning importance of these tasks, considerable time is spent in this chapter on identifying the relevant processes involved. It is an exercise in understanding how these assessments were made, and whether the process, and the final determination, were lawful.

The Commissioner notes the various commentary provided throughout the course of the Commission to the effect that exploring matters, including the lawfulness of the ESLT and SDL set in 2012, is nothing more than a legalistic attempt to ‘blow up’ the Basin Plan. Given its importance, this perspective is addressed and refuted at the outset of this report, in the Overview. As stated there, the contrary is true.

As a starting premise, the laws of this country should be observed. The Water Act and Basin Plan, as part of the national legislative framework, are no exception. The consequences of not doing so are serious, whether they be through ignorance, carelessness or knowingly. Beyond that important premise, the errors of the past have, in the context of achieving the objects and purposes of the Water Act through the implementation of the Basin Plan, ongoing consequences.

The MDBA set out first to determine the ESLT. Following the negative reaction to the proposed recovery amount set out in the Guide to the proposed Basin Plan 2010

(Guide), the MDBA further pursued its process for determining the ESLT. In November 2011, it proposed the ESLT that was ultimately reflected in the SDL and recovery amount incorporated in the Basin Plan.⁶

The opinion of the Australian Government Solicitor dated 25 October 2010 (**AGS Opinion**) appears to have been key in the process which led to the ESLT.

The MDBA points to a change in approach to the modelling, as between the Guide and its November 2011 ESLT Report (**ESLT Report**), to justify the ESLT determination, SDL and recovery amount; namely, from the end-of-system flow analysis, to the indicator site method. The evidence is clear that despite this change in modelling method, the ESLT and associated determinations failed to accord with the requirements of the Water Act. The SDL did not reflect an ESLT.

Two fundamental errors gave rise to this unlawfulness. First, the MDBA impermissibly adopted a so-called triple bottom line approach. This approach pervades the ESLT methodology and determination and thereby necessarily infects the SDL and recovery amount assessments that followed. As discussed in Chapter 3, the Water Act requires environmental priorities to be given primacy when determining the ESLT. A triple bottom line approach plays no part in that determination, nor the determination of the SDL. Instead, any optimisation of environmental, social and economic outcomes must come later, and it is unlikely to be possible to optimise all three simultaneously with determinations such as the setting of an ESLT or SDL. Accordingly, the adoption of a triple bottom line approach has resulted in the SDL not reflecting an ESLT, contrary to sec 23 of the Water Act.

Second, in determining the ESLT and then the SDL, the MDBA failed to act on the best available science, contrary to para 21(4)(b) of the Water Act. The Commissioner heard evidence from some of Australia's leading and eminent scientists in the field. Without exception, they advised that the science relied upon was not best, insofar as it lacked transparency and was unable to be thoroughly tested or replicated. The science was not the best available, insofar as climate change was ignored, and existing science regarding the environmental water needs of the Basin, as reflected in the Guide, was set aside. No scientist was prepared to accept that the SDL, giving rise to a recovery amount of 2750 GL, reflected an ESLT.

Accordingly, the determinations of the ESLT and SDL, as at November 2012, were unlawful.

Instead, the MDBA determined the ESLT/SDL based on a political compromise. In doing so, the ESLT was set at a level which, on the evidence, risks compromising the key environmental priorities prescribed in the Water Act. This points to a fundamental failure on the part of the MDBA to properly discharge its legislative functions.

That fundamental failure has wide-reaching and continuing consequences in the context of the ability of the Basin Plan to achieve the objects and purposes of the Water Act. The unlawfulness of the ESLT/SDL determination underpins and pervades the implementation of the Basin Plan. It is not a mere matter of history, of interest only to pedantic lawyers.

Legislative context

Chapter 3 sets out a detailed analysis of the legislative provisions governing the ESLT. For the purposes of this chapter, the following provisions are of particular significance:

- The purpose of the Basin Plan is to provide for, among other things, giving effect to relevant international agreements; the establishment (and enforcement of) environmentally sustainable limits on the quantities of water that may be taken from Basin water resources, and the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes.⁷
- In performing powers and functions under Div 1 of Part 2 of the Water Act, the MDBA and the Minister must act on the basis of the best available scientific knowledge and socio-economic analysis.⁸
- The Basin Plan must include, among other things, the maximum long-term annual average quantities of water that can be taken, on a sustainable basis, from:
 - (a) the Basin water resources as a whole; and
 - (b) the water resources, or particular parts of the water resources, of each water resource plan area.⁹
- The SDL must reflect an ESLT.¹⁰
- ‘ESLT’ for a water resource means the level at which water can be taken from that water resource which, if exceeded, would compromise:
 - (a) key environmental assets of the water resource; or
 - (b) key ecosystem functions of the water resource; or
 - (c) the productive base of the water resource; or
 - (d) key environmental outcomes for the water resource.¹¹

The procedure for making the Basin Plan is set out in secs 41–44 of the Water Act. In summary, it prescribes a procedure whereby the MDBA is responsible for preparing the proposed plan, consulting with Basin States and the general public, and preparing and publishing documentation reflecting the effect of the MDBA’s consideration of the consultation process. The MDBA must then prepare and provide the proposed Basin Plan to the Murray-Darling Basin Ministerial Council (**MinCo**), together with advice on socio-economic implications of any reductions in the SDL proposed, and consider and respond

to comments of the MinCo, including through, if appropriate, further consultation and publication. The MinCo must advise the Minister in writing of any view it wishes to express. The Minister must consider the Basin Plan and either adopt it, or return it to the MDBA with suggestions for consideration, which the MDBA must consider and, if desired, further consult and publish, reverting to the Minister with either an unaltered, or amended, Basin Plan, and a written explanation. The Minister must then consider and either adopt or direct the MDBA to make modifications, except in relation to matters of a factual or scientific nature. Any such direction must be complied with by the MDBA and the resulting Basin Plan adopted by the Minister.

The role of construction issues in the ESLT process

As evidenced by the detailed statutory analysis that appears in Chapter 3, consideration of the powers and functions of a statutory authority must start with, and be informed by, a proper understanding and interpretation of the relevant legislative provisions that underpin them.

The same is true for the fundamental task allotted to the MDBA of determining the ESLT. This task lies at the heart of the objects and purposes of the Water Act, and their implementation by way of the Basin Plan.

If the starting premise is wrong, the process that follows is necessarily infected with the same error. So it is, in the case of the MDBA's ESLT determination. The MDBA proceeded on an incorrect interpretation of the Water Act, which then infected the MDBA's methodology, process and ultimate determination. The starting point was fundamentally wrong. The intended end point cannot be reached until that has been corrected.

The 2010 controversy

In late October 2010, prompted by the publication of the Guide, a very public and well documented controversy emerged concerning the proper construction of the Water Act. It arose in the context of a public discourse concerning whether, in the drafting and implementation of the Basin Plan and more specifically, in determining the ESLT, the Water Act permitted a triple bottom line approach.

That was a strictly legal question, but with tangible consequences for interest groups and stakeholders across the Basin.

On 20 October 2010 the then Minister for Sustainability, Environment, Water, Population and Communities, Mr Tony Burke, advised the Parliament that he had sought advice from the Australian Government Solicitor (AGS) regarding whether the Water Act delivered on a triple bottom line approach, and that he intended to publicly release that advice.¹²

On 26 October 2010, Minister Burke made a speech to Parliament and tabled the AGS Opinion. He said:

Part of the problem in maintaining consensus on these issues has been uncertainty in the community and around the Parliament about whether the Water Act does in fact demand the plan adopt a triple bottom line approach of taking into account environmental, social and economic impacts of reform.

The MDBA has been reported as saying that the Act requires a focus on environmental issues first, with limited attention to social and economic factors.

For this reason I sought legal advice from the Australian Government Solicitor to determine whether the interpretations referred to publicly by the MDBA matched the requirements of the Act.

...

Much has been made of the international agreements which underpin the Water Act and it's been suggested that these agreements prevent socio-economic factors being taken into account. In fact, these agreements themselves recognise the need to consider these factors.

The Act specifically states that in giving effect to those agreements, the plan should promote the use and management of the basin water resources in a way that optimises economic, social and environmental outcomes.

It is clear from this advice that environmental, economic and social considerations are central to the Water Act and that the Basin Plan can appropriately take these into account.

I do not offer the advice as a criticism of the MDBA. What is important now is how the MDBA now responds to it.¹³

Whilst Minister Burke remarked that the purpose of tabling the AGS Opinion was to resolve the issue, in fact the controversy persisted. As noted in his speech, it became clear, and the Commissioner accepts as uncontroversial, that the MDBA had previously obtained legal advice, at least from the AGS, on precisely these matters of construction, but with a different effect. Based on media reports at the time and public statements by the then Chair of the MDBA, Mr Mike Taylor AO, it appears that that legal advice aligned with the approach to construction set out in Chapter 3; namely, that the Water Act required environmental priorities to be given precedence.

In a question without notice on 26 October 2010 to Minister Burke, the Member for Sturt, Mr Christopher Pyne, asked:

The chairman of the Murray-Darling Basin Authority has publicly said that he advised the minister for water prior to the release of the guide that the authority's interpretation of the Water Act put the environment ahead of social and economic factors. If so, why did the minister wait until after the release of the guide to seek his own legal advice?

Minister Burke replied:

When that issue was first raised with me by Mike Taylor in a meeting which I think was held here in Parliament House, I asked the department to consider whether that was also their view It was not their view and they spoke to the Murray-Darling Basin Authority, advancing their opinion. There was a difference in opinion between my department and the authority ...¹⁴

Consistent with the exercise of good governance and transparency, on 1 December 2010 Mr Robert Freeman, then Chairman of the MDBA, wrote to the Attorney-General's Department advising that the MDBA had received advice from the AGS on economic and social considerations under the Water Act and that it was considering whether or not to release it on public interest grounds. That letter sought advice regarding the possible release of the advice, pursuant to legal services directions and given the advice in question raised matters relating to constitutional and international law.¹⁵

On 3 December the Attorney-General's Department responded that the advice shouldn't be released, on grounds of legal professional privilege and the potential for implications for other schemes supported by external affairs and other powers.¹⁶ In a later, clarifying statement, the Commonwealth Government sought to distinguish the release of the AGS Opinion on the basis that it was prepared on that understanding. Regarding the implications of release, the later statement says:

constitutional and international law advice to the Government is tied to the Solicitor-General, the Attorney-General's Department, the AGS, and, in relation to some aspects of international law advice, the Department of Foreign Affairs and Trade. As constitutional and international law issues permeate considerations of the Act it would not be appropriate for an independent third party to undertake review of legal advice or recommend amendment to the Act.¹⁷

That decision to withhold from the public material that provided the foundation for the MDBA's decision-making and approach to that point, and that may have permitted a full and frank discussion regarding the proper construction of the Water Act, was symptomatic of the Commonwealth's culture of preferring secrecy over openness.

Minister Burke himself demonstrated transparency in October 2010 by committing to releasing the AGS Opinion, prior to knowing what would be in it:

Well I've asked for legal advice once. And before I knew what was in it I gave a guarantee that whatever it said I'd be making it public. I received that advice for the first time yesterday and within a few hours I was on my feet in the Parliament tabling it.

I figured the only way to make sure that there was true transparency here was for me to give the commitment that it didn't matter what the legal advice said, I'd be making sure it was made public and that's exactly what I've done.¹⁸

Plainly, genuine openness requires production of material both in support, and against, the contending positions. Transparency on the part of the Commonwealth might have been more readily accepted if all advices were released. The policy to withhold them was not in the public interest, and marked a turning point in the MDBA's approach to construction of the Water Act with respect to the triple bottom line approach. This was not good governance.

Mr Taylor soon after resigned from his position of Chair of the MDBA, on 7 December 2010. Mr Taylor declined to participate in the Commission's proceedings. Nonetheless, the character of his resignation as one made in circumstances where there was a stark difference between the Commonwealth's publicly adopted position, and legal advice previously provided to the MDBA, is clear on the public record. Upon his resignation he said:

The Guide was developed with full regard to the requirements of the Water Act, and in close consultation with the Australian Government Solicitor. However, the Authority has sought, and obtained, further confirmation that it cannot compromise the minimum level of water required to restore the system's environment on social or economic grounds.¹⁹

On 28 January 2011, the Minister appointed Mr Craig Knowles AM to the position of Chair of the MDBA.²⁰ At the time of his appointment, and in response to Mr Taylor's comments that environmental needs had to be prioritized ahead of social and economic outcomes, Mr Knowles reportedly stated:

No I just disagree with Mike Taylor, let's be frank about that.

I've delivered on a lot of environmental legislation over the years — in forestry, in natural resource management, native vegetation, water, and all of those international agreements, all of those environmental imperatives are found in every piece of legislation. The Water Act is no different.

I am very comfortable that the scope of the legislation, the objectives of the legislation talk about optimising the economic, social and environmental outcomes as plain as day.²¹

Senate Legal and Constitutional Affairs References Committee

Notwithstanding the new and apparently united position of the Commonwealth and MDBA on these matters of construction by early 2011, and given the controversy and apparent confusion that had ensued on these issues, on 9 February 2011 the Senate referred the provisions of the Water Act to the Senate Legal and Constitutional Affairs References Committee (LCARC) for inquiry.

The LCARC received submissions and evidence in relation to key matters of legal interpretation and canvassed a number of competing interpretations of the Water Act. As stated in Chapter 3, certainly some of those opinions accord more or less with the Commissioner's conclusions.

At the time the AGS Opinion was released, Professor George Williams reportedly stated that the AGS Opinion had been misconstrued by the Commonwealth:

University of NSW law professor George Williams said the [AGS Opinion]... actually confirms that the water plan has to "faithfully implement" the international environmental conventions upon which the 2007 Water Act is based.

"It says they have to give primacy to the environment and then they can give consideration to social and environmental effects," Professor Williams said.

"If the plan does anything else, if it is incompatible with the environmental conventions, then it will be unconstitutional, because it is the conventions that the Howard government relied upon to get constitutional power for the Water Act."²²

That view was subsequently reiterated by Professor Williams in his submission to the LCARC.²³

Contrary to the message conveyed publicly by Mr Taylor on the occasions set out above, the following exchange occurred in the course of questioning by the LCARC on 18 May 2011:

Senator Joyce: You have read the legal advice released by the minister; you are aware of the legal advice that has been given to you. Are they the same thing?

Mr Freeman: The legal advice is different, but the legal advice is entirely consistent, as I have said, and we have actually had the Australian Government Solicitor confirm that they are entirely consistent.²⁴

On 2 June 2011, in an answer to a question on notice, Mr Freeman stated:

The Australian Government Solicitor has provided eight advices to the Authority in relation to the role of social and economic factors in relation to the Basin Plan. The advice was provided on 4 December 2008, 15 May 2009, 2 November

*2009, 16 March 2010, 15 June 2010, 26 October 2010, 26 November 2010 and 30 November 2010.*²⁵

Having confirmed the controversy and likely divergence in advice documented above, and having received multiple submissions calling for its release²⁶, in its report of 10 June 2011 the LCARC recommended ‘that the Australian Government publicly release the legal advice on the [Water Act] provided by the Australian Government Solicitor to the Murray-Darling Basin Authority on 26 November 2010 and 30 November 2010, and any other relevant legal advice, as a matter of urgency’.²⁷ The Senate noted in its report that the MDBA itself was initially of the view that the release of the advice would assist public understanding of the provisions of the Water Act.²⁸

Those advices were never released in response to that recommendation. The Commonwealth appears to have tabled its response to the recommendation on 10 May 2012, attaching the correspondence of December 2010 between the MDBA and the Attorney-General’s Department, referred to above.²⁹

Commission’s evidence on construction & request for advices

The abovementioned controversy not only raised important questions regarding the construction of the Water Act with wide-reaching implications, including for the ESLT determination, it also raised questions concerning the conduct of the Commonwealth and the MDBA in relation to matters of national significance, including to South Australia. It was clearly in the public interest for those matters to be debated in the open.

For these reasons, this Commission called for public submissions on these matters of construction, and for production of relevant advices by the Commonwealth Department of Agriculture and Water Resources (**DAWR**) and the MDBA, both in letter form and subsequently through summonses.

Public submissions

Persons who provided legal submissions to the LCARC advised the Commission that they still held those views on matters of construction. Those persons included Professor George Williams and Mr Paul Kildea from the Gilbert and Tobin Centre of Public Law, representatives of the Australian Network of Environmental Defenders Offices and the New South Wales Law Society. Dr Anita Foerster of the Melbourne Law School and Professor Alex Gardner of the University of Western Australia Law School also went to the trouble of providing more detailed, written submissions on these matters.³⁰

In over 20 submissions provided specifically in relation to matters of construction, whilst a number supported the essence of the approach to construction set out in Chapter 3, there was also a number that supported a triple bottom line approach, specifically from persons with irrigation interests. Whilst the sincerity of those latter submissions is

not doubted, it is noted that arguments in support of a triple bottom line approach to construction largely did not provide any legal reasoning in support of that position.³¹

The South Australian Government advised that it maintained an interpretation of the Water Act at the time of drafting the Basin Plan that accords with that adopted by the Commissioner, including that ‘The Act cannot permit the elevation of economic and social considerations to the same level or above environmental considerations’. That interpretation informed, at least in part, its response to the draft Basin Plan in April 2012.³² Observations regarding how the South Australian Government subsequently reconciled that position appear below.

Response from the MDBA & Commonwealth

The High Court proceedings noted in the Overview sought to address, at least in part, the Commissioner’s summonses seeking production of prior advices. However, it was open to both entities to co-operate with the Commission, either before the commencement, or after the finalization, of those proceedings.

Subsequent to the Commission’s request, the Commonwealth Minister for Agriculture and Water Resources, Mr David Littleproud, apparently wrote to the South Australian Minister for Environment and Water, Mr David Speirs, by letter dated 2 July 2018. The letter expressly relates to matters in contention before this Commission and seeks to apprise Minister Speirs of the government’s position on matters raised in the Commission’s Issues Paper 2. The letter then encloses what purports to be a statement in support of the government’s position, including regarding setting the ESLT (**DAWR Statement**). The following extracts from the letter are particularly noteworthy:

The request by the Royal Commission for the Commonwealth’s legal advices, followed by the issuing of summonses, have been of great concern to the government.

...

The government considers the basis on which the Basin Plan was developed ... [is] fully consistent with the requirements of the Water Act.

...

Given the significant public interest in the Murray-Darling Basin Plan, it is the government’s intention to make this letter and statement publicly available.³³

The DAWR Statement is in the nature of a submission regarding matters under consideration by this Commission, but which was not provided to this Commission. That was no way for a Commonwealth Minister to engage with a Royal Commissioner.

In a rather unhelpful submission from the DAWR to the Commission dated 10 October 2018 (discussed further below) and enclosing the DAWR Statement, it stated:

5. *The department also wishes to take this opportunity to acknowledge that it is a long-standing Commonwealth practice not to waive privilege over legal advice provided to the Commonwealth or Commonwealth agencies. While there may be occasions where legal advice is made publicly available, the Commonwealth's standard position is to preserve confidentiality over advice it has obtained.*

6. *The department is however committed to engaging in public debate and open dialogue on important national issues, including in relation to water resources, and otherwise to ensuring transparency, including in relation to decision-making.*³⁴

Discussion

The MDBA's position on the interpretation of the Water Act had clearly shifted by the release of the AGS Opinion and around the time of Mr Knowles' appointment to the Board. Specifically, the best inference is that the MDBA was originally advised, and understood, the need to prioritize environmental considerations in the setting of the ESLT, as evidenced by the approach adopted in the Guide and the commentary from the MDBA during the public controversy over this issue in 2010.

As a result of the fallout from the Guide in 2010 and 2011, the MDBA, and perhaps those advising it, came under pressure to reduce the proposed recovery amount, which could be achieved if they were to adopt a triple bottom line approach to the construction of the Water Act.

The DAWR Statement came indirectly to the Commission, in such a way as to prevent engagement, confrontation and challenge in respect of the legal and factual positions that it put forward. Thus untested, it holds little weight in resolving matters of controversy.

Public statements such as those that appear in the DAWR submission regarding its commitment 'to engaging in public debate and open dialogue' are to be regarded with deep suspicion.

Given the documented history of public controversy set out above, and the obvious legal complexity associated with the Water Act and Basin Plan, it seems somewhat surprising that the only advice ever 'provided to the Department' concerning these matters is the AGS Opinion. In that regard, and in his statement to the Commission, Mr David Bell noted that whilst the MDBA received a great deal of legal advice during the relevant period, in general terms, formal requests for advice went through the Department responsible for the relevant legislation. He was unsure whether the responding advice was also provided to the Department, but expected it was.³⁵ It is, to put it mildly, unfortunate that secrecy continues to be maintained over such legal advice, given the public interest in an informed debate, and the lack of any litigation currently or in the offing.

Process to ESLT: Chronology of key events

The content of the Guide, its various reviews and the public reaction to its release are a significant part of the history of the process to ESLT, as discussed in Chapter 4.

Thereafter, there were a number of well-documented events that culminated in the Basin Plan being adopted by the Minister and receiving bi-partisan support in the Parliament in November 2012.

The following summarizes various key steps, which are in addition to the controversy surrounding matters of construction of the Water Act, discussed above. This summary does not, in any way, purport to reflect a comprehensive chronology of those events.

The Basin Testing Committee

Following his appointment, Mr Knowles undertook an extensive community consultation process and established the Basin Testing Committee (**BTC**), an advisory group designed to assist him with re-establishing trust between the broader community and the MDBA.³⁶ There was a generally held view that the MDBA had failed to undertake effective public consultation in releasing the Guide which resulted in strong public distrust in the MDBA.³⁷ The BTC comprised around 12 representatives, including the New South Wales Farmers' Association, the Wentworth Group of Concerned Scientists (**Wentworth Group**), Total Environment Centre in New South Wales, Ms Karlene Maywald and irrigators.

Ms Karlene Maywald, former South Australian Minister for the River Murray and former Chair of the National Water Commission, gave evidence that the purpose of the BTC was to test, in an informal environment with a broad range of people who were experienced in the water sector, feedback that Mr Knowles was receiving from the community, and a range of issues and responses that the MDBA was developing. She felt it was a really effective process.³⁸ Ms Maywald confirmed that there was strong opposition from communities to the Guide, particularly in the upstream States of New South Wales and Victoria. Her evidence was that the negative response was driven by individuals reacting and protesting out of fear for themselves and their families to what they perceived to be a threat to their legal rights to water allocation, which they had been lawfully using for many years, on account of a major, national policy change, and in the context of the worst drought the Basin had seen. Whilst everyone agreed that too much water had been allocated, nobody wanted to have to give up their part of that water. It was a classic case of 'everyone thought someone else should fix it'.³⁹ Given this reform was the biggest known water policy reform that had been embarked upon in Australia and anywhere in the world, Ms Maywald stated there was insufficient attention paid to the concurrent regional and community restructure that would be required to support it, which necessarily resulted in difficulties in implementing the reform. To that end, Mr Knowles had a difficult task.⁴⁰

Mr Peter Cosier of the Wentworth Group was also invited by Mr Knowles to be one of the founding members of the BTC. Mr Cosier referred to the MDBA commissioning a report from KPMG in relation to the economic impacts of recovering 4000 GL of environmental water, which he felt contained a ‘quick and dirty’ analysis to the effect regional communities would never accept a recovery of that amount.⁴¹ Shortly after, in April 2011, Mr Cosier became aware of media coverage suggesting that Commonwealth officials were meeting with Victorian Government officials regarding their preparedness to accept a SDL of 2200 or 2400 GL. Based on assurances sought by Mr Cosier from Mr Knowles that the Basin Plan would be based on the best available science, Mr Cosier considered that if the media content was accurate, it reflected a ‘monumental breach of trust’.⁴² The Wentworth Group, through Mr Cosier, put forward a proposal to Mr Knowles for the establishment of an independent science accreditation panel, in order to ensure the Basin Plan did reflect the best available science.⁴³ Soon after, Mr Cosier was advised that the MDBA would not proceed with those suggestions. Mr Cosier told the Commissioner in evidence that he ultimately resigned from the BTC by letter dated 4 May 2011, in circumstances where he and the Wentworth Group became concerned that the BTC process, and the Basin Plan, would not be based on the best available science.⁴⁴

Those concerns were well-founded.

Remaining steps to determine the ESLT

On 28 November 2011, and consistent with the subsequently published ESLT Report⁴⁵, the MDBA released its proposed Basin Plan and plain English summary proposing a SDL of 10 873 GL, reflecting a recovery amount of 2750 GL.

The MDBA published the ESLT Report, on 30 November 2011, setting out its methodology and recommendation regarding the ESLT, namely that it be set at 10 873 GL, in support of the proposed Basin Plan. Also in November, the panel of experts engaged by CSIRO to review the MDBA’s ESLT estimation released their report titled ‘Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray-Darling Basin’ (**CSIRO Review**).⁴⁶ Those reports are discussed further below, insofar as they set out and clarify the MDBA’s methodology for determining the ESLT, and give rise to a discussion concerning the merits of that determination.

The legislatively prescribed, 20-week public consultation period then followed.

In February 2012, and in further support of the proposed Basin Plan, the MDBA released its report titled ‘Hydrologic Modelling to Inform the Proposed Basin Plan: Methods and Results’ (**Hydrologic Modelling Report**).⁴⁷

Under cover of a letter dated 28 May 2012, Mr Knowles provided a revised draft Basin Plan to the MinCo, together with the associated consultation report and advice on socio-economic implications of the proposed Basin Plan.⁴⁸

On 9 July 2012, members of the MinCo provided a collective response to the MDBA on matters agreed between the States, including regarding the SDL adjustment mechanism, the need to determine a downstream apportionment and develop a Constraints Management Strategy.⁴⁹ Responses of individual State governments were also provided.

By way of response the MDBA engaged in a further period of consultation and subsequently prepared a consultation report and altered Basin Plan, provided by Mr Knowles back to the MinCo by letter dated 6 August 2012.

On 28 August 2012, Minister Burke issued a media release noting the Commonwealth Government would continue to work closely with the Basin States to finalize the Basin Plan, and further noted that the Basin States ‘... last night reached further consensus on the details of the Murray-Darling Basin Plan, but there is still work to be done’. It was acknowledged in the media release that whilst the Minister was effectively able to unilaterally finalize the draft Basin Plan at that point in time, he preferred to seek to resolve final matters through consensus.⁵⁰ By letter dated 13 September 2012 to Mr Knowles, Minister Burke provided initial suggestions on the altered proposed Basin Plan for consideration.

In October 2012, the MDBA published its report titled ‘Hydrologic Modelling of the Relaxation of Operational Constraints in the Southern Connected System: Methods and Results’ (**Relaxed Constraints Report**).⁵¹

By letter dated 1 November 2012, Minister Burke wrote to Mr Knowles again, providing further suggestions on the altered proposed Basin Plan for consideration. The Minister noted that ‘I am not returning the Plan to you at this time, to allow for the possibility that I may wish to make further suggestions’.⁵² In a further letter on 20 November 2012, Minister Burke wrote to Mr Knowles, returning the altered proposed Basin Plan and reiterating his earlier suggestions for consideration.⁵³ Mr Knowles promptly responded by letter of 21 November 2012 recommending adoption of the enclosed, new version of the Basin Plan. A number of attachments were also enclosed, including a Regulation Impact Statement re Costs and Benefits of the Basin Plan and Attachment G: A synthesis of the analysis associated with the MDBA’s determination of the ESLT.⁵⁴

On 22 November 2012 Minister Burke adopted the Basin Plan, and it received bi-partisan support in the Parliament on 29 November 2012. At the time it was passed, the Basin Plan included provision in the note to sec 6.04(2) that the Authority estimated the SDL to be 10 873 GL per year, reflecting a consumptive use reduction (or recovery) amount of 2750 GL per year.

Methodology for determining the ESLT

There are four key reports, prepared or commissioned by the MDBA, which specifically inform the process that the MDBA adopted to determine the ESLT for the Basin Plan. Those reports include the following, which are discussed further below:

- ESLT Report
- CSIRO Review
- Hydrologic Modelling Report, and
- Relaxed Constraints Report.

ESLT Report

The ESLT Report sets out the methodology devised and used to determine the ESLT. In particular, it sets out:

- the MDBA's interpretation of the requirements of the Water Act relevant to the task of setting the ESLT
- based on that interpretation, the MDBA's seven step method to determine the ESLT (**methodology**), and
- the MDBA's determination of the ESLT based on its application of the method, modelling results and its consideration of 'other matters', including socio-economic impacts and climate change.

The ESLT Report indicates various points throughout the methodology where it incorporated socio-economic considerations into its decisions — certain judgements about available scientific evidence, various practical and policy assumptions and limitations influencing the method and the modelling, and its approach to climate change.

As discussed in Chapter 4, the Guide considered social and economic considerations in its determination of the ESLT. It did this by, after determining that the best available science indicated a recovery amount of 3000 to 7600 GL, resolving to model the range of 3000 to 4000 GL only, on account of the social and economic impacts associated with reductions in water to be used for consumptive use.⁵⁵

The MDBA's triple bottom line approach to determining the ESLT is confirmed in this report. In the context of modelling three recovery scenarios, being 2400 GL, 2800 GL and 3200 GL,⁵⁶ the MDBA stated:

The task for determining an ESLT is therefore to determine the level of take that aligns with [the overall management objective of achieving a healthy, working Murray-Darling Basin, including a healthy environment, strong communities and a productive economy] and is consistent with the legal definition of the ESLT provided

*in the Water Act. To do this MDBA has approached implementing the concept of compromise in the definition of the ESLT ... having regard to the objects of the Water Act, the purpose of the Basin Plan, the objective of a healthy working Basin and the wise use concept, and the need to optimise economic, social and environmental outcomes — in this sense taking into account a triple bottom line approach.*⁵⁷

The methodology included the following:

- determine Basin-wide objectives
- identify key ecological values and ecosystem services across the Basin
- determine environmental watering requirements (set local objectives and targets to determine site specific flow indicators)
- select ESLT options for assessment against water requirements (referred to as ‘range finding’ — based on all lines of evidence, including socio-economic issues)
- hydrological modelling of the ESLT options (using the available water to achieve the environmental watering requirements)
- assess environmental outcomes (compare flow outputs produced by the modelling with environmental watering requirements, iterating, if required, to meet environmental and socio-economic objectives), and
- select the ESLT/SDLs.⁵⁸

Notably, the MDBA stated that, while initially its modelling approach was to estimate the reduction in diversions (or the recovery amount) needed to achieve specified environmental watering outcomes, it later moved to an approach by which it would estimate the environmental flow outcomes that could be achieved from a specified reduction in diversions (or recovery amount). The MDBA states, in defence of the latter approach, that it ‘allowed the simulation of use against an environmental water account; that is, entitlements acquired by the Commonwealth’ and that ‘[i]t is also simpler to represent in the models and provides greatest confidence in output’.⁵⁹

The results of modelling using the first approach were used as a ‘range finding exercise’; that is, to indicate the likely scale of reductions needed to achieve the environmental objectives. These ‘ranges’ were then used to apply the second approach; namely, to test the environmental outcomes that could be achieved with volumes in the selected ranges.

The ESLT Report claims to have applied a ‘more robust’ approach to modelling than under the Guide, through its indicator site method. It says the proposed reduction of 3000–4000 GL per year was based on a ‘relatively simple ‘end of system’ flow analysis’, and that while development and implementation of the indicator site method began in 2009, ‘the work could not be completed in the required timeframe for the Guide’. It states

that since then the indicator site method has been subject to a number of peer-reviews, including the CSIRO review which began in June 2011.⁶⁰

The indicator site method was used to test the nominated ESLT options, being recovery amounts of 2400, 2800 and 3200 GL per year. The report contains the MDBA's conclusions in terms of environmental outcomes in each case. The three options were used for most parts of the system, except the northern rivers. Ultimately, the ESLT Report found that while 2400 GL was insufficient to meet a number of key environmental objectives, 3200 GL delivered few additional benefits relative to the 2800 GL option:

Modelling of the 3200 GL/y reduction in diversions option shows incremental improvements in some indicators compared to the other options. The ability to maintain the resilience of mid to higher elevation parts of the lower River Murray floodplain during dry periods is not expected to vary significantly between any of the three ESLT options due to operational and physical constraints limiting the potential to increase inundation of these parts of the landscape. However, with the objectives anticipated to be achieved with a 2800 GL/y reduction in diversions, and greater socioeconomic impacts associated with a further 400 GL/y reduction to secure the marginal increase in environmental outcomes. MDBA considers this option would not optimize economic, social and environmental outcomes.⁶¹

The MDBA ultimately concludes:

MDBA has undertaken a detailed assessment of the environmental flow outcomes that could be achieved with this ESLT. This shows a broad array of benefits across the Basin for a range of flows...⁶²

And

MDBA's judgment is that an ESLT of 10,873 GL/y optimises environmental, economic and social outcomes to achieve a healthy working Basin ... This represents a Basin wide reduction in take of 2,750 GL/y compared to a June 2009 baseline.⁶³

Discussion

One could be forgiven for thinking that conclusion was somewhat underwhelming. What follows confirms that it was.

The MDBA notes in its report that the Water Act does not prescribe how the ESLT should be determined and as such, prescribing specific environmental targets or outcomes is a key decision for the MDBA in the ESLT process.⁶⁴

The MDBA does not make any more detailed reference to the specific objects and requirements of the Water Act, and in particular it makes no reference to the basis for developing the Basin Plan, set out in sec 21. The methodology and associated modelling approach for determining the ESLT does not account for the legislated priority in relation

to the matters in sec 21. The MDBA makes a general statement that the requirements of the Water Act mean that in setting the ESLT, the MDBA must take into account both ecological values and ecosystem services, and the socio-economic benefits of water resources and the impact of any reduction in take.⁶⁵ The MDBA has expressly incorporated a consideration of the socio-economic impacts of returning water to the environment into its methodology and the use of its modelling, contrary to the proper construction of the Water Act. As stated in Chapter 3, the Water Act requires the optimisation of environmental, social and economic outcomes, but only after setting the ESLT and SDL.

In the context of embracing the triple bottom line approach, the ESLT Report appears to record an interpretation of the term ‘compromise’, referred to in the definition of ESLT in subsec 4(1) of the Water Act, as referring to a compromise between environmental, social and economic objectives, rather than not compromising environmental criteria, as identified in Chapter 3.⁶⁶ If that is the meaning attributed to that word by the MDBA, it is plainly wrong. The word ‘compromise’ in that other give-and-take sense describes the Water Act itself, not the process of ascertaining an ESLT under it — where the word ‘compromise’ conveys the notion of threat or danger.

It is noted that the explanation for the jump from the modelled scenario of 2800 GL, to a recommended ESLT/SDL that gave rise to a recovery amount of 2750 GL, does not appear in the ESLT Report. A purported explanation does, however, appear in the Hydrologic Modelling Report, discussed below.

The MDBA’s stated objectives in establishing the methodology included the following:

The approach should provide an estimate of the long-term average reduction in diversions required to achieve specified environmental objectives and targets, related to an ESLT;

The approach should be scientifically robust, transparent and able to be understood by a wide audience ...⁶⁷

This report was, typically, less than helpful in clarifying the MDBA’s methodology. Certainly, modelling and expert scientists have not been able to recreate the level of detail and understanding necessary in order to test its conclusions. To that end, it has failed utterly to reach its stated objectives.

CSIRO Review

In June 2011 the MDBA invited the CSIRO to lead a review regarding the ESLT determination. The CSIRO Review was published in November 2011.⁶⁸

In terms of its scope, the CSIRO Review states that it was invited to review ‘parts of the information base and analyses used by the MDBA to determine an [ESLT]’, and that

it reviewed ‘recent refinements to the methods and their combined application in guiding the preparation of the proposed Basin Plan’.⁶⁹

Key points made in the CSIRO Review were:

- there was a sufficient body of science to make an informed decision about an ESLT for the Basin
- the best available hydrological models for the Basin were used by MDBA, and
- the concept of the indicator site method was sound.⁷⁰

However, in discussing the methodology, the following includes some of the comments made by the Review Panel:

- The determination of the ESLT and SDLs involves consideration of social and economic objectives as well as environmental objectives, but that the balancing of these ‘requires policy judgements made in the context of the requirements of the Water Act and reflecting multiple trade-off decisions. Consideration of the social and economic dimensions of ESLT determination is outside the terms of reference of the review’.⁷¹
- The MDBA made ‘limited use of expert scientific opinion’ in developing the Basin Plan, despite such opinion being important in the absence of formal scientific knowledge to guide environmental water planning.⁷²
- While the use made of individual items of scientific information was defensible, the use made of the collected body of information was ‘not fully consistent because of the absence of a clear over-arching conceptual ecological model’.⁷³
- The work lacked a biophysical classification able to demonstrate that the indicator key ecosystem assets and key ecosystem functions adequately represent the full range of those assets and functions across the Basin.⁷⁴
- The method for determining the key ecosystem functions was not fully defensible because the classification was scientifically weak.⁷⁵
- The MDBA had modelled the likely impacts of climate change to 2030 on water availability, but this information was not used to determine the ESLT/SDLs. The Review Panel understood this to be the result of a policy decision that climate change risks should be shared by all users under current water sharing plans — but the Panel points out that water for the environment is inherently much less secure because most is not held under legal entitlements.⁷⁶
- The indicator site method used to assess environmental water requirements is an ‘appropriately pragmatic approach’ but it was not demonstrated that the ‘indicator’ key environmental assets selected for that assessment method were sufficiently representative of the Basin’s water-dependent ecosystems.⁷⁷

- Expressing reservations about the 2800 GL figure: ‘Given the current evidence base the level of take represented by the 2800 GL/yr reduction scenario is not consistent with the hydrologic and ecological targets provided in the review’.⁷⁸
- ‘The SDLs modelled in [the 2800 GL/yr] scenario do not achieve the majority of the hydrologic targets; they meet 55% of the “achievable” targets at either the “high risk” or “low risk” frequency. The 2800 GL/yr reduction scenario is thus not consistent with the currently stated environmental targets’.⁷⁹
- ‘In summary, the modelling indicates that the proposed SDLs would be highly unlikely to meet the specified ecological targets even in the absence of future climate change. Operational constraints are a key reason for this, but a large number of achievable targets are also not met in the modelling.’⁸⁰

Discussion

In evidence before the Commissioner, Professor Justin Brookes, one of the Review Panel members who contributed to the CSIRO Review, clarified that the report noted that, if all of the ecological targets were to be met, a SDL based on a 2800 GL recovery target would not, on the science presented to the Panel, reflect an ESLT.⁸¹ Further, in making various recommendations for future work, the Review Panel was seeking:

- sufficient documentation to provide clarity on the MDBA method, identifying a clearer line of evidence between the hydrological indicators and the ecological outcomes⁸²
- a more thorough report, setting out final modelling methods and key assumptions,⁸³ and
- a model to determine environmental benefits at the Basin-scale, rather than purely at specific sites.⁸⁴

In a speech in April 2012, Mr Knowles said of this report:

Our current methodology has been peer reviewed by a panel led by CSIRO and they determined this was sufficient as a basis to make a start.

As Professor Bill Young of CSIRO said

“There is sufficient science available to make an informed decision on an environmentally sustainable level of take in the Basin. In other words, the science and evidence base is clear — the improvements in environmental flow regimes achievable under the proposed SDLs would deliver significant environmental benefits. It also found that the substantial body of work undertaken by the MDBA represents a sufficient basis to begin an adaptive process of managing the level of take in the future and that the methods of modelling and analysis used by the MDBA were generally robust and defensible.”

...

As Professor Bill Young also said:

“Of course, in a system as large and as complex as the Basin, some gaps remain in the scientific knowledge base. It is important for all stakeholders engaged in shaping the future of the basin to acknowledge that an absence of perfect scientific knowledge does not provide a reasonable basis for not embarking on the journey that is needed to secure the long term future of one of Australia’s most economically, socially and ecologically important assets.”⁸⁵

In light of the history noted above, that reference to the CSIRO Review was so incomplete as to be misleading.

Hydrologic Modelling Report

In February 2012, the MDBA released its Hydrologic Modelling Report.⁸⁶ Along with the ESLT Report, this document was used to support the proposed Basin Plan and in particular, the ESLT/SDL determination. It purports to describe the hydrological models used, the methods adopted and the hydrological and environmental outcomes resulting from the proposed SDL. To that end, its publication was anticipated in the ESLT Report.⁸⁷

Ultimately, the report provides details of the flow indicator achievement at each of the region indicator sites, and under the three water recovery scenarios — 2400, 2800 and 3200 GL. Whilst it reaches the same conclusions as the ESLT Report, it does so with some more specificity.

That specificity results in the MDBA concluding that the 2800 GL scenario resulted in some flow indicators not being met. It states:

The modelling carried out shows that a 2800 GL reduction in consumptive use achieved significant targeted environmental outcomes, within the uncertainty levels of current hydrological and ecological science and within the limitation of current modelling tools available. Some flow indicators, especially those requiring large, infrequent flows to inundate higher parts of the floodplain were not met under any of the scenarios modelled. In regulated systems, this is primarily due to ... constraints.⁸⁸

To that end, it appears to say that near enough is good enough, which clearly fails to achieve the essence of an ESLT, namely that the SDL (and thereby the recovery amount) does not compromise the environmental values protected by the Water Act.

An explanation for the reduction in the recovery amount from 2800 GL to 2750 GL in the ESLT Report is given in terms that, based on feedback from Queensland, further modelling in the Condamine-Balonne revealed that:

*The results for 100 GL/y to 150 GL/y reduction scenarios did not differ significantly in environmental outcomes. Hence, a further 50 GL/y increase in the Condamine-Balonne SDL was agreed, reducing the Basin-wide proposed water recovery to 2750 GL/y.*⁸⁹

On closer enquiry, the MDBA Board Minutes from 5 and 6 July 2011 refer to a report from the Queensland Government to this end, stating that ‘a reduction in diversions of considerably less than 203 GL/yr could provide significant ecological benefits, and the additional ecological benefits between a reduction of 130 GL/yr and 203 GL/yr are not substantial’.⁹⁰ The members agreed to ‘revise the proposed reduction to 150 GL/yr ... with a hold point at around 2015 at a 100 GL reduction when this decision was to be reviewed’.⁹¹ At a further Board meeting on 26 October 2011, and following a powerpoint presentation by Mr Tony McLeod of the MDBA, ‘members provisionally agreed that the SDL for the Condamine-Balonne Catchment should be 100 GL, contingent on agreement with Queensland on a joint program on the Northern Basin’.⁹²

That change to the Condamine-Balonne SDL/recovery amount was later described by the MDBA as follows:

*An SDL of 150GL was initially set for the Condamine-Balonne catchment, however, new scientific assessment and analysis commissioned by the Queensland Government, and subsequent remodelling by the MDBA (see [Hydrologic Modelling Report]) indicated that an SDL of 100 GL/y would water the catchment’s key environmental assets, such as the Narran Lakes.*⁹³

Contrary to the assertion that the reduction in the recovery amount was based on scientific assessment, analysis and remodelling, Mr Bell asserted that the reduction of the recovery amount from 2800 GL to 2750 GL resulted from a deal done by Mr Knowles to appease Queensland. In a statement to the Commission, Mr Bell said:

*There was no suggestion this deal was based on the best available science, or that we would get the same environmental outcomes with 50GL less in the Condamine. It was 2,800GL minus 50GL because Craig KNOWLES needed to do a deal with Queensland.*⁹⁴

The Commissioner notes that the evidence of Mr Bell in this regard, and generally, has gone unchallenged by the MDBA, notwithstanding every opportunity to do so. Mr Knowles declined to give evidence.

Constraints relaxation

Chapter 8 discusses the evolution of the concept of constraints relaxation during the drafting of the Basin Plan, and into implementation. Consideration of the impact of constraints featured specifically in the context of the MDBA’s approach to determining the ESLT. As indicated above, the ESLT Report referred to the impact of constraints as a

factor contributing to its proposal to set an ESLT that represented a recovery amount of 2750 GL.

South Australian Government contribution to constraints relaxation

During the development of the Basin Plan, in effect by way of challenge to the methodology, science and ultimate recommendation in the ESLT Report, the South Australian Government took steps to advocate for a higher recovery amount.

In March 2012, the South Australian Department of Environment and Natural Resources released three reports analysing the MDBA's approach to modelling the recovery scenarios and concerning the ecological and hydrological consequences for the Coorong, Lower Lakes and Murray Mouth (CLLMM) of the proposed recovery amount of 2750 GL.⁹⁵ In the report titled 'An Analysis of MDBA Modelling Outputs for the Draft Basin Plan: Hydrodynamic Modelling of the Coorong and Murray Mouth', Mr Jason Higham expressed the opinion that, under the 2750 GL scenario:

there are multiple years within the 114 years modelled in which average salinities in the Coorong South Lagoon exceed known thresholds for important plants and animals ... Only the provision of larger volumes (up to 3200 GL) reduces the number and duration of consecutive years when salinity thresholds are exceeded ... under the 2750 GL scenario ... the Coorong would remain at considerable risk of ecological degradation during dry periods.⁹⁶

The South Australian Government analysis was reviewed by the Goyder Institute in a report released in April 2012, which found that the ecological character of South Australian environmental assets was unlikely to be maintained under the 2750 GL scenario, and recommended consideration of a wider range of environmental water scenarios with relaxation of constraints.⁹⁷

The South Australian Government provided the MDBA with its response to the proposed Basin Plan on 16 April 2012. That response stated that, based on its own, peer-reviewed scientific analysis, 'the MDBA's proposed 2750 GL water recovery scenario is not sufficient to protect and restore key environmental assets and functions and does not meet the requirements of the Water Act'.⁹⁸ As a consequence, it made 71 recommendations, including that the MDBA prioritize further modelling of additional water recovery scenarios, including 3200, 3500 and 4000 GL, with constraints relaxed and removed.⁹⁹

Notably, the CSIRO also provided a submission in April 2012 regarding the proposed Basin Plan. The CSIRO observed that, whilst the MDBA placed significant emphasis on constraints preventing delivery of higher flows to secure greater environmental outcomes, some of the shortfalls in meeting the watering requirements related to providing sufficient water during extended dry periods, including to the CLLMM, such that constraints could

be relaxed or removed to achieve better outcomes with a 2750 GL, or higher recovery amount. In that context the CSIRO recommended a rigorous analysis of constraints.¹⁰⁰

At the time of the collective response by members of the MinCo to the MDBA in early July 2012, the South Australian Government maintained its concerns, including that the MDBA had failed to act on the best available science, 2750 GL was insufficient to achieve environmental outcomes for the CLLMM and the SDL did not reflect an ESLT.¹⁰¹

Relaxed Constraints Report

South Australia's work in relation to its analysis of the proposed 2750 GL recovery amount ultimately culminated in the MDBA's release of its Relaxed Constraints Report in October 2012.¹⁰² That report modelled the relaxation of constraints for 2800 and 3200 GL scenarios, in order to make the best use of environmental water, and found that the 3200 GL scenario with relaxed constraints delivered greater environmental benefits to the floodplains. Specifically, the report concluded that, for key environmental targets for the Murray River, 11 out of 18 flow indicators were achieved for both the BP-2800 and RC-2800 scenarios, as compared with 13 out of 18 for the BP-3200 scenario and 17 out of 18 for the RC-3200 scenario.¹⁰³

The South Australian Government did an analysis of that report and concluded that, irrespective of constraints relaxation, the 3200 GL scenario provided greater potential to protect and restore the CLLMM.¹⁰⁴

Merits of the ESLT determination

The following analysis identifies that there are flaws throughout the ESLT process adopted by the MDBA — in the methodology, the science relied upon and the determination made. These flaws were really inevitable, given they stemmed from an erroneous interpretation of the Water Act.

The assertion that the MDBA's ESLT process was flawed is not new. Quite to the contrary. It is well-documented that concerns persisted throughout the drafting of the Basin Plan regarding the basis for the determination of the ESLT and SDL, and the justification for the recovery amount of 2750 GL, both of which remained unchanged from the time of the ESLT Report right through until the Basin Plan was made. The discussion below regarding the 2013 Senate Report, and the persistent concerns of the Wentworth Group, are evidence of this.

However, notwithstanding the long history of concerns raised about the merits of the ESLT process, they are reiterated again here, in order to highlight not only the fact that they persist, but the gravity of the concerns raised and the consequences of failing to address them. In short, the objects and purposes of the Water Act will not be achieved,

without the ramifications of a SDL that does not reflect an ESLT being addressed and rectified.

Specifically, the survey of the evidence that follows highlights the decision of the MDBA and Commonwealth to gloss over and not engage with these matters. By contrast, the approach of the witnesses who did engage with this Commission spoke in some cases at length, and with consistency, regarding:

- the MDBA's method being unscientific, including lacking rigour, review and sufficient transparency to permit replication
- the ultimate SDL, and recovery amount determination, not being based on the best available science and not reflecting an ESLT, and
- the recovery amount, instead, reflecting a political compromise.

At the heart of the concerns with the MDBA's methodology is its application of a triple bottom line approach. As discussed in Chapter 3 and above, that approach is flawed from a legal and logical perspective. From a practical perspective, the use of a triple bottom line approach arises from the fallacious assumption that all three outcomes — environmental, social and economic — can actually be optimised simultaneously. That results in the bizarre trade-off of one environmental priority over another. The then Federal Member for Wentworth, Mr Malcolm Turnbull, expressed it thus, whilst supportive of the triple bottom line approach, when commenting on the controversy surrounding the interpretation of the Water Act in 2010:

all this talk about the Act is really just a smoke screen obscuring the real issue which is (a) how many environmental assets are significant, how many of them do you want to preserve, and (b) how much water will need to be acquired to do that? You are weighing up red gum forests versus fields of grass for dairy cows to eat versus rice, wheat and vines. All of those questions are contentious and that is where the debate should be focussed not on the arid, uninformed debate about the interpretation of the Act.¹⁰⁵

In fact, with respect, the practical outcome is more perverse. It amounts to questions not only about trade-offs between Red Gum forests and rice, but between Red Gum forests and fish, for example — that is, between environmental priorities.

2013 Senate Report

On 28 October 2010, the Senate referred an inquiry to the Rural and Regional Affairs and Transport References Committee concerning the management of the Murray-Darling Basin. Its Terms of Reference required the Committee to investigate the development and implementation of the Basin Plan. The Committee delivered its final report on 13 March 2013 (**2013 Senate Report**), after the Basin Plan was legislated.¹⁰⁶

The 2013 Senate Report identifies the rationale for the 2750 GL, as advised by the MDBA at that time. The MDBA reportedly told the Senate Inquiry that it considered the 2750 GL figure was:

*sufficient to achieve most of the key ecological targets and objectives set by the Authority, while also ensuring that social and economic impacts on the Basin community are manageable.*¹⁰⁷

During the period of that inquiry, and as discussed in Chapter 4, in March 2012 the MDBA discounted examination of the higher recovery amount of 4000 GL as follows:

*The modelling of the 3200 GL/yr scenario indicated that returning this volume of water to the environment achieved only minor additional environmental improvements, compared to the 2,800 GL/y scenario, due largely to the constraints in the system that can limit the delivery of environmental water. For this reason, the Authority believes a 4,000 GL/y scenario is unlikely to achieve any significant environmental improvements but would have unacceptable social and economic impacts.*¹⁰⁸

The 2013 Senate Report (and its interim reports) canvass concerns expressed by parties who provided submissions and gave evidence to that Committee regarding these matters. A detailed review of those concerns is not necessary here. It is of interest, however, to note that they were focussed around the MDBA's modelling process, its failure to model higher scenarios and take account of climate change, and concerns regarding a lack of scientific justification for the 2750 GL recovery amount.¹⁰⁹ These are all concerns which were re-agitated in evidence to the Commissioner.

The 2013 Senate Report ultimately recommended that the MDBA 'develop a concise and non-technical explanation of the hydrological modelling and assumptions used to develop the 2750 GL/y return of surface water to the environment, to be made publicly available'.¹¹⁰

Whilst, somewhat curiously, the government response to that recommendation does not appear to have been tabled until March 2018, some five years later, the delay may be explicable on the basis that the Committee released an interim report on 3 October 2012, with a similar recommendation, to which the government tabled a response dated January 2013. In the 2013 response, the government agreed and pointed to various fact sheets and other publications, purporting to be responsive to the recommendation.¹¹¹ Likewise, in 2018, the response pointed to various publicly available documents.¹¹²

Evidence to the Commission

The written and oral evidence of expert witnesses before the Commission was, without exception, critical of the methodology, ESLT process and ultimate ESLT and SDL determinations made by the MDBA.

Unscientific methodology

The expert witnesses who presented to the Commission spoke uniformly about the nature of science — the need for rigour, transparency, testing and replication.¹¹³

The MDBA's lack of transparency, key to the application of genuine science, was a common thread throughout the evidence. Professor John Williams gave the following evidence:

as a scientist, I find it just so disappointing, when we are a very able community scientifically as Australians, that we are investing all this money and we do not have the scientific analysis open and before us and available for scrutiny.¹¹⁴

Mr Cosier of the Wentworth Group said: 'the lack of transparency in process, is not only with regard to the SDL adjustment process, it goes right back to the draft Basin Plan'.¹¹⁵

Criticisms regarding the MDBA's lack of transparency arose specifically in the context of the MDBA's consideration of socio-economic considerations in its methodology, and in respect of its assertions surrounding the more 'robust' nature of the modelling underpinning the ESLT Report.

In terms of the methodology — the order in which steps were taken to determine the ESLT, Chapter 4 discusses that the Guide had it largely right; that is, the needs of the environment were determined first, in order to reach a SDL. As evidenced in the discussion of the MDBA reports above, this process was inverted following the Guide. As a consequence, the science was being asked to justify a certain result, rather than the science producing the result. Dr Theresa Heneker from the South Australian Department for Environment and Water told the Commissioner that she considered it 'probably not unfair' to characterize the method adopted by the MDBA in this case as failing to reflect the best available science.¹¹⁶

Clarification was sought during the evidence regarding the supposed manner in which socio-economic considerations were factored into, or quantified in terms of volume, in the recovery amount of 2750 GL. No witness was able to provide an explanation in that regard.¹¹⁷ The MDBA failed to engage in any way with the Commission on this topic.

Eminent scientists gave consistent evidence that the actual application of the triple bottom line approach to the determination of the ESLT was unscientific, insofar as it was opaque and unable to be replicated. Professor Williams told the Commissioner that the MDBA also failed to publish an explanation on this issue and that it caused him deep concern:

muddling the hydrological, ecological requirements that our river systems need and their functioning, muddling that up with the socio-economic is a very unsatisfactory, it's unscientific. There's no basis, I understand, in science for coming to those

*conclusions at all. What we know in ecological science is we need to say what the science says and then work through the management of the socio-economic issues that have to be dealt.*¹¹⁸

Dr Matthew Colloff perhaps had, of all the scientific witnesses that appeared before the Commission, the most detailed exposure to the MDBA methodology and modelling that underpinned the ESLT and SDL. He was given personal briefings by the Director of the MDBA's ESLT team during 2011, in the context of his work with the CSIRO on an MDBA funded project to determine the ecological and economic benefits of environmental water in the Basin (**Multiple Benefits Project**).¹¹⁹ That project culminated in a report released by the CSIRO in March 2012 (**Multiple Benefits Report**).¹²⁰ The purpose of the briefings was to enable the CSIRO team to work closely with the MDBA and use its modelling. Dr Colloff was given direct briefings regarding the MDBA's process for modelling environmental water requirements and the indicator site method. It is therefore telling that, notwithstanding those personal briefings, Dr Colloff described the modelling procedure as 'opaque, to say the least' and, based on his experience, could 'not understand how the MDBA determined that 2,750GL was the appropriate SDL that reflected the ESLT'.¹²¹

The lack of information available to interrogate and test the indicator site method, and the consequential assertions that it was more 'robust', caused witnesses genuine concern in the context of the MDBA's lack of transparency. Witnesses told of their requests for access to the MDBA's modelling, which were not complied with.¹²² The Wentworth Group described the modelling underpinning the Basin Plan as 'secretive and contested ... It is not possible to assess the ecological outcomes from the information available in the modelling reports accompanying the Basin Plan'.¹²³

That lack of openness, however, was suffered beyond the scientific community: it also affected the government. The South Australian Government has reportedly asked for access to the MDBA's modelling, to no avail. The Commission was advised in writing by the South Australian Government that those requests were made at the time of the draft Basin Plan due to serious concerns that the volumes under consideration would not maintain key environmental assets and functions within South Australia.¹²⁴ Instead, they were provided with 2400, 2800 and 3200 GL model outputs only for their analysis.

The MDBA has referred to this approach as being 'consistent with our approach to provide our data and information to all states if requested'.¹²⁵ That proposition was not accepted, at least by implication, by the South Australians. In evidence, Mr Ben Bruce from the Department for Environment and Water was optimistic about the collaborative relationship currently enjoyed with the MDBA, but confirmed that the South Australian Government was neither given full access to the models then, nor more recently in the context of the SDL adjustment mechanism. He accepted that there should be no secrecy regarding the modelling, and that upon request, they should be given full access to it.¹²⁶

The MDBA has failed to meet the appropriate standard in respect of sharing its modelling.

A serious episode exemplifying the MDBA's lack of scientific rigour and transparency during the ESLT process was described by Dr Colloff. He gave evidence that in the course of drafting the Multiple Benefits Report, the CSIRO's scientific integrity was being compromised, and independence undermined, by the MDBA.¹²⁷ He recounted that the MDBA exercised material influence over the way the CSIRO conducted its review and presented its findings, including requesting that certain information be removed on the basis that it contradicted the MDBA's own findings. He and others involved in the Multiple Benefits Project considered they had no choice but to accept the MDBA's requests because the CSIRO held concerns it might not otherwise be paid for its work. Alarmingly, Dr Colloff concluded that in his opinion, the MDBA's conduct amounted to scientific censorship. Finally, due to the level of staff discontent following the Multiple Benefits Project, an independent facilitator was brought in to assist staff to work through those issues.¹²⁸

The CSIRO declined an invitation to attend voluntarily before the Commission, to respond to Dr Colloff's assertions and answer the Commissioner's questions. It did, however, provide a written submission to the Commission under cover of a letter dated 5 November 2018.¹²⁹ Not only did that submission arrive some six months after the close of public submissions, and five days after the close of the public hearings (which spanned 33 sitting days over some four and a half months), it was patently unhelpful. The covering letter to the submission blankly objected to submissions made by Senior Counsel in closing regarding the CSIRO's conduct and inferences of maladministration, arising in the context of Dr Colloff's evidence.¹³⁰ It provided no material or argument to support that position. That absence of substantive answer enhances confidence in Dr Colloff's damning evidence.

Notwithstanding its status as Australia's leading, independent, scientific research body, the CSIRO declined to attend and participate in debate and discussion concerning matters of scientific controversy with national significance. The Commissioner regards the lack of responsiveness, apparent lack of interest and presumptuous tardiness of the CSIRO in this regard as reflecting no credit on a once well-regarded institution.

2750 reflects a political compromise

The MDBA's assertion that its determination of the SDL (and thereby the recovery amount) was based on the best available science was also challenged in evidence by Mr Bell. Mr Bell was the Director of Environmental Water Planning at the MDBA until his retirement in November 2017. He gave evidence that when he was first employed by the MDBA, there was a clear understanding that the ESLT was to be determined on the basis of environmental criteria only and was not to be determined by having regard to

social or economic outcomes. That evidence was consistent with the statement referred to above and made by the former Chair, Mr Taylor, when he resigned.¹³¹

Mr Bell's evidence, however, was that there was a change in that position when Mr Taylor left. At that time, a general consensus emerged among MDBA staff that the 'SDL had to be a number beginning with 2'. His evidence was that there were jokes among staff regarding the recovery amount being a postcode reference.¹³²

That evidence of Mr Bell also went unchallenged and is credible. (Mr Bell's evidence, obviously, concerned a reference to the recovery amount of 2750 GL).

As discussed in Chapter 4, this very concern was foreshadowed in the international review of the Guide.¹³³ In a discussion concerning that review, Professor Williams explained it this way:

*Science must be able to say what is the truth of the matter. It is for society to judge how it utilises it. But we need to be unfettered in stating what and how the science works. Once you start to fiddle with the science, you are just fooling yourself and you're not helpful to society.*¹³⁴

The Wentworth Group made the following, scathing observation: '... the Murray-Darling Basin Authority ignores much of the good work and has instead produced a draft Plan that manipulates science in an attempt to engineer a pre-determined political outcome' and '[i]t can only be described as selective presentation of information to encourage the uninformed reader into believing a reduction of 2,750 GL will produce a healthy river, when its own science and that of CSIRO says it won't'.¹³⁵

Ms Maywald gave evidence from a slightly different perspective, regarding the political reality concerned with the Basin Plan and determining the recovery amount. She said in a statement to the Commission:

Ultimately the Plan had to get through 11 houses of Parliament. In that sense, it is a remarkable achievement.

In order to obtain a consensus across such divergent perspectives, however, there needed to be trade-offs reached. In essence, that means the various competing sciences — social, economic, environmental need to be overlaid with the political reality.

...

Ultimately, it was difficult to get the plan through, and especially in Victoria. South Australia preferred a recovery of 3,200GL, but by way of trade-off, ended up agreeing to an initial target of 2,750GL, but with the added recovery of 450GL to be recovered over a longer implementation period by 2024. In contrast, the Sustainable Diversion Limit Adjustment Mechanism was critical in getting Victoria and NSW across the line.

*In my view there has been a lack of clear communication and transparency regarding the trade-offs that have occurred that gave rise to the Basin Plan, which has resulted in some confusion regarding how the science was overlaid with the political climate. There is also possibly a lack of understanding around the decisions that were made as a consequence of those trade-offs, in order to achieve a political outcome.*¹³⁶

In Ms Maywald's view, in order for the Basin Plan to be legislated, it had to occur in an environment of trade-offs.¹³⁷ Mr Bruce also gave evidence of that political reality; namely that, in order for the Basin Plan to be passed, a negotiated agreement was required.¹³⁸

However, that negotiated policy position, which is certainly the best explanation of what happened, based on the evidence before the Commission, did not accord with the law. Mr Bell's evidence reflects a gross failure by the MDBA to accord with the requirements of the Water Act in determining the ESLT, and is further evidence of the incapacity, both then and now, of the MDBA to fulfil its statutory functions.

SDL determination does not reflect an ESLT

The experts were perplexed by the MDBA's lack of an intelligible, scientific justification for the change in the recovery amount, as between the Guide and the ESLT Report. Professor Williams said: 'As a hydrologist, I see no scientific evidence that is publicly available ... which shows the line of logics and mathematics which takes us to the 2,750 from the credible report that was in the Guide'.¹³⁹

The Wentworth Group has consistently maintained and advanced their objections to the MDBA's ESLT/SDL determination. In its 'Statement on the 2011 Draft Murray-Darling Basin Plan' dated January 2012, the Wentworth Group expressed severe criticism of the draft Basin Plan delivered on 28 November, based on the ESLT Report. Whilst they expressly accepted the 'scientific methodology used by the [MDBA]' of setting specific environmental flow targets using 122 hydrological indicator sites and 18 key indicator sites to determine the SDLs, they stated there was no information regarding the volumes or timing of water required to achieve those objectives. Their numerous criticisms include that the MDBA failed to proceed based on 'ample science', that 2750 GL grossly underestimates the environmental water requirements needed to 'protect and restore' and that, absent any independently reviewed scientific information, the Guide remains the best evidence of what is needed to restore the Basin to health.¹⁴⁰ In evidence to the Commissioner, Mr Cosier stated that at the time: 'We formed the view that the absence of critical information makes it impossible for the community, science or Parliament, to understand its implications or have confidence that the plan has any prospect of delivering a healthy, working river'.¹⁴¹

In a later criticism of the methodology submitted to a Senate Inquiry (discussed further below), Mr Tim Stubbs, formerly of the Wentworth Group, said:

*Just to be clear, that model did not tell [the MDBA] that 2,750 was the number. You select a number and plug it into the model. It is like a sausage machine. So if you put good mince in, you will get nice sausages. If you put bad mince in, you will get bad sausages.*¹⁴²

Previously, in a ‘mythbusting’ section of its website, the MDBA sought to address and counter an assertion by the Wentworth Group that the Guide was the best available science, on grounds that the end-of-system flow analysis used in the Guide was not peer-reviewed, whereas the indicator site method:

*has been independently reviewed three times throughout its development, the most recent review completed in November 2011 by a scientific panel led by CSIRO. This review confirmed that this science is sufficient to use as a starting point for an adaptive management approach.*¹⁴³

The Wentworth Group advised the Commissioner in evidence that, apart from this high level type of response to their criticisms, the MDBA didn’t seriously engage with their concerns or complaints.¹⁴⁴

In October 2012, the Wentworth Group published a document titled ‘Does a 3,200GL Reduction in Extractions Combined with the Relaxation of Eight Constraints Give a Healthy Working Murray-Darling Basin River System?’. It comments on the MDBA’s modelling of the 3200 GL scenario with relaxed constraints and concludes that although that scenario would deliver improved outcomes over the 2800 GL scenario, it still falls ‘well short’ of satisfying the requirements of the Water Act.¹⁴⁵ Most recently, the Wentworth Group commented on its view as at that time as follows:

*There was no published scenario that achieved all flow indicators, nor was there any reason given as to why only some indicators were achieved and others not. In other words, on the evidence provided by the government’s own Authority [it] suggested that the reduction amount grossly underestimated the environment water requirements needed in all but the relaxed constraints scenario.*¹⁴⁶

It confirmed that it had not seen any proper scientific justification for setting the ESLT so as to give rise to a recovery amount of 2750 GL, including from the MDBA and despite requests to that effect.¹⁴⁷ Further, that in its view, at least 3800 GL is required.¹⁴⁸

A survey of the evidence regarding the MDBA’s failure to account for climate change appears in some detail in Chapters 4 and 6. The evidence was consistent that, in the context of the ESLT and SDL determination, ‘best available science’ certainly required climate change to be taken into account.¹⁴⁹

The CSIRO Review refers to the MDBA's 'policy decision' in this regard. Professor Brookes' evidence was significant, given his membership of the Review Panel. His evidence reiterated concerns of an unscientific approach, specifically in the context of climate change. He, like many others, took the view that climate change was part of the best available science and that 'prudent modelling would suggest we should consider climate in setting future flow'.¹⁵⁰ Further, Professor Brookes recalled the Review Panel advising the MDBA at the time that to leave it out was a bad decision.¹⁵¹ Professor Brookes confirmed that, at the time of the CSIRO Review, even in the absence of climate change, the 2800 GL recovery amount was highly unlikely to meet the specified ecological targets.¹⁵²

As noted above, the MDBA has publicly pointed to the CSIRO Review as evidence that the ESLT determination was based on the best available science. Given the task afforded to the Review Panel, Professor Brookes' conclusion, of itself, is damning. The MDBA's failure to take account of climate change in determining the ESLT is yet another example of the MDBA's incapacity, both then and continuing, to properly discharge its legislative functions.

Mr Andrew Close, a former Head of the Water Resources Group at the MDBA and experienced modeller, also considered that including climate change projections into the modelling was prudent and could have been done for the ESLT determination but, noted that inclusion would have made the modelling process three to four times longer.¹⁵³ Based on his experience, and from a modelling perspective, he was unable to explain the change in recovery amounts, as between the Guide and the Basin Plan. Instead, he considered that change was due to political factors.¹⁵⁴

South Australian position

The detailed and engaged submissions from the South Australian Government Department for Environment and Water (**South Australian Government**), both in writing and in person during the public hearings, stand in stark contrast to the relatively sparse assistance provided by other States.

That evidence has been emphatic that the South Australian Government consistently raised concerns during the drafting of the Basin Plan that it could not support it on numerous grounds, including that it failed to protect the environment, did not use the best available science and the SDL did not reflect an ESLT.¹⁵⁵ Simply, these concerns were constantly raised from the earliest possible time: they are not recent constructs to be haughtily dismissed as belated inconveniences.

The assertion that the draft Basin Plan failed to use the best available science arose specifically in the context of concerns regarding the MDBA's modelling, and its failure to take climate change risks into account in any meaningful way.¹⁵⁶ The South Australian Government takes the view, however, that this defect was addressed through the amendments to the draft Basin Plan culminating in sec 6.06(3), requiring a review be

undertaken having regard to the management of climate change risks.¹⁵⁷ Problems with that approach are discussed in Chapter 6.

The South Australian Government ultimately accepted a negotiated policy position regarding the ESLT/SDL determinations that reflected a political compromise, notwithstanding its erstwhile genuine and, with respect, accurate concerns about illegality. Mr Bruce described it simply in terms that ‘we needed to reach an agreement where we move forward’.¹⁵⁸ In recent correspondence with the Commission, the South Australian Government noted that:

*the environmentally sustainable level of take, the long term average SDL and the results of the SDL adjustment mechanism must achieve the requirements of the Water Act. Determining and adopting these are solely the responsibility of the Authority and the Commonwealth Minister respectively.*¹⁵⁹

In a sense, that is a correct allocation of legal responsibility. However, everyone — and every polity — bound by law has an interest in the rule of law and its due administration.

The South Australian Government has submitted that, whilst the Basin Plan reflects a negotiated result, it is committed to delivering the Basin Plan as agreed on the basis that it ‘produces equivalent environmental outcomes to a water recovery of 3,200 gigalitres per year at 2024’ and ‘should’ achieve key environmental outcomes.¹⁶⁰

In evidence before the Commissioner, Mr Bruce adopted, with respect, an understandable position on the part of the South Australian Government, namely, that rather than being fixated on the MDBA’s errors of the past, the government’s focus was to be forward looking. He expressed a high level of confidence in the current hierarchy of the MDBA, a view which the Commissioner definitely does not share.¹⁶¹

Regrettably, the supposedly pragmatic South Australian position as to ESLT/SDL does not accord with the law. Whilst understandable in its practical application, this position overlooks the reality that the unlawfulness of the ESLT and SDL, as at November 2012, has not been overcome with the effluxion of time, or remedied in any way. In fact, that unlawfulness has been perpetuated through the subsequent implementation of the Basin Plan. This prospect was previously identified by the South Australian Government, when it said:

*While the South Australian Government supports the MDBA working with Basin jurisdictions to develop a proposed mechanism for consideration by the Murray-Darling Basin Ministerial Council, the starting point must be a water recovery volume that meets key environmental outcomes as required under the Water Act and the draft Basin Plan objectives.*¹⁶²

The ramifications of the starting point not according with the Water Act in the particular context of the SDL adjustment mechanism are explored further in Chapter 7.

At the time of the Basin Plan being made in November 2012, the SDL did not reflect an ESLT. In particular, further to the discussion in Chapter 3, the SDL was set at a level that was insufficient to avoid compromise (in terms of an unacceptable risk of serious damage), and to rehabilitate and restore.

Position of the MDBA & Commonwealth

MDBA Board papers re ESLT determination

A number of MDBA Board minutes and papers were produced in response to Senate Motion 960 in October 2018, which provide further insight into the MDBA's methodology and reasoning historically adopted in determining the ESLT, SDL and recovery amount.

They suggest some differences of opinion about the triple bottom line approach. For instance, a paper presented to the March 2011 Board meeting by MDBA staff stated:

Ultimately setting the ESLT is a matter of judgement within which the Authority has considerable scope to consider environmental, social, and economic issues. However, it is important to note that setting the ESLT does not require an optimisation of social, economic, and environmental outcomes. Rather, optimisation is a task that is required after the ESLT has been established. Such optimisation is particularly focussed on the use and management of water resources.¹⁶³

As early as March 2011, the MDBA was advised that 'lines of evidence could be used to support a reduction in diversions to achieve an ESLT of 2800 GL or even 2600 GL'.¹⁶⁴ In response to that advice, initially Mr Knowles stated that if the MDBA chose an ESLT figure lower than the range given in the Guide, 'a robust rationale would be required'.¹⁶⁵ At a later meeting Board members also reportedly stated that 'an incontestable explanation for that change would need to be provided'.¹⁶⁶

Professor Barry Hart, Board Member, expressed concerns on two recorded occasions during that period that the recovery amounts being presented were less than the bottom end of the range in the Guide.¹⁶⁷ Further, whilst the Board members sought to make it clear that the SDL figures were 'open to amendment in either direction' and the figures in the Basin Plan should be seen as a starting point, Professor Hart 'believed it unlikely that volumes would be changed to provide more water for the environment'.¹⁶⁸ He specifically asked for his concerns to be recorded that during SDL deliberations, key numbers had been rounded down, with the net effect being a 'net 'loss' to the environment of 100 GL/yr'.¹⁶⁹ Professor Hart believed the final recovery amount should have been 3000 GL per year, but he was prepared to reduce that to 2900 GL.¹⁷⁰ In response to

his concern, the other members responded that ‘the move away from the end of system method ... had overtaken the need for a strictly numerical approach’.¹⁷¹

Public statements

There are numerous statements scattered throughout publications and media statements over the past eight years that reflect the MDBA’s position on its approach to the ESLT determination. Some of them are referred to above. The MDBA has been consistent in its rationale and commentary, since 2011. The position is encapsulated in the Basin Plan Regulation Impact Statement, which states:

Taking into account the evidence on benefits and costs, the diminishing capacity to achieve additional benefits as water is recovered above 2,800 GL/y in the context of existing system constraints, and further analyses undertaken in the Condamine-Balonne region, the Authority considers that water recovery of 2,750 GL/y on a long-term average will result in environmentally sustainable levels of take in the surface water resources, returning enough environmental water to the Basin to achieve most environmental objectives, while also ensuring that social and economic effects are best managed. As noted earlier in this RIS, many of the benefits and costs are not specified with sufficiently high accuracy to be able to discern a noticeable difference between 2,750 GL/y and 2,800 GL/y.¹⁷²

The MDBA stated as follows in 2012: ‘MDBA has in fact taken into account constraints and socioeconomic considerations when setting the ESLT and SDLs. External legal advice sought by MDBA prior to the release of the proposed Basin Plan is that the methods used are compliant with Act’.¹⁷³ It is not clear who the author of that advice may have been.

During the course of this year Mr Phillip Glyde, Chief Executive of the MDBA, stated publicly that the MDBA was ‘aware’ of the issues raised about the proper construction of the Water Act in this Commission’s Issues Paper 2, but ‘considers that the Basin Plan 2012 was developed consistent with the requirements of the Water Act 2007’.¹⁷⁴ In the same article, Minister Littleproud reportedly stated that the Federal Government was also ‘aware’ of the issues raised in Issues Paper 2, and that ‘[t]he government considers the Basin Plan 2012 including the SDL adjustment instrument have been developed consistent with the requirements of the Water Act 2007’.¹⁷⁵

Perhaps those gentlemen should have ventured to explain and justify these positions by participation in this Commission’s hearings, through qualified witnesses or professional legal submissions. That they did not does not augur well for the federal co-operation that is crucial to the Basin’s future.

DAWR Statement

As discussed above, further and recent evidence of the MDBA and Commonwealth's position regarding the ESLT process and determination appears in the DAWR Statement attached to Minister Littleproud's letter to Minister Speirs of July 2018. Whilst the DAWR Statement was not provided directly to the Commissioner, it addressed key matters under consideration by this Commission which have not, recently, been the subject of detailed commentary by the MDBA or the Commonwealth.

This material is in fact attached to, and endorsed by, the DAWR submission to this Commission, discussed further below.

The MDBA's position in relation to the DAWR Statement is less clear. In its submission to this Commission, also discussed below, it supports the DAWR Statement 'in relation to some of these issues'.¹⁷⁶ That cryptic and unhelpful statement is a sample of the MDBA style.

Whilst there is no need to canvass all matters addressed in the DAWR Statement, the following extracts are specifically of note in relation to this chapter:

- *Initial analysis examined a reduction in the broad range of 3000–4000 GL. This analysis was gradually narrowed to 2400 GL–3200 GL based on ecological outcomes and risk. The minimum required to achieve acceptable outcomes across the Basin, including for the Coorong and Lower Lakes, was subsequently judged to be 2,800 GL.*¹⁷⁷
- In a purported response to concerns raised regarding the ESLT process: *The Commonwealth's view is that the Water Act was properly made and supported, that the Basin Plan was properly made and supported ... Any assertion that the Commonwealth has acted unlawfully or without foundation are refuted.*¹⁷⁸
- In the context of the ESLT determination: *There is no simple objective mechanism for determining an ESLT. It was (and remains) an exercise of expert judgement, informed by the best available information...*¹⁷⁹

Discussion

The statement by the DAWR concerning the recovery amount is inaccurate on the grounds that:

- It fails to recognize the impact of the ranges selected in the Guide, and the role of social and economic considerations in reaching the range of 3000–4000 GL.
- The evidence indicates that no-one claims credit for understanding how the reduction in the range occurred, but what is clear is that it did not arise on account of ecological outcomes and risks, and there is no published report that suggests that 2800 GL

represents a SDL that reflects an ESLT. To the contrary, the CSIRO Review stated that the related SDL would be ‘highly unlikely to meet the specified ecological targets’.¹⁸⁰

- The reference to ‘acceptable outcomes’ does not arise from the Water Act, and is not an appropriate statement of the requirements for an ESLT.

There was no serious attempt by the Commonwealth or the MDBA to defend their assertion that the Water Act and Basin Plan were properly made and supported, or to allow that assertion to be tested.

The assertion that the ESLT determination was informed by the best available information appears to be a misreading of the requirements of the Water Act. Insofar as the MDBA has proceeded on that basis, it has not proceeded in accordance with the law. Paragraph 21(4)(b) of the Water Act is clear — the obligation is not merely to take into account the best information, or to have regard to it, or to be informed by it. It is to act on the basis of the best available scientific knowledge, in exercising powers and performing functions under that Division.

MDBA and DAWR submissions

The MDBA and the DAWR provided written submissions to the Commission on 27 September and 10 October 2018 respectively, notwithstanding that the timeframe for doing so closed at the end of April. Further, both organizations declined to make themselves available to engage in respect of those submissions.

In relation to matters of controversy relevant to this chapter, they were largely of no assistance. In particular, the MDBA states that the submission doesn’t extensively revisit the content of the Basin Plan on grounds of its confidence that the Plan was made consistent with the requirements of the Water Act, the Basin Plan in 2012 had bi-partisan support, and they consider it more useful to focus on full implementation of current arrangements and the ‘here and now’.¹⁸¹

Notwithstanding the desire of the MDBA to proceed in that fashion, questions of the unlawfulness of statutory authorities in the exercise of their statutory functions are not amenable to being dismissed or discounted as a matter of convenience, or on account of the passage of time.

The MDBA asserts, sententiously, that ‘Good science is critical to the Basin Plan’.¹⁸² Again, the Water Act is rather more explicit regarding what it requires, and plainly the bar of scientific ‘basis’ is much higher than that bland piety.

In any event, in the absence of the MDBA and the Commonwealth making themselves available for their assertions to be openly and publicly tested, their submissions carry little weight. It was open to both the MDBA and the DAWR to voluntarily participate in the Commission’s proceedings (notwithstanding the High

Court challenge). Unsurprisingly, and outside of these submissions, they declined to do so. The timing of the submissions gives rise to an unexcluded inference that that delay was deliberate, in order to avoid the scrutiny of this Commission.

Productivity Commission

In the draft Productivity Commission Report released in August 2018,¹⁸³ the issue of the ESLT determination in the Basin Plan is not addressed. But consideration of that issue is required both by the Terms of Reference of that inquiry, and sec 87 of the Water Act. In particular, any inquiry regarding the effectiveness of the implementation of the Basin Plan cannot be fully performed without consideration of this issue, given the two are inextricably linked. These matters were drawn to the attention of the Productivity Commission, but no substantive response was received.

Conclusion

There is no question that much work has been done, much of it beneficial (if not cheap), by the MDBA and stakeholders around the Basin, in the intervening years since the Basin Plan was made. This report is not intended in any way to derogate from those efforts. But the ESLT determination, and the associated SDL and recovery amount, go to the heart of the purpose of the Basin Plan, and the achievement of the objects and purposes of the Water Act. They set the foundation for everything that follows. Perhaps, with the enormity of the task that lay ahead, and the great social and political success that was the passing of the Basin Plan, the substantive questions, challenges and extant concerns regarding central aspects of legality were lost sight of. That may be a charitable view of the matter, and maybe that is where (in this forum) it should rest.

The SDL, as set in 2012, did not reflect an ESLT and was thereby unlawful. The passage of time has not cured that illegality, nor has any adjustment or process that has occurred in the interim. Chapter 7 demonstrates that what was unlawful then, remains unlawful now.

Statutory authorities, such as the MDBA, charged with legislative functions and a huge expenditure of public money, should not disregard the law. The MDBA's expression of confidence to this Commission that the 2012 Basin Plan is consistent with the Water Act and that they 'consider it more useful to focus on the implementation of the current arrangements' is over-confident, and undesirably complacent.

The MDBA should therefore address the illegality of the ESLT and SDL urgently. The people of the Basin should not only expect that, but demand it, not the least because the ramifications of any failure to do so go so far beyond matters of strict legal interpretation, to impacting the lives and livelihoods of over two million people. Further, the Basin Plan is a national plan. While they may not reside in the Basin, the taxpayers of Sydney,

Melbourne and Brisbane (and other non-Basin capitals and towns) have funded the Basin Plan. They too are entitled to demand that it be prepared and implemented lawfully, and in accordance with the best available scientific knowledge.

References

- 1 *Water Act 2007* (Cth) sec 3.
- 2 Ibid para 20(b); sec 22(1), item 6. For the purposes of this chapter, the primary focus of the discussion in respect of the SDL is in the context of the surface water basin-wide SDL, and the consequential basin-wide recovery amount.
- 3 Ibid subsec 23(1).
- 4 See the Note that appeared under sec 6.04(2) of Compilation No. 5 of the *Basin Plan 2012* (Cth). That note was subsequently amended, effective 3 July 2018, to take account of the outcome of the Northern Basin Review. The note in Compilation No. 6, sec 6.04(2) now reads: ‘As at 14 November 2017, the Authority had estimated the long-term average sustainable diversion limit for all surface water SDL resource units to be 10,945 GL per year. This reflects a reduction of 2,680 GL per year from the Authority’s estimate of the BDL for all surface water SDL resource units’. That is, the recovery amount has now been further reduced by 70GL, being the outcome of the Northern Basin Review. The SDL and recovery amount is also impacted by the 605 GL adjustment, discussed further in Chapter 7.
- 5 See also the Note that appears under sec 6.04(4) of the *Basin Plan 2012* (Cth), which appears to support this proposition.
- 6 Murray-Darling Basin Authority, ‘The Proposed “Environmentally Sustainable Level of Take” for Surface Water of the Murray-Darling Basin: Methods and Outcomes’ (MDBA Publication No 226/11, November 2011) (RCE 6) vii.
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- 22 Taylor, above n 19.

- 23 Paul Kildea and George Williams, Gilbert and Tobin Centre of Public Law, Submission No 15 to Senate Legal and Constitutional Committee, *Parliament of Australia, Provisions of the Water Act 2007*, March 2011 (RCE 11) 3.
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- 138 Transcript of Murray-Darling Basin Royal Commission Public Hearings (26 September 2018, B Bruce) 3291.

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- 140 Wentworth Group of Concerned Scientists, above n 135, 2, 6.
- 141 Transcript of Murray-Darling Basin Royal Commission Public Hearings (10 July 2018, P Cosier) 579.
- 142 Senate Rural and Regional Affairs and Transport References Committee, Parliament of Australia, *Management of the Murray-Darling Basin — Second Interim Report: The Basin Plan* (2012) (RCE 36) [2.11].
- 143 Murray-Darling Basin Authority, above n 108.
- 144 Transcript of Murray-Darling Basin Royal Commission Public Hearings (10 July 2018, P Cosier/B Thom) 579–80.
- 145 Wentworth Group of Concerned Scientists, ‘Does a 3,200Gl Reduction in Extractions Combined with the Relaxation of Eight Constraints Give a Healthy Working Murray-Darling Basin River System?’ (October 2012) (RCE 90) 4; Wentworth Group of Concerned Scientists, above n 123, 9.
- 146 Wentworth Group of Concerned Scientists, above n 123, 9.
- 147 Transcript of Murray-Darling Basin Royal Commission Public Hearings (10 July 2012, P Cosier/C Steinfeld/B Thom/J Pittock) 628–9. The Wentworth Group also gave evidence, however, that, despite being critical of the process, they accepted that the role of science was to inform decisions, rather than make them, and that in 2012, the Parliament made a decision which the Wentworth Group has accepted. As a result, their focus is now on ensuring the Basin Plan is delivered, which will then ensure that ‘a demonstrable improvement in the health of the river’ will be achieved.
- 148 Transcript of Murray-Darling Basin Royal Commission Public Hearings (10 July 2018, P Cosier) 586.
- 149 Transcript of Murray-Darling Basin Royal Commission Public Hearings (27 June 2018, M Colloff) 195–6; Transcript of Murray-Darling Basin Royal Commission Public Hearings (11 July 2018, J Pittock) 641, 651; Transcript of Murray-Darling Basin Royal Commission Public Hearings (26 July 2018, Q Grafton) 1570; Transcript of Murray-Darling Basin Royal Commission Public Hearings (21 September 2018, A Pitman) 3093; Transcript of Murray-Darling Basin Royal Commission Public Hearings (23 October 2018, M Howden) 3477–8; Transcript of Murray-Darling Basin Royal Commission Public Hearings (23 October 2018, P Tschakert) 3451–2.

- 150 Transcript of Murray-Darling Basin Royal Commission Public Hearings (17 July 2018, J Brookes) 965.
- 151 Transcript of Murray-Darling Basin Royal Commission Public Hearings (17 July 2018, J Brookes) 964–6.
- 152 Transcript of Murray-Darling Basin Royal Commission Public Hearings (4 September 2018, J Brookes) 2665–6.
- 153 Witness Statement of Andrew Close, 28 August 2018 (RCE 348), [41]–[44].
- 154 Transcript of Murray-Darling Basin Royal Commission Public Hearings (6 September 2018, A Close) 2883–4.
- 155 South Australian Government, above n 32, 19.
- 156 South Australian Government, above n 124, 11; Transcript of Murray-Darling Basin Royal Commission Public Hearings (26 September 2018, B Bruce) 3343–4.
- 157 South Australian Government, above n 124, 11-12; Transcript of Murray-Darling Basin Royal Commission Public Hearings (26 September 2018, B Bruce) 3343–4, 3348–50.
- 158 Transcript of Murray-Darling Basin Royal Commission Public Hearings (26 September 2018, B Bruce) 3291.
- 159 South Australian Government, above n 124, 5.
- 160 South Australian Government, Submission to Murray-Darling Basin Royal Commission, June 2018 (RCE 21), [60], [64].
- 161 Transcript of Murray-Darling Basin Royal Commission Public Hearings (26 September 2018, B Bruce) 3340–2. Whilst the Commissioner is somewhat buoyed by Mr Bruce’s optimism regarding the merits of the current hierarchy of the MDBA, it is unfortunate that those sentiments have not been shared among the large majority of witnesses that have provided evidence to the Commission, and are thereby not shared by the Commissioner.
- 162 South Australian Government, above n 101, 14.
- 163 Murray-Darling Basin Authority, ‘Environmentally Sustainable Level of Take’ (Agenda Item 7.1 of Meeting 29, 1 March 2011) (RCE 1042), [36].
- 164 Murray-Darling Basin Authority, ‘Meeting 29 — 1 March 2011 — Adelaide: Minutes’ (RCE 1041), [22].
- 165 Ibid.

- 166 Murray-Darling Basin Authority, ‘Meeting 30a — 11 April 2011 — Teleconference: Minutes’ (RCE 1043), [10].
- 167 Murray-Darling Basin Authority, above n 164, [23].
- 168 Murray-Darling Basin Authority, above n 90, [30].
- 169 Ibid [34].
- 170 Ibid.
- 171 Ibid [35].
- 172 Murray-Darling Basin Authority, ‘Regulation Impact Statement: Basin Plan — *Water Act 2007* (Cth)’ (RCE 503) 77.
- 173 Murray-Darling Basin Authority, above n 48, 157.
- 174 Peter Hannam, ‘“Trust Us”: Changes to Murray-Darling Plan May Face Legal Challenges’, *The Sydney Morning Herald* (online), 2 May 2018 <<https://www.smh.com.au/environment/conservation/trust-us-changes-to-murray-darling-plan-may-face-legal-challenges-20180502-p4zcvt.html>> (RCE 990).
- 175 Ibid.
- 176 Murray-Darling Basin Authority, Submission to Murray-Darling Basin Royal Commission, 27 September 2018 (RCE 775), [8a].
- 177 Littleproud, above n 33, Attachment 1.
- 178 Ibid [2].
- 179 Ibid [21].
- 180 Young et al, above n 46, 30.
- 181 Murray-Darling Basin Authority, above n 176, [8]–[9].
- 182 Ibid [69].
- 183 Productivity Commission, ‘Murray-Darling Basin Plan: Five-Year Assessment’ (Draft Report, August 2018) (RCE 539).

6 Climate Change

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Introduction

Senate Estimates

On Friday 26 October 2018, employees of the Murray-Darling Basin Authority (MDBA) gave evidence at the Rural and Regional Affairs and Transport Legislation Committee (**Senate Estimates**). During the course of the hearing, Senator Rex Patrick asked the following question:

if my understanding is correct, the Basin Plan has not been constructed with consideration of climate change. Would that be correct?

The answer given by Mr Phillip Glyde, Chief Executive Officer, MDBA was:

That's incorrect.¹

Mr Glyde could have given some context to the absolute character of his answer. For example, at the core of both the *Basin Plan 2012* (Cth) (**Basin Plan**), and the *Water Act 2007* (Cth) (**Water Act**), is the setting of a long-term average surface water sustainable diversion limit (SDL) for the Murray-Darling Basin (**Basin**), which must reflect an environmentally sustainable level of take (ESLT). This is the diversion limit beyond which the environment of the Basin will be 'compromised', and Australia will fall into breach of its international obligations. The Water Act requires no more important task to be undertaken.

No account of climate change was taken in the eventual determination of the ESLT, or in the setting of a Basin-wide SDL which reflects it. This was despite advice being given by the CSIRO to the MDBA in 2009 that modelling for the determination of the ESLT should take into account climate change projections.

The lack of context to Mr Glyde's answer was further highlighted when Senator Patrick expressly raised the issue of climate change and modelling — twice. He did so in the course of the following exchange with Mr Glyde, and the MDBA's Head of Science and Knowledge, Mr Colin Mues:

Senator PATRICK: *Can you just elaborate then what input that has had to the Plan, to the modelling and to the management of the river system?*

Mr Mues: *... the impacts of climate change on surface water availability in the basin are still somewhat uncertain. Projections are for a range in the Northern Basin. The range suggests, from all the different climate models, it might be a wetter future or it might be a drier future, although in the southern part of the basin there is probably more consensus in terms of heading towards a drier future. But when we develop the Basin Plan it's been constructed to be an adaptive framework that can incorporate some actions, immediate actions, to address and prepare for climate*

change but also provide a framework where we can adjust things through time. ... I think we have released some work, several years ago, which categorised the various mechanisms within the plan as falling under about four categories. Actions that refine existing arrangements are things like, as you say, our hydrological modelling, which incorporated 114 years' worth of climate records and included a wide range of climatic permeability, and the climate projections are around that level of climate outcomes. We use that to make sure that there's sufficient variability. So we have got: how does the plan perform in very dry years and extended dry periods as well as very wet years?

There are other actions which buffer the system for climate change risks. The most obvious example would be the recovery of water for the environment to restore its health and resilience and prepare for climate change. ... we give guidance on annual environmental watering priorities ... We take into account the particular seasonal conditions that lie ahead and give guidance on watering priorities in accordance with that climate outlook. Lastly, we also have an opportunity to adapt to future changes. And that's where we have opportunities for monitoring, evaluation and regular review of the plan. So as we get additional information we can incorporate that into the next versions of the Basin Plan.

Senator PATRICK: *Is one of the inputs into things like hydrological models? Where would I see, in simple terms, how things like SDLs might vary as a function of time on account of climate change?*

Mr Mues: *The SDLs are designed — the limit on take in any given year — to reflect the seasonal conditions in that year and water availability in that year. So if we go into a sequence of drier times, the limit on take in that given year will be lower, adjusted down accordingly. When we talk about the SDLs as being a long-term average number, that's the long-term average number which is derived from the long, 114-year climate sequence which we use to underpin our modelling.*

...

Mr Glyde: *Indeed, we're obliged to consider climate change for the first time as the No. 1 thing when we do any formal review. Really the question you're asking is: when data becomes available, when it's clearer, really the question is: is 2,750 the right level in the long run? And that's what we're looking to invest our resources in, and try and hope that the academic community and the research community can come up with more information that enables us to make those decisions over time.²*

Mr Mues answered Senator Patrick's query concerning modelling by referring to the fact that the Basin-wide SDL had been derived from the '114-year climate sequence which was used to underpin our modelling'. For reasons that will be discussed later in this chapter, climate data for the years 1895 to 2009 has limited relevance for the purposes of incorporating climate change considerations into the Basin Plan.

On the evidence presented at the Commission hearings, and from the tendered reports, the Commissioner also does not agree with many aspects of Mr Glyde’s final answer. Among the reasons for this disagreement are:

- The information on climate change is available. It has been for many years.
- The information is clear, albeit there is — naturally — a range of projections for matters such as the likely daily average temperature increases, or reductions or increases in rainfall or run-off.
- Both the Australian and overseas scientific communities have already ‘come up’ with ‘information’ — that is, the best available scientific knowledge — enabling decisions to be made concerning climate change.
- Only a change to the laws of physics will prevent the general direction of climate change projections eventuating. No political party, ideological persuasion, illogical position, nor the attitude taken by the MDBA will, it is expected, change the laws of physics. There was robust and clear scientific research, literature and knowledge concerning climate change projections both globally and in Eastern Australia prior to the enactment of the Basin Plan. This research and the peer-review of literature continues to grow, and corroborate projections made in the past.
- The best scientific knowledge points with high levels of confidence to increases in the daily average temperature in the Southern Basin, in the next decade and beyond, and to significant likely reductions in run-off.
- To state whether ‘2750’ is the ‘right level in the long run’ is a fundamental misconception of the requirements of the Water Act.

Fires in California

In California, at about the same time that Mr Glyde and Mr Mues were giving their evidence at Senate Estimates, the most catastrophic wildfire in that State’s history took hold. Many lives were lost as a result of it, thousands of homes were destroyed, as well as tens of thousands of hectares of land ravaged.

Like the Southern Basin, California has had a historically highly variable climate. As in the Basin, drought is frequent, the most recent being from 2011–16 (and ongoing in Southern California). Each year brings new temperature records, as in Eastern Australia. Like the Southern Basin, California is prone to devastating bushfires, which are a regular occurrence, and no longer seasonal. They are growing in intensity, and occur at all times of the year. The fuel that starts them is often noxious weeds and dry shrubs, and, as also in Eastern Australia, these fires are often exacerbated by hot inland winds.

While the Commonwealth Government may have sidelined its academic and scientific community from climate change research, that is not the case globally. California, for example, has recently released its Fourth Climate Change Assessment.³

The authors of that assessment expect California to experience temperatures 2.5°F (1.4°C) above its historical daily average by 2039, 4.4°F (2.4°C) above the historical average from 2040 to 2069, and 5.6°F (3.1°C) above the historical daily average from 2070 to 2100.⁴ These scenarios however are predicated on a moderate rate of reduction in greenhouse gas emissions. If emissions continue at the current rates, the relative daily average temperature increases are respectively, for the periods given, 2.7°F (1.5°C), 5.8°F (3.2°C) and 8.8°F (4.9°C).⁵ If emissions are not reduced, snow pack melt will drop to one third of historical levels by 2100.⁶ The first range of expected daily average temperature rises will present significant challenges. Without a reduction in greenhouse gas emissions, the future expected temperature rises will have catastrophic consequences.

These projections are based on climate modelling and a variety of emission scenarios and are the combined product of over 40 State and privately funded research projects coordinated through the Governor's Office of Planning and Research, the State of California Energy Commission, and the California Natural Resources Agency. A network of knowledge and expertise has been constructed involving California's universities and centres of higher learning and knowledge. It is the kind of investment into the future climate — and an attempted adaptation to that climate — that Australia should be making, a matter discussed further below.

Also discussed later in this chapter are other parallels between the Californian climate and that of Eastern Australia. For the moment though, to put Mr Mues' evidence at Senate Estimates about historical climate data into further perspective, and to demonstrate its limited relevance, from 1961 to 2005 Fresno in California experienced an average of four days per year when the temperature exceeded 106.6°F (41.4°C).⁷ That is expected to increase to 26 days between 2050 and 2099 if greenhouse gas emissions are reduced at a moderate rate. Without such reduction, it is expected that Fresno will experience 43 days per year where the temperature exceeds 41.4°C.⁸ It is these extremes — not just bland figures of average daily temperature increases — that need to be understood and planned for. A PhD in ecology is not needed to understand the consequences of long periods of excessively high temperatures. Any farmer, or gardener, could succinctly explain what those consequences to crop and plant life will be.

Other climate change reports

Discussed later in this chapter is the research and publications of the CSIRO and the South Eastern Australian Climate Change Initiative (**SEACI**). Other recent reports are referred to also, such as those of the Intergovernmental Panel on Climate Change (**IPCC**) (2014 and 2018 reports), the 'Deluge and Drought: Australia's Water Security in a Changing Climate' Report (**Climate Council Report**) of November 2018, and a recent publication on climate change by the Australia Institute, which highlights scenarios for a dramatic increase in hot days for Western Sydney similar to that referred to above for Fresno in California. Finally, at the conclusion of this chapter, reference is made to the

Fourth National Climate Assessment for the United States, also published in November 2018.

MDBA negligence

It is clear that historical data are becoming increasingly meaningless when it comes to the future. A head in the sand approach to the certainty of higher temperatures and less water in the Southern part of the Basin is, amongst other things, unfair to the residents who live and work there. It deprives many of the foresight, such as it is, that science can provide as to the likely future climate scenarios. It inhibits informed, appropriate and necessary planning and adaptation. It is also a slight on all those who live outside the Basin, but who have an interest in either its economy or environment. On a purely materialist view, that includes at least everyone who pays tax. It is an approach that is in breach of the requirements imposed by the Water Act. It amounts to gross negligence. Gross, because the MDBA ignored the obviously sound advice they were given by the CSIRO in 2009 to incorporate climate change projections into its modelling for the determination of the ESLT and hence the Basin-wide SDL.

The CSIRO is Australia's pre-eminent scientific research organization. It was funded by the Commonwealth Government to research climate change and produce projections for the Basin. It was then ignored by another government entity — the MDBA — which has the responsibility for determining how much water the environmental values of the Basin need in order not to be compromised, and how much water may thus be left for consumptive uses. This is a task that cannot be performed — either practically or lawfully — without taking into account those projections.

The MDBA's approach risks decadel inertia, and has almost on its own ensured that the recovery target for surface water per year — whether that figure is 3200 GL, 2750 GL, or some lower volume — results in a Basin-wide SDL that does not reflect an ESLT. Not only does the MDBA's conduct represent a failure to prepare the Basin Plan on the basis of the best available scientific knowledge, it has also failed to develop an adaptation pathway strategy to assist communities to prepare for the reality of a drier future.

Senior people at the MDBA may continue to assert in public that the Basin Plan takes account of climate change. In any meaningful way, it does not. Climate change of the kind predicted for the Basin presents a number of real and significant hazards to human health — both physical and mental. Hazards to water and food availability, to infrastructure and the economy. Even to security. Australia, and the Basin, will not be immune from the threats to humanity that climate change poses.⁹ Far from it. Based on the evidence made available to this Commission, summarized in this chapter, the MDBA's approach to climate change is indefensible.

Brief history of the science of climate change and international agreement

Research into global warming began with a theory that compared the Earth's atmosphere to a greenhouse. This theory was either first developed by French mathematician and scientist Jean Baptiste Joseph Fourier (1768–1830),¹⁰ or another French physicist Edme Mariotte (1620–84).¹¹ The Commissioner is not authorized to resolve this debate. The first person to present a credible analytical theory of an atmospheric greenhouse was another French physicist, Claude Pouillet (1790–1868).¹²

Succeeding the work of Mariotte, Fourier, and Pouillet, English physicist John Tyndall (1820–93) conducted a series of studies throughout the 1850s to measure the capacity of water vapour and carbon dioxide to trap infra-red light. From these studies he established the notion of greenhouse gases being a 'blanket' that covers the Earth.¹³

Swedish scientist Svante Arrhenius (1859–1927) first quantified the influence of changes in the concentration of carbon dioxide in the atmosphere on the temperature of the Earth's surface.¹⁴ Arrhenius ultimately applied his results to the issue of possible future climate change caused by industrial emissions.¹⁵ He concluded that doubling the carbon dioxide content of the planet's atmosphere would raise its temperature by 5 to 6°C.¹⁶

In 1938, English engineer Guy Callendar (1898–1964) pieced together temperature and carbon dioxide measurements from the 19th Century onwards and observed an appreciable rise in both.¹⁷ In 1956, physicist Gilbert Plass (1920–2004) confirmed that adding carbon dioxide to the atmosphere increases infra-red radiation thus raising the Earth's temperature. In the 1960s and '70s research conclusively established that concentrations of carbon dioxide in the atmosphere were increasing.¹⁸ Such was the increasing awareness of the potential for greenhouse gases to warm the planet that, as long ago as 1968, it was raised as a potential political issue by the poet Allen Ginsberg in a meeting he had with Senator Robert F Kennedy during the lead up to the Senator's run for the Democratic Party's nomination for President.¹⁹

Further studies in the 1980s showed that temperature increases were broadly consistent with global warming forecasts. A general consensus was ultimately produced amongst the scientific community that the Earth is warming.²⁰ In addition, improved technology helped develop more sophisticated climate modelling, which became 'sufficiently reliable to provide a basis for policy decisions'.²¹

In 1988, the United Nations General Assembly recognized that 'climate change is a common concern of mankind'.²² In that year the UN Environmental Programme and the World Meteorological Organization established the IPCC to provide scientific guidance about what action ought to be taken to address climate change.²³ Early work by the IPCC estimated that increasing concentration of greenhouse gases would produce an average global warming temperature rise of 2 to 5°C by the end of the 21st Century.²⁴

In response to the threat of global warming the Climate Change Convention was adopted on 9 May 1992,²⁵ becoming the first international environmental agreement to be negotiated by the whole of the international community. Following adoption of the Climate Change Convention, global negotiations sought to strengthen the response to climate change, which on 11 December 1997 resulted in the adoption of the Kyoto Protocol. The Kyoto Protocol binds developed countries to achieving emission reduction targets. To this end, there are two emission reduction commitment periods. The first started in 2008 and ended in 2012. The second began on 1 January 2013 and will end in 2020.²⁶ Following on from the progress made by the Climate Change Convention and the Kyoto Protocol, on 12 December 2015, 175 world leaders signed the Paris Agreement — the largest number to sign an international agreement in one day. The purpose of the Paris Agreement is to accelerate and intensify actions and investments needed for a sustainable low carbon future. The Paris Agreement’s central aim is to keep the global temperature rises this century to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C.²⁷

In addition to climate change specific agreements, the international community has agreed to additional independent yet complementary commitments. A pertinent example is the United Nations Convention to Combat Desertification (**Desertification Convention**), adopted on 17 June 1994. The Desertification Convention is the sole legally binding international agreement linking environment and development to sustainable land management having regard to the impact of matters such as climate change. It operates alongside the Climate Change Convention and the Convention on Biological Diversity to provide an integrated approach to the use of natural resources.²⁸

Requirement to consider climate change

The Water Act and international obligations

As detailed in Chapters 2 and 3, giving effect to Australia’s obligations in accordance with relevant international agreements is central to the constitutional validity of the Water Act, and provides a basis upon which the Basin Plan must be prepared. The Climate Change Convention and the Desertification Convention are key international agreements that reflect global progress and commitments to address the risks of climate change. Both conventions are relevant international agreements for the purposes of the Water Act, and the Basin Plan must give effect to Australia’s obligations under these agreements.

The preamble and definition of climate change under the Climate Change Convention focus attention on the consequences of anthropogenic activity on changes to the composition of the atmosphere (ie global warming) for natural ecosystems and humankind. The ultimate objective of the Climate Change Convention is to stabilize greenhouse gas concentrations at a level that would prevent dangerous anthropogenic

interference with the climate system and within a time that would enable natural and human systems to adapt.²⁹

The principles of the Climate Change Convention, as set out in art 3, guide the achievement of the Climate Change Convention's objectives and include requirements to take measures and adopt policies which are precautionary, cost-effective, take into account different socio-economic contexts,³⁰ and are to be integrated with national development programs.³¹ The Climate Change Convention's general commitments in art 4 require parties to, amongst other things, formulate and implement national, and where appropriate regional, programs containing measures to mitigate climate change.³²

The Desertification Convention requires long-term integrated strategies to combat land degradation in arid, semi-arid and dry sub-humid areas resulting from factors including climate change.³³ This includes policies to mitigate the predicted impact upon natural and human systems as a consequence of drought.³⁴ A fundamental principle of the convention is that such policies be developed with the participation of local communities.³⁵ Although the Desertification Convention is particularly focussed on Africa, Australia is a continent also vulnerable to the risks of land degradation and drought — a vulnerability which has increased as a consequence of both development and climate change. There is an obvious application of the objectives, principles and commitments of the Desertification Convention to the sustainable management of Basin water resources.

In addition to giving effect to relevant international agreements, under the heading 'General basis upon which Basin Plan to be developed', subsec 21(4) of the Water Act relevantly provides that when exercising its power and performing its functions under the Water Act (such as preparing the Basin Plan), the MDBA must take into account the principles of ecologically sustainable development (**ESD**), and act on the basis of the best available scientific knowledge.

It cannot be seriously argued that the research discussed in this chapter does not form part of the best available scientific knowledge that the Basin Plan must be based on. Climate change denial is now in the realm only of the mendacious, the intellectually challenged or the hopelessly ignorant.

One of the reasons proffered by the MDBA for postponing the incorporation of climate change projections into the Basin Plan in any meaningful way is that the science around it — and the consequent projections — are not certain.³⁶ In a written response dated 23 October 2018 to a question from the Commissioner, the South Australian Government suggested that, at least partly because of the 'highly uncertain' nature of climate change projections, incorporating them into a change of the SDL was 'likely to be subject to high degrees of criticism and would be difficult to reach agreement on'.³⁷

This is difficult to accept as a proper approach, for the following reasons.

Firstly, that projections exist within a range creates only a level of uncertainty as to how much the Southern Basin will warm, and how much it will dry. That it will be both significantly warmer and drier is unfortunately not uncertain in any realistic sense. Further, the best available scientific knowledge often involves a best available estimate. Scientific analysis does not always, or even often, result in absolutes. A climatic change projection is just that — it is unlikely to ever involve a statement that the climate will warm by a precise amount expressed in Fahrenheit or Celsius. A range will always be involved, in relation to which there will be a median. And temperatures vary with natural rhythms, such as night and day, and summer and winter.

Secondly, while it may be that incorporating climate change projections into the determination of the ESLT, and a SDL that reflects it, might be subject to criticism, it is important to consider where any such criticism might come from. It is unlikely to come from the relevantly qualified scientific community. They would be more likely to endorse such an approach. Should the criticism come from the representatives of irrigators, or from talkback radio or late night television hosts — whose qualifications do not appear to be in climate science, hydrology, economics or other relevant fields of learning — then with great foresight the Water Act does not require their criticisms to be entertained as far as determining the environmental or economic needs of the Basin.

Thirdly, agreement on a rational and lawful approach to incorporating climate change projections into the determination of an ESLT and SDL might well be the subject of lively discussion among Australia's best scientists, but the experience in this Commission justifies confidence in not only their expertise but also in their common sense, to the point of confidence that they could help produce a consensus view for the purposes of workable account being taken of the risks of climate change.

Fourthly, when the Water Act directs the MDBA to take account of ESD that means it must take account of the precautionary principle, which is defined in the Water Act.³⁸ It instructs the MDBA that in circumstances where there is a threat of serious or irreversible environmental damage, a lack of scientific certainty is no reason to postpone measures to prevent that damage occurring. Incorporating climate change projections into the determination of the ESLT (and hence the SDLs) is precisely the kind of precaution needed to be taken to prevent the risk of serious environmental degradation. Doing so also has the advantage of not putting off a hard decision either today, or on 1 July 2019, to a later date when that decision will almost certainly be even harder.

The Basin Plan

While the setting of the SDL for the Basin has not incorporated climate change science, that term is nevertheless referred to in parts of the Basin Plan. For example:

- it is an objective of the Basin Plan that water-dependent ecosystems are resilient to climate change: sec 5.03(1)(c)

- it is an objective that the water market is made more efficient by strengthening the market's capacity to adapt to future climate change: sec 5.07(2)(c)(ii)
- a review must be taken having regard to the management of climate change risks: sec 6.06(3), and
- the environmental watering plan must ensure that water-dependent ecosystems are resilient to climate change and climate variability and disturbances: sec 8.07.

Chapter 4 of the Basin Plan is headed 'Identification and management of risks to Basin water resources'. It contains four subsections. Relevant to climate change risks, it is in the following terms.

Part 1 — Preliminary

4.01 Simplified outline

(1) This section sets out a simplified outline of this Chapter.

(2) This Chapter identifies:

(a) risks to the condition, or continued availability, of Basin water resources (item 3 of the table in subsection 22(1) of the Act); and

(b) strategies to manage, or address, those risks (item 5 of the table in subsection 22(1) of the Act).

Part 2 — Risks and strategies to address risks

4.02 Risks to condition, or continued availability, of Basin water resources, and consequential risks

(1) The risks to the condition, or continued availability, of Basin water resources, including the risks to the availability of Basin water resources that arise from the matters specified in item 3 of the table in subsection 22(1) of the Act are:

(a) insufficient water available for the environment; ...

(2) The consequences of the materialisation of the risks identified in subsection

(1) include:

(a) that insufficient water is available, or water is not suitable for consumptive and other economic uses of Basin water resources; and

(b) that insufficient water is available, or water is not suitable to maintain social, cultural, Indigenous and other public benefit values.

4.03 Strategies to manage, or address, identified risks

(1) This section sets out the strategies to manage, or address, the risks identified in section 4.02.

(2) The Authority must have regard to the strategies when undertaking its functions.

(3) *The strategies are the following:*

...

(g) to improve knowledge of water requirements within the Murray-Darling Basin, including the following:

(i) environmental watering requirements; ...

(iii) the impact of climate change on water requirements;

(h) to improve knowledge of the impact on Basin water resources of the following: ...

(iii) climate change;

It can be seen that this chapter of the Basin Plan identifies insufficient water availability to the environment as a risk to Basin water resources. Thus it inane diagnoses a lack of water as a risk to a water resource. In order to manage this risk, the MDBA must have regard to the strategies defined in Chapter 4. In relation to climate change, the strategies identified are to improve knowledge of climate change and the impacts of climate change.

The word ‘strategy’ in the English language is usually in reference to some form of plan of action. As plans of action, the climate change strategies identified in Chapter 4 of the Basin Plan seem somewhat whimsical at best. Further, anyone seeking to read and consider the MDBA’s plans of action for climate change from at least the publicly available material will be disappointed.

The only publicly available document that purports to provide a description of how climate change is accounted for in the Basin Plan is the MDBA’s Technical Paper entitled ‘Managing Water in the Murray-Darling Basin under a Variable and Changing Climate’ (**Technical Paper**).³⁹ Its authors acknowledge the high likelihood of a long-term trend of higher temperatures, more hot extremes, decreased rainfall, a decline in freshwater resource, and an increase in drought frequency and severity. They accepted the findings of the Sustainable Yields Project Report, particularly regarding the impact of water availability under a median 2030 climate, and that planned environmental water is the most exposed to adverse impacts of climate change. They then asserted that the Basin Plan provides four types of responses to climate change, namely:

1. refining existing water sharing arrangements
2. buffering the system from additional climate change stress
3. enhancing climate change responses, and
4. facilitating adaptation.⁴⁰

As to 1, water trading is provided as an example of how water sharing arrangements have been refined.

As to 2, the return of 2750 GL of water for the environment is expressed as purportedly providing a buffer for the environment from climate change stress.⁴¹

As to 3, to enhance responses to climate change, the MDBA will improve knowledge about the impact of climate change.⁴²

As to 4, facilitating adaptation includes the setting of priorities under environmental watering plans and conducting 10-yearly reviews of the Basin Plan.⁴³

While the Commissioner intends no disrespect to the authors of the Technical Paper, his view is that it unambiguously demonstrates the almost farcical approach to climate change by the MDBA.

Firstly, to suggest that the return of 2750 GL per year of water to the environment provides a 'buffer' against climate change is quite wrong. Even if a return of 2750 GL per year did result in a SDL that reflected an ESLT — which it does not — on no sensible view is this a buffer to climate change. Climate change formed no part of the determination of the ESLT. This is a volume of water that purports to be a limit on consumptive use to prevent compromise to the defined environmental values. As such, it need not extend further so as to provide an extra margin, so as to buffer against climate change. It is bold to suggest 2750 GL per year is both the water needed to not compromise the environment, and a buffer against climate change. Given climate change formed no part of the ESLT determination, it is no buffer at all.

Secondly, it is inaccurate to suggest that climate change responses will be enhanced by further MDBA research. The MDBA is not conducting research into climate change at any level that could be considered appropriate. It is not funded to do so, and has shown no real eagerness to revisit the topic.

Thirdly, to suggest a 10-year review is a means of facilitating an adaptation is irrational and hence unscientific. Adaptation planning and implementation should be occurring now, and be ongoing. It should be properly funded. Australia should have moved past the time where climate change is merely considered a problem to be put off into the future. It is time — possibly past the time — where solutions and adaptive approaches really must be developed and put in place.⁴⁴

The Technical Paper refers to the provisions of the 2004 Intergovernmental Agreement on a National Water Initiative (NWI) relating to entitlement holders bearing the risk of any reduction in reliability as a result of climate change and that such reduction will be shared amongst entitlement holders, including the environment.⁴⁵ This is the justification the MDBA has given for not including climate change projections in the determination of the ESLT. While it is fundamental to recognize that this is an unlawful approach to the determination of the ESLT, it also defies sensible and responsible policy.

The only other report of any substance on climate change published by the MDBA is its brief ‘Hydrological Assessment of Flow Changes in the Northern Basin’, of October 2018. This report suggests that since 1975 dry spells have been getting longer in the Northern Basin, a matter influenced by both climate change and development.⁴⁶ Dry spells (cease to flow events) are increasing in frequency at Wilcannia, as an example.⁴⁷

Evidence on climate change

SEACI and CSIRO research

Between 2007 and 2013, the Commonwealth Government funded research into the likely impact of climate change on the future availability of water in the Basin. Reports were prepared by the SEACI,⁴⁸ which was managed by the MDBA from 2008 to 2012,⁴⁹ and the CSIRO’s Sustainable Yields Project.⁵⁰ Regrettably, since 2013 the Commonwealth Government has ‘shredded’ Australia’s capacity to conduct research into climate change and adaptation to such change.⁵¹

At the time the Basin Plan was enacted the best available scientific knowledge strongly pointed to the likelihood of increasing daily average temperatures in the Southern Basin, which is highly likely to result in increased aridity.⁵² This is the case even if there is no significant reduction in rainfall, because the warming will increase evaporation. Therefore, years that previously had marginal rainfall for agriculture will become increasingly drought affected — in short, additional rain is required for the Basin to maintain ‘a zero sum game’.⁵³ Unless water availability increases, average temperature rises will result in less run-off for both the environment and for consumptive use.⁵⁴ The evidence pointed to a likely decline in water availability,⁵⁵ with a very substantial decline in the Southern Basin a real possibility. This long-term drying trend can only be reproduced by global climate models when human influences (in the form of greenhouse gases, aerosols etc) are included.⁵⁶ Anthropogenic climate change raises the likelihood of dry conditions persisting and possibly intensifying.⁵⁷ SEACI’s research concluded that it is unlikely that the decline in rainfall may be part of the natural cycle, and that a return to wetter conditions may occur in the near future.⁵⁸ Future conditions are expected to be drier and warmer than the long-term historical climate in South-Eastern Australia.⁵⁹

Under a median 2030 climate, the CSIRO’s Sustainable Yields Project research in 2008 pointed to a likelihood of an average decline of 11% in water availability across the Basin as a whole,⁶⁰ and 17% in the Southern Basin. As discussed below, these projections produced in 2008 are likely to be underestimates. The reduction in water availability varies considerably between regions.⁶¹ There are likely to be significantly different impacts to diversions in some regions.⁶² The impact on diversions would be more significant in drier years, including a likely fall by more than 10% in most of New South Wales, 20% in the Murrumbidgee and Murray regions, and from around 35 to over 50% in Victoria.⁶³ The greatest reduction in reliability of water would occur in regions where the relative level

of surface water use is already high, and where the effects of climate change are expected to have the largest impact — for example, in the Murray, Goulburn-Broken, Campaspe regions, as well as for entitlements that are already less reliable.⁶⁴

Whilst reliability of water for consumptive use is likely to be affected, current water sharing arrangements would transfer the majority of the impact of climate change to the environment,⁶⁵ particularly planned environmental water⁶⁶ which comprises 75% of Basin water resources. End-of-system flows would likely cease 47% of the time and the Lower Lakes would likely experience severe drought in 13% of years.⁶⁷ Environmentally beneficial flooding across the Basin is also likely to be affected.⁶⁸ When the impacts of climate change are superimposed on the existing impacts from water resource development, the ecological consequences could be severe. The CSIRO concluded that ‘... ecological thresholds may be crossed and the resulting changes may well be largely irreversible’.⁶⁹ Without changes to water sharing arrangements, ‘climate change would be likely to lead to irreversible ecological degradation’.⁷⁰

Additional risks to water availability due to climate change include the implications of rising sea levels on the salinization of irrigation and well water, estuaries and freshwater systems. Research also concluded that most of the severe impacts to the Australian economy from climate change are likely to be the result of changes due to more extreme events (drought, floods, heatwaves, bushfires) rather than a gradual change in temperature.

Comparing the most recent climate against the historical climatic record indicated a possible climatic shift for South-Eastern Australia and it was recommended that the ‘baseline climate’ scenario be reconsidered as it can no longer be assumed that climate variability is stationary.⁷¹ An example of the possible climatic shift is the Millennium Drought, an analysis of which revealed that it was unprecedented compared to other recorded droughts in Australia in terms of its geographical extent, its severity and duration, the absence of any intervening wet years, and the fact that rainfall decline occurred predominantly in autumn and early winter. The decline in rainfall resulted in larger than expected decline in stream flow.⁷² It was recommended that it would be prudent for water resource managers to plan for conditions that are likely to be drier than the long-term average.⁷³

Having regard to the likelihood of a drier future, in 2009 the CSIRO advised the MDBA that the climate sequence modelling for the period of implementation of the first Basin Plan should consider the recent climate over the past 10–20 years, and future climate scenarios.⁷⁴ This was because much greater dry periods have been shown to be possible, dry conditions may continue for some time and there is evidence partly attributing the drought to climate change. The report prepared for the MDBA by the CSIRO at this time was even titled ‘Advice on defining climate scenarios for use in the Murray-Darling Basin Authority Basin Plan modelling’. This advice undoubtedly falls into the category of ‘best available scientific knowledge’ on which the Basin Plan must be based. Despite this, the

MDBA chose to ignore future climate scenarios in its modelling, basing it instead on historical data from between 1895–2009.

The CSIRO and SEACI recommended further research to assist in informing predictions and policy decisions in relation to climate change. Recommendations for further research included clarifying the causes of changes to regional rainfall patterns and improving integrated seasonal forecast modelling.⁷⁵

Intergovernmental Panel on Climate Change

In 2014, the IPCC released its 6th assessment report. It examined the impacts of, and adaptation and vulnerability of ecosystems and communities to climate change. The report included a chapter that focussed on the Australasia region, and confirmed that increased greenhouse gas concentrations have contributed to the average temperature in Australia rising over the past 50 years.⁷⁶ The report confirmed that warming will continue through the 21st Century,⁷⁷ and based on projections for warming at 2°C, South-Eastern Australia may experience a 40% decline in annual run-off.⁷⁸ The IPCC found that the Basin is highly vulnerable to future water security problems by 2050 under a medium emissions scenario.⁷⁹ If future water projections⁸⁰ and scenarios of severe drying are realized there will be a significant reduction in agriculture in the Basin, even with comprehensive adaptation⁸¹ including ‘more efficient water use, allocation, and trading’.⁸²

These findings were confirmed in the 2018 IPCC Report.⁸³ The 2018 IPCC Report found that Australia is likely to be affected ‘if the reduction in water availability is computed for nonwater scarce basins in addition to the reductions in water scarce regions’ even if average global warming increases can be kept to 1.5°C.⁸⁴ Nevertheless, Australia would benefit from limiting temperature increases to 1.5°C as it could substantially reduce the risk of water availability.⁸⁵ There is also high confidence that reducing warming to 1.5°C compared to 2°C will make adaptation easier,⁸⁶ and reduce the risks for food, water, ecosystems and exposure to droughts, heat waves and associated health impacts.⁸⁷

Climate Council Report

In November 2018, the Climate Council released its Climate Council Report.⁸⁸ The report reinforces the impact of climate change on the Basin and its water resources. According to the Climate Council, the Basin has experienced the most rapid warming in Australia since the 1970s.⁸⁹ Since the mid-1990s stream flow has declined, on average, by 41% across the Basin compared to the long-term historical average.⁹⁰ In some regions a greater than average decline is recorded, such as a 70% decline in Central and Western Victoria.⁹¹ The observed decline in autumn rainfall across South Eastern Australia is likely to continue as a consequence of (climate change induced) changes to the water cycle.⁹² Further, climate change is making the atmosphere more ‘energetic’, increasing the likelihood of severe droughts (including the drought currently experienced in large parts of New South Wales as well as parts of Queensland and Victoria) and more intense

rainfall over the Basin into the future.⁹³ This will have significant implications for the ecology and economic viability of the Basin.⁹⁴ It also presents significant risks to human health, such as the spread of disease⁹⁵ and the reliability of energy supply, as current coal-based energy sources in Australia require significant volumes of water.⁹⁶ The consequence of climate change related extreme weather events such as bushfires will put further pressure on natural and human systems.⁹⁷ Australia's tradition of resilience in the face of highly variable water availability will likely become increasingly challenged without concerted action, particularly the rapid global phase out of fossil fuels.⁹⁸ Without taking immediate action in this regard, short-term drought solutions will be futile.⁹⁹ In a global context, climate change will lead to future water insecurity.¹⁰⁰ Water insecurity is at risk of becoming a global 'threat multiplier'.¹⁰¹

The Australia Institute's HeatWatch Report

In November 2018, the Australia Institute released a HeatWatch Report into the impact increasing extreme heat will have on people, industries and ecosystems in Western Sydney.¹⁰² From the 1970s days over 35°C (extreme heat) have increased in Western Sydney from an average of 9.5 days to 15.4 days.¹⁰³ The report is based on recent data from the CSIRO and the Bureau of Meteorology (**BOM**), whose 'projections estimate that the average number of days over 35 could increase by up to five times without strong climate policies from a historical average of 11 up to 52 days by 2090'.¹⁰⁴ The projected estimates are based on eight climate models used by the CSIRO and two Representative Concentration Pathway (**RCP**) scenarios (RCP 8.5 and RCP 2.6) from the IPCC.¹⁰⁵ The RCP scenarios are referred to later in this chapter.

The report demonstrates that when the temperature increases above 35°C it can have a severe impact on people's health as a result of not being able to maintain a safe body temperature, including heat exhaustion, heart failure and death.¹⁰⁶ In 2009, 374 deaths were recorded as a result of the heatwave over the summer in Melbourne.¹⁰⁷ The HeatWatch Report demonstrates that climate change will have different effects on people depending on where they live, but that it is in the best interests of Australia as a whole to have strong climate change policies to reduce emissions and fossil fuel use and production.¹⁰⁸

State of the Climate Report 2018

In December 2018 the BOM and CSIRO released their fifth, biennial 'State of the Climate Report'. The report provides a brief synthesis of the 'latest' monitoring, science and climate change projection information. There is no indication that the report is based upon new research undertaken by the BOM or CSIRO in relation to climate change in Australia (and particularly the Basin) since the completion of the Sustainable Yields Project or the SEACI research.

The report concluded that global greenhouse gas emissions are continuing to rise¹⁰⁹ as a consequence of ‘emissions from human activities such as the combustion of fossil fuels and industrial processes, and changes in land use and land cover’.¹¹⁰ The observations and climate modelling for Australia ‘paint a consistent picture of ongoing long term climate change’ interacting with natural variability.¹¹¹ The report confirms that since 1910 temperatures in Australia have increased by, on average, 1°C with most of that increase having occurred since 1950.¹¹² Eight out of the ten warmest years in Australia have occurred since 2005.¹¹³ The increase in temperature has been observed across all seasons both during the day and at night time. Increased temperature has been accompanied by an increase in the frequency of extreme heat events, extreme fire weather¹¹⁴ and severity of drought conditions.¹¹⁵ Although the year to year changes in Australia’s climate are mostly associated with natural climate variability, the natural variability now occurs on top of a warming trend.¹¹⁶

Rainfall for most of the Basin has been lower during the period April to October over the last 20 years.¹¹⁷ Southern Australia has experienced below average rainfall in 17 of those years.¹¹⁸ The prolonged decrease in rainfall in Southern Australia is described as being ‘... the most sustained large-scale change in rainfall since national records began in 1990’.¹¹⁹ More specifically, rainfall over South-Eastern Australia has decreased by 11% between 1999–2018 when compared to the period between 1990–98. Decreased rainfall in South-Eastern Australia is associated with known responses to global warming such as high mean sea level pressure as well as a shift in large scale weather patterns.¹²⁰ A decrease in the number of ‘cut-off lows’ (which bring the majority of rainfall to some regions of Victoria) has also been observed.¹²¹ Further, as a consequence of the relationship between higher temperatures and the water-holding capacity of the atmosphere, a higher portion of total rainfall in recent decades has come from heavy rainfall events.¹²² Heavy rainfall days are expected to increase by around 7% per degree in average temperature rise. Short-duration, hourly extreme rainfall events (associated with flash flooding) have, however, shown a larger than 7% increase.¹²³ The decrease in rainfall has led to greater reductions in stream flow.¹²⁴ The report does not specifically quantify the relationship between rainfall and stream flow decreases for the Basin, but the decrease appears to be between 66–75% since the 1970s.¹²⁵ It is noted that the report concluded that average rainfall in Northern Australia has increased over the last 20 years. The reference to increased rainfall in Northern Australia does not appear to include any part of the Basin.

Other impacts associated with climate change include increased ocean temperatures, more frequent marine heatwaves, rising sea levels, acidification of oceans and changes to the cryosphere. These changes will impact upon the environment, including coral bleaching in the Great Barrier Reef. The impact of compounding extreme events (for example, heavy rainfall along with rising sea levels) may have severe implications for coastal and estuarine environments¹²⁶ as well as for agriculture and human health (for example, the compounding events of drought and prolonged heatwaves or droughts and fires followed by flooding).

The report confirms that in the future Australia is expected to experience further increases to sea and air temperatures, more frequent hot days, extreme fire weather, marine heatwaves, further sea level rises, and increased ocean acidification. A decrease in rainfall across Southern Australia is expected with more time in drought. Heavy rainfall events, particularly short duration extreme events are likely to escalate, increasing the risk of flash flooding.¹²⁷

Witness evidence before the Commissioner

The evidence is that scientific conclusions as to temperature increases as a consequence of greenhouse gas emissions were robust and have been largely settled since the 1990s.¹²⁸ Temperature increases in Australia are largely attributable to human-induced greenhouse gas emissions. Expert witnesses explained that it is certain the climate will get hotter and that hot periods will become longer.¹²⁹ This is supported by multiple lines of evidence, including observational data, modelling and theoretical understanding of climate change.¹³⁰ Whilst there is always, obviously and inherently, uncertainty regarding the future,¹³¹ including as to how much hotter it will become and how much longer hot periods will last, Professor Andy Pitman, Director of the Australian Research Council's Centre of Excellence for Climate Extremes at the University of New South Wales, explained that the only way a change to the general direction of current projections about increased temperature in Australia will happen is if there is a change to the laws of physics.¹³²

Expert witnesses also described how the projected consequences of temperature change on evaporation, heat waves, and the change in seasonality of the climate (such as drier winters) are considered robust in science.¹³³ They could not identify any mechanism or phenomenon that would likely increase rainfall over the Southern Basin. The probability is that the rainfall over the Basin will become substantially less than enjoyed over the past 10–30 years.¹³⁴ By reference to various modes of variability Professor Pitman explained why the current drought is unusual in the sense of perhaps departing from the pattern of understood cycles.¹³⁵ Professor Pitman also opined that the prevailing narrative of Australia being a country of floods and droughts creates a false sense of security.¹³⁶ Dorothea Mackellar's hackneyed lines are, unfortunately, apt to foster complacency in the face of aggravated extremes and frequencies of these oscillations.

The Commissioner was informed that local and international experience demonstrates climate change can occur abruptly. One example of abrupt climate change, chosen as it is directly relevant to risks observed in Australia, is the experience of Perth, in Western Australia.¹³⁷ Perth had established its average inflows up until 1974, since which time they have never once had an average inflow. Such experience demonstrates that even a small reduction in rainfall can reduce water use by 70–80%.¹³⁸

In relation to previous research on climate change, witnesses confirmed that the Sustainable Yields Project represented the best available science at the time.¹³⁹ To undertake

that work the CSIRO brought together expertise across climate science, hydrology and other areas. However, expert witnesses identified limitations to the science at the time the Sustainable Yields Project was undertaken, including the capacity of climate modelling to capture extreme events such as droughts, as well as knowledge quantifying how temperature increases impact evaporative demand.¹⁴⁰ Understanding of these matters has improved since that time,¹⁴¹ as has the understanding of some fundamental mechanisms that are likely to reduce the probability of rain over the Basin.¹⁴² No witness was able to identify any updated work or modelling in Australia. In its submission to the Commission, the CSIRO acknowledged that scientific understanding, technology and certainty of information has improved since that time, but did not provide any detail in this regard.¹⁴³

A further qualification of the previous scientific research was that a striving for elusive certainty within the scientific community tended to produce conservative assessments of the likely impact of climate change.¹⁴⁴ Professor Pitman explained that observed data indicates that climate change is occurring at a faster rate than expected.¹⁴⁵ Further, there has generally been a failure to properly communicate the consequences of a change in temperature of 1 to 2°C.¹⁴⁶ Professor Pitman explained that while a temperature increase of 1 to 2°C represents an average, what is important to understand is that climatic extremes occur disproportionately as a consequence of even a seemingly small average increase in temperature.¹⁴⁷ An example illustrative of extreme consequences due to what might appear to a lay person to be relatively small differences in average temperature was provided by Professor Mark Howden, Director of the Climate Change Institute at the Australian National University and formerly Chief Research Scientist (Agriculture) at the CSIRO, who explained that the last ice age was only 5°C cooler on average per day than the current climate.¹⁴⁸ Witnesses confirmed that it is the climatic extremes that are likely to cause damage to people, economies, and crops.¹⁴⁹ The anticipated number of days of plus 41°C (106.6°F) for Fresno in California, referred to in the introduction to this chapter, is an example of how extremes perhaps provide a more accurate picture to lay people of the serious nature of the risk that climate change poses. Professors Sarah Wheeler and Pitman gave evidence that climate change impacts on farms and their profitability. In Professor Wheeler's opinion, climate change is much more significant in driving out farms than water use patterns.¹⁵⁰

There is an increasing trend of less run-off in major catchment areas. Professor Howden gave evidence about the declines in wheat across Australia, as hot days (greater than 35°C) are starting approximately three weeks earlier across the Eastern wheat belt.¹⁵¹ Although Australia's vegetation and animals are resilient to drought and climatic extremes, there are limits to their ability to adapt.¹⁵² Once certain temperatures are exceeded, then as with crops, the physiological processes of other plants and animals will be impacted.¹⁵³ Widespread concern about the risks posed by climate change was expressed particularly by farmers and Aboriginal leaders.¹⁵⁴ Professor Pitman said that communities, including the farming community, are already taking measures to respond to and mitigate the impacts of climate change.¹⁵⁵ Again, adaptation has its limits.¹⁵⁶ Having regard to environmental and community concerns about the implications of climate change, the Wentworth Group of

Concerned Scientists (**Wentworth Group**) recommended that preparations be made for ‘a future with less water ... and long-term changes in climate including water availability, supported by a climate change adaptation program for environmental assets, industries and public infrastructure’.¹⁵⁷

Since the Sustainable Yields Project, investment in climate change research in Australia has plummeted. Investment has fallen so significantly that even the MDBA’s own climate change research program, the SEACI, was disbanded and prevented from undertaking its Phase III research.¹⁵⁸ The science has evolved so substantially since that time and the expertise to contribute to that science has now been significantly depleted in Australia. As a consequence, updating the existing scientific research would be nearly as difficult as starting from the beginning.¹⁵⁹ Professor Pitman gave evidence that although ‘little tiny pieces of the jigsaw’ may be identified, ‘[t]here is a world of difference between whole little bits of a jigsaw puzzle that characterise little bits of the problem and a properly managed integrated approach with all of the various components brought into a system to inform the management of the plan’.¹⁶⁰ Further evidence of the lack of investment in climate change research was provided by Professor Howden: since 2013, Australian publications in relation to climate change have fallen ‘75 per cent below the trend line’.¹⁶¹ This represents ‘an absolute shredding of the adaptation capacity and adaptation output in Australia just at the same time as we’re seeing unprecedented climate changes’.¹⁶² No witness could point to any current funding by the MDBA in relation to climate change research or partnership programs to build upon the previous research, or the research recommended by the CSIRO and SEACI.¹⁶³

As discussed above, the MDBA received advice from the CSIRO about the use of climate projections for the development of the Basin Plan,¹⁶⁴ and of its concerns about relying only upon historical data.¹⁶⁵ As a result of climate change, the assumption typically relied upon for water planning — that ‘natural systems fluctuate within an unchanging envelope of variability’¹⁶⁶ — is no longer appropriate. Put simply, ‘stationarity is dead’.¹⁶⁷ Experts have advised the MDBA against setting the SDL on the basis of long-term averages.¹⁶⁸

Professor Mike Young, of the Centre for Global Food and Resources, University of Adelaide, discussed options with the MDBA about how to set the SDL.¹⁶⁹ According to Professor Young, state-of-the-art water planning systems incorporate methods to build in ‘approximators’.¹⁷⁰ Professor Young proposed that the Basin Plan be designed in a way that expects climate change will occur and automatically adapts to changing conditions.¹⁷¹ This would include the possibility of a sudden climatic shift.¹⁷² To achieve this, the SDL could be expressed as a formula or as an algorithm that adjusts to new data.¹⁷³ This may involve utilizing a moving SDL average of between 5 to 15 years.¹⁷⁴

Mr Jason Alexandra, Adjunct Fellow at Charles Darwin University and former Director of the Ecosystem Management Branch of the MDBA from 2008–13, also supported this approach and advised the MDBA about setting SDLs using a formula or

other such method.¹⁷⁵ A proposal put forward by Mr Alexandra to the MDBA included that the SDL incorporate five phases of the average climatic conditions in the Basin from very wet to very dry, which could then be adjusted.¹⁷⁶ Mr Alexandra advised the MDBA that any SDL should incorporate contingency planning.¹⁷⁷

In Professor Young's opinion, setting a variable SDL so that communities are aware the SDL may change annually, by way of increase or decrease, would begin a dialogue to assist communities to adapt to climate change and develop better ways to manage water resources.¹⁷⁸ Notwithstanding the scientific evidence regarding the implications of climate change and advice given to the MDBA regarding how it could be accounted for in the Basin Plan, the Commissioner heard evidence of a view held by some in the MDBA that climate change was being overstated.¹⁷⁹

MDBA's approach to climate change

Chapter 4 of this report notes that in the Guide to the proposed Basin Plan (**Guide**), a 3% allowance was proposed to be made to account for climate change for the determination of an ESLT range. In 2010, the CSIRO advised the MDBA that the 3% allowance oversimplified climate change projections, and was based on logic that is unclear.¹⁸⁰

In April 2011, a proposal was made to the MDBA Board to adopt a different approach, namely to attribute 0% to climate change when establishing the ESLT. This proposal was made on the basis that:

- the CSIRO supported the use of 114-year historical data to determine the climate baseline
- it was not possible to distinguish a long-term climate signal from climate variability
- any reduction due to climate change be addressed through reduced access to water resulting from the standard procedures of water resource plans
- water users bear the risks of reduced water availability due to climate change, which is consistent with cls 48–50 of the NWI and the Water Act (sec 74A and Sched 3A), and
- the Water Act does not require the Basin Plan to specify a reduction attributable to climate change, but 'rather it is a consequence of determining the Commonwealth's share of the risk' pursuant to sec 75 of the Water Act.¹⁸¹

In support of these reasons, MDBA staff advised the MDBA Board of the CSIRO's critique regarding the proposal in the Guide for a 3% allowance to account for climate change.¹⁸² It was also put to the MDBA Board that more detailed exploration of the effects of climate change could be considered for future amendments to the Basin Plan.¹⁸³

The recommendation was adopted by the MDBA Board, and now ultimately underpins the position reflected in the Basin Plan that climate change not be included in the ESLT or SDL. The MDBA's justification for this position was explained in its 2012 proposed Basin Plan consultation report, in which the MDBA stated:

*In developing the proposed Basin Plan, MDBA formed the view that there is considerable uncertainty regarding the potential effects of climate change, and that more knowledge is needed to make robust water planning and policy decisions that include some quantified allowance for climate change. Until there was greater certainty MDBA considered that the historical climate record remains the most useful climate benchmark for planning purposes.*¹⁸⁴

In 2011, the CSIRO was commissioned by the MDBA to review the basis of the ESLT.¹⁸⁵ In its review, the panel of authors of the report observed that the MDBA determined SDLs using only the historical climate and inflow sequences, without reference to the robust modelling regarding the impact of climate change on water availability under a median 2030 climate.¹⁸⁶ The panel concluded that failing to account for climate change represents a significant risk in the longer term and a smaller risk in the shorter term.¹⁸⁷ Professor Justin Brookes, one of the authors of the report, confirmed that the MDBA informed the panel that it made a policy decision not to consider climate modelling, as an extension to the underlying policy position of not requiring a change to water users' rights.¹⁸⁸ The CSIRO considered that:

*this policy represents a significant risk to the environment during future extended dry periods, especially should these be more severe than in the past as a result of future climate change. A dry period more extreme than has occurred in the past could occur during the first implementation period for the Basin Plan; the planning approach adopted by the MDBA does not consider such an eventuality.*¹⁸⁹

The authors went on to state that if climate impacts 'do unfold as projected lower SDLs would be required to maintain the level of environmental protection offered by the currently proposed SDLs'.¹⁹⁰ The CSIRO recommended the MDBA undertake additional work to reduce ESLT and SDL uncertainty. Its recommendations included to communicate to stakeholders the policy choices implicit in the proposed Basin Plan around climate change, and to determine the magnitude of future adjustments to SDLs that would be required under a range of future climate change scenarios, to maintain the level of environmental protection offered by the proposed SDLs.¹⁹¹

As set out above, highly qualified and credible witnesses asserted, unsurprisingly, that climate projections form part of the best available scientific knowledge¹⁹² and it was crucial that they be included in setting SDLs for Basin water resources. The decision of the MDBA to simply rely upon regression modelling, informed by historical data, is not suitable to predict long-term trends (such as climate change) and is not consistent with world best practice, which uses physics-based modelling.¹⁹³ By assuming climatic stationarity and not taking climate change projections into account, the Basin Plan

necessarily omits information pertinent to future water allocations. Worse, by not taking climate change into account water planners are in effect acting contrary to science by assuming that rainfall will increase to compensate for climatic change by way of warming (ie drying through evaporation) when quite obviously the science indicates that rainfall is most likely to decrease.¹⁹⁴

Further, the failure to incorporate climate change into the modelling was flawed ‘from a standard risk management approach’.¹⁹⁵ The evidence was that governments, corporations, and individuals take measures to protect against high impact events even if there is a low probability of them occurring.¹⁹⁶ A relevant example given was in relation to bushfires.¹⁹⁷ Professor Howden made the point that planning involves the assessment of risks and the severity of potential consequences.¹⁹⁸ It was suggested that the MDBA was negligent in failing to account for future risks based on climate change projections.¹⁹⁹

Professor Pitman and Mr Alexandra both opined that the Sustainable Yields Project could have been used to inform the hydrological modelling for the Basin Plan.²⁰⁰ In Professor Pitman’s opinion, had the Sustainable Yields Project been used as a foundation for the development of an operational system for the Basin, it would have been quite straightforward to update the information around the Basin Plan on an annual basis, gradually evolving the nature of advice, consistent with the best science, which would have become part of the infrastructure to manage the Basin Plan.²⁰¹ Professor Pitman estimated the cost of building and maintaining a properly managed forecast and projection system for the Basin within, for example, the Bureau of Meteorology or CSIRO would have cost ‘an infinitesimal amount of money given the economic value of the Basin to have an integrated system which allows the best science to be fed into the strategies for the Plan’.²⁰²

Witnesses expressed concern that the failure to account for climate change raises concerns about the long-term viability of the Basin, including ‘as an economic powerhouse of agriculture in Australia’.²⁰³ The Wentworth Group submitted that a ‘[f]ailure to manage for climate variability and climate change, eroding the security of water entitlements and placing livelihoods and ecosystems at risk’ was an underlying problem inhibiting progress.²⁰⁴

There was some support for the MDBA’s within-tolerance approach to climate change. Representatives from the South Australian Department for Environment and Water considered that building reviews into the Basin Plan process to take into account climate change means that climate change is accounted for.²⁰⁵ The New South Wales Irrigators’ Council considered that irrigation allocations adjust to climate variability and that the burden of the risk of climate change needs to be shared.²⁰⁶ Other witnesses disagreed. Professor Young, for example, gave evidence that ‘the full costs of climate change risks should be borne by water users’.²⁰⁷

Professor Howden gave evidence that 10-yearly reviews cannot be considered genuinely adaptive, as the 10-year period might in fact encompass quite significant

changes to flow regimes, which may cause significant changes to be made rapidly.²⁰⁸ A truly adaptive approach should seek to make smoother transitions. That would require reviews to be conducted more regularly.²⁰⁹

Professor Pitman considered that generally on a time scale of a decade the driver of change in variability and the impact of carbon dioxide is relatively small. Thus planning for something like the Basin on a 10-year time scale is just not compatible with the best available science.²¹⁰ By taking a decade by decade approach, Professor Pitman was concerned that decision-makers risk facing the same approach at the beginning of every decade — that is, not to worry about it until the next review period.²¹¹

Further, a proper adaptive approach would also include consideration of strategies to enable communities to adapt. Professor Petra Tschakert, Centenary Professor of Rural Development, University of Western Australia, and coordinating lead author of Chapter 5 of the 2018 IPCC Report, gave evidence in this regard. Professor Tschakert noted that different communities have different, particular values, concerns and priorities.²¹² Recognizing that it is unlikely that everything a community values can necessarily be maintained, successful adaptation planning requires the implementation of ‘adaptation pathways’, which are defined in the 2018 IPCC Report as:

*A series of adaptation choices involving trade-offs between short-term and long-term goals and values. These are the processes of deliberation to identify solutions that are meaningful to people in the context of their daily lives and to avoid potential maladaptation.*²¹³

Professor Tschakert explained that this approach better understood that in many areas, such as the Murray-Darling Basin, farming communities being asked to shoulder more adaptation and become more resilient, are already ‘stretched to the limit’, and uses a collaborative approach that incorporates the knowledge and experience of scientists, politicians, farming communities and Aboriginal groups to formulate actions. Professor Tschakert acknowledged that ‘deliberation and contestation are inevitable’, but that this approach embraces and utilizes contestation and disagreement to formulate options, and strives to reach a consensus.²¹⁴ There has been no evidence before the Commissioner of a suitable adaptation pathway strategy in the context of the Basin Plan.

Witnesses agreed that the first Basin Plan ‘with the significant investment of Commonwealth money’ has likely set a precedent for subsequent Basin Plans.²¹⁵ Had climate change been included, there would have been precedent for how it could be updated. There may be political difficulties in attempting to add climate change as a new component into future Basin Plans.²¹⁶ There is a risk this will produce an acceptance of resource depletion until the problem deteriorates such that the situation becomes desperate.²¹⁷ There remains the possibility the approach to climate change will not be revisited.²¹⁸ Such a possibility remains very real given the MDBA’s record to date. In this regard, the Northern Basin Review required the MDBA to have regard to climate change risks, including an up-to-date assessment of those risks. The only reference to climate

change in the Northern Basin Review is a reference to the 114-year long-term climate record and a general description of the Basin Plan's adaptive approach.²¹⁹ No witnesses could point to any evidence of an up-to-date climate change risk assessment.

Conclusion

The MDBA is required to take into account climate change to accord with Australia's international obligations, satisfy the principles of ESD and to meet the requirement to draft the Basin Plan and exercise its other functions based on the best available scientific knowledge. Chapter 4 of the Basin Plan, as currently made, does not come close to meeting these requirements.

At the time the Basin Plan was first made, there was sufficiently robust scientific knowledge to include projections for climate change into the modelling for the Basin Plan, in particular the determination of the ESLT to be reflected in the Basin-wide SDL. The MDBA was advised by the CSIRO to include climate change projections into its modelling. Mechanisms should have been included for ongoing adjustments to be made (if necessary) as a result of continued climatic change and further scientific knowledge in the area. The MDBA's failure to heed the advice of the CSIRO, and to follow the requirements of the law, imposed by the Water Act, has not been explained and cannot be justified. Its reasoning for not incorporating climate change into the determination of ESLTs and SDLs is not defensible.

The position ultimately decided upon by the MDBA has ramifications for the environment and communities, and is predicated upon assertions that are, at best, misleading. It is wrong for the MDBA to suggest that the CSIRO supported using the historical climate record to establish the climatic baseline for the Basin Plan. Further, there is no scientific evidence that the water recovery target of 2750 GL will genuinely buffer the environment from the additional stress of climate change, and it is simply not logical that it could do so since ultimately the calculation of the ESLT did not account for climate change at all. It is also intellectually dishonest for the MDBA to attempt to justify its decision to not include climate projections on the basis that the CSIRO queried the 3% reduction to allocations as set out in the Guide. It was never suggested by the CSIRO, or any other expert, that a 0% reduction to allocations due to climate change was to be preferred or even contemplated. In deciding not to incorporate climate change into the Basin Plan and to rely upon a policy that allocated the risks of climate change amongst all users, the MDBA has chosen to permit the environment to be disproportionately impacted.

There is, today, no need for the MDBA to wait for the academic and scientific community to provide information as to the likely risks of climate change, how those risks could be accounted for in the Basin Plan, or whether the water recovery target is sufficient. That information is available now, and has been for many years. The MDBA has unfortunately shown an unwillingness to lead on climate change. Factoring in climate change into the ESLT, defining the SDL such that it adjusts to climatic changes, and

creating ongoing operational infrastructure that updates knowledge about climate change, are all options that remain possible. This should happen now, not in 2024, or 2026, or 10 years after that.

Investment in research and infrastructure is also necessary for the purpose of facilitating community adaptation to the complex future scenarios that may eventuate on account of climate change. Although steps have been taken by individuals, businesses and communities to adapt, there are limits to what can be achieved, particularly absent appropriate governmental support. There is sufficient knowledge about, and examples of, sophisticated adaptation pathway strategies that are likely to be of significant benefit to communities. It is incumbent upon the MDBA to take the lead role to progress an adaptive pathway reality that acknowledges the likelihood of a drier future. For the MDBA to do so, it must start by ensuring communities are informed of the best available science in relation to climate change. It is to be hoped that the MDBA's record in relation to climate change will not set a precedent for how this issue is to be dealt with in the future.

Properly funded research on how the Basin — which is so important for the country as a whole — can best adapt to climate change should be urgently undertaken. The Southern Basin almost certainly faces a future with less water. Probably considerably less. The Californian Government, as described in the introduction to this chapter, has advised its citizens of what the future climate for that State looks like. The challenges are enormous.

There are many parallels between the climate of the west coast of the United States and the east coast of Australia. The weather in both is influenced by El Niño and La Niña. Both are part of the Earth's mid-latitude Mediterranean climate. This part of the globe — whether one chooses Santiago or Canberra, Los Angeles or Cape Town — is showing strong correlation in climate data and climate change.²²⁰ While Australia may have a slight buffer as a continent surrounded by water, if the CSIRO Sustainable Yields Project of 2008 was repeated now, it would almost certainly produce projections of even higher likely daily average temperature rises in the Southern Basin, and even less likely water availability.²²¹ Not only does this present huge challenges for both the survival of the environment and the irrigation industry in the Basin, it brings with it the increased likelihood of further fires of greater intensity, at all times of the year. This is all happening at a time when (since 2013) the Commonwealth Government has slashed Australia's research capacity in climate change and climate change adaptation.²²² That is a position that needs to be remedied, at a national level, immediately.

Regrettably, it is apparent that the current senior management of the MDBA, and its Board, have failed to ensure that with respect to addressing the risk of climate change, the Basin Plan is lawful.

The conduct of the senior management and the Board of the MDBA — both past and present — has failed to ensure lawfulness of the Basin Plan. Their conduct in relation to climate change — in particular ignoring the advice of the CSIRO in 2009 — was

negligent. But this sorry conclusion does not just mark a shortcoming in reasonable care, skill and diligence. It is an alert of an emergency.

This is best illustrated this way: In November 2018, pursuant to the *Global Change Research Act 1990* (US), the Fourth National Climate Assessment was provided to Congress and President Trump (**4th US Climate Assessment**).²²³ The lead agency for coordinating the research and preparation of this report was the National Oceanic and Atmospheric Administration.²²⁴ Three hundred scientists were engaged in the report's preparation.²²⁵ They came from Federal, State, and Local Government agencies, from national laboratories, universities, the private sector and Indigenous communities.²²⁶

The Commissioner does not intend in this report to summarize all of the projections and scenarios covered in the 4th US Climate Assessment. In highly abbreviated form, however, four future greenhouse gas emission scenarios are considered²²⁷:

- Representative Concentration Pathway 8.5 (RCP8.5), being a non-reduction scenario leading to 940 ppm of CO₂ in the atmosphere by 2100 (the current level is 410 ppm²²⁸).²²⁹
- Other scenarios are RCP6.0 (lower, but still 660 ppm by 2100), RCP4.5 (lower again, peak emissions 2040, 540 ppm by 2100), and RCP2.6 (the most ambitious reduction, with 440 ppm of CO₂ anticipated by 2100).²³⁰

If the planet is to keep global warming to the Paris Agreement target of less than 2°C, then there will need to be a large reduction in greenhouse gas emissions. RCP8.5 or even RCP6.0 will result in catastrophic global and US climate change — in the order of 2.4 to 4.7°C.²³¹

While all of the above is relevant to those given the responsibility to prepare and implement the Basin Plan, of great significance is not the 2100 scenario (although that should not be ignored in national planning), but the fact that, as the 4th US Climate Assessment makes clear, it has already been getting hotter since at least the beginning of the 20th Century, and particularly so since 1986 (a 1.2°F rise in global temperatures since then).²³²

Further, the climate is changing faster than at any time in recorded history, and it is changing because of human activities²³³ — the MDBA knows this.

There will undoubtedly be higher temperature extremes globally and in the Basin — the MDBA knows this.

Sixteen of the past 17 years of the planet's recorded history have been the hottest on record²³⁴ — the MDBA knows this.

Whatever might be said by commentators outside, and against, the science, or by dangerous deniers in the political class, the above and more are the consistent results and

projections of all of the serious and credible research undertaken on climate change by the world's leading scientists and scientific organizations.

What is the MDBA's response to this? It is, in terms of an effective response, to do nothing.

As Mr David Littleproud, Minister for Agriculture and Water Resources, informed the House of Representatives on 22 November 2018 in response to a Question on Notice from Ms Rebekha Sharkie, Federal Member for Mayo: 'The MDBA has not conducted a review of climate change risks on the Basin since the Basin Plan was finalised'.²³⁵

And so the organization responsible for the Basin Plan has:

- ignored climate change projections for its modelling of the Basin Plan and hence not based it on the best available scientific knowledge, and
- not bothered to review climate change for the Basin — ever.

There is to be a review of the Basin Plan in 2026,²³⁶ but the threats to the Basin do not permit inaction until sometime after a 2026 review before we start attempts to find solutions to climate change degradation of its national social and economic resource.

The Efficiency Measures Agreed Criteria considered by the MinCo on 14 December 2018 contain a belated and inadequate gesture to the abiding need for the Basin Plan and its administration to address the fact of climate change.²³⁷ They include (item 13a) the requirement that projects promise improvement in 'resilience to climate variability'. It is remarkable that the word and concept of 'change' could not be used even now by those drafting this intensely political screed. At least, one might be somewhat grateful for 'resilience' earning a modest role. As a piece of rhetoric, this latest intergovernmental effort warns us of the distance yet to be travelled by those who are currently in charge of dealing with climate change in the Basin's future.

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7 The SDL Adjustment Mechanism

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Introduction

The Sustainable Diversion Limit Adjustment Mechanism (**SDLAM**) was introduced as part of the apparent compromise between the Basin States in the formulation of the *Basin Plan 2012* (Cth) (**Basin Plan**). As a concept, it has merit, and ostensibly allows for the Basin States and the Murray-Darling Basin Authority (**MDBA**) to achieve equivalent environmental outcomes through the use of infrastructure and other works, whilst retaining more water for consumptive use. However, as the discussion in this chapter will outline, its application has been significantly flawed, and has resulted in an adjusted sustainable diversion limit (**SDL**) that places the already endangered environmental resources of the Murray-Darling Basin (**Basin**) at even greater risk of degradation and decline.

Background

The concept of incorporating into the Basin Plan a process by which the Basin-wide SDL could be amended in the period between its original determination in 2012, and it coming into effect in 2019, was included in the very first draft published by the MDBA for comment in November 2011. Through extensive discussion and negotiation between the MDBA, the Commonwealth and the Basin States between 2011 and 2012, there was a significant evolution in the underlying basis and purpose of the review process, together with its timeline, design, and the evidence that it may be based upon.

The original review provision in sec 6.07 of the draft released on 28 November 2011 required the MDBA to review the SDL in 2015 for the purpose of determining any potential changes to the Basin-wide SDL, its apportionment between the Basin States, or the individual sustainable diversion limits that applied in the SDL resource units (**the 2015 Review**).¹ Accompanying that review power was a ‘register’ where the MDBA would record its views on matters that may result in a need to adjust the SDL, including works or measures, river management and river operational practices, methods of delivering water, new knowledge, and proposals which serve to advance the objectives and outcomes of the Basin Plan.² In conducting the 2015 Review, the MDBA would have been required to take into account ‘all relevant information’ including the matters on the register, and it was required to be undertaken in consultation with the Basin States.³

As evidenced by its explanatory material and public statements, the MDBA’s intention appears to have been that the 2015 Review would contemplate a broad re-assessment of the original SDL to ensure it reflected new scientific information and any changes to the way in which the Basin’s rivers were operated. The MDBA explained that the 2015 Review would ‘take into account new science that informs the determination of the ESLT’, involve ‘implementing the recommendations of the CSIRO-led science review’ of the environmentally sustainable level of take (**ESLT**),⁴ and facilitate ‘a rigorous assessment of the implications of future climate change for the environmental outcomes sought under the Basin Plan’.⁵ The MDBA further explained that the 2015 Review would

take into account any changes to river management or the construction of environmental works and measures that may justify a reduction in the water recovery whilst achieving the same environmental outcomes.⁶

The formal response by the Murray-Darling Basin Ministerial Council (**MinCo**) under subsec 43A(4) of the *Water Act 2007* (Cth) (**Water Act**) reflected the divergence of views on the appropriate water recovery target amongst the Basin States. As discussed in Chapter 5, South Australia advocated for a 3200 GL water recovery target, whilst New South Wales and Victoria advocated for a water recovery target closer to 2100 GL. On the one hand, the MinCo noted that the ‘environmental and socio-economic outcomes’ could be achieved by initiatives that remove constraints and ‘enable growth in water availability for environmental purposes without further adverse socio-economic impact’. On the other hand, the MinCo noted that these outcomes could also be achieved by initiatives that ‘implement environmental works and measures that achieve given environmental outcomes with less water; or improve the efficiency of river operations by changes to rules and procedures’.⁷

To that end, the MinCo recommended that the MDBA develop a ‘SDLAM’. This could operate to increase the water recovery target through what would become known as ‘efficiency measures’ to achieve additional water recovery, addressing South Australia’s bid for a 3200 GL water recovery target. This aspect is discussed more fully in Chapter 9. The SDLAM could also operate to decrease the water recovery target, particularly on the basis of environmental works and measures which would become known as ‘supply measures’, and it was suggested that a decrease of up to 650 GL could be achieved, thus addressing the 2100 GL target mooted by New South Wales and Victoria.⁸ It was envisaged that the adjustments would operate by 30 June 2015, based on proposed initiatives, and re-calculated in mid-2019 in light of the progress of those initiatives. Importantly, it was envisaged that any adjustments ‘attributable to initiatives that will come into operation between 2019 and 2022 would have effect once they have commenced operation’.⁹

At this early stage, the concept of a SDLAM was the subject of criticism. The CSIRO submitted that it ‘could be interpreted as providing a less rigorous approach to adaptive management’ because the method for making adjustments would be ‘fully procedural with no room for judgement’, and would not permit a revisiting of the scientific technical knowledge, or the trade-off between environmental and socio-economic outcomes that underpinned the original SDL.¹⁰ The NSW Environmental Defenders Office (**NSW EDO**) expressed concern that ‘the mechanism will not factor in scientific developments, notably in respect of climate change’.¹¹

Nonetheless, the MDBA largely adopted the MinCo’s suggestion for a SDLAM in subsequent drafts of the Basin Plan. The provision that provided for the 2015 Review was replaced with a more general ‘research and investigations’ provision in sec 6.06, a new sec 23A was inserted into the *Water Act*,¹² which in turn empowered what became Chapter 7 of the Basin Plan in final form. In an apparent vindication of the criticisms

noted above, the MDBA explained that the SDLAM was indeed a ‘procedural approach’ that could not accommodate revisions to the SDL on the basis of new knowledge, either environmental, social, or economic.

Requirements of the Water Act and Basin Plan

The SDLAM is set out in a complex set of interlocking provisions in the Water Act, and Chapter 7 and Sched 6 of the Basin Plan, a typically Australian legislative gymnastic exercise.

Adjusting the SDL

Section 23A of the Water Act permits the Basin Plan to include a process by which the MDBA can propose an adjustment of the SDL. That section prescribes certain matters that must be included in the Basin Plan in that case, including a requirement for the MDBA to seek and consider advice from the Basin Officials Committee (**BOC**) and submissions from the public.

Subsection 23A(4) provides that one or more adjustments can be proposed, but only if the total Basin adjustment percentage does not exceed 5%. Based on the starting point of a total Basin-wide SDL of 10 873 GL (recovery amount of 2750 GL), this would permit the SDL to be adjusted within the range of 11 416 GL (recovery amount of 3293 GL) and 10 330 GL (water recovery of 2207 GL). The discrepancy between the apparently permissible 543 GL increase to the SDL and the 650 GL increase proposed during the negotiations remains unexplained.

Finally, and critically, the SDL that is produced after an adjustment is made must still reflect an ESLT.¹³

Measures that affect an adjustment

An adjustment proposed under the SDLAM in Chapter 7 of the Basin Plan is affected by two types of ‘measures’. Measures which increase the ‘efficiency of water use’, known as ‘efficiency measures’, are addressed in Chapter 9. Measures which increase ‘the supply of water’, known as ‘supply measures’ are defined in sec 7.03 as:

a measure that operates to increase the quantity of water available to be taken in a set of surface water SDL resource units compared with the quantity available under the benchmark conditions of development.

Note: Examples include:

re-configuring suitable lakes or storage systems to reduce evaporation;

reducing the quantity of water required to deliver water at a particular place, whether for purposes of consumptive use or for environmental use;

changing the methods of environmental watering in such a way that equivalent environmental outcomes can be achieved with a smaller quantity of water than was required under the benchmark conditions of development.

The achievement of equivalent environmental outcomes is at the heart of the SDLAM, and is explicitly an objective, in respect of supply measures, in sec 7.09(b).

Determining the adjustment amount

Notification of supply measures

The adjustment must be based on a package of supply measures that have been ‘notified’ to the MDBA in two stages: before 30 June 2016 and before 30 June 2017. The process by which the BOC was to develop these supply measures for notification is the subject of an intergovernmental agreement discussed later in this chapter.

A measure is capable of being notified only if it will enter operation by 30 June 2024, the notification is agreed to by the relevant entity (the Basin State or Commonwealth) that is funding or undertaking the measure, and is not an ‘anticipated measure’.¹⁴ Anticipated measures are discussed below.

Determining the adjustment

If the MDBA receives a notification of supply measures under sec 7.12, in order to ‘determine the amounts of proposed adjustments’ resulting from those notified measures under sec 7.10, it must first calculate the ‘supply contribution’ in accordance with sec 7.15.

Section 7.15 requires the MDBA to calculate the total increase in the SDL arising from supply measures in such a way that ensures that there are equivalent environmental outcomes, as compared to the ‘benchmark environmental outcomes’, and that there are no detrimental impacts on reliability of supply of water to holders of water access rights that are not offset or negated.

The term ‘benchmark environmental outcomes’ is a reference to the outcomes generated under the modelling scenario developed in the formation of the original SDL discussed in Chapter 5, and the water recovery target of 2750 GL, subject to certain modifications. It is important to note at this stage that, on the assumption that these ‘benchmark environmental outcomes’ were consistent with the obligations of the Water Act, nothing short of requiring environmental equivalence for the SDLAM would be sufficient for its validity.

The manner in which the MDBA is to calculate the total increase is by way of the ‘applicable method’, which is then defined to be the ‘default method’ as set out in Sched 6.¹⁵

The default method

Schedule 6 is an attempt to distil in legislation an essentially scientific procedure. The result is, unsurprisingly, a specimen of difficult, bordering on impenetrable, statutory drafting. The euphemistically titled ‘simplified outcome’ in cl S6.01 offers no consolation. This is not merely a disconnected lawyer’s complaint. The difficulty that several key scientific witnesses before the Commissioner had in interpreting Sched 6, notwithstanding their significant experience in scientific and environmental administration, leads to a concern that the drafting of Sched 6 can cause real difficulties in its application.

The first step in the default method is the calculation and application of the ‘benchmark environmental outcomes’. As outlined above, these are the outcomes derived from the model that was developed in the formation of the original SDL, and purportedly ‘described’ in the MDBA publication on hydrologic modelling published in February 2012,¹⁶ with some modifications. Those modifications, outlined in cl S6.02(1), largely relate to certain refinements of the model, including adjusting the water recovery target from 2800 GL to 2750 GL.

The benchmark conditions of development are assessed according to ‘flow regime characteristics’, which incorporate the frequency of flow events and the interval between watering events, on two scales: reaches and regions. The regions are defined as the Northern Basin, the Southern Basin, and two ‘disconnected rivers regions’, namely the Lachlan and Wimmera Rivers. The Coorong, Lower Lakes and Murray Mouth are not identified as part of the Southern Basin, as they are separately scored and assessed as discussed below.

The reaches are identified as the 24 reaches selected for ‘detailed assessment’, and are to incorporate one of the hydrological indicator sites used in the ESLT model.¹⁷ It is unexplained why only one hydrological indicator site is used. Whilst some of the ‘reaches’ include only one, such as the Riverland-Chowilla Floodplain, others incorporate several, such as the Lower River Murray (in-channel flows), which includes six hydrological indicator sites.

A model run incorporating the ‘benchmark environmental outcomes’, as modified and using the reaches and regions described above (**benchmark model run**), is then compared with a model run which includes a SDL adjusted for the ‘supply contribution’ and incorporating the notified supply measures (**SDL adjusted model run**). Clause S6.06 prescribes the manner in which that comparison is conducted, which includes the use of ‘science based, independently reviewed, fit for purpose’ preference curves and metrics to compare ecologically weighted ‘scores’. As discussed further below, the MDBA utilized a method which generated weighted scores based on 12 ecological elements.¹⁸

The comparison is conducted as against the benchmark model run with successive SDL adjusted model runs that start with a ‘test supply contribution of an amount that is likely to be smaller than the actual supply contribution’, and is then scaled progressively to the largest supply contribution that results in an equivalent or higher score than the benchmark model.¹⁹

Finally, the difference in the scores or outcomes arising from the comparison between the benchmark model run and the SDL adjusted model run must fall within the prescribed ‘limits of change’ set out in cl S6.07. With respect to each region, there must be no reduction in the benchmark environmental outcomes, except where reductions in individual elements may be permitted if offset by increases elsewhere.

With respect to a reach, this depends on what the benchmark model run was able to achieve. Where the benchmark model run achieved a flow target, the SDL adjusted model run must also achieve the target, and not vary by more than 10%. Where the benchmark model run did not achieve a flow target, the SDL adjusted model run must not vary by more than 10%, and in any event not fall below the baseline conditions. Where the benchmark model run provides less than 50% progress towards a flow target, the SDL adjusted model run must not vary more than 15%, and in any event must not fall below the baseline conditions. Somewhat curiously, the manner in which cl S6.07(b) is drafted precludes a SDL adjusted model run from achieving an improvement of greater than 10 or 15% towards a flow target.

As noted above, the Coorong, Lower Lakes and Murray Mouth are separately scored, and cl S6.07(c) prescribes the maintenance or improvement of certain salinity, flow, and Murray Mouth openness targets.

Schedule 6 is silent in respect of the other criterion specified in sec 7.15, that the supply contribution must be assessed on the basis that ‘there are no detrimental impacts of supply of water to the holders of water access rights that are not offset or negated’.

Anticipated measures and unimplemented or pre-requisite policy measures

One of the more opaque aspects of the SDLAM is the integration or otherwise of so-called ‘anticipated measures’. These would appear to be critical in the application of not only the SDLAM, but to the implementation of the SDL itself. It is therefore significantly concerning that such a critical component of the Basin Plan is characterized by such obscurity.

An ‘anticipated measure’ is unhelpfully defined as a measure that is ‘part of the benchmark conditions of development’. The note to that definition offers little further assistance, and vaguely indicates that this includes ‘various measures’ that are expected to be in operation by 2019.²⁰ It is a decidedly unenlightening definition.

No further assistance is given in any of the materials publicly available, including the reports that purportedly describe those ‘benchmark conditions of development’. In various reports, references to ‘anticipated measures’ by the MDBA are simply paraphrases of the above definition.²¹ It is simply not possible for even an informed and engaged member of the public or the scientific community to know just what the features of these ‘measures’ actually are.

This is unacceptable. A supply measure proposal is eligible only if it is not an anticipated measure. This requirement is reflected in the guidelines used for the assessment developed by the MinCo discussed above. As will be discussed below, this is especially critical when regard is had to the Enhanced Environmental Water Delivery Project (**Hydro-cues Project**).

An apparent subset of anticipated measures are the ‘unimplemented policy measures’, which are defined in sec 7.15(2). By navigating that tortuous definition, it is possible to ascertain that ‘unimplemented policy measures’ are ‘anticipated measures’ that will not eventuate by 30 June 2019. In those circumstances, the otherwise ‘anticipated’ measure cannot be taken into account as part of the benchmark model, and accordingly sec 7.15(1)(b)(ii) requires its removal from consideration. At some point in time, for reasons inadequately explained, the Basin States and the MDBA began using the term ‘pre-requisite policy measures’ (**PPMs**) as a substitute for the term ‘unimplemented policy measures’.

The definition in sec 7.15(2) provides some guidance as to the nature of PPMs. However, from the materials before the Commissioner, it would appear that their application and interpretation by the Basin States and the MDBA has been inconsistent, both amongst the jurisdictions and as against the provisions of the Basin Plan.

It is clear from a proper reading of paragraph (a) of that definition, which describes measures that ‘credit environmental return flows for downstream environmental use’, that these measures are what is often described as ‘water shepherding’. As explained in the New South Wales ‘Pre-requisite Policy Measure Implementation Plan’ (**NSW PPM Implementation Plan**), a measure that fits that definition:

*would formally recognise the return flow of water to a river downstream of an environmental watering event, to allow that water to be reused to water other environmental sites or outcomes further downstream. These return flows would be protected from extraction and re-regulation into downstream storages for the length of the river.*²²

The NSW PPM Implementation Plan was ‘endorsed’ by the MDBA in June 2017.²³ This extract is also consistent with the South Australian equivalent plan.²⁴ However, in response to concerns discussed below raised by the NSW EDO, Mr Russell James, a Senior Executive at the MDBA, provided the following ‘comment’:

*The PPMs defined in the Basin Plan do not include shepherding. Rather, the PPM that appears to be referred to [by the EDO] only requires a mechanism for crediting environmental return flows.*²⁵

Notwithstanding that it was forwarded to Dr Emma Carmody of the NSW EDO through the MDBA's principal lawyer, this explanation is itself devoid of much content. It is contrary to not only a clear reading of sec 7.15(2), but to the explanation found in the NSW PPM Implementation Plan as endorsed by the MDBA.

However, of particular concern is that the NSW PPM Implementation Plan makes it clear that PPMs will be implemented only 'to the extent that impacts on third party licenced access rights can be mitigated or offset, whilst aiming to optimise environmental outcomes'. Section 7.15(1)(d) is said to support this position.

Dr Carmody persuasively submitted that 'water shepherding' measures could not result in detrimental impacts on reliability of supply of water to the holders of water access rights as meant by sec 7.15(1)(d). Dr Carmody fairly describes the position in the NSW PPM Implementation Plan as 'legally questionable'.²⁶

The notion that the implementation of PPMs is somehow linked to sec 7.15(1)(d) represents a fundamental misunderstanding of the relevant provisions of the Basin Plan. It fails to recognize that 'anticipated measures' are measures that are a mandatory part of the benchmark conditions required for the modelling exercise in sec 7.15. In the note in sec 7.02, they are even linked to an anticipated recovery of 600 GL per year. The removal of any PPMs is to reflect any failure to implement these otherwise mandatory aspects of the benchmark model. A proper reading of sec 7.15 simply does not support the interpretation that PPMs are somehow intended to be an independent, optional variable that can be adjusted to ensure the model produces certain results. The South Australian equivalent plan²⁷ does not contain a similar misinterpretation of sec 7.15.

The definition in para (b) would appear to be more straightforward in its understanding, and is often described as 'piggy-backing' or 'topping-up'. This is further discussed below in relation to the Hydro-cues Project.

Whilst sec 7.15 provides a timeframe by which it is envisaged that PPMs will be implemented, 30 June 2019, no further detail is provided in the Basin Plan. However, it would appear that by the middle of 2017, each of the Basin States had prepared an 'implementation plan', such as the NSW PPM Implementation Plan referred to above. In a report as part of its Basin Plan Evaluation in December 2017, the MDBA confirmed the timeframe expressed in the Basin Plan. However, little detail can be ascertained from the public record as to the progress of these plans.

Finally, there is very little discussion or analysis regarding the ramifications that may arise if the 'anticipated measures' are not implemented as assumed under the benchmark model, on not only the SDLAM, but also the underlying SDL. This is particularly

concerning given the added socio-economic qualification that appears to have been placed on their implementation by New South Wales. A very brief analysis by the MDBA is found in the 2013–14 annual progress report published on the constraints projects, which indicates that if the PPMs are not implemented ‘additional water would need to be called from storage to achieve the Basin Plan environmental outcomes, equivalent to a SDL reduction of more than 4,000 GL’.²⁸ However, Ms Maryanne Slattery from the Australia Institute submitted that it has been estimated internally in the MDBA that the impact of not implementing PPMs would require an additional 1370 GL in the Murray River alone.²⁹

Final determination of amounts

Having calculated the supply contribution under sec 7.15, in accordance with the method in Sched 6, the MDBA was required, as soon as practicable after 30 June 2017 and before 15 December 2017, to determine the SDL adjustment amount under sec 7.10. Section 7.20 then qualifies that function in 7.10 by the prescription of additional matters. First, sec 7.20 provides that the MDBA can only make such a determination if it has considered the advice from the BOC and any submissions from the public, and is satisfied of the criteria under sec 7.17.³⁰

Importantly, those criteria relevantly include the requirement in sec 7.17(2)(a) that the MDBA is satisfied that the ‘supply contributions to the proposed adjustments achieve equivalent environmental outcomes compared with the benchmark environmental outcomes’. It is important to note that this is an additional requirement that has followed the modelling exercise conducted under sec 7.15 and Sched 6. That earlier exercise was concerned with ‘results’ that ‘occur’ from the application of the relevant models. In contrast, sec 7.17 requires the MDBA to assess whether the supply contributions ‘achieve’ environmental equivalency. For these reasons, the Commissioner considers that compliance with sec 7.17(2)(a) requires additional substantive assessment beyond that of the modelling exercise already conducted under sec 7.15 and Sched 6. To interpret these provisions in any other way would leave sec 7.17(2)(a) redundant, with no work to do. Worse, it would substitute a knowing fiction for the fact of environmental equivalency. Modelling should never be preferred to empirical observation, when real environmental outcomes are at stake.

However, sec 7.17 nonetheless requires environmental equivalence to be achieved by reference to the original modelling, by dint of the reference to the ‘benchmark environmental outcomes’. This reliance on original modelling is discussed further below.

Section 7.20(2) requires the MDBA, in making a determination under sec 7.10, to determine supply contributions ‘as at 30 June 2017’. This would appear to require the MDBA to consider the status of supply measure projects, and their respective supply contributions, as they actually existed on that date. However, the note to this section suggests otherwise, and explains that: ‘[S]ome of the supply measures may not be

operating by that date. The determination is based on the effect that they will have when they have come into operation by 2024’.

Section 7.20(4) further requires that an adjustment must be expressed ‘in the form of a formula as a function of time’, which must reflect any changes up to 30 June 2024 of relevant efficiency contributions and the requirement that the adjustment cannot exceed an alteration of greater than 5%.

Finally, before finalizing a determination of the amount by which it proposes to adjust the SDL, the MDBA is required to publish a draft determination of the amounts ‘with an account of how they were arrived at and the reasons for decisions made in arriving at the draft determination’, and conduct a consultation period of not less than one month.³¹

Amending the SDL

Section 23B of the Water Act then provides a process, separate from the ordinary process under Subdiv F of Div 1 of Part 2 of the Water Act, whereby any adjustments proposed under the SDLAM can be proposed as amendments to the Basin Plan by the MDBA and adopted by the Minister. The MDBA is required to provide certain prescribed particulars in a notice to the Minister, importantly including advice on the implications of the proposed amendment on any declared Ramsar wetlands.³²

Whilst this process is considerably less onerous than that required for general amendments to the Basin Plan under Subdiv F, it is important to note that the requirements of subsec 21(4) of the Water Act, including the requirement that the MDBA act on the basis of best available scientific knowledge and socio-economic analysis, apply to the function of the MDBA in proposing the amendment. By extension, therefore, in order for that function to comply with sec 21, the underlying exercise that informs that function must also comply.

The functions exercised by the MDBA under the SDLAM in Chapter 7 and Sched 6 of the Basin Plan require the MDBA to act on the best available scientific information and socio-economic analysis. A crux is presented by the evident possibility that stipulated modelling is weak, unrealistic or outdated.

Reconciliation in 2024

The Basin Plan offers the MDBA an opportunity to revisit the SDL adjustment by 2024, by way of a so-called ‘reconciliation’ under sec 7.11. This section invests the MDBA with a discretion, in the sense that it must make a new determination only ‘if it appears’ that a new determination would produce a different result from that already achieved. Nonetheless, a modestly purposive reading of this section would require the MDBA actually to consider the exercise of that discretion. No guidance is given in the Basin Plan regarding the basis upon which the MDBA should exercise that discretion. If

the discretion is exercised, and an amendment is proposed as a result, as discussed above, it would of course need to be on the basis of the best available scientific information in accordance with subsec 21(4).

If it does appear to the MDBA that a new determination is required, sec 7.21(3)(a) requires the MDBA to determine the adjustments that would be appropriate to ‘reflect the notified measures’. No more precise guidance is given as to what is meant by ‘reflect’ in this section.

Applying the SDL Adjustment Mechanism

Developing supply measures

In addition to the prescribed matters as set out above in the Water Act and the Basin Plan, the Basin States and the Commonwealth agreed to a protocol under which the development and assessment of supply measure projects would proceed (**the IGA**), together with three ‘phases’ of assessment set out in three ‘guidelines’ documents.³³ These would appear to be ‘processes’ within the meaning of sec 7.17(2)(c), with which the MDBA is required to comply.

A SDL Adjustment Assessment Committee (**SDLAAC**) was established, consisting of representatives of the Commonwealth and the Basin States, with the MDBA and the Commonwealth Environmental Water Office participating in ‘non-voting capacities’.³⁴

Under Phase 1, the SDLAAC would assess ‘feasibility studies’ developed by the Basin States, which were intended to demonstrate that each proposal was likely to be technically feasible, be cost-effective and to achieve its intended outcome, and that its risks and impacts would be manageable and acceptable.

Under Phase 2, SDLAAC would assess ‘business cases’ developed by the Basin States. Under this phase, the MDBA and a SDL Adjustment Technical Working Group would provide ‘technical assistance’, such as in respect of the application of the default method in assessing environmental outcomes. Under this phase, business cases were required to address an extensive set of criteria, which covered technical viability and governance, assessments of ecological benefits and risks, compliance with the Water Act, Basin Plan and overall legal and regulatory compliance, and community engagement.

Finally, Phase 3 required Basin States to provide a ‘Statement of Confirmation’, which required confirmation of funding, that works approvals and legislative and regulatory requirements were ‘in train’, the provision of an estimate of the proposal’s SDL adjustment, and final advice on environmental and other risks associated with the proposal.

Under the IGA, the Commonwealth provided \$34.5 million towards the development of supply measure project proposals, although the Basin States could supplement this with their own funding.³⁵ Between September 2014 and June 2017, Basin States submitted a total of 37 business cases under Phase 2. Of those, 32 were solely supply measure projects, of which 23 involved constructing new environmental works and measures, eight related to changes to rules or operations, and six were existing projects that were part of The Living Murray initiative. An additional five projects were ‘constraints measures’ which the MinCo decided could be assessed as supply measures for the purposes of the SDLAM.³⁶

The Commissioner understands that in addition to the analysis conducted by the SDLAAC, the Commonwealth, through the Department of Agriculture and Water Resources (**DAWR**), also conducted a due diligence assessment of proposals that requested Commonwealth funding. However, the Commission has only received one such due diligence assessment, released under the *Freedom of Information Act 1982* (Cth), which relates to the Menindee Lakes Water Savings Project (**Menindee Lakes Project**), and is discussed below.

No documentary material has either been tendered or made publicly available with respect to the assessment processes conducted by the SDLAAC. Documents evidencing the analysis and advice from the MDBA were only provided under compulsive processes in the Senate, and subsequently copies were provided by the South Australian Government. Some further assistance was also provided by the South Australian Government, both in submissions and evidence, to shed some light into this otherwise secretive and opaque process, in particular with respect to the Menindee Lakes Project, discussed in detail below.

Draft determination

Regrettably, published reports of the MDBA offer striking examples of repetitive, vague, inconsistent and unhelpful communication, replete with bland and sanitized phrases that impart little in the way of solid information. They provide grounds to suspect that this may well be an intended character.

A particular example of this pseudo provision of information through obfuscation is the discussion in the MDBA’s report entitled ‘Sustainable Diversion Limit: Draft Determination Report’ (**Draft Determination Report**) regarding what actual supply measure projects were considered in that determination. On the one hand, early in the report the reader is advised that the BOC notified the MDBA of 36 supply measure projects on 5 May 2016, and a further supply measure project on 28 June 2017.³⁷ However, the report later states that only 36 supply measure projects were notified, as the Goulburn Catchment Constraints Project was ‘proposed’ but had not been ‘included’ in the determination.³⁸ To add further confusion, the table that immediately follows that explanation includes 37 supply measure projects, with a note attached to two projects — the New Goulburn

constraints measure and the Improved Regulation of the River Murray project — that those projects were not ‘modelled as part of the SDL adjustment determination’.³⁹ This table is consistent with the table that forms part of the Register of Measures published on the MDBA’s website in accordance with sec 7.13.

This simple, yet fundamental, matter could have been made clear in unambiguous language at the forefront of the Draft Determination Report.

In the Draft Determination Report, the MDBA outlined that it determined the notified supply measures were capable of permitting a 605 GL reduction to the water recovery volume. That report was published on 2 October 2017, the MDBA accepted public submissions from that date until 3 November 2017, narrowly complying with the minimum period prescribed in sec 7.06. Nonetheless, the MDBA received over 3000 submissions, and reportedly held 29 public information sessions, publishing a response to the feedback it received in December 2017. In addition, the BOC advised that it was:

*satisfied that the Authority’s proposed supply contribution of 605 gegalitres meets Basin Ministers’ expectations set out in the COAG plan to offset the full remaining water recovery gap in the southern Basin.*⁴⁰

Adopting the amendment

On 8 December 2017, the MDBA delivered its final, unchanged, determination to the Commonwealth Minister under sec 23A. The *Basin Plan Amendment (SDL Adjustments) Instrument 2017 (the Amending Instrument)* was registered on 12 January 2018, and was tabled in both Houses of Parliament on 5 February 2018.⁴¹ A disallowance motion was defeated on 9 May 2018, following an agreement reached by the Commonwealth Government and the Federal Opposition, which is discussed further in this chapter and in Chapter 9.

The Amending Instrument inserted a new Sched 6A into the Basin Plan. In a typically convoluted way, this provides for the way in which the SDL adjustment amount of 605 GL is to be applied such that it is purportedly consistent with sec 23A, including the requirement that no adjustment greater than 5%, or 543 GL, be made.

First, the 605 GL increase is apportioned across 17 SDL resource unit areas under cl S6A.02(2). This, however, is affected by the calculation of the ‘net effect’ of the SDLAM, which is calculated by subtracting the total efficiency contribution — the sum of all efficiency measure projects — from 605 GL. If that ‘net effect’ is equal to, or less than, 543 GL, then the adjusted amount for each of the 17 SDL resource unit areas is calculated by subtracting any efficiency measure project amounts that relate to that resource unit area from the amount apportioned under cl S6A.02(2). If, however, the ‘net effect’ is greater than 543 GL, cl S6A.05 provides for a calculation which operates to decrease that amount apportioned under cl S6A.02(2). For example, for the Murrumbidgee resource

unit area, the amount apportioned to it of an increase of 162 GL would be reduced to an increase of 145 GL if no efficiency measures are applied.

Concerns with the approach taken

Ecological Elements Method

The application of the ‘default method’ in Sched 6 is found in what is described as the ‘Ecological Elements Method’ developed by CSIRO, as outlined in a report entitled ‘Development of the Murray-Darling Basin Plan SDL Adjustment Ecological Elements Method’ (**Ecological Elements Report**).⁴² The Ecological Elements Report explains that 12 ecological elements were selected for the purposes of determining environmental equivalency under Sched 6, consisting of four waterbird elements, six vegetation elements and two fish species elements.

On its face, the analysis in the Ecological Elements Report is heavily qualified. It repeatedly notes a number of knowledge gaps which affect its conclusions. For example, it notes that the response relationships used for waterbirds were based on expert opinion, and that the body of literature used was largely anecdotal in nature.⁴³ With respect to the assessment of floodplain forests, it notes the methodology used takes into account only over-bank events, and does not take into account other sources of water, and represents only inundation, but not drawdown, of wetlands.⁴⁴ With respect to fish species, it notes that the methodology does not consider the role of flow variability in driving production and food availability, and therefore concludes that ‘the contribution of floods to fish production has almost certainly been overlooked in determining the flows required to restore and sustain native fish populations into the future’.⁴⁵

The conclusions in the Ecological Elements Report are equally qualified. It notes that:

The method is not intended for site-scale planning or assessment of works and measures scenarios. We are not predicting a score that equates to ecosystem health, but a metric that represents a measure of environmental outcome of the marginal change between two very similar hydrological modelling scenarios with changes only to the frequency of successful [Site specific flow indicator] events. As the Ecological Elements’ relationships to flow are broad scale, the method will not adequately represent species or responses at a fine-scale.

...

This method ... is not a detailed ecological response model that provides absolute ecosystem condition. Therefore caution should be taken in analysing the results as ecological realism in scoring ecosystem health. The method is a highly simplified hydro-ecological model for a particular management purpose.⁴⁶

Doctor Martin Mallen-Cooper, in both his submission and in evidence, was particularly critical of how both the ‘default method’ prescribed and the Ecological Elements Method inappropriately assessed the ecological responses of fish and aquatic species. In respect of the ‘default method’, Dr Mallen-Cooper convincingly argued that cl S6.04(1) addressed only the hydrology of the river, thereby neglecting the crucial hydraulics of the river, and that cl S6.05(2), by referring only to flood-dependent areas, ignored the dependence of fish species on the river channel.

Uncertainties in the MDBA’s modelling

The MDBA commissioned a number of independent reviews as part of the SDLAM. Broadly speaking, the conclusions in those reviews offered general support for the approach taken by the MDBA, qualified by their limited scope, and qualified by an emphasis on the largely experimental and unprecedented nature of the exercise, the knowledge gaps in the science used, and the inherent uncertainty in the results produced.

First, Bewsher Consulting was engaged in two reviews of the MDBA modelling. In September 2016, it undertook an independent review of the hydrological modelling frameworks of both the SDLAM and the Northern Basin Review.⁴⁷ This review did not consider any particular supply measure project, nor was it within Bewsher Consulting’s terms of reference to undertake any review of the underlying modelling components that made up the SDLAM, including the ecological elements method and the method for determining the ESLT. Bewsher concluded that the modelling framework and processes were compliant with Sched 6; however, noted that this did not constitute an endorsement of any proposed numerical SDL changes.⁴⁸

In September 2017, Bewsher undertook an independent review of the processes undertaken by MDBA staff in preparing the models that underpinned the SDLAM.⁴⁹ Again, any review of the underlying modelling components that made up the SDLAM were explicitly excluded from Bewsher’s terms of reference. Bewsher noted that this review did not constitute an ‘audit’, and that it had been conducted ‘on the basis that the various documents prepared by the MDBA and the jurisdictions accurately portray the hydrological facts’.⁵⁰ Bewsher concluded that the models had been operated in accordance with the requirements of Chapter 7 and Sched 6 of the Basin Plan, but again noted that this did not constitute an endorsement of any proposed numerical SDL changes.⁵¹

Second, an Independent Review Panel was commissioned to review the SDL Adjustment Ecological Elements Method.⁵² That panel concluded that the method was scientifically robust, defensible, and fit for the purpose intended under Sched 6. However, it qualified that conclusion by stating that the method was ‘novel and untried’,⁵³ ‘without precedent’,⁵⁴ and that ‘no one should assume that the adoption of the [method] is without significant uncertainty or risk’.⁵⁵ The panel recommended that deficiencies in the method arising from the limited state of scientific knowledge and consistency of available data be addressed by ‘concerted and continuous assessment’.⁵⁶ However, Professor Justin

Brookes, one of the panel members, gave evidence that he was unaware of whether this recommendation was implemented, nor whether there was any further review of the method following any such implementation.⁵⁷ If it did occur, it has not reached the light of day.

Finally, a separate Expert Advisory Panel was commissioned to review whether the MDBA's modelled outcomes satisfied the limits of change prescribed in cl S6.07 of Sched 6 of the Basin Plan.⁵⁸ That panel observed that there was 'substantial "error space"' inherent in the model used, because the assessment of the relationship between ecological responses and flow events was heavily reliant on expert judgement, and 'only partly based on knowledge of robust provenance'.⁵⁹ The panel found that the model's ability to produce scores that accurately and comprehensively reflected reality was diminished. As a result, and as Professor Brookes, a member of the Expert Advisory Panel explained, the highly specific results the model generated did not have the benefit of uncertainty bounds, and as a consequence there was considerable uncertainty regarding any reported breaches.⁶⁰ Notwithstanding these uncertainties, the Expert Advisory Panel concluded there was 'no systematic alternative capable of providing a robust, consistent and standardized assessment of likely relative ecological change caused by changes in flow event frequency'.⁶¹ Whilst it may be true that the methods used may be the best that the MDBA is capable of producing, it is nonetheless concerning that ecological reality is being claimed on the basis of favourable modelling, which produces at best only approximate and uncertain results.

Further, of particular concern were the Expert Advisory Panel's 'other issues and observations'. In that section of the report, the Panel noted that there was a 'lack of enquiry and investment' in addressing uncertainty in modelling, and that as a result:

A culture of reactionary information management is inevitable in the current poorly resourced environment, with a strong reliance on expert opinion and models that lack rigorous testing and transparent documentation. This is coupled with a philosophy of 'making do' with the current tools available while assuming that comparisons of models may 'factor out' uncertainties. ...

This highly undesirable state leaves management of environmental watering in the Basin open to confusion, error and potential abuse.⁶²

Evidence from other expert witnesses confirms that the simplified modelling utilized for the SDLAM cannot capture the full range of hydraulic subtleties that can impact real-world outcomes. As discussed above, Dr Mallen-Cooper gave evidence he was concerned that the Ecological Elements Method did not incorporate an assessment of a project's hydraulic impact, including, for example, the response of fish to changes in water velocity and turbidity.

The supply measure projects

Benefits of the supply measures

On their face, it is evident that many of the notified supply measures are capable of providing environmental benefits. As discussed elsewhere in this report, the achievement of environmental outcomes requires more than a ‘just add water’ approach; the way in which it is managed, and the timing, frequency and location of its delivery are all important.

In the Draft Determination Report, the MDBA states that the supply measure projects will ‘make a real difference in the Basin and achieve environmental results’, but typically provides little detail in support.⁶³ The Commission was assisted, however, by site visits facilitated by the Governments of Victoria and South Australia to the structural works on the Hattah Lakes and the Chowilla Floodplain respectively, which provided some insight into the possibility of environmental benefits from such projects. Some of these projects increase the ability of river operators to optimise the usage of flows for maximum environmental benefit, such as through the use of structures like the Chowilla Creek Environmental Regulator, or through rule-based changes such as the Hydro-cues Project, discussed below. In addition, the construction and operation of physical works has ‘follow-on economic benefits’ to local businesses and communities.⁶⁴

To the extent, therefore, that the supply measure projects do ‘make a real difference’ they are to be commended, and could have offered a useful supplement to the recovery of 2750 GL of environmental water. However, the Commissioner heard evidence raising serious concerns surrounding environmental outcomes and risks of the projects, such that the extent to which they are likely to achieve environmental outcomes equivalent to 605 GL of environmental water is far from clear.

Risks identified by the MDBA

As discussed above, the MDBA provided ‘technical assistance’ during Phase 2, which is recorded in a series of analyses that was eventually produced to the Senate in March 2018, and to the Commission by the South Australian Government in October 2018.

Those analyses indicate that many of the supply measure projects exist only in a simplified ‘concept’ form, such that any detailed design will require further work and consultation. Therefore, much is unknown about what those projects will involve, how they will be implemented and what their outcomes are likely to be. A number of business cases are identified as lacking critical detail about expected environmental impact and the ability to meet environmental water requirements. Before projects can begin construction or implementation there are a wide range of issues needing resolution, investigations

to be undertaken, evidence to be gathered and critical decisions to be made, including regulatory and planning permissions.

A summary of the issues raised by the MDBA's analysis of the supply measure project business cases has been usefully prepared by the Wentworth Group of Concerned Scientists (**Wentworth Group**).⁶⁵ By way of example:

- **SDL Offsets in the Lower Murray NSW**
The MDBA noted that the majority of ecological targets were not supported by evidence, and that further information was requested regarding the rationale and evidence base of the project, and the need for a detailed Environmental Impact Statement to assess potential impacts on the ecology and cultural heritage of the site was required.⁶⁶
- **Improved Flow management works at the Murrumbidgee Rivers — Yanco Creek Offtake**
Whilst MDBA noted that without a refined operating regime, the ecological benefits or risks could not be confirmed, there was a risk that the project would result in adverse environmental outcomes for the significant fish population of Yanco Creek.⁶⁷
- **Computer Aided River Management (CARM) Murrumbidgee**
The MDBA noted that there was a 'high risk of benefits being overestimated requiring a reconciliation adjustment in 2024'.⁶⁸
- **Modernising Supply Systems for Effluent Creeks — Murrumbidgee River**
The MDBA recorded concerns that the project did not meet the requirements of a supply measure project, in that it must achieve equivalent environmental outcomes. Concerns were raised that the ecological objectives were not specified, that the anticipated ecological benefits were only described very generically and only qualitatively, and that the level of detail was insufficient.⁶⁹ The MDBA further noted the risk assessment did not include impacts from changed flow regimes on aquatic ecosystems.⁷⁰

Risks associated with the supply measure projects

The Commissioner heard a range of serious concerns from a number of expert witnesses regarding the capacity of the notified supply measures to achieve equivalent environmental outcomes. Those concerns relate to the lack of information regarding the projects, the extent of significant challenges still to be resolved, the major and unaddressed risks to several projects, the possibility of causing environmental degradation and unrealistic implementation timelines. The most comprehensive critique is found in the Wentworth Group's analysis in its submission to the MDBA on the Draft Determination Report, which the Commissioner commends and adopts.⁷¹

Adverse ecological impacts generally

Associate Professor Jamie Pittock of the Wentworth Group gave evidence regarding the risks of ecological damage associated with environmental works and measures, which apply to the large number of supply measures of that character. Those risks arise from the fact that works and measures represent highly experimental substitutions of natural flow processes. The Independent Review Panel that assessed the Ecological Elements Method noted in its report that ‘using works and measures to adjust the SDL represents a large-scale experimental manipulation of a river system, which has never been trialled before’.⁷² Professor Brookes, a member of that Independent Review Panel, noted that the SDLAM was ‘untried both in terms of a model but also in its implementation and the development of these structures’.⁷³

A/Professor Pittock explained that the risk of adverse ecological impacts manifests in two ways. First, works and measures such as regulators, levees and stopbanks can adversely impact water quality. Artificially ponding water on floodplains, causing it to seep through the ground, can increase salinity.⁷⁴ The Independent Review Panel noted that the projects may produce ‘negative collateral outcomes’, such as blackwater events, algal blooms or mosquito plagues resulting from environmental watering events.⁷⁵ To that end, a number of business cases for environmental works and measures identified a ‘moderate’ risk to the environment, even once mitigation measures have been applied, of low dissolved oxygen levels, hypoxic blackwater from watering events, increased Carp and animal populations, and reduced hydrodynamic diversity. Dr Mallen-Cooper identified the risk of increased Carp populations arising from the use of the Chowilla Creek Environmental Regulator.⁷⁶ The identified risks ultimately eventuated upon operation of the regulator, with the invasive species Carp being observed to thrive at the expense of native Cod.

As a result, the Independent Review Panel recommended that rigorous risk assessment and monitoring would be required.⁷⁷ Professor Brookes noted there ‘has to be a risk assessment, a risk mitigation and adaptive management at every step of the process’.⁷⁸ Whilst these sentiments are, partially, echoed in the MDBA analyses, the MDBA nonetheless acknowledged that ‘risks of negative watering impacts are not assessed in the SDL adjustment mechanism’.⁷⁹ That acknowledgment scarcely alleviates the gravity of the deficiency it accepts. It smacks of an unattractive complacency in the face of remediable scientific doubt.

Second, A/Professor Pittock explained that whilst works and measures may enable watering of easily accessible, low lying floodplains, this can come at the expense of watering higher floodplains. As such, they are typically biased towards the conservation of low lying River Red Gum forests rather than higher Black Box forests. Associate Professor Pittock gave the example of the Nyah Floodplain Management Project, which enables regular inundation of just over half the site; an area that contains three quarters of the site’s River Red Gum population, but only 6% of its Black Box population. This

discrimination, A/Professor Pittock argued, is not compatible with Australia's obligations under the Ramsar Convention to conserve representative areas of different ecosystems and species.⁸⁰ The Commissioner accepts the unchallenged evidence of A/Professor Pittock.

Adverse ecological impacts on the Coorong

Associate Professor David Paton AM gave evidence regarding his concerns about the South Australian Government's South East Flows Restoration Project (SEFRP). The SEFRP involves the construction of new drains and the widening of existing drains, across a distance of 92 kilometres, to divert an average of 26.5 GL of freshwater per year from the upper South East of the State to the Coorong South Lagoon, with the primary aim of managing the South Lagoon's salinity. As a supply measure, the purported consequence is that, whilst not a total replacement, this volume would no longer need to be provided by the upstream River Murray. The SEFRP began construction in March 2017 and is scheduled for completion in late 2018.⁸¹

Associate Professor Paton, whose expertise is grounded in over 30 years of monitoring and study of the region, argued that there is no historical evidence suggesting that the South Lagoon requires freshening, and that the recent diversions of freshwater to that location from a previous drainage scheme had damaged the Coorong's ecology. In his view, the South Australian Government's own investigations in designing the SEFRP, and its assessment as part of the Ecological Elements Method, had narrowly focussed on water quality outcomes, with no regard for the biotic responses to the proposed action, such as the possibility of algal blooms that threaten the food resources of migratory and non-migratory birds. Associate Professor Paton argues that existing actions are causing, and the SEFRP will exacerbate, a change in the ecological character of the Coorong.⁸²

In April 2018, A/Professor Paton expressed these concerns in letters to the Premier of South Australia and the Chief Executive of the MDBA.⁸³ As of October 2018, he had not received a response from the South Australian Government.⁸⁴ When asked by the Commissioner to respond to this concern, the South Australian Government reiterated that a water quality risk assessment undertaken by the Department for Environment and Water, the Environment Protection Authority and the University of Adelaide indicated that SEFRP's water quality risks were 'low and manageable'. However, it acknowledged that the South Australian Government 'recognises the need to understand the spatial scale of the filamentous green algae problem in the Coorong' and that 'opportunities to undertake this work are currently being explored'.⁸⁵ There can be no serious questions of any 'opportunity' to conduct this science — it is merely a question whether resources will be allocated so that scientists can be paid to do so.

Operational risks

Mr David Papps, the former Commonwealth Environmental Water Holder (CEWH), gave evidence regarding his concerns that some supply measures propose a

course of operation predicated upon the access to, and use of, held environmental water at certain locations, times and frequencies. In doing so, they anticipate or require a certain pattern of behaviour on the part of the CEWH, in circumstances where such a pattern of behaviour cannot be guaranteed, let alone compelled. Mr Papps explained:

*if, for example, you had come up with a project that assumed [the CEWH] was going to put 10 gigalitres through it every single year, you couldn't make that assumption.*⁸⁶

At its simplest, such an assumption would be an attempt to unlawfully fetter the CEWH's discretion in its statutory decision-making regarding the delivery of environmental water. More particularly, an assumed delivery of water may not align with the Basin-wide Environmental Watering Strategy, pose unacceptable risks, not be facilitated by operational arrangements, or may be subject to other watering requirements of higher priority.

A related concern is the possibility of future CEWHs being subject to considerable pressure to release environmental water in a manner that would enable the realization of the projects' intended outcomes, possibly in circumstances where doing so may be inconsistent with the CEWH's obligations under the Water Act. On the other hand, any failure by the CEWH to release environmental water in those instances may not only diminish the ability of certain projects to achieve their stated goals, but may risk criticism from Basin States and result in a diminution of public support for the CEWH.

Implementation, construction and scheduling risks

The Agreement between the Commonwealth and the Opposition at the time of the disallowance motion referred to above incorporates matters under the heading 'Strengthening SDL Adjustment Mechanism'. Under the Agreement, it was noted that Commonwealth funding for supply measure projects would be governed by a National Partnership Agreement, and linked to Basin States being able to 'demonstrate their full cooperation with the delivery of efficiency measures'. Amongst other matters, the Agreement envisages that performance milestones will be stipulated, and the MDBA would deliver annual technical workshops.⁸⁷

It should be noted that this so-called Agreement has no status as enacted (or delegated) law. It is not an intergovernmental agreement, it is merely a political agreement between two national political parties. There is no suggestion that the Basin States were involved in any part of its negotiation or execution. Nonetheless, the South Australian Government has since informed the Commissioner that senior officials from the Basin States and the Commonwealth commenced discussions on the National Partnership Agreement in August 2018, and expect to finalize a draft for consideration by mid-2019, with a final agreement in late 2019.⁸⁸

The Productivity Commission's draft finding that 'it is likely that some key projects in the approved supply package will not be fully operational by 2024' is surely fair and correct, if perhaps understated.⁸⁹ This timeframe is extremely ambitious in which to address the plethora of outstanding risks and issues associated with many of the supply measure projects. These include the development of more detailed project designs, the formulation of governance and funding arrangements, complying with relevant development approvals including environmental, heritage and cultural, the engagement in genuine and proper consultation with the general public and affected communities, completing construction, and the introduction of complex rule and operational changes.

Further, as the Productivity Commission notes, there is little contingency built into the existing timelines, even to account for circumstances beyond the control of the Basin States, such as delays to construction on account of adverse weather.⁹⁰ Further, as is discussed in detail in Chapter 8, the Basin States' aspiration to successfully complete negotiations with all landowners affected by constraints measure projects by 2024 is, in the Commissioner's view, a very unrealistic prospect.

Reliance on constraints measures

Finally, the ability for some supply measures to achieve their modelled outcomes is either highly or wholly dependent on the full implementation of the five constraints measures proposals. Hydro-cues, discussed below, is 'critically dependent' on this.⁹¹ However, for the reasons discussed in Chapter 8, those constraints measures are highly unlikely to be implemented on schedule, if at all. This greatly jeopardizes the ability of the package of supply measures to operate as supposedly intended, achieve its maximum benefit and thereby achieve or constitute environmental equivalence.

Case study: Menindee Lakes

The Menindee Lakes Project is arguably the highest profile and most controversial supply measure project. It also represents a significant proportion of the 605 GL reduction, as it has been estimated to contribute approximately 106 GL of that total (making due allowance for the truism that the net effect of all measures is the finally meaningful outcome).⁹²

The Productivity Commission notes a concern that there is a significant risk that the Menindee Lakes Project will not be fully operational in 2024, primarily on the basis of outstanding consultation requirements, environmental assessments, and Aboriginal heritage assessments.⁹³ For the reasons outlined below, the Commissioner shares that concern, but in addition has grave concerns regarding the lawfulness of the Menindee Lakes Project as a supply measure, the serious environmental, cultural and social risks, and the so far profoundly deficient community consultation and engagement associated with it.

The Menindee Lakes

The Menindee Lakes system is a semi-terminal lake system that primarily consists of four main lakes: Wetherell, Pamamaroo, Menindee and Cawndilla. The lake system is approximately 25 000 years old,⁹⁴ and forms an important part of the ecosystem of the Darling River. About 28% of the Kinchega National Park is included within the wetlands area of the lakes.⁹⁵ It is an important ecosystem for migratory shorebirds, and a key nursery habitat for Golden and Silver Perch.⁹⁶

Between 1949 and 1962, a series of regulating structures was constructed in and on the lake system to augment the storage capacities of the four major lakes. Together, the lakes have a full supply volume of 1731 GL, with a surcharge capacity of 2050 GL.

The Menindee Lakes are operated jointly by the New South Wales Government and the MDBA under the Murray-Darling Basin Agreement. When the storage levels fall below 480 GL, their operation is the responsibility of the New South Wales Government, so as to preserve amounts for the nearby townships of Broken Hill, Menindee and Pooncarie, a reserve for the water users on the Lower Darling, and a drought reserve. When storage levels exceed 640 GL, their operation becomes the responsibility of the MDBA.⁹⁷

With a large surface area and shallow depth,⁹⁸ Menindee Lakes have evaporative losses estimated to be approximately 420 GL per annum.⁹⁹ The Menindee Lakes Project is the latest in a series of proposals and reviews conducted over decades to address those evaporative losses.

The Menindee Lakes Project

In order to achieve evaporative savings, the Menindee Lakes Project Business Case (**Menindee Lakes Business Case**) proposes to operate Lake Menindee independently of Lake Cawndilla, and to draw it down much faster than it is currently operated. Lake Cawndilla would only be utilized in the wettest years, that is, approximately 30% of the time. To achieve this, infrastructure works are proposed to, amongst other things, install a regulating structure between Lake Menindee and Lake Cawndilla, and increase the channel outlet from Lake Menindee to the Darling River.¹⁰⁰

A pipeline has been constructed from the River Murray to address the reliance of Broken Hill on the Menindee Lakes as a water supply, and is addressed separately from the Menindee Lakes Business Case. The Menindee Lakes Business Case proposes compensating high security water entitlement holders to allow for their transition from permanent plantings to annual cropping, which is discussed further below. A reserve of 80 GL is proposed to supply other 'riparian demands', which would appear to be a reference to other water users on the Lower Darling, including the townships of Menindee and Pooncarie, and other stock and domestic users.¹⁰¹

Deficiencies identified by the MDBA

Serious deficiencies in the Menindee Lakes Project were identified by the MDBA in its Phase 2 analysis. That analysis identified several areas where detail was lacking with respect to the anticipated ecological benefits of the Menindee Lakes Project.¹⁰² However, it is not apparent from the Menindee Lakes Business Case where there is any discussion regarding such benefits. In a document that spans over 150 pages including appendices, barely four pages are devoted to a high level description of the ecology of the area — in non-compliance with the Phase 2 Business Case Guidelines. A short reference to ‘fish passage’ is made under the heading ‘Preliminary Project Costs and Benefits / Benefits’, before more detail is provided with respect to social and economic matters.¹⁰³

With respect to ecological risks, the MDBA analysis states that an ‘environmental impact statement (EIS) is required’, but nonetheless notes that this is not sufficient, as an EIS will likely focus on threatened species, rather than the ecology of the area as a whole. However, the MDBA analysis does indicate that the potential impacts from the Menindee Lakes Project do include the loss of over 8000 hectares of Golden Perch nursery habitat in Lake Cawndilla for over 65% of the time, and over 15 000 hectares of Golden Perch nursery habitat in Lake Menindee for over 20% of the time.¹⁰⁴

Finally, the MDBA analysis notes:

*The Menindee Lakes falls outside of the SDLAM framework for testing environmental equivalence. As such, any trade-off of environmental outcomes associated with generating water savings at Menindee Lakes will not contribute to lower environmental outcome scores using the Ecological Elements method and therefore is not taken into account in determining the adjustment volume. The business case states that a separate assessment of the local environmental needs has been commenced and further work will be necessary as part of the formal EIS process.*¹⁰⁵

Quite what that passage may presage is discussed further below. These deficiencies and other matters were raised by the Wentworth Group in its report on the MDBA analyses of the supply measure projects.¹⁰⁶

Finally, in its Draft Determination Report, the MDBA states that the New South Wales Government ‘acknowledges the need for consultation with communities and the need to set out transparent governance arrangements’.¹⁰⁷

Deficiencies identified by Jacobs

On 29 August 2018, a report entitled ‘Due Diligence on Menindee Lakes Business Case’ by Jacobs Group (Australia) Pty Limited (**Jacobs Report**) was released under the *Freedom of Information Act 1982* (Cth) by the DAWR. The Jacobs Report, dated October 2017, describes itself as a due diligence assessment ‘to inform the Commonwealth

assessment' of the Menindee Lakes Business Case. The DAWR is described as the client; it is not apparent whether the MDBA had access to the Jacobs Report prior to its draft determination dated 2 October 2017, nor whether it has had access to it following that date.

The conclusion of the Jacobs Report condemns the Menindee Lakes Business Case:

*In general, the business case does not present an organised, comprehensive, consistent or persuasive case for the project. It does not include all the elements that would be expected for a project of this type, and in some instances provides cursory consideration of key project issues.*¹⁰⁸

The Jacobs Report outlines numerous substantial deficiencies in the Menindee Lakes Business Case including the absence of a clear identification of the proposed works on a detailed map, a clear identification of their current and proposed ownership structure, and a detailed description of the proposed operating strategies. Insufficient consultation with respect to Aboriginal heritage is identified, including a failure to properly include the Barkandji people as the native title claimant group, and referring to the incorrect Aboriginal heritage process under New South Wales law. Significant environmental, social, economic and third party risks are identified by the Jacobs Report that the Menindee Lakes Business Case either does not comprehensively address or fails to include. The Menindee Lakes Business Case provides 'cursory regard to economic and social considerations'¹⁰⁹ and provides 'very little discussion' with respect to environmental benefits.¹¹⁰

Finally, the Jacobs Report refers to a 2016 report from the MDBA entitled 'Modelling of Menindee Water Saving Options Technical Report No. 2016/01',¹¹¹ on which the Menindee Lakes Business Case relies but to which it makes no reference. This 2016 report is not publicly available, nor has it been made available to the Commission. Given the wide range of technical reports to which access is readily granted on the MDBA website, it is not apparent why this particular report is not similarly freely available. It should be.

Consultation and community response

The MDBA's Phase 2 Assessment Guidelines for Supply and Constraint Measure Business Cases indicates that business cases will be assessed on the basis, amongst other matters, that:

- those materially affected have been consulted
- the consultation strategy will meet stakeholder expectations and respond to their concerns, and
- there is evidence of broad community support for the project.¹¹²

The consultation that has been conducted to date and as evidenced by the Menindee Lakes Business Case falls far short of these criteria. In contrast to the requirement that there be evidence of ‘broad community support’, the Commissioner heard evidence of widespread community concern and opposition over the Menindee Lakes Project. This was consistent with the sentiments expressed at a community consultation held by the Commission in Broken Hill on 25 May 2018.

The Commissioner heard evidence from a number of community members regarding the Menindee Lakes Project. Mr William ‘Badger’ Bates is an elder of the Barkandji Nation, and a member of the Barkandji native title claimant group for the area. Mr Robert and Mrs Katharine McBride operate a merino sheep, cattle and rangeland goat station on the Lower Darling. Ms Rachel Strachan and Mr Alan Whyte are irrigators on the Lower Darling, growing largely citrus and grapes, and are members of the Lower Darling Horticulture Group, comprising six family farms and formed in August 2014 for the purpose of negotiating with the New South Wales Government with respect to their high security water access entitlements.

Witnesses who gave evidence were plainly by no means satisfied that they had participated in useful consultation with either the MDBA or the New South Wales Government, nor did they consider they had received sufficient information to be properly informed about the Menindee Lakes Project.

The Commissioner heard evidence that consultation sessions were held at Pooncarie on 29 March 2017, Broken Hill on 30 March 2017 and again in Pooncarie in September 2017. Mr and Mrs McBride characterized the March 2017 sessions as ‘closed meetings called at short notice, with no formal invitation or information’.¹¹³ Ms Strachan explained the meeting in September 2017 was to discuss all 36 supply measure projects, rather than the Menindee Lakes Project specifically.¹¹⁴ More recently, a ‘Stakeholder Brief’ with respect to a ‘Lower Darling Options Analysis’ was conducted on 14 and 15 August 2018. Notice of that meeting was given to Mr and Mrs McBride merely one week earlier.¹¹⁵

In March 2017, meeting attendees were provided a six page summary document regarding the Menindee Lakes Project.¹¹⁶ The Menindee Lakes Business Case is dated June 2017, however it was only publicly released under compulsion in the Australian Senate a year later in June 2018. When Mr Whyte and Ms Strachan managed to obtain a copy of the document in August 2017, they were told by officials in September 2017 that it nonetheless couldn’t be officially released as it purportedly remained a confidential work in progress.¹¹⁷ Finally, a two page document outlining six purported options for the Lower Darling was provided to the community in August 2018. Mr McBride fairly described this document and the meeting as ‘insulting our intelligence’.¹¹⁸

Mr Bates understandably described the consultation approach of the MDBA and the New South Wales Government towards Aboriginal stakeholders as ‘fake consultation’.¹¹⁹ In particular, he described the general approach as characterized by short notice, with little to no documentation, and no feedback on the matters discussed. Further, Mr Bates

described this approach as ‘colour coded’; namely, that a decidedly different, and even less sufficient, approach has been afforded to Aboriginal stakeholders than to non-Aboriginal stakeholders.¹²⁰ This is demonstrated by the most recent meeting in August 2018. Whilst Mr and Mrs McBride were given one week’s notice of this meeting (itself obviously inadequate), Mr Bates became aware of the meeting only a day or two before.¹²¹

Based on what little information they were able to discern regarding the Menindee Lakes Project, the local community members remained substantially concerned about the project and its ramifications. Ms Strachan, in particular, expressed concern regarding the significant lack of detail regarding the proposed operating rules.¹²²

The Darling River below the Menindee Lakes recently experienced a significant ‘cease to flow’ event in 2015–16, and another such event in December 2018. In each case, temporary mud weirs called ‘block banks’ have been or are being constructed across the river to preserve small amounts of water. Mr and Mrs McBride impressively presented a passionate account of the significant effect that this water scarcity and low water quality has had on their livelihoods and their business.¹²³ Its weight is by no means lessened by the evident emotion: rather the emotion is well explained by the objective facts. Mr Whyte described the water quality as ‘muck’.¹²⁴ Whilst they have been told by government officials that these conditions are as a result of drought, Mr and Mrs McBride argued in their evidence that each of these ‘cease to flow’ events are a direct result of operational decisions on the Menindee Lakes, as each event followed significant drawdowns from those storages in 2013–14 and 2016–17, which results in an inability to provide subsequent maintenance flows down the Darling River from the severely depleted storages. Mr and Mrs McBride, together with Mr Whyte, each expressed the view that what appeared to be proposed under the Menindee Lakes Project was a continuation of this practice, which has had a disastrous effect on the Lower Darling.¹²⁵ The plight, and threatened fate, of the Lower Darling should be of great national social concern.

Other analyses

In August 2015, Mr Martin and Mr Turner noted that there was ‘insufficient information to quantify local and downstream [environmental] benefits’ and assigned the Menindee Lakes Project an overall ‘moderate’ confidence rating, although noting that it was ‘extremely likely’ that this confidence rating would be raised upon the submission of a business case.¹²⁶ No subsequent re-rating or additional report has been produced to test that prediction.

In her paper ‘Desperate Measures’, Ms Slattery argues that a SDL adjustment arising from the Menindee Lakes Project is unlawful because it fails to appropriately account for unimplemented policy measures in accordance with sec 7.15(1)(b)(ii) of the Basin Plan, and that it results in detrimental impacts on the reliability of supply of water that have not been offset or negated, contrary to sec 7.15(1)(d).¹²⁷

When asked to explain the basis for its satisfaction that the Menindee Lakes Project would achieve ‘equivalent environmental outcomes’, the South Australian Government stated that its satisfaction was, in part, based on:

*A requirement for further scientific work to better identify ecological objectives, environmental water requirements and ecological risks for the Menindee Lakes system as a result of the changed operating arrangements. Based on these outcomes and any associated project updates, an assessment of environmental equivalence can be undertaken, which will inform the reconciliation assessment.*¹²⁸

It is apparent from both the materials available to the Commission, and the submission of the South Australian Government, that no assessment of environmental equivalence has been conducted in respect of the Menindee Lakes Project. It simply will not do to anticipate favourable implications of scientific research yet to be conducted and considered.

In the absence of any environmental analysis conducted by the relevant government entities, the Commissioner heard unchallenged evidence of the serious environmental risks associated with the Menindee Lakes Project. Drawing on decades of waterbird research and surveys, Professor Richard Kingsford stated that he was ‘in no way convinced that what [he had] seen and read comes even close’ to the Menindee Lakes Project achieving equivalent environmental outcomes.¹²⁹

Analysis

The Menindee Lakes Project is a dispiriting instance of environmental infrastructure project planning. There is justified widespread community concern regarding its social, economic and environmental effects. Specifically, members of the Barkandji Nation voiced concerns about the effect the Menindee Lakes Project could have on their significant and substantial cultural heritage in the area. By contrast, the approach of the relevant officials to those concerns in particular, and to the concerns voiced by the broader community, has bordered on appearing to be indifferent, dismissive, and thereby disrespectful.

Genuine consultation demands that critical information such as the Menindee Lakes Business Case be made publicly available in a timely fashion. The delay in its public release until compelled by the Australian Senate demonstrates a serious lack of commitment to transparency. Aside from genuine commercial matters relevant to probity of future tender processes, which were masked in the version produced in the Senate, there is no respectable basis to support its asserted confidentiality.

It follows that there must be serious concerns as to the lawfulness of the Menindee Lakes Project as a supply measure under Chapter 7 of the Basin Plan. There is no basis, in the materials or the evidence before the Commissioner, to support a finding that the MDBA could have been satisfied that the Menindee Lakes Project achieves ‘equivalent environmental outcomes’ as compared with the benchmark environmental outcomes. On

the contrary, the Commissioner finds that no such analysis has been done, contrary to sec 7.17 of the Basin Plan.

As noted above, in its own analysis the MDBA states that the Menindee Lakes Project ‘falls outside the SDLAM framework for testing environmental equivalence’. If this is a suggestion that it was unnecessary to consider sec 7.15(1)(c) of the Basin Plan, it is plainly incorrect. There is no special exemption that applies to the Menindee Lakes Project that would preclude its consideration under that section.

If this is a suggestion that somehow the Menindee Lakes falls outside the ‘applicable method’ to calculate environmental equivalence as outlined in Sched 6 of the Basin Plan, this is also plainly incorrect. Clause S6.03 plainly demonstrates the use of indicator sites that include the Menindee Lakes,¹³⁰ and explicitly includes the Menindee Lakes in the regions to be used in subcl (3). In the MDBA analysis, there is reference to the Ecological Elements method, and it appears to be asserted that this method cannot be used to test environmental equivalence. However, there is nothing in the relevant report that would support such an assertion.¹³¹ On the contrary, by way of example, the section of that report dealing with waterbirds understandably draws heavily on the research of Professor Kingsford; research which is based, in part, on observations and assessments of waterbirds within the Menindee Lakes.

Instead, the only explanation for this sentence is that, for some reason, the method utilized by the MDBA does not appropriately include assessments for the environmental impacts on the Menindee Lakes. As Dr Theresa Heneker explained, the ‘ecological factors for the site hadn’t been defined appropriately’. Dr Heneker further explained that this ‘needs to happen’.¹³² With respect, it needed to happen before, not after, a determination was made under sec 7.10.

The answer provided by the DAWR to question 113 on notice, posed by Senator Rex Patrick in the Australian Senate Supplementary budget estimates hearings and in response to questions regarding the Menindee Lakes Project, states that ‘[T]he projects act in synergy with each other, and are inter-dependent. It is not possible or appropriate to disentangle the effects of a single project from the combined effect of the remaining 35 projects’.¹³³ Notwithstanding the fact that the adjustment volume is calculated on the basis of the total package of projects, given the analysis outlined in this chapter and the range of ecological issues raised by the MDBA itself in other analyses, this response by the DAWR over-simplifies the position with respect to the Menindee Lakes Project and appears to avoid engaging with the substantive criticisms and concerns that arise from this project. Further, the Commissioner fails to see how it can be asserted that the Menindee Lakes Project will act in ‘synergy’ with other supply measures. There is nothing about the Menindee Lakes Project that interacts with or relates to other supply measures that would justify the use of the word ‘synergy’. This assertion has more in common with pseudoscience than actual science.

If, contrary to the conclusions reached above, the Menindee Lakes somehow do not require environmental equivalence analysis and demonstration, so much the worse for the Basin Plan. It would be a radical fiction completely alien to the core purposes and processes of the Water Act.

Finally, the Commissioner finds that, had any assessment of environmental equivalence been conducted by the MDBA, based on the evidence and materials available, including those of Professor Kingsford, the MDBA could not have been satisfied of that criterion under sec 7.15.

The ecological concerns regarding the Menindee Lakes Project are amplified by the recent, highly concerning, reports of algal blooms and mass fish deaths on the Lower Darling. Recent commentary, including from witnesses who gave evidence to this Commission, casts doubt that drought conditions alone are a cause, and asserts that current operations of the Menindee Lakes have contributed to present conditions.¹³⁴ In particular, these events illustrate and warn of the very adverse environmental outcomes threatened by a combination of setting the SDL too high, and too readily adjusting it, thereby reducing recovery flows for the environment. These events also demonstrate the clear need to foster resilience in Basin water resources, through their management, particularly in the face of the reality of drought and given the increasingly severe climatic conditions.

The alarmingly complacent response by a New South Wales Government spokesperson to these events, namely that the current conditions would be used to ‘learn more about our native fish and improve management’, is wholly inadequate.¹³⁵ It could scarcely offer comfort to the general public nor provide any assurance to the scientific community that their concerns are being heard.

Insofar as he admits that increased development, non-compliance upstream and current operations ‘play a role’, Mr Phillip Glyde, Chief Executive of the MDBA, pays at least lip service to some of the concerns that have been repeatedly raised by the scientific community.¹³⁶ However, Mr Glyde’s assertion that two of the objectives of the Menindee Lakes Project are to improve reliability of low flows on the Lower Darling and support the role of the Menindee Lakes in fish breeding is, having regard to the above, blatantly misleading.¹³⁷ It appears to be nothing but a vain and unworthy attempt at diverting scrutiny, where a properly resourced, scientifically-based analysis of the Menindee Lakes Project, and the current operating rules on which it is based, is urgently required and is in the national interest.

Case study: Hydro-cues

Another important supply measure project is the Hydro-cues Project, which is estimated to contribute approximately 200 GL of the 605 GL adjustment.¹³⁸

The Productivity Commission notes that given the complex issues that need to be resolved, the likelihood of the Hydro-cues Project being fully operational by 2024 is low.¹³⁹ The Commissioner agrees with that assessment. Further, whilst as a concept the Hydro-cues Project appears meritorious, the Commissioner nonetheless is concerned that, rather than being appropriately considered a supply measure, it is, in fact, properly characterized as a PPM or ‘unimplemented policy measure’ within the meaning of sec 7.15 of the Basin Plan.

The Hydro-cues Project

The Hydro-cues Project is a joint supply measure submitted by Victoria, New South Wales and South Australia. It aims to coordinate decision-making of environmental water managers and river operations managers with hydrological cues. The primary method of doing so involves the coordination of regulated releases from storages to coincide with natural flows caused by rainfall. In other words, environmental water managers will be able to ‘top up’ natural flows with appropriately timed releases from storages to achieve greater environmental outcomes than would otherwise occur.

As the Enhanced Environmental Water Delivery Business Case (**Hydro-cues Business Case**) itself notes, the concept of ‘topping up’ natural flows is not new, and has already been the subject of prior trials throughout the Basin. However, as Dr Heneker explained, the Hydro-cues Project represents a ‘step change in river management’, where improvements in environmental water management allow the timing and release of environmental water, during both regulated and unregulated flows, according to hydrological inputs, to achieve better ecological outcomes.¹⁴⁰ For example, releases may be timed so as to promote particular breeding events in fish or waterbirds, or to provide water according to different climatic signals. The Hydro-cues Business Case and its addendum suggests that the project represents an advancement of river operations that would otherwise occur in 15–20 years, in a timeframe of six years.¹⁴¹

Ecological outcomes

The ecological outcomes described in the Hydro-cues Business Case are expressed in broad, qualitative rather than quantitative, terms. It explains that ‘better environmental outcomes’ will be achieved, including, amongst other matters, ‘triggers for fish movement and breeding, low level floodplain vegetation condition and recruitment, movement of carbon and nutrients to/from the river channel, and connectivity for biota’.¹⁴²

This level of generality is not surprising. The project appears to be relatively early in its development, with a significant number of dependencies discussed below. The very nature of the project encompasses a level of unpredictability, as its operation is largely dependent on natural variations and conditions. This is not necessarily a criticism; on the contrary, this level of flexibility and adaptation to the inherent variability of the Basin,

including the variations produced by long and short-term climatic conditions, is to be commended.

However, when the ecological outcomes are expressed at such a high level of generality, it leads to a degree of scepticism as to how such general matters can realistically and appropriately be considered in the ‘default method’ prescribed by sec 7.15 and Sched 6 of the Basin Plan. When that method is applied to an infrastructure project such as a regulator, specific environmental outcomes arising from flow rates and inundation scenarios can readily be applied in the relevant modelling exercise to generate assessable scores. However, no such data of sufficient specificity seems possible with respect to the Hydro-cues Project.

Risks and dependencies

The Hydro-cues Business Case expressly admits that the project is a ‘relatively high risk proposal’.¹⁴³ Section 2.5 outlines what are designated ‘critical dependencies’, which are additional projects and measures that are to be ‘progressed independent[ly]’ from the Hydro-cues Project.¹⁴⁴ Those critical dependencies are identified as the implementation of six constraints measure projects, the implementation of PPMs, the implementation of other supply measure projects, and annual environmental watering trials.

Of these critical dependencies, the most concerning appears to be the implementation of the constraints measure projects. As a risk, a failure to implement the constraints measures is assessed as ‘possible’, and having a major consequence for the Hydro-cues Project, with an initial risk of high, which is downgraded to moderate after mitigation strategies are implemented. Having regard to the discussion in Chapter 8, the Commissioner considers that the constraints measures will almost certainly not be implemented by 2024, such that the ‘residual risk’ to the Hydro-cues Project remains high.

However, as explained by Dr Heneker, it should be noted that whilst the implementation of the constraints measures is listed as a critical dependency, the Hydro-cues Project could still be partially implemented without physical constraints being removed.¹⁴⁵ For example, the Hydro-cues Project could allow for the release of environmental water to supplement a natural flow, but not to the extent that the flows would flood areas which are not yet the subject of, say, flood easements; which Dr Heneker described as ‘high events’.¹⁴⁶

Pre-requisite Policy Measures

Ms Slattery submitted that, insofar as the Hydro-cues Project proposes to ‘top up’ or ‘piggy-back’ natural, or unregulated, flows with held environmental water from storages, it is effectively a PPM within the meaning of sec 7.15 and thereby cannot be notified as a supply measure under sec 7.12(3)(b).¹⁴⁷ Through a combination of oral evidence and

subsequent submission,¹⁴⁸ the Commissioner was greatly assisted by the response to this proposition given by the South Australian Government.

The South Australian Government explains that the benchmark model incorporated an assumption that environmental releases could be called upon during natural flows, and protected as environmental water, based on previous trials. As an example, during 2010–11 held environmental water was released from Hume Dam, used first in the Barmah-Millewa Forest and then protected from extraction until its entry into the Lower Lakes and Coorong. The South Australian Government explains that this required ad hoc changes to practices on the part of the river operators.

By contrast, the South Australian Government submits that the implementation of the Hydro-cues Project is a ‘step change in river management over and above the scale envisaged’ by the PPMs in the benchmark model. It is submitted that the PPMs ‘allow river operators to undertake specific actions while the [Hydro-cues Project] will help define when and where those actions should occur’.¹⁴⁹ Dr Heneker clarified that PPMs provide the ‘framework’ for the Hydro-cues Project to operate in.

However, three matters can be noted with respect to this submission. First, the distinction made by the South Australian Government is not one that finds support in the Basin Plan; the definition in sec 7.15 is, like many in the Basin Plan, too broadly and vaguely expressed. Second, the characterization of PPMs providing the ‘framework’ is difficult to understand in terms of modelling. In order for a model to incorporate such a ‘framework’, it would be necessary for that model to assume that the framework will be used. A variable that is not used no longer becomes a variable, and is, instead, a nullity. Third, it is therefore implicit that some ‘top up’ measures that may otherwise be considered within the scope of the Hydro-cues Project would nonetheless be part of the PPMs in sec 7.15. In those circumstances, Ms Slattery’s submission may well be correct that the Hydro-cues Project cannot be considered as a supply measure. However, concluding so is presently impossible, as the MDBA has not made its modelling available, even to the South Australian Government. If that has been so by accident, it is regrettable; if deliberately, deplorable.

Analysis

There is considerable merit in Basin States implementing measures such as those envisaged by the Hydro-cues Project. So long as they are directed at the achievement of beneficial environmental outcomes, properly timed and coordinated releases from storages in conjunction with natural flows can be regarded as appropriate examples of adaptively managing the Basin’s water resources. None of the evidence heard by the Commissioner contradicts such an assessment. However, it is highly likely, to the point of being virtually certain, that the Hydro-cues Project will not be implemented to its fullest extent, dependent as it is on the implementation of constraints measure projects.

Further, there are still unanswered questions as to what extent the proposed increase in the SDL attributed to the implementation of the Hydro-cues Project is overstated, such that it should otherwise be considered as part of the benchmark model as an ‘anticipated measure’. Unless and until a transparent and open assessment is provided, this critical concern remains unaddressed. As such, it constitutes a serious systemic failure in this aspect of the Basin Plan.

Engagement with the public

As outlined above, the Commissioner heard evidence regarding the wholly inadequate consultation process conducted to date with respect to the Menindee Lakes Project. There has been an overall absence of disclosure and meaningful public consultation throughout the SDLAM process. At the time of the publication of the Draft Determination Report, only generalized and limited information was publicly available about the supply measures said to justify it. No detail was given regarding the projects, the risks that were identified, nor the nature of the conditional approval by the BOC. Only one month was afforded to the public for comment. Overall, this approach concealed from the public the risks involved with the MDBA’s determination, and prevented a fully informed public debate as to the overall merits of the SDLAM. This failure to engage in genuine and transparent consultation has generated substantial mistrust on the part of Basin communities toward the MDBA and the supply measure projects generally.

Documentary information

Published information

As indicated above, the MDBA published the Draft Determination Report on 2 October 2017. It is brief and vague in its explanation, and practically devoid of any detail on which to assess the MDBA’s decision.

Contemporaneously with the Draft Determination Report, the MDBA published a report outlining the benchmark conditions of development (**Benchmark Model Report**),¹⁵⁰ briefly mentioned above, along with a modelling report (**SDLAM Model Report**).¹⁵¹

Whilst the publication of detailed technical reports of this kind is to be commended, their utility is considerably circumscribed when additional information or materials are not similarly made publicly available. Each of these reports is replete with references to materials that provide little enlightenment to the reader, as those materials are not publicly available. For example, the Benchmark Model Report refers to decisions made by various bodies such as the SDLAAC and the BOC.¹⁵² Aside from some assistance provided by the South Australian Government regarding the broad membership and functions of the BOC and the SDLAAC, details of the specific decision-making processes remain a mystery, as

no materials or documents regarding such processes are publicly available. The SDLAM Model Report refers to model run numbers¹⁵³ in circumstances where the models are not available, even to the Basin States.

It is therefore unsurprising that not one of the expert witnesses who gave evidence before the Commissioner, many of whom were highly critical of the SDLAM, referred the Commissioner to either the Benchmark Model Report or the SDLAM Model Report. It is perhaps possible that these reports provide assistance to persons within the MDBA, with access to the relevant explanatory and background material, but even to the most expert of outside readers, they provide little in the way of assistance.

Business cases

Aspects of the requisite detail that would have been of assistance when assessing the MDBA's determination were found in the business cases for the supply measure projects. However, neither as at the date of the publication of the Draft Determination Report on 2 October 2017, nor as at the close of the MDBA's public consultation, were the business cases provided. On request, the South Australian Government was the only Basin State to provide business cases on the projects for which they were solely responsible to the Wentworth Group, on a confidential basis, for expert analysis. However, inconsistently, the South Australian Government repeatedly refused similar requests by waterbird expert, A/Professor Paton, for access to the SEFRP business case.¹⁵⁴

Ultimately, it took the compulsive processes of an order for production in the Senate in June 2018 for the business cases to be widely published.

The Commissioner has neither heard in evidence, nor read in the materials tendered, any satisfactory explanation for the failure to disclose the business cases at the time when the general public was invited to comment on the Draft Determination Report. The South Australian Government proffered the explanation that the business cases were 'developed for the purpose of securing funding rather than public communication', that they contained 'commercial-in-confidence' information such as estimates for project costs in advance of tender processes, and finally explained that:

*Projects can undergo significant changes during the due diligence process and as such, the information contained in the business case, if made public, can cause greater public confusion and consternation.*¹⁵⁵

These explanations are quite unacceptable. First, it is a misleading characterization of the purpose of the business cases to purely describe them as a funding proposal. The 'business' is governmental, not privately financial. The processes outlined above clearly require the business cases to contain significant detail about supply measures, including anticipated ecological outcomes and risks. They inform the assessment of a substantial decision-making process in the implementation of the Basin Plan, including

the expenditure of up to \$1.3 billion, and it is clearly in the public interest that they be publicly available to inform the consultation process.

Second, insofar as any business case does legitimately contain commercially sensitive information such as costs proposals for the purposes of assessing tender processes, then this information can readily be, and was eventually, redacted in the publicly released version.

Third, to say that the documents may be technical in nature is no basis for refusing public access. Highly technical documents are routinely the subject of public disclosure and inspection in many areas of government decision-making. In any event, it would often be salutary for so-called technical documents to be critiqued by ordinary users of English who vote and pay taxes.

Finally, the submission that the disclosure of the business cases can cause ‘confusion and consternation’, implying that the public is incapable of recognizing the basic proposition that a significant infrastructure project may develop over time, is alarmingly condescending. The failure to disclose the business cases of, or any detailed information about, the supply measure projects has been a primary contributor to the ‘confusion and consternation’ amongst Basin communities. As Ms Emma Bradbury, Chief Executive of the Murray Darling Association, explained:

*communities are being expected to accept projects and outcomes for which they have no knowledge, they have no technical detail provided to them before the consultation process occurs.*¹⁵⁶

BOC and MDBA analysis of business cases

Similarly, the analyses of the MDBA remained secret until their production in the Senate in March 2018. These reveal the range of concerns referred to earlier, and are essential to informing the public debate regarding the merits of the supply measure projects, as the Wentworth Group’s subsequent analysis demonstrates. No explanation, satisfactory or otherwise, has been provided for why these analyses were not made public. The attitude of the MDBA manifested by this secrecy reduces any confidence in the organization’s aptitude for its vital public tasks, under its present management.

The analysis by the BOC or the SDLAAC remains entirely secret. As discussed above, the approval of supply measure projects by the BOC was apparently conditional on the resolution of certain issues and risks identified during the assessment process. These conditions have purportedly been documented in an internal register; however, this register is not public.

Equally concerning is that the Draft Determination Report not only fails to recognize the conditional nature of that approval, it implies that the Basin States’ approval was largely unconditional. It blandly asserts that the Basin States are confident the projects

‘will get results’,¹⁵⁷ and vaguely states that the Basin States have ‘specified actions which the proponent/s would need to undertake in project refinement, design and implementation, including risk mitigation’.¹⁵⁸

Whilst the MDBA has belatedly published a list of generalized ‘issues to be resolved’ on its website with respect to each project in early 2018,¹⁵⁹ this is clearly no substitute for proper, timely, and full disclosure in the public interest.

Consultation

Prior to publicly announcing the 605 GL adjustment, the MDBA undertook some targeted consultation with relevant experts. For example, Dr Anne Jensen recalled in evidence her attendance at an MDBA Briefing for SA Conservation Groups on 23 August 2017. However, Dr Jensen described the event as little more than an opportunity for the MDBA to announce its decision. It was not a consultative discussion that permitted scrutiny of the MDBA’s proposal.¹⁶⁰

There probably is a wider culture in Canberra that mandates the Commonwealth should always hold back information for as long as the law permits, and also should provide as brief a period of public consultation as the law permits: the familiar and cynical treatment of maxima as minima and vice versa. As a wider culture, it is to be deprecated. In the case of the MDBA’s practice of it, it is counter-productive.

The MDBA then sought public feedback on its Draft Determination during a one-month period, thereby taking the statute’s minimum prescription of 30 days’ consultation as the maximum afforded in practice. The Commissioner heard from multiple witnesses that this was an insufficient period of time to provide meaningful feedback on such a consequential proposal.

The Murray Lower Darling Rivers Indigenous Nations (**MLDRIN**) submitted that Aboriginal groups had not received sufficient opportunity to learn about and provide their views on the SDLAM. MLDRIN was provided with approximately one week’s notice for a series of targeted workshops; a timeframe that was wholly inadequate to mobilize community involvement or allow a thorough consideration of the complex projects. The MDBA offered to provide funding to MLDRIN to facilitate workshops themselves, however, only one month was given to design them, engage facilitators and undertake the consultation and prepare submissions. A request for a two-week extension was denied.¹⁶¹ The Commissioner agrees with MLDRIN’s assessment that this deprived First Nations of an opportunity to provide their informed views not only on individual projects, but on the system-wide impacts of a 605 GL reduction in recovery.

The Murray Darling Association submitted that it is usually necessary to provide a minimum of six weeks for local governments to meaningfully participate in a consultation process.¹⁶²

The fact that a longer timeframe is critical for meaningful consultation is perhaps illustrated most effectively by the striking lone example in the evidence before the Commissioner of successful consultation on a supply measure project, discussed below.

For those reasons, the Commissioner considers the one-month consultation period was insufficient for meaningful consultation on the SDLAM.

Meaningful and successful consultation

Mr Chris Bagley, a dryland farmer located north-west of Lake Alexandrina in South Australia gave evidence regarding the consultation conducted with respect to the SEFRP. In conducting consultation with respect to this supply measure project, the relevant South Australian department utilized a pre-existing consultative body, known as the Community Advisory Panel (CAP). The CAP was originally established for the purposes of consultation for Commonwealth-funded projects during the Millennium Drought, but was continued by the South Australian Government beyond that purpose from 2016. In addition to the primary discussion being barrage management, the South Australian Government facilitated consultation on the SEFRP with the CAP for approximately 18 months.

Mr Bagley described the project team as making a ‘particular effort’ to attend those meetings. In stark contrast to the witnesses describing the consultation surrounding the Menindee Lakes, when asked whether he had any concerns about the level of information provided by the government regarding the SEFRP, Mr Bagley responded:

On the contrary, I think they did an outstanding job. Anecdotally, land-holders in the southeast are a pretty feisty lot. That project could have brought on World War 3. The project managers made a great effort to keep community involvement productive, and good communication flows and their representations at CAP, I believe, were a part of that.¹⁶³

Whilst this is the evidence of one community member, the notable absence of submissions made to this Commission with any contrary views regarding the consultation process — leaving aside the ecological concerns discussed above — suggests that the consultation process with respect to the SEFRP was far more successful than that conducted elsewhere, such as with respect to the Menindee Lakes Project. It is readily evident that a significant contribution to that success is the effort expended by government officials, together with the length of time afforded to consultation.

MDBA response to public feedback

The MDBA published a report in December 2017 titled ‘Summary of Public Feedback’, in which it acknowledged that ‘the timeframe for consultation’ was short, that there was a need to embed better consultation processes,¹⁶⁴ and that ‘communities

have every right to understand the impacts of the projects and that, to date, there has been limited detailed information available for all supply projects'.¹⁶⁵

Whilst these broad, generic statements are unfortunately correct, the absence of any actual and immediate remedial response, such as the immediate publication of information and materials prior to the making of the decision, shows a depressing tendency to disrespect Basin communities and stakeholders.

Furthermore, where the public feedback identified concerns with specific projects, the MDBA's response was to simply note that it 'has captured this information ... and will provide this information to the Basin State governments responsible for the projects'.¹⁶⁶ Nothing by way of a substantive clarification or explanation of those critical issues was provided.

The need for increased transparency appears to have been recognized, albeit belatedly, by the MinCo, which has recently committed to a program of regular reporting about supply measure implementation, discussed below.

Reconciliation

The consistent refrain from the Basin States, the Commonwealth and the MDBA regarding criticisms about the viability and uncertainty of supply measure projects has been to refer such critics to the reconciliation process contemplated by sec 7.11 of the Basin Plan (**the Reconciliation**). For example, Mr Ben Bruce described the Reconciliation as providing 'some degree of comfort' if 'these projects do fail'.¹⁶⁷ Similarly, in a media statement published on 3 May 2018, the MDBA claimed:

*If the projects do not deliver the expected benefits, there is a safety net built into the Plan — a legislated reconciliation process in 2024 to make up any shortfall, so the environment cannot be short-changed.*¹⁶⁸

As a result, therefore, the legitimacy of the SDLAM, and its application to produce a reduction of 605 GL in environmental water recovery, necessarily depends on the Reconciliation's capacity to correct any errors or uncertainties in the original determination, accurately reflect any altered designs or effect of supply measures, and confidently evaluate whether environmental equivalence has been achieved. The Commissioner heard evidence and has had regard to materials that raise really substantial concerns about the likely efficacy of the Reconciliation to achieve these worthy aims.

Method of reconciliation

As noted above, the MDBA appears to have considerable discretion whether to implement the Reconciliation. A Reconciliation is dependent on an assessment by the MDBA that it would 'appear' that a new determination would produce a different result

from the original determination. It is to be hoped that no-one would seek to evade that matter appearing to be so, by not undertaking the study and thought by which that might occur. This Commission is not so confident on the basis of the current MDBA management that this hope will be realized.

Importantly, if it does so appear to the MDBA, any new determination would need to abide by the requirements of subsec 21(4) of the Water Act, including the application of the best available scientific information.

Section 7.11(1)(a) requires the Authority to make a determination in the Reconciliation using the same process as outlined in sec 7.10 for the original determination. This incorporates the default method prescribed in sec 7.15, and the applicable criteria prescribed in sec 7.17, which is picked up by sec 7.21.

However, a ‘Process Review’ dated May 2018 recommended that the Reconciliation should take into account multiple lines of evidence, as opposed to an isolated application of hardwired numbers in a model. The reasoning behind such a recommendation is twofold. First, the range of ecological benefits or risks may differ if they are derived from a different mix of supply measure project contributions. Second, any assessment of equivalent environmental outcomes must be informed by comprehensive monitoring and evaluation of real project outcomes and risks that go beyond the relatively narrow Ecological Elements method.¹⁶⁹ The Commissioner agrees with that recommendation and its underlying reasoning. There is, however, no indication what position the MDBA has with respect to this recommendation.

In any event, the Reconciliation will necessarily involve some degree of projection. In this regard, the MDBA’s submission that the Reconciliation will enable it to ‘consider actual against anticipated contributions and adjust relevant SDLs accordingly’¹⁷⁰ does not entirely accurately reflect the actual complete process.

Some supply measure projects are already in operation. If all goes according to the anticipated timelines, some will have experienced only one or two years of operation from which to assess their actual impacts. Many others are not anticipated, even according to the overly optimistic timelines, to be constructed or fully implemented until the end of 2023, or early 2024. This is true for complex and significant projects like the Menindee Lakes Project and the Hydro-cues Project.

Many experts agreed, even when supply measure projects are constructed and in operation, an assessment over a long period of time would be necessary to determine whether they are capable of achieving their intended outcomes. The phenomena in question do not lend themselves to overnight transformation. As such, the modelling or observation of unimplemented or very new supply measures in 2024 will be limited in its ability to inform whether environmental equivalency has been, or is likely to be, achieved.

Possible consequences of a reconciliation

The understood effect of the SDLAM is that water recovery can be partially paused. As a result of its application, 605 GL of water entitlements that would have otherwise been recovered can supposedly remain for consumptive use — at least until 2024 when the Reconciliation, if properly applied, will revisit whether the supply measures can achieve environmental outcomes equivalent to that amount of water recovery, and re-adjust accordingly.

Having regard to the above matters, it is conceivable, and perhaps likely, that a proper application of the Reconciliation will warrant an adjustment much lower than 605 GL; that is, the recovery of some portion of that 605 GL from consumptive users. This is particularly conceivable where some projects are highly unlikely to be even implemented, but could also arise out of circumstances where projects need to be redesigned or their implementation altered. In that event, a potentially large volume of water would need to be recovered in a short space of time. That recovery could be achieved by revising SDLs in Water Resource Plans, or through the Commonwealth purchasing additional entitlements.

However, it is readily apparent from the history of the Basin Plan to date that, should any shortfall be uncovered as a result of the proper application of the Reconciliation, any attempt to recover it will be met with significant opposition.

In this regard, the praise that peak irrigator bodies such as the National Irrigators' Council and the NSW Irrigators' Council have for the SDLAM is somewhat muted with respect to the Reconciliation. Mr Steve Whan of the National Irrigators' Council gave frank evidence that he remained hopeful that it would be unnecessary to recover any shortfall, and expressed a hope that some supply measure projects may even over achieve.¹⁷¹ Whilst such optimism is refreshing, having regard to the matters discussed above, the Commissioner does not share it. In a submission to the Productivity Commission, the Riverina and Murray Joint Organisation, which represents 11 Basin Councils in New South Wales, expressed much more stringent opposition, submitting that it:

*opposes any suggestion that failure to deliver Supply Measure projects by the deadline date may require Governments to make good the shortfall through further water recovery. Any additional water recovery from basin communities would certainly aggravate the adverse impacts which have been experienced to date.*¹⁷²

The community unease regarding the prospect of a sudden unknown additional amount of water recovery in 2024 is well and truly understandable. The 'pause' created by the SDLAM, together with the uncertainty surrounding the supply measure projects, has produced a major uncertainty about the status of the SDL after June 2024. It creates the prospect of a significant step change in the SDL at that point, and a major disruption to water markets. This can hardly be said to represent an optimisation of social and economic outcomes, nor provide the degree of certainty that Basin communities justifiably prefer.

The South Australian Government has indicated that the prospect of a Reconciliation will become obvious well before 2024, and has submitted that Basin States can take steps to intervene in failing projects or mitigate their shortcomings in other ways. Mr Bruce explained in evidence that it is intended that the BOC will receive regular updates on the progress of supply measure projects.¹⁷³ In its subsequent submission, the South Australian Government further elaborated that a separate ‘Adjustment Implementation Committee’ had been established for that purpose, and the progress of supply measure projects will be subject to regular annual reporting requirements that begin in 2019.¹⁷⁴

The Commissioner enthusiastically commends an approach that envisages comprehensive, consistent and constant monitoring of the potential outcomes and risks of supply measure projects, and consequently an approach that facilitates a flexible approach to the SDL. Such a flexible approach would arguably be more consistent with the obligation on the MDBA to act on the best available scientific information. Of course, such an approach would need to be balanced with the important policy of ensuring a certain level of consistency and stability in the consumptive use of water resources. However, this is the challenge of any comprehensive, evidence-based and long-term administration of the highly variable water resources of the Basin. It is the essence of adaptive management, a concept with motherhood status in relation to the Basin’s water resources.

Analysis

The SDLAM is a critical component of the Basin Plan. Its application has resulted in a substantial reduction in the water to be recovered for the environment. That reduction has occurred through the application of poor public policy, applied contrary to the requirements of the Water Act, in order to fulfil a political compromise reached during the sometimes unedifying negotiation of the Basin Plan.

The MDBA, the Basin States and the Commonwealth have achieved this political compromise in circumstances that pose a substantial risk of further environmental degradation, and on the basis of a crippled scientific approach. The SDLAM has been applied in a manner that can fairly be described as the opposite of open, transparent and accountable government decision-making, with a clearly deficient approach to community consultation, and in the face of sustained criticism and concern by informed members of the public and the scientific community.

Inconsistency with the Water Act

For the reasons discussed in Chapter 5, the Commissioner considers that the original SDL, giving rise to a recovery amount of 2750 GL, does not reflect an ESLT, contrary to the requirement in subsec 23(1) of the Act. Any amended SDL, incorporating a reduction of that recovery amount of 605 GL, must necessarily also fail to reflect an

ESLT, contrary to that same requirement. To avoid any doubt, this requirement is made clear in para 23A(3)(b).

However, even on the assumption that the original SDL did reflect an ESLT consistent with subsec 23(1), the adjusted SDL arising from the application of the SDLAM nonetheless remains inconsistent with the Water Act. The adjusted SDL is based on assumptions and projected outcomes said to arise from a package of supply measure projects that have not been completed. An increased SDL that takes into account apparently environmentally equivalent outcomes said to arise from a supply measure project not yet completed simply cannot reflect an ESLT unless and until that supply measure project is complete and actually achieves those equivalent outcomes. To proceed otherwise is to proceed on the basis of a legal fiction. Worse, the fiction concerns the state of the Basin environment, which is a real state of affairs, at the heart of the Water Act.

Accordingly, to the extent that it takes into account increases attributable to supply measure projects that are not yet complete and operational, the amended SDL is inconsistent with the requirements of the Water Act and is unlawful. To the extent that sec 7.20(2) apparently permits the calculation of a SDL that takes into account projected outcomes, that section is also inconsistent with the requirements of the Water Act and beyond power.

A calibrated and incremental approach to water recovery is consistent with achieving the environmental objectives of the Water Act, whilst optimising social and economic outcomes. This accords with the compelling force of the arguments in this vein explained by Mr Bruce in his helpful and measured evidence.

However, acceptance of that argument must necessarily be qualified. First, as outlined above, utilizing the SDLAM, together with the Reconciliation in 2024, to facilitate such an incremental approach to water recovery is not permitted under the current provisions of the Water Act. The only manner in which the Water Act permits such an approach is through the use of temporary diversion limits as envisaged by sec 22, item 7 and sec 24 of the Water Act. Ultimately, the MDBA and the Basin States did not utilize those provisions.

Second, insofar as Mr Bruce argued that any potential delay attributed to the implementation of the Reconciliation after five years is not material from an ecological point of view,¹⁷⁵ that must be considered in light of the scientific evidence heard by the Commissioner which has stressed the urgent need for ecological response in many parts of the Basin, especially Ramsar sites like the Coorong, to protect against further ecological degradation.

Decision-making and scientific basis

On 3 May 2018, the MDBA issued a media release publicly arguing against a disallowance of the Amending Instrument in the Australian Senate. The appropriateness or otherwise of an independent statutory authority commenting on political matters

contested in Parliament is beyond the scope of this discussion. Relevantly for present purposes, however, the MDBA stated that it:

*stands by the amendments to the Basin Plan, which it recommended based on a rigorous, CSIRO-approved methodology, independently reviewed and verified, and in accordance with the requirements set down in the Basin Plan in 2012.*¹⁷⁶

However, given the scale and significance of the concerns heard in evidence and received in documentary form, it is to be wondered how the MDBA could genuinely hold such a view. The statement is another reason to query the capacity of the MDBA as currently managed to capably perform its statutory functions.

Having regard to the business cases generally, and to the Menindee Lakes Business Case specifically, it cannot reasonably be argued that the criteria set out for Phase 2 were satisfied. No reasonable decision-maker could be satisfied that all the supply measure projects demonstrated that they would be designed and implemented by 30 June 2024, that the ecological objectives and targets had been clearly articulated and supported by evidence, and that all significant risks had been identified, analysed, and robust mitigation strategies proposed. Certainly, no person claiming that character was heard (or read) to say so. By contrast, consider the MDBA's media release. The most recent answers by the MDBA to questions on notice posed by Senator Rex Patrick in the Australian Senate Supplementary budget estimates hearings provide little further insight, and do not alter this finding, nor any other findings made in this chapter.

Indeed, it would appear that the BOC has expressly accepted that these criteria could not be met. The South Australian Government explained the purportedly conditional approval given 'in many cases'.¹⁷⁷ However, no 'conditional approval process' is envisaged in any of the stages of development for supply measure projects. Near enough is not good enough — and maybe, maybe not is definitely not a yes.

Further, of particular concern is the approach apparently taken to the satisfaction of criteria expressly prescribed by the Basin Plan. Section 7.17(2)(a) requires the MDBA to be satisfied that the supply contributions achieve environmental equivalency. However, the South Australian Government revealed that the Menindee Lakes Project was approved on the view that it was merely capable (scilicet might or might not be capable) of achieving environmental equivalency, on the basis that further scientific work can be undertaken to assess the ecological outcomes of the supply measure.

The assertion in the media release that the processes undertaken by the MDBA have utilized a 'rigorous, CSIRO-approved methodology' displays an idiosyncratic use of the term 'rigorous'. It fails to acknowledge the substantial qualifications in the Ecological Elements Report, including that it is 'a highly simplified hydro-ecological model', that 'will not adequately represent species or responses at a fine scale' and is 'not intended for site-scale planning or assessment of works and measures scenarios'.¹⁷⁸

The media release's bland assertion that the SDLAM has been the subject of independent review might be thought by the unwary to imply that no substantial issues were identified. However, the observations made by the Expert Advisory Panel in September 2017 regarding poor resources, a reactionary environment and a philosophy of 'making do', leaving the management of environmental watering in the Basin open to confusion, error and potential abuse,¹⁷⁹ are highly critical, deeply concerning, and left unanswered by the MDBA.

Accountability and community consultation

The over-defensive approach of the MDBA to community consultation and accountability is illustrated by the following passage in the media release: 'It is disappointing that the culmination of years of progress and world-leading water reform in our country may be put at risk by ill-informed and unsubstantiated claims'.¹⁸⁰

But the approach taken by the MDBA to the provision of critical, detailed information to inform the public generally, and the scientific community specifically, has itself been unsatisfactory. Key materials, in the form of business cases, analyses, decision-making registers were, or still are, kept confidential from the public. Included amongst the MDBA's statutory functions is to 'disseminate information about the Basin water resources, and water-dependent ecosystems, to the extent that the [MDBA] considers it desirable to do so'.¹⁸¹ That the MDBA apparently did not consider it desirable to disseminate key information about one of the most significant decision-making processes under the Basin Plan presents serious concerns about the felt mission of the MDBA to appropriately fulfil its functions under the Water Act.

In those circumstances, perhaps the Chief Executive of the MDBA should have been less ready to criticize members of the public and the scientific community for making apparently 'ill-informed and unsubstantiated claims'.

Many expert witnesses gave evidence to the Commissioner about their frustrations arising from repeated queries about MDBA processes and decision-making that went largely unanswered. It is surprising that experts of the professional calibre of those who gave evidence before the Commission were not routinely involved by means of public or scientific consultation in such complex ecological planning decisions.

Conclusion

The SDLAM is the result of a political compromise. This, alone, would be no cause for concern, if it were applied consistently with the Water Act and in a manner that achieved its objects and purposes. It is, after all, an important act of government.

However, the SDLAM has most likely delayed the chances of achieving the Basin Plan's intended environmental outcomes by at least five years. Those outcomes, insofar

as they depended on the additional 605 GL to be recovered in 2019, now cannot be achieved unless and until the supply measures are fully and environmentally successfully implemented as envisaged by 2024. A delay in bringing about the circumstances necessary to achieve environmental outcomes is calculated to result in a commensurate delay in the possibility of achieving those same outcomes. At the least, it will result in diminution of necessary improvements to environmental outcomes during that period.

This approach is hardly consistent with the targets prescribed in Sched 7 of the Basin Plan, which require ‘no degradation’ before 2019 and ‘improvements’ after 2019. Instead, the SDLAM intrinsically contemplates the possibility of some degradation for the next five years, which is intended to be rectified at the Reconciliation in 2024. Worse, that would undoubtedly be a most unfortunate disruption to the legitimate planning and hopes of consumptive users, especially irrigators.

It is evident, therefore, that the prospective nature of the SDLAM is its fatal flaw. It removes the requirement to recover water for the environment in many cases years in advance of even knowing whether the projects said to justify that removal will even come into existence, be effective, or provide equivalent environmental outcomes. As a result, the SDLAM takes the risk of recovering less water for the environment than the best available scientific knowledge states is necessary, in the hope that equivalent environmental outcomes will eventually be achieved in the future. It is a gamble that is wholly contrary to the objects and purposes of the Water Act. It compromises the core environmental values at stake.

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8 Constraints

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Introduction

There has been minimal progress made in easing or removing constraints since the introduction of the Constraints Management Strategy 2013 to 2024¹ (**CMS**), published in November 2013.

The ability to progress the CMS is hampered by a range of factors, in particular the lack of much progress in negotiations with affected floodplain landholders. It is understood that there remain thousands more negotiations to conclude with appropriate agreements if all current constraints measures are to be implemented by 2024. The lack of progress suggests that if that timeframe is to be met, it will be necessary to reconsider the current commitment to a wholly voluntary approach, and to consider alternatives, including legislated compulsory processes, coupled with a transparent, liberal and proactive approach to compensation.

The solid prospect of the requisite constraints measures not being operational by 2024 is of great concern.

Implementation of the constraints measures is one of two avenues by which enhanced environmental outcomes are to be achieved under the *Water Act 2007* (Cth) (**Water Act**), pursuant to subsec 86AA(3). Without addressing² constraints, enhanced environmental outcomes will not be realized.³

Although the phrase ‘enhanced environmental outcomes’ may colloquially suggest merely desirable or aspirational further beneficial outcomes, there are in fact serious and significant consequences to the overall health and sustainability of the Murray-Darling Basin (**Basin**), and the ecological systems that rely upon it, arising from a failure to achieve those outcomes (see further discussion in Chapters 9 and 13).

The significance of constraints in the context of the Basin is summarized as follows by the South Australian Government:

The SDL is delivered in the adjustment mechanism as a three-element package that includes measures that adjust the SDLs along with measures to manage constraints.⁴

...

The third element is the development and prioritisation of constraints measures to address the physical, operational and management constraints that are affecting or have the potential to affect environmental water delivery.⁵

...

Constraints measures are uniquely placed as part of the SDL Adjustment Mechanism as they work across both supply and efficiency measures. Constraints as supply measures directly contribute to the 605 ggalitres supply offset as works and measures will allow environmental water be used more efficiently and reach greater areas of the floodplain. Managing constraints also increases the capacity of river

*managers to maximise use of the additional 450 gigalitres from efficiency measures to contribute to enhanced environmental outcomes. However, as noted, the 450 gigalitres will enhance environmental outcomes without constraints measures.*⁶

Accordingly, not only is addressing constraints important to successfully achieving the enhanced environmental outcomes, it will also permit the intended benefits from the Enhanced Environmental Water Delivery SDL Adjustment Proposal (**Hydro-cues**) to be realized. The importance of the successful implementation of constraints measures to the success of Hydro-cues is such that it is correctly dubbed a ‘critical dependency’.⁷ This matter is discussed in further detail in Chapter 7.

Concerns regarding the implications of a failure to address constraints is exacerbated by evidence that even if a total of 3200 GL of environmental water is recovered, such an amount may likely be insufficient to achieve the enhanced environmental outcomes set out in the Water Act. A failure to address constraints is calculated to render such concerns more acute.

The Productivity Commission’s draft finding is surely correct in opining that it is ‘highly ambitious, if not unrealistic’ to think that constraints measures will be fully operational by 2024.⁸ If anything, that view is a polite understatement. With such minimal progress since 2013, there can presently be little (if any) confidence that that deadline will be met, as envisaged in the CMS. The Basin States and the Commonwealth have recently agreed to establish an ‘Adjustment Implementation Committee’ to support, among other things, the delivery of constraints measures.⁹ It remains to be seen whether that Committee will assist in overcoming the current shortfall in progress.

The Productivity Commission cogently states in its draft report that:

*The enhanced environmental outcomes are dependent on progress in easing or removing constraints. However, these constraint projects are unlikely to be fully operational by 2024 and may not deliver the full range of anticipated constraint easing. If constraints are not eased, rushing to recover the full 450 GL by 2024 would risk the Australian Government spending hundreds of millions of dollars for an asset that potentially cannot be used for some time — if at all.*¹⁰

The submission by the South Australian Government to the Commissioner that ‘[t]he overall constraints program remains on track for the longer-term implementation timeframe of completion in 2024’¹¹ appears overly optimistic at best. There is nowhere near enough track record to justify that projection.

Notwithstanding that addressing constraints critically underpins the ability to achieve the enhanced environmental outcomes, for the reasons discussed below it remains unknown how the Murray-Darling Basin Authority (**MDBA**) has taken constraints into account for the purpose of the modelling of a sustainable diversion limit (**SDL**) that reflects an environmentally sustainable level of take (**ESLT**).

However, the Department of Agriculture and Water Resources (**DAWR**) has submitted to the Commissioner that ‘only some of the environmental benefits associated with recovering more water are dependent on relaxing constraints’.¹² That somewhat defensive suggestion does not remove the criticality of constraints easing or removal (see subpara 86AA(2)(h)(ii) of the Water Act) to many and probably most of the mooted enhanced environmental benefits — and thus to the whole package of those benefits.

Accordingly:

- The Basin Plan in its current form (which includes the CMS) is highly unlikely to achieve the enhanced environmental outcomes.
- A fundamental flaw and significant impediment to implementing the proposed constraints measures is the current piecemeal approach to negotiating easements and agreements with affected landholders on a voluntary basis.
- It is open to Australian governments to consider legislating an easement in gross in favour of those who manage constraints pursuant to the CMS. Any such approach should be pursued on just terms with respect to compensation to affected landholders. Those terms should be respectfully, carefully and liberally designed, and honoured openly and promptly.
- Genuine consultation is essential throughout this process. This requires better and more accessible information provided to affected landholders in order for them to properly understand proposed constraints measures and their potential impacts. Such information should also assist landholders to share the relatively untapped benefit of their local knowledge and understanding, in order to assist with the development and implementation of constraints measures, and thus to improve relevant business cases associated with the key focus areas.

Constraints — legislative context

During the development of the Basin Plan and in the context of the MDBA providing a revised draft Basin Plan to the Murray-Darling Basin Ministerial Council (**MinCo**) pursuant to sec 43A of the Water Act, the relaxation of constraints was explored as a means of potentially achieving additional environmental benefits.¹³

Mr Craig Knowles AM, then Chair of the MDBA, provided the revised Basin Plan to the MinCo by letter dated 28 May 2012, raising two specific issues on which different approaches had been advocated in submissions from Basin States. One concerned the SDL Adjustment Mechanism (**SDLAM**) and how a SDL may be amended in response to ‘work underway by governments to improve river operating rules, new infrastructure to water key sites more efficiently, and addressing some of the key physical constraints to achieving environmental flows’, without a need to then also amend the Basin Plan.¹⁴

By notice pursuant to subsec 43A(4) of the Water Act dated 9 July 2012 from the MinCo to the MDBA, the MinCo jointly requested the development of a constraints management strategy in consultation with Basin governments, and that the MDBA report annually on progress to the MinCo.¹⁵

Separate notices in response to the draft proposed Basin Plan were given by Basin States to the former Minister, Mr Tony Burke, then Chair of the MinCo. Additional matters of note were raised by the Basin States as follows:

- In response to third party impacts arising from delivery of environmental water (presumably untimely or excessive flooding of private property), ‘NSW seeks the Basin Plan to set in place mechanisms whereby third party impacts will be avoided from occurring to the greatest extent possible’.¹⁶ This is repeated in Victoria’s notice.¹⁷
- ‘Constraints alone are not a valid reason for failing to recover the volume of water that is required to achieve a healthy sustainable Basin or for reducing the proposed water recovery volume when not all the environmental water requirements are being met. System constraints limiting the delivery of environmental water must be identified and addressed as a matter of the highest priority ...’.¹⁸
- The South Australian Government’s ‘submission contains an extensive discussion and list of recommendations regarding the rationale and importance of addressing system constraints. This need to address constraints is also supported by the MDBA’s own work’.¹⁹
- ‘The Commonwealth Government must invest in addressing key system constraints, including purchasing flood easements, as an important step to improve environmental water delivery’.²⁰

Following the process laid out in secs 43A and 44 of the Water Act, the Minister ultimately adopted the Basin Plan on 22 November 2012, including a requirement that a CMS be prepared.

The *Water Amendment (Water for the Environment Special Account) Act 2013* (Cth) was passed on 15 February 2013 and introduced Part 2AA of the Water Act. That amendment established the Water for the Environment Special Account (**WESA**), part of the object of which was to fund projects that assist in the easing of constraints.

Constraints must be addressed together with the recovery of the additional 450 GL of environmental water in order to achieve enhanced environmental outcomes provided for in the Water Act (subsecs 86AA(1) and (2)). In particular, subsec 86AA(3) provides:

The object of this Part is to be achieved by:

(a) easing or removing constraints on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin; and

(b) increasing the volume of the Basin water resources that is available for environmental use by 450 gigalitres.

Section 7.08 of the Basin Plan sets out the requirements for the MDBA to prepare a constraints management strategy within 12 months after the commencement of the Basin Plan, and also sets out requirements for the MDBA to publish annual progress reports. Section 7.08(1) requires the MDBA to prepare a constraints management strategy that:

(a) identifies and describes the physical, operational and management constraints that are affecting, or have the potential to affect, environmental water delivery; and

(b) assists all jurisdictions to participate in constraint measures in order to allow environmental water to be used to maximum effect and to maximise the benefits of any increase in held environmental water; and

(c) evaluates options, opportunities and risks to water users, communities and the environment, associated with addressing key constraints, including through constraint measures that are relevant to measures that might be notified under section 7.12; and

(d) assesses the impacts of modifications of constraints on environmental water delivery and third parties, as well as downstream impacts, and assesses options to address those impacts; and

(e) identifies mechanisms by which impacts on third parties can be addressed.

Consistent with the Water Act, sec 7.09(e) of the Basin Plan recognizes that the easing or removal of constraints and the 450 GL of additional water recovery are required in order to achieve the enhanced environmental outcomes set out in Sched 5 of the Water Act.

Section 86AD of the Water Act establishes the WESA, part of the object of which is to fund projects that assist in the easing of constraints.

Section 86AJ of the Water Act requires the Minister to cause two independent reviews as to the use of funds from the WESA and provides the Minister the power to require any such review to consider any matter relating to the broad objects of Part 2AA of the Water Act.

In 2013, the Basin States and the Commonwealth agreed to the Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin.

In November 2013, the MDBA published the CMS, applicable from 2013 to 2024.²¹

What are constraints in the system?

Over time the regulation and consumptive use of water from the Basin has significantly altered the flow regime of the Basin. For over 100 years, infrastructure and management of the Basin has been developed in support of navigation (in bygone times for commercial transport purposes, nowadays available for recreation, both private and commercial), and most importantly for consumptive use (predominantly agricultural industries, townships and cities).²²

The MDBA has described constraints as ‘river management practices and structures that govern the volume and timing of regulated water delivery through the river system’.²³

In the Water Act and Basin Plan constraints are addressed in the context of looking to achieve better and more efficient delivery of environmental water to the environmental assets of the Basin, in order to enhance the environmental outcomes achieved under the Basin Plan.²⁴ In particular, achieving the environmental outcomes set out in Sched 5 of the Basin Plan relies on constraints being addressed.²⁵ Accordingly, from the perspective of managing environmental water, constraints can be either physical or non-physical (policy) limitations on the delivery of environmental water.

Physical constraints on the capacity to deliver environmental water include infrastructure like dams and water storages, weirs, regulators and bridges in that, for example, high water may damage them. They may also be naturally occurring physical limitations on the volume of flow in the Basin.²⁶

For example, as part of the Yarrowonga Weir to Wakool Junction reach (which is one of the seven key focus areas of the CMS), the River Murray flows west from Yarrowonga through Tocumwal to near Mathoura where it meets the Barmah Choke.²⁷ The Barmah Choke is recognized as a significant physical constraint on River Murray flows, insofar as, by virtue of its narrowed width, it restricts the ability, particularly during high flow events, for large volumes of water to flow quickly through and downstream.²⁸ Given the significance of the Barmah-Millewa Forest as the ‘largest complex of tree-dominated wetlands in southern Australia’, occasional (and timely) over-bank flow is important to maintaining the health and habitat of the forest and floodplain region. The timing and volume of those over-bank flows are key. They inherently give rise to conflicts.

The demands on water use and of irrigation have resulted in a reversal of the seasons — over-bank flows are least desirable for the forest/floodplain during the summer months (mid-December to end April), just when the downstream irrigation demands are the highest. Conversely, over-bank flooding is most favourable for the forest in winter/spring, at a time when lesser volumes are required downstream for irrigation.²⁹

In the case of the Barmah Choke, the CMS has identified no plans to alter the Barmah Choke itself,³⁰ but rather it appears that to overcome this constraint the proposed Yarrowonga to Wakool Junction constraint measure proposes to deliver significant

volumes of water through a network of irrigation channels and escapes to bypass the capacity restrictions of the Barmah Choke.³¹

Constraints can also include practices and operations by which the Basin's rivers and dams are managed, such as when and how much water is delivered for consumptive uses to townships, cities and farms. These practices are found in policies, procedures, and protocols created pursuant to legislation, regulations, intergovernmental agreements, water resource plans, river operating manuals and procedures and guidelines, and may include unwritten practices.³² For example, many of these practices and operations have been developed to favour consumptive use without consideration for environmental watering, or planned environmental watering, and fail to account for natural cues and seasonal variability.³³ As stated by Ms Maryanne Slattery, former Director of Water Policy at the MDBA (now with the Australia Institute):

Australian rivers are episodic and are among the most variable in the world. Modern agriculture and urban developments want regular water supply, so for more than 100 years, our rivers have been increasingly regulated to manage variability. Almost every aspect of regulation — dams, weirs, legislation, water licences, allocation policies, etc. — are part of a framework to remove that variability, so water is available when humans need it.

The Australian ecology evolved in response to water variability and environmental watering aims to reinstate some of that natural variability. But importantly, governments have committed to achieving this within the regulatory framework designed to remove variability in the first place.³⁴

In July 2013, the MDBA published a technical report titled 'Preliminary Overview of Constraints to Environmental Water Delivery in the Murray-Darling Basin'³⁵ (**Technical Report**). The Technical Report provided a review of existing constraints within the Basin and identified a non-exhaustive list of constraints to the delivery of environmental water. In particular the Technical Report identified the main known physical constraints in each valley which had a direct impact on achieving enhanced environmental outcomes, and which were considered important to address in order to achieve Basin-scale and local outcomes.³⁶

The Technical Report identified seven key focus areas, among other areas, which include: Hume to Yarrawonga (Upper Murray); below Yarrawonga to Wakool Junction (Mid-Murray); Goulburn; Murrumbidgee; Lower Darling; Gwydir; and South Australia (Lower Murray) (**seven key focus areas**), forming the basis for the focus of the CMS.³⁷

The seven key focus areas are reflected in the CMS and characterized 'as first order constraints – not at the exclusion of other areas or structures, but those most worthy of further investigation in the first instance'.³⁸ Except for South Australia (Lower Murray), the other six key focus areas are considered to primarily involve physical constraints which inhibit the achievement of enhanced environmental outcomes. On the other hand, South

Australia (Lower Murray) is said to be included as a key focus area because ‘changes to flow regime through the delivery of environmental water may have implications that require further investigation to understand issues and determine if mitigation options are needed’.³⁹ In particular, it is recognized in the CMS that ‘[r]egulated flows of up to 80,000 ML/day in the River Murray at the SA border have significant environmental, cultural and social benefits’.⁴⁰

MDBA’s modelling scenario of 3200 GL of environmental water recovery was the only scenario in which the environmental flow target of 80 000 ML/day for 30 days in the River Murray at the South Australian border was achieved.⁴¹ In this regard, the South Australian Department of Environment, Water and Natural Resources found that:

Overall, it is considered that the relaxation of constraints in combination with 3200 GL of water recovery provides the greatest opportunity and flexibility to deliver environmental watering events to South Australia’s mid-level floodplain.

*For the CLLMM site, the 3200 GL water recovery volume has the greatest impact on reducing the risks of ecological degradation.*⁴²

Constraints and modelling

As discussed in Chapter 4, the Guide to the proposed Basin Plan (**the Guide**) explains that, in relation to the modelling undertaken to propose a range from ‘high uncertainty’ to ‘low uncertainty’ for a SDL reflecting an ESLT, the MDBA relied upon the following approach:

*MDBA is undertaking modelling and other analysis to verify that this end-of-system flow approach provides an aggregate environmental water share that aligns with the specific estimates of environmental water requirements for key environmental assets and key ecosystem functions, and that these environmental water requirements can be implemented within operational constraints. This verification will continue through the public consultation period, but modelling to date has shown that the approach is consistent with the specific estimates of environmental water requirements, and that there are no insurmountable operational issues.*⁴³

The Guide provides that in setting SDLs the MDBA focussed on ‘three critical matters’, one of which included taking account of the Basin’s physical constraints, hydrologic characteristics, and inter-dependencies of each catchment.⁴⁴

The MDBA subsequently reported that in determining the ESLT, and then the SDL in the proposed Basin Plan, it was informed by modelling based on the indicator site method, which took into account ‘the specific ecological targets and flow requirements for indicator sites, and opportunities and constraints for environmental water delivery’ — see further discussion in Chapter 5.⁴⁵

In 2012, the MDBA completed modelling of the effect of addressing eight key physical constraints in the Southern Basin.⁴⁶ The MDBA undertook this modelling at the request of the MinCo on 29 June 2012, which sought a complete ‘relaxed-constraints’ model scenario with a SDL that reflected a 3200 GL recovery amount.⁴⁷ It is also noteworthy that this likely arose from the submission by the South Australian Government made in April 2012 in response to the draft Basin Plan, in which submission the South Australian Government called precisely for such modelling to be undertaken.⁴⁸

The MDBA noted that with constraints, a 3200 GL recovery amount:

... showed marginal improvements in some outcomes; but no significant improvement for mid- and high-level floodplain environments in the southern Basin. This was because river operating constraints were found to limit the ability to deliver sufficiently high flows to inundate mid- to high-elevation floodplains; thus outcomes such as watering vegetation communities like river red gum and black box woodland on these floodplains was unachievable, regardless of the SDL volume.⁴⁹

In modelling a 3200 GL recovery amount with constraints addressed, the MDBA found that there would be sufficient increased environmental water to water approximately 75% of the wetland and dominant vegetation communities of the floodplain in the southern connected system.⁵⁰ In particular, MDBA modelling based on the recovery of 3200 GL of environmental water with constraints addressed, states that it would achieve the following benefits:

- *improvements in the health and resilience of flood-dependent vegetation*
- *recharged floodplain groundwater systems*
- *flushing of salt from the landscape*
- *improvements in the lateral connectivity and nutrient and carbon exchange between the floodplain and river to support fundamental ecosystem functions ...*
- *larger areas of native vegetation and floodplain ecosystems would benefit (such as river red gum, black box woodland and lignum shrublands) especially in the Lower Murray.⁵¹*

The MDBA asserts that whilst the 2750 GL recovery amount can be delivered within the current physical constraints,⁵² the CMS is about investigating how more can be achieved with the available water through the relaxing or removal of key constraints, in a way that avoids or addresses impacts on third parties, thereby optimising environmental, social and economic benefits.⁵³

Indeed it is understood that, for example, in the River Murray, the easing and/or removal of constraints:

... could allow for improved environmental watering for between 111,000 to 194,000 hectares of floodplain vegetation. In addition to environmental benefits, constraints

measures can assist in the management of minor flood impacts for landholders, including improving access during high flows.

There are also anticipated enhanced recreational and tourism opportunities associated with the restored health of the channel, backwaters, anabranches, wetlands and floodplains.⁵⁴

Following modelling of a 3200 GL recovery amount with constraints addressed, the MDBA concluded that such a scenario would achieve 17 out of 18 flow indicators along the River Murray (compared to 11 out of 18 with a 2800 GL recovery amount with constraints addressed).⁵⁵

In relation to the MDBA's findings regarding the 3200 GL scenarios, the South Australian Government's submission to the Commissioner notes that, irrespective of whether constraints are addressed, a 3200 GL water recovery results in a greater potential to protect and restore the health of the Coorong, Lower Lakes and Murray Mouth.⁵⁶

In the CMS, the SDL is said to be determined based on existing physical characteristics and river operations in the Basin.⁵⁷

The MDBA noted that the initial 'end-of-system flow' approach used to inform the Guide was undertaken while 'the more comprehensive modelling of environmental water requirements was still underway',⁵⁸ and asserted that the approach contained several significant weaknesses, including that it was not sensitive to potential flow delivery constraints and opportunities to deliver environmental water efficiently.⁵⁹ The MDBA statements suggest that, along with the change in approach to the modelling from the 'end-of-system flow' analysis in the Guide to an 'indicator site method' in the Basin Plan (which is said to be a 'a more robust analysis'),⁶⁰ the ability to factor constraints into the modelling that informed the method for determining the ESLT and SDL contributed to a significant difference in the water recovery ranges proposed as between the Guide and the Basin Plan.

In particular, the MDBA has recently submitted to the Commission that the indicator site method:

incorporated the environmental watering requirements of a number of well-known indicator sites across the Basin. In contrast to earlier work, the more extensive modelling undertaken with this work assumed that the environmental water portfolio would be actively managed to maximise environmental outcomes.⁶¹

Accordingly, it appears that in both the earlier 'end-of-flow analysis' modelling undertaken for the Guide, and the 'indicator site method' modelling undertaken for the Basin Plan, constraints were taken into account, and the method of modelling improved. This suggests that in theory, one possible or partial explanation of the difference between

the proposed recovery amounts found in the Guide and then in the Basin Plan may be due to some change in modelling itself or the way in which constraints have been modelled.

Modelling itself cannot explain the difference

However, evidence given to the Commission suggests a change in modelling cannot in itself explain the significant difference between the proposed water recovery range found in the Guide and a recovery amount of 2750 GL.

As discussed in Chapter 5, the Commissioner heard evidence from Mr Andrew Close, an experienced modeller, who advised that, from a modelling perspective, he was unable to explain the discrepancy in the recovery range recommended in the Guide of 3900 GL (at high uncertainty) and 7000 GL (at low uncertainty), and the recovery amount of 2750 GL under the Basin Plan:

THE COMMISSIONER: It means, as the explanation you've heard quoted today suggests, the only other integer that might have produced such a large decrement would be the modelling.

MR CLOSE: Well, the modelling hasn't changed enough to cause that difference, no.

THE COMMISSIONER: Did you not have an opinion at the time about this very large change following publication of the Guide?

MR CLOSE: I did. And I believe it's a response to the political ruckus that... produced.

THE COMMISSIONER: So, as a modeller and as somebody familiar with the integrity of your colleagues, I take it you didn't then and you don't now believe that there was a technical modelling change that justified that drop?

MR CLOSE: No.

THE COMMISSIONER: You agree with me?

MR CLOSE: I agree with you.⁶²

Questions regarding modelling of constraints

Further, the Commissioner has also received evidence from eminent scientists who confirm that it remains unknown how, as a matter of science, constraints have been modelled.

Chapter 5 discusses Dr Matthew Colloff's role in, and evidence regarding the Multiple Benefits Report produced in March 2012 (**Multiple Benefits Report**).⁶³ Dr Colloff raised considerable concerns about the MDBA's modelling, as a result of his involvement in the Multiple Benefits Report.

Specifically, Dr Colloff commented in evidence regarding discrepancies between his draft and the final version of the Multiple Benefits Report in the context of constraints. In particular, Dr Colloff was referred to a key finding that:

*Nevertheless, higher elevations of River Murray floodplains see little improvement in flood inundation under the 2800 scenario because of constraints to providing large flood discharges.*⁶⁴

Dr Colloff confirmed that the above passage had not been in his draft copy of the Multiple Benefits Report.⁶⁵ He did not add that proposition to the final draft report, and believed it was included without his knowledge. Dr Colloff believed the information on constraints was likely inserted by the MDBA.⁶⁶ He stated:

*the Murray-Darling Basin Authority had consistently been invoking constraints as a reason for differences between our modelling outputs and theirs. I would have cause to consider that the most likely alteration of that text was made in (sic) by Murray-Darling Basin Authority.*⁶⁷

In relation to environmental targets concerning flow, contrary to the MDBA's results, the CSIRO found such targets were not met.⁶⁸ When Dr Colloff sought to understand this difference, the MDBA merely asserted to the CSIRO that the MDBA's results were correct because the MDBA 'factored in constraints' without providing any further explanation or details to support the assertion or show how constraints were factored in.⁶⁹

Dr Colloff specifically pressed the MDBA for information concerning how it incorporated issues concerning constraints into its modelling.⁷⁰ However, Dr Colloff was not provided with sufficient details for him to either understand or use the MDBA's hydrological modelling.⁷¹

Dr Colloff's overriding impression from the MDBA was that 'they treated all constraints as not up for discussion ... as far as we were concerned, that was knowledge that they had, it was their business, and that we shouldn't question their judgement on that'.⁷² While such an obdurate refusal of scientific collaboration by a publicly funded statutory agency properly arouses shock, such conduct is not uncharacteristic of the MDBA historically and currently.

It therefore remains unknown how the MDBA accounted for constraints in its hydrological modelling.⁷³ Further, a change in the modelling method cannot, of itself, explain the difference between the recovery amounts set out in the Guide and the recovery amount of 2750 GL.

The Productivity Commission noted in its draft report that the Commonwealth and the Basin States should 'undertake further modelling to establish the benefits of additional water recovery with the current suite of constraints proposals'.⁷⁴ It stated:

The extent to which the lower flow rates in current constraints proposals will affect the ability of river operators to deliver additional water to key sites (and achieve the Schedule 5 outcomes) is unknown, because the MDBA has not updated its modelling to account for these and other developments since 2012.⁷⁵

How are constraints eased or removed?

In November 2013, the MDBA published the CMS.

The CMS provides a 10-year plan by which Basin States, the Commonwealth and communities will address constraints in the Basin through the development of projects. The CMS envisages that there will be ‘many opportunities’ for interested people to participate in the scoping and development of specific projects that may be pursued under the CMS.⁷⁶

The CMS is intended to deliver the relaxation of constraints over three phases. The first phase, ‘pre-feasibility’ was intended to conclude by the end of 2014. The second phase, ‘feasibility’ was intended to conclude by June 2016. The third phase, ‘implementation’ was intended to commence from July 2016 and conclude in 2024.⁷⁷ All agreed constraints projects must be achieved or be in operation by 2024.

In addition to setting out those three phases, the CMS identified priority actions to be undertaken in 2014 for each of the seven key focus areas. The focus areas were identified in the earlier Technical Report. It is understood that, in consultation with various State water agencies, the MDBA identified these areas because it was believed that the easing or removal of constraints in these areas would provide the greatest environmental outcomes for the Basin as a whole.⁷⁸

The priority actions relate to non-physical constraints.⁷⁹ It appears that such priorities are to be determined in part on the basis that constraints projects will be assessed for their overall benefits and those which have local, regional and Basin-scale benefits will be given highest priority and so on.⁸⁰ Another criterion against which priorities are to be determined is based on a recognition that some constraints rely on other constraints being addressed first. This is particularly so, for example, where there may be minimal benefit derived from easing a constraint downstream unless a constraint upstream is addressed.⁸¹

Supply measures being pursued as part of the SDLAM under the Basin Plan, including those relating specifically to constraints, are not caught by the CMS.⁸² A more detailed discussion of constraints measures which have also been nominated as supply measures appears in Chapter 7.

Initially the Commonwealth Government ‘allocated \$200 million to relax or remove priority constraints in the context of the SDL adjustment mechanism’.⁸³ From an MDBA estimation of \$220 million in 2014, the Productivity Commission expressed the view in its

draft report that the cost of easing constraints in six key focus areas in the Southern Basin would be between \$509 and \$629 million.⁸⁴ The DAWR is responsible for implementing the efficiency measures program and administering funding from the WESA. The Commonwealth Environmental Water Holder is responsible for managing environmental water recovered by the Commonwealth towards the environmental outcomes set out in Sched 5 of the Water Act. The Productivity Commission rightly identified the potential for constraints measures to access two separate streams of funding and the risks this poses.⁸⁵

In a practical sense, physical constraints are addressed by, for example, removing physical barriers (such as increasing the height of bridges), building levees to protect land or roads from inundation, and (at present) negotiating easements and agreements with relevant landholders whose land will be flooded as a result of easing or removing constraints.

When undertaking modelling of the 3200 GL scenario with constraints addressed, the MDBA noted, for example, that the types of actions that ought to be investigated in addressing constraints included:

- *obtaining flood easements*
- *upgrading access infrastructure (roads, bridges)*
- *enhancing flood mitigation works (e.g. levees)*
- *increasing outlet capacity for some dams.*⁸⁶

Importantly, the premise on which the CMS is pursued includes these desiderata:

- *recognise and respect the property rights of landholders and water entitlement holders*
- *not create any new risks to the reliability of entitlements*
- *be identified in consultation with affected parties to determine if impacts can be appropriately addressed and mitigated to enable changes to proceed*
- *identify and aim to achieve net positive impacts wherever possible*
- *be worked through in a fair and transparent/equitable way*
- *work within the boundaries defined by the Water Act, the Basin Plan, and relevant State water access and planning systems.*⁸⁷

The CMS identifies the roles and responsibilities of the Commonwealth and the Basin States. According to the CMS, the Basin States are largely responsible for developing relevant constraints projects, which projects will be considered by the MinCo on advice from the Basin Officials Committee. Any ultimate decision to fund a constraints project is determined by the Commonwealth.⁸⁸

In 2014, further analysis and consultation was undertaken with respect to the seven key focus areas, with the MinCo agreeing to progress the development of business cases for those areas.⁸⁹ In 2015, Basin States and the MDBA developed business cases for constraints projects for the consideration of the MinCo in mid-2016.⁹⁰ In August 2015, the MinCo noted that constraints projects offer the potential as ‘supply measures’.⁹¹ In April 2016, the MinCo agreed to nominate six out of the seven key focus areas for constraints as ‘supply measures’ as well, which six included Goulburn, Lower Darling, Murrumbidgee, Hume to Yarrawonga, Yarrawonga to Wakool Junction and the Lower Murray (South Australia) (with Gwydir remaining a constraints measure only).⁹²

However, the MDBA’s submission to the Productivity Commission in May 2018 stated that five constraints measures have been approved as part of the SDL adjustment supply measure package, namely: Hume to Yarrawonga, Yarrawonga to Wakool Junction, Murrumbidgee, Lower Darling, and the Lower Murray (South Australia).⁹³ The MDBA submission to the Productivity Commission confirmed that constraints in the Gwydir will be considered as part of the toolkit measures and that the Goulburn area was proposed as a constraint proposal and is not part of the supply measure package.⁹⁴ This is also consistent with the South Australian Government’s submission to the Commission.⁹⁵

As at the time of writing, the most recent annual progress report on the CMS published by the MDBA appears to be the 2016 Constraints Management Strategy Annual Progress Report.⁹⁶ Contrary to the requirements of sec 7.08(3) of the Basin Plan, there does not appear to be an available annual progress report for 2017.⁹⁷

Non-physical constraints (ie operational and management constraints) will be addressed as part of the SDLAM, through the constraints supply measures that have been approved.⁹⁸ It is noted that an initial assessment of the implementation plans for the pre-requisite policy measures (**PPMs**) ‘indicates the policies are at differing stages of progression in the states and the River Murray’,⁹⁹ but all relevant States have indicated a commitment to have the policies implemented by 2019.¹⁰⁰

The Constraints Management Strategy Annual Progress Report 2016 concludes that the next steps in addressing physical constraints will include further assessment of each proposal against the ‘Phase 2 Assessment Guidelines for Supply and Constraint Measure Business Cases’, established under the Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin.¹⁰¹ Additionally, constraints measures nominated as supply measures were to be assessed by the MDBA pursuant to Chapter 7 of the Basin Plan.¹⁰² As for the non-physical constraints, it was noted that assessment of the PPM implementation plans prepared by Basin States were expected to be finalized in 2017.¹⁰³

As at August 2018, the Productivity Commission noted in its draft report that the Yarrawonga to Wakool Junction, Murrumbidgee, Hume to Yarrawonga, Lower Darling, and the River Murray in South Australia constraints measures were still in ‘concept design’ stage.¹⁰⁴

Impediments to easing or removing constraints

In order to protect and recover the ecosystem, it is necessary for floodplains to be flooded from time to time.¹⁰⁵ However, the timing and duration of the flooding are key factors in determining whether the flooding ultimately has detrimental or beneficial environmental outcomes.¹⁰⁶

The impact of easing or removing constraints created by landowners, farmers, and communities living and working on floodplains can include restricted accessibility, damage to agricultural land, bank erosion, damage to levees and irrigation pump damage.¹⁰⁷ That is, the constraint is essentially an understandable reluctance to flood those areas (speaking generally), and addressing the constraint therefore entails resultant flooding.

There are also recognized benefits from easing or removing constraints which result in improved biodiversity and maximising benefits from environmental watering,¹⁰⁸ including through improved native pasture productivity and possibly increased tourism, fishing and recreational fishing activities.¹⁰⁹ Professor Bruce Thom AM of the Wentworth Group of Concerned Scientists (**Wentworth Group**) noted this as the ‘floodplain paradox’.¹¹⁰

There is a range of factors that have hampered the progress of the CMS and addressing constraints. These reasons may be broadly grouped in terms of technical, social and legal. In particular, the legal impediments and the consequent reliance in the CMS on negotiated easements are the most significant challenges to the approach to date, leading to the looming delays in addressing constraints.

Technical impediments

In order to effectively deliver on the CMS and achieve the enhanced environmental outcomes, there remains an imperative to ensure a coordinated approach to delivering the constraints measures, including as between the States, on account of the very nature of a connected river system.

For example, in order to achieve the enhanced environmental outcomes for floodplains, including the target at the Riverland-Chowilla floodplain of 80 000 ML/day for 30 days in the River Murray at the South Australian border, significant upstream flows from four major river reaches, Upper Murray, Goulburn, Murrumbidgee, and Darling, will be required.¹¹¹

The Commissioner heard evidence from Ms Jan Beer, a farmer from the Goulburn Valley, who also observed the issue of inter-dependence in the context of the Goulburn constraints measure and business case. She spoke of:

the theory of constraints, whereby whatever obstruction is preventing the system from achieving a higher output is removed, in reality, when applied to river systems

and the vagaries of nature simply cannot work due to the hundreds of constraints within each key focus area, which are all interdependent not only in their own area and river system, but on all downstream systems as well.¹¹²

In the context of considering the inter-dependency and connectivity of the Basin river systems when addressing constraints, it is also necessary to grapple with the various river operation regimes across jurisdictions which encompass different practices, policies, and legislation. Ms Slattery gave evidence in relation to, among other matters, her responsibility for the operational and policy aspects of the CMS.¹¹³ She reiterated some of the complexities and challenges involved with river operations:

River operations is not an exact science and requires operators to make professional judgements, on a daily basis. The operators often have to deal with a lot of uncertainty, and the longer the river, the more uncertainty there is.

...

When operators decide how much to release each day, assumptions have to be made about rainfall, transmission costs, tributary inflows and irrigation demands. Operators also have to consider how much can physically be released, as well as channel capacity, minimum and maximum flow rates.

When an environmental manager places an order of say 100 GL to be delivered in September, it is not a set and forget action. The river operator has to reassess how much environmental water they can release on a daily basis.

The environmental water managers rely on the river operators to advise how much environmental water has been released. This can only be done when the watering event is finished.

Because so much of operations is based on judgement, different river operators will make different assumptions and have different estimates of how much environmental water has been used.¹¹⁴

The technical limitations upon delivering water from upstream over vast distances necessarily requires complex coordination. In this regard, the South Australian Government advised the Commission that since the introduction of the CMS in 2013, jurisdictions have undertaken:

further integration work by refining technical information, developing policy principles and undertaking additional community engagement to address community concerns about the proposals. The extra time has also allowed states to develop the Enhanced Environmental Water Delivery supply measure project, which will complement the constraints management projects by improving coordination, forecasting, planning and operations across the Basin to better synchronise managed environmental watering events with natural flows.¹¹⁵

In addition, the South Australian Government advised that in accordance with a COAG Plan, Basin States and the Commonwealth are ‘working to develop an integrated constraints work plan to provide a coordinated, cross-jurisdictional approach that enables strong community involvement in a staged implementation manner’.¹¹⁶ The integrated constraints work plan was due in November 2017 but the Commission was advised it was expected in ‘late 2018’.¹¹⁷

The technical matters identified above highlight the complexities associated with addressing constraints and the consequential urgency in attending to these matters.

Social impediment

The overarching principles by which the MDBA has said constraints are to be addressed relevantly include notions of ‘not [creating] any new risks to the reliability of entitlements’ and ‘[being] focussed on avoiding and addressing any impacts to third parties’.¹¹⁸

A number of submissions and a deal of evidence concerned landholders whose properties are at risk of flooding and/or have been flooded.¹¹⁹ The experience and evidence from Ms Beer and Ms Louise Burge impressively described the important local impact that addressing constraints will have on landholders and communities along the Basin, and the understandably deep concerns they have regarding proposed constraints measures. Unfortunately, it appears that the MDBA and relevant governments have thus far approached the concerns in a way that has exacerbated rather than allayed them.

Ms Beer, together with other landholders, were members of the Mid-Goulburn Constraints Technical Advisory Committee which advised the MDBA on the constraints measure proposed at Goulburn. Ms Beer and other landholders expressed (and continue to express) opposition to that proposal.¹²⁰ Notably, Ms Beer’s impression of the MDBA is that it ‘had no idea whether you could relax constraints, no idea whatsoever’ and as such Ms Beer and other relevant landholders ‘will in no way negotiate easements’.¹²¹

In particular, Ms Beer provided evidence to the Commissioner outlining significant impacts on landholders and the local community in the Upper Goulburn catchment area arising from environmental watering and flows of around 20 000 ML/day to 30 000 ML/day. The impacts include various damage to property due to inundation, and more frequent and prolonged flooding events, the continuation of which will impact on the livelihoods of the local people.¹²²

The Commissioner also heard evidence that past environmental water releases have occurred without notice, with devastating effects. Ms Burge gave compelling evidence of the impact of environmental flows released in 2010 on her property and livelihood, without prior warning to, or consultation with, her. The release resulted in impacts to property access and significant consequential business losses arising from more than 90% of her wheat crop being lost.¹²³ Ms Burge described the impact as follows:

So that meant all corresponding creeks and rivers also ran at a higher height. Unbeknownst to us, we weren't advised of the flows, and those flows dissected our property in half. We couldn't get to half our property. All our wheat was on the other side of the creek, and by the time we could get our header across the creek, we had — my husband stripped two header loads, and then we got five — five days of rain, and we lost the lot. Hundreds and hundreds and hundreds of thousands of dollars. And that was after the 10-year drought.¹²⁴

Ms Burge's evidence highlights the potential impacts on so-called third parties of planned environmental flows, in light of existing constraints. Not surprisingly, it highlights the importance of engaging communities and stakeholders early in the process in order that proposals for planned environmental watering (and addressing constraints), and their impacts, can be readily understood by those affected by them. It should go without saying that such consultation must include consultation and communication regarding the timing of planned environmental watering. Such engagement has the benefit of drawing on local knowledge, experience, and expertise in order to produce more realistic and sustainable solutions, and of building trust between stakeholders and government decision-makers.

Unsurprisingly, past experiences of poor consultation may drive a negative community response to the CMS and proposed measures for addressing constraints among some stakeholders.¹²⁵ Based on the evidence provided to the Commission, there will be some landholders who are most likely to be reflexively opposed to the proposed constraints measures and in outright opposition to the CMS. That bodes ill for negotiations.

To this end, Ms Burge's experience is a case study in the paramount importance of thorough, genuine and transparent consultation with stakeholders throughout the process of implementing the CMS and constraints measures, and in managing environmental watering more generally, particularly in circumstances where even a minor (planned release) flood event is expected to, or may, be complemented by subsequent rainfall events.¹²⁶ That requirement for consultation is consistent with the CMS.¹²⁷

The Productivity Commission's draft finding that it is 'highly ambitious, if not unrealistic' to think that constraints measures will be fully operational by 2024 sensibly proceeds on the assumption that the relevant landholders need to be willing participants, but some of whom may have a level of 'mistrust and concern'.¹²⁸

Noting the other impediments to achieving the implementation of constraints measures within that timeframe, any small chance of doing so can be realized only through a renewed, consistent and collaborative approach to consultation with stakeholders by responsible State governments, in a manner that reflects the necessary connectivity of the river system.

Impediments in the legal context

In the context of private properties being potentially inundated as a result of the delivery of environmental water or addressing constraints, and subject to the peculiar factual circumstances in each case, plainly the relevant landholders may have grounds to pursue a claim against relevant parties in nuisance.¹²⁹ This has no doubt informed the approach of Basin States to date, including attempts to negotiate easements with individual landholders.

The CMS identifies various options to mitigate negative impacts arising from the easing or removal of constraints (for example, by providing short and medium term notifications to landholders affected by a proposed easing or removal of a constraint, and negotiating easements and covenants). The CMS also highlights the need to consider compensation for affected landholders and other mitigation costs as part of the costing of constraints projects.¹³⁰

Individual resistance to constraints measures of the kind discussed above is surely understandable in the circumstances. It is another question, however, whether the objections of a small minority within a broader and complex scheme should prevent such important policy initiatives as the CMS from being implemented. The objectives of the Water Act and Basin Plan reflect the national interest and policy to protect and restore the Basin. Basin States and the Commonwealth should reconsider their approach so that constraints measures can be earnestly progressed in the national interest. The experience so far renders the likelihood of successfully negotiating with over 3000 landholders by 2024 fanciful. The need to appeal to every relevant landholder regarding their preparedness to agree to easements in order to progress the easing or removal of constraints is socially ideal on one level, but on the level of pragmatic achievement is, regrettably, probably a flawed approach. This is all the more obvious if the Commonwealth and Basin States wish to finalize addressing constraints by 2024.

As Mr Peter Cosier of the Wentworth Group, and a former town planner, pointedly observed, the manner in which constraints has been approached in the Basin Plan, being on a voluntary basis, stands in stark contrast to other major infrastructure projects undertaken by Australian governments.¹³¹ It is difficult to see any material difference in principle between managing a river system for the benefit of the public at large, versus managing any other significant public infrastructure such as roads or highways.

There are various means by which the above issues arising in the legal context may be sought to be overcome.

In the legislative context, it was noted in evidence that the *River Murray Act 2003* (SA) provided ‘greater powers than what our interstate colleagues have at their disposal’.¹³² In this regard, sec 17 of the *River Murray Act 2003* provides the Minister power to effectively ‘construct, maintain or remove’ works, including physical constraints such as banks, levees, culverts, bridges, and other infrastructure. Whilst there may have

been reticence to date to invoke such provisions, clearly legislative power exists, at least in South Australia.

In the alternative, it may be open to Basin States to consider the granting of an easement in gross (which is relevantly a creature of statute)¹³³ in favour of those responsible for delivering constraints measures pursuant to the CMS. This is not an uncommon approach adopted for many utility services, such as water, electricity and gas providers.¹³⁴

Any such legislated remedy can be pursued only in conjunction with a decision properly to compensate persons impacted by this policy agenda. The scope in the CMS to give consideration to compensating affected landholders represents an appropriate acknowledgment that the impact and cost of policy initiatives advanced in the public and national interest should never fall unequally on selectively affected private individuals.¹³⁵ The requirement in sec 51(xxxi) of the *Constitution* that property be acquired ‘on just terms’, which is picked up by State legislated provisions requiring compensation for compulsory acquisitions, reflects that basal notion of social justice.

It is noted that in a submission by the MDBA to the Productivity Commission it appears that the MDBA is open to changing its approach to easing or removing constraints. However, it is unclear in what way the MDBA may seek to do so.¹³⁶

Consequences of failing to ease or remove constraints

The Wentworth Group has stated that:

- the proposed constraints measures are inconsistent with the MDBA’s reported ability to achieve 17 out of the 18 flow targets in a 3200 GL water recovery target and constraints addressed scenario¹³⁷
- of the original six constraints measures proposed to be nominated as a supply measure, only two (Hume to Yarrawonga, and River Murray in South Australia) are consistent with the CMS. In addition, those two constraints measures rely on upstream constraints being addressed.¹³⁸

Dr Anne Jensen gave evidence that the enhanced environmental outcomes will not be achieved if there is less than 3200 GL of environmental water, and if constraints are not addressed, and if all SDL supply measures are not successfully implemented as intended.¹³⁹

The Productivity Commission persuasively opined that the enhanced environmental outcomes:

are dependent on progress in easing or removing constraints. However, these projects are unlikely to be fully operational by 2024 and may not deliver the full range of flow rates required to deliver the [enhanced environmental outcomes]...

There is at present no coherent water recovery strategy that aligns water recovery with progress on easing constraints, ensures that recovered water will contribute to achieving the enhanced environmental outcomes in the southern Basin, and demonstrates how socioeconomic impacts will be mitigated.¹⁴⁰

It is also relevant to note the view that the estimated cost of constraint easing appears to have substantially increased. From an MDBA estimation of \$220 million in 2014, the Productivity Commission has stated that the cost of easing six key focus areas in the Southern Basin will be between \$509 and \$629 million.¹⁴¹ The trend is clear, and ominous.

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- 2 Various MDBA reports and other sources from time to time make reference to the 'relaxation or removal' of constraints. Subsecs 86AA(2) and (3) of the Water Act refer to 'easing or removing' constraints. Although the terms refer to similar concepts, for ease of reference the term 'addressing constraints' is used here.
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- 22 Murray-Darling Basin Authority, above n 3, iii. See also, eg, *ibid* 10.
- 23 Murray-Darling Basin Authority, above n 1, vii.
- 24 *Water Act 2007* (Cth) subpara 86AA(2)(h)(ii); para (3)(a); *Basin Plan 2012* (Cth) secs 7.08, 7.09(c), (e).
- 25 See *Basin Plan 2012* (Cth) sec 7.09(e); *Water Act 2007* (Cth) sec 86AA.
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- 27 Murray-Darling Basin Authority, ‘River Murray from Yarrawonga Weir to Wakool Junction Reach Report: Constraints Management Strategy’ (Final Report, July 2015) (RCE 569) 22.
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- 31 Murray-Darling Basin Authority, above n 27, 30.
- 32 Murray-Darling Basin Authority, above n 1, xi, 21–22.

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- 84 Productivity Commission, above n 8, 139. It should be noted that the Productivity Commission’s reference to six (and not seven) key focus areas is correct because Gwydir is not a supply measure and the reference to six is made in the context of those constraints measures which have been proposed as supply measures. However, it appears this may now actually be five (Hume to Yarrawonga, Yarrawonga to Wakool Junction, Murrumbidgee, Lower Darling, and Lower Murray (in South Australia)) because the proposed Goulburn Valley is currently designed to deliver lower flow rates than originally proposed by the Victorian Government and so cannot now be considered a supply measure: See Murray-Darling Basin Authority, above n 60, [50]–[51].
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- 123 Louise Burge, Submission to Murray-Darling Basin Royal Commission, 2018 (RCE 220), 6.
- 124 Transcript of Murray-Darling Basin Royal Commission Public Hearings (16 August 2018, L Burge) 2019.
- 125 See, eg, Murray Darling Association Inc, Submission No 52 to Productivity Commission, *Murray-Darling Basin Plan: Five-Year Assessment*, 19 April 2018; Murray Valley Private Diverters, Submission No 69 to Productivity Commission, *Murray-Darling Basin Plan: Five-Year Assessment*, April 2018, 13.
- 126 Burge, above n 123.
- 127 Murray-Darling Basin Authority, above n 1, 19.
- 128 Productivity Commission, above n 8, 112; cf where the South Australian Government say: ‘The overall constraints program remains on track for the longer-term implementation timeframe of completion in 2024’: South Australian Government, above n 11, 31.
- 129 A temporary interference may nonetheless be considered substantial: *Wherry v K B Hutcherson Pty Ltd* (Unreported, Supreme Court of New South Wales Equity Division, Hodgson J, 4 April 1986). The duration and the degree of harm is relevant: *Bayliss v Lea* [1962] SR (NSW) 521. No action in nuisance for things naturally occurring on the land so any alleged interference must be above and beyond natural flows: *Gartner v Kidman* (1962) 108 CLR 12, 48–9 (Windeyer J); *Kiddle v City Business Premises Ltd* [1942] 1 KB 269; *Nalder v Commissioner of Railways* [1983] 1 Qd R 620. See also generally: *Reynolds v Clarke* (1725) 2 Ld Raym 1399; 92 ER 410; *Southport Corp v Esso* [1956] AC 218; *St Helen’s Smelting Co v Tipping* (1865) 11 HL Cas 642; 11 ER 1483.
- 130 Murray-Darling Basin Authority, above n 1, 36–8, 40.
- 131 See Transcript of Murray-Darling Basin Royal Commission Public Hearings, (10 July 2018, P Cosier) 563.
- 132 Transcript of Murray-Darling Basin Royal Commission Public Hearings, (26 September 2018, B Bruce) 3339.
- 133 *Rangeley v Midland Railway Co* (1868) LR 3 Ch App 306, 311; *Bouquey v District Council of Marion* [1932] SASR 32, 37; *Commissioner for Main Roads v North Shore Gas Co Ltd* (1967) 120 CLR 118, 134.

- ¹³⁴ See for example, *Law of Property Act 1936* (SA) sec 41A; *Conveyancing Act 1919* (NSW) subsec 88A(1), (1A); *Crown Lands Act 1992* (NT) subsec 61(1); *Conveyancing and Law of Property Act 1884* (Tas) subsec 90A(1); *Local Government Act 1989* (Vic) sec 187A; *Land Administration Act 1997* (WA) secs 147, 195.
- ¹³⁵ Mark McKenzie of the NSW Irrigators' Council, who gave evidence to the Commissioner, speaks to the need for compensation: Transcript of Murray-Darling Basin Royal Commission Public Hearings (24 August 2018, M McKenzie) 2272–3.
- ¹³⁶ Murray-Darling Basin Authority, Submission No DR136 to Productivity Commission, *Murray-Darling Basin Plan: Five-Year Assessment*, October 2018 (RCE 610), 11.
- ¹³⁷ Wentworth Group of Concerned Scientists, Submission to Murray-Darling Basin Royal Commission, 21 May 2018 (RCE 73), 11.
- ¹³⁸ *Ibid* 20.
- ¹³⁹ Transcript of Murray-Darling Basin Royal Commission Public Hearings (30 August 2018, A Jensen) 2617.
- ¹⁴⁰ Productivity Commission, above n 8, 19.
- ¹⁴¹ *Ibid* 139.

9 Efficiency Measures & the 450 GL

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Introduction

The Murray-Darling Basin Authority (**MDBA**) has asserted, since November 2011, that a Basin-wide long-term average sustainable diversion limit (**SDL**) of 10 873 GL — representing a water recovery for the environment of 2750 GL a year on average compared to a 2009 baseline — reflects an ‘environmentally sustainable level of take’ (**ESLT**).¹

Based on the best available scientific knowledge, it almost certainly does not.² The MDBA knew that in November 2011, and knows it now. Persistence with the fiction that a political compromise is science is disappointing. This is particularly so given the expenditure of billions of dollars of public funds involved in the implementation of the *Basin Plan 2012* (Cth) (**Basin Plan**).

The State of South Australia has always argued that a level of take equivalent to a water recovery of 2750 GL is not an ESLT. This remains its position, as confirmed in its submission to this Commission dated June 2018.³

Based on reports it commissioned, South Australia said prior to the enactment of the Basin Plan that a level of take equivalent to a water recovery of at least 3200 GL per year from the baseline diversion limit (**BDL**) was required for the SDL to reflect an ESLT.⁴ Based on the scientific evidence before this Commission, it is highly doubtful even whether a water recovery of 3200 GL would result in a SDL that reflects an ESLT.⁵

During negotiations leading up to the enactment of the Basin Plan in late 2012, the States of Victoria and New South Wales argued for a recovery of 2100 GL per year for the environment from the BDL. Ultimately, agreement was reached between the Basin States and the Commonwealth for a qualified recovery target of 2750 GL. The qualification was that Chapter 7 was added to the Basin Plan, allowing for the adjustment of SDLs. Provision was made for an increase of the long-term average SDL through what are defined as supply measures (a decrease in the amount of water recovered for the environment, a subject within Chapter 7), and a decrease in the SDL of up to 450 GL per year through what are described as efficiency measures (an increase in the amount of water to be recovered for the environment). Sections 23A and 23B were also added to the *Water Act 2007* (Cth) (**Water Act**), allowing for the MDBA to propose adjustments to the long-term average SDL for water resources of a particular water resource plan area, and for the Minister to adopt such proposals.⁶

The proposed extra 450 GL of water (referred to as ‘upwater’) has the object of achieving certain environmental outcomes relevant to areas of ecological importance in South Australia, in particular the Lower Lakes, the Coorong and the Murray Mouth.

Efficiency measures are not only relevant to the proposed additional 450 GL per year of water. In 2015, the Water Act was amended to cap the volume of water the Commonwealth could acquire through the purchase of water entitlements, at 1500 GL.

Since this time, efficiency measures — usually on-farm or off-farm infrastructure upgrades — have been the focus of a supposed acquisition of additional water for the environment by the Commonwealth to achieve the Basin-wide SDL. The sum of \$1.77 billion of public money was set aside by the Commonwealth Government in the Water for the Environment Special Account for efficiency measure infrastructure and other projects,⁷ with \$200 million of this reserved for constraints measures (discussed below, but the subject of Chapter 8 of this report). For ‘on-farm’ irrigation efficiency measures, this was part of the Commonwealth Government’s Sustainable Rural Water Use and Infrastructure Program (**SRWUIP**).

Basin States also develop their own efficiency measure infrastructure upgrade schemes, funded by the Commonwealth. An example is the South Australian River Murray Sustainability Program. In 2016, the Commonwealth commenced a program called the Commonwealth On-Farm Further Irrigation Efficiency Program to assist South Australia’s irrigators to upgrade their on-farm infrastructure to achieve water savings. This program has been recently discontinued. The Commonwealth has now commenced a new Basin-wide program — the Murray-Darling Basin Water Infrastructure Program (**MDBWI**) to attempt to recover the 450 GL of upwater.

This chapter contains findings in relation to those parts of Terms of Reference three, five, six and 12 (but not seven and 10), which relate to:

- the recovery of water from efficiency measures, and
- the ‘additional 450 GL’ of water to be recovered for the environment through efficiency measures and the removal of constraints.

Statutory provisions

Water Act

Section 86AA of the Water Act is in the following terms:

(1) The object of this Part is to enhance the environmental outcomes that can be achieved by the Basin Plan, as in force from time to time, by:

(a) protecting and restoring the environmental assets of the Murray-Darling Basin; and

(b) protecting biodiversity dependent on the Basin water resources;

so as to give effect to relevant international agreements.

(2) Without limiting subsection (1), environmental outcomes can be enhanced in the following ways:

(a) further reducing salinity levels in the Coorong and Lower Lakes so that improved water quality contributes to the health of insects, fish and plants that form important parts of the food chain, with the aim of achieving the following outcomes:

(i) the maximum average daily salinity in the Coorong South Lagoon is less than 100 grams per litre;

(ii) the maximum average daily salinity in the Coorong North Lagoon is less than 50 grams per litre;

(iii) the average daily salinity in Lake Alexandrina is less than 1000 microsiemens per centimetre for 95% of years and 1500 microsiemens per centimetre all of the time;

(b) keeping water levels in the Lower Lakes above:

(i) 0.4 metres Australian Height Datum for 95% of the time; and

(ii) 0.0 metres Australian Height Datum at all times;

to provide additional flows to the Coorong, and to prevent acidification, acid drainage and riverbank collapse below Lock 1;

(c) ensuring the mouth of the River Murray is open without the need for dredging in at least 95% of years, with flows every year through the Murray Mouth Barrages;

(d) discharging 2 million tonnes of salt per year from the Murray-Darling Basin as a long-term average;

(e) further increasing flows to the Coorong through the Murray Mouth Barrages, and supporting fish migration;

(f) in conjunction with removing or easing constraints referred to in subparagraph (h)(ii), providing opportunities for environmental watering of an additional 35,000 hectares of floodplains in the River Murray System, to do the following:

(i) improve the health of forests and the habitats of fish and birds;

(ii) improve connections between the floodplains and rivers in the River Murray System;

(iii) replenish groundwater;

(g) increasing the flows of rivers and streams, and providing water to low and middle level floodplains and habitats that are adjacent to rivers and streams, in the River Murray System:

(i) to enhance environmental outcomes within those floodplains, habitats, rivers and streams; and

(ii) to improve connections between those floodplains and habitats, and those rivers and streams;

(h) in any other way that is consistent with:

(i) the Authority's modelling of the effect of increasing the volume of the Basin water resources that is available for environmental use by 3200 gigalitres; and

(ii) easing or removing constraints on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin.

(3) The object of this Part is to be achieved by:

(a) easing or removing constraints on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin; and

(b) increasing the volume of the Basin water resources that is available for environmental use by 450 gigalitres.

One thing is mercifully clear from the text of this strange provision: any 450 GL increase in the volume of water available for the environment is not a mandatory requirement, nor (perhaps for obvious reasons) is it mandatory for 'environmental outcomes' to be 'enhanced' in the ways set out in subsec 86AA(2). These outcomes — which relate to the environmental assets of South Australia — 'can' be enhanced in the ways listed, but this leaves open the possibility that this desire will be unfulfilled.

The enhancement of these environmental outcomes is to be achieved by the actions outlined in subsec 86AA(3) — that is, by a) easing and removing constraints and b) increasing the volume of water available to the environment by 450 GL. Enhancement of the environmental outcomes will not be achieved if only para 86AA(3)(a) is satisfied, or if only para 86AA(3)(b) is. Both must be.

The importance of removing or easing constraints to the achievement of environmental outcomes, and to the usefulness or otherwise of supply measures and efficiency measures, cannot be overemphasized. The constraints projects have the purpose of increasing the volume of flows that can be delivered down the river systems so that (for example) greater areas of floodplains and other environmental assets can be watered than is currently the case without removal of constraints. At present there are limits to the amount of water that river operators can release from dams beyond a certain flow rate, as damage might be caused to physical infrastructure (for example, bridges and roadways), or private property might be inundated. In 2012 the MDBA modelled the achievement of certain flow rates at various flow indicators under a 3200 GL 'relaxed constraints scenario'.⁸ This modelling is meaningless in the real world without actually easing the constraints. While the South Australian Government is of the view that not all constraints measures will need to be operational for there to be some increase in environmental outcomes from the extra 450 GL of water,⁹ it still follows that this water recovery through

efficiency measures risks wasting public money, without the requisite removal or easing of constraints.

The easing of constraints will involve the removal of physical barriers such as increasing the height of bridges, the need to build levies to protect land from inundation, and perhaps most difficult of all, the requirement to reach agreement with landholders whose property is likely to be flooded at certain flow volumes. This will involve the need to negotiate easements, for example, and compensation.

The constraints issue raised in para 86AA(3)(a) is dealt with in Chapter 8 of this report. Suffice to say here that the evidence before the Commission provides no basis to have confidence that constraints will be eased or removed to enable the enhancement of the environmental outcomes listed in paras 86AA(2)(a) to (h). No substantial progress has been made on removal of constraints in the more than five years since the MDBA published its constraints management strategy.¹⁰ Constraints management, to date, has involved little more than talking about, or writing about, constraints management. The Commissioner's pessimism concerning the removal of constraints appears to be shared by, amongst other persons and bodies, the Productivity Commission.¹¹

The Basin Plan

Chapter 7 of the Basin Plan is entitled 'Adjustment of SDLs'. The SDLs for surface water SDL resource units will come into operation on 1 July 2019. This chapter of the Basin Plan contains, amongst other things, details concerning how SDLs may be adjusted by supply and efficiency measures that must come into operation by 30 June 2024.

As at 14 November 2017, the MDBA estimated that the long-term average SDL for surface water in the Basin was 10 945 GL a year.¹² This volume was arrived at by adding together the SDL for all surface water SDL units in the Basin, and reflects a long-term average reduction of 2680 GL a year from the BDL determined in 2009 (the volume was 2750 GL prior to the Northern Basin Review, and has subsequently been notionally reduced by a further 605 GL as a result of reduction in water for the environment due to supply measures — see Chapter 7 of this report).

Chapter 7 of the Basin Plan provides for the possible addition of 450 GL of water for the environment (a 450 GL decrease in the long-term average SDLs for surface water) through what it describes as efficiency measures. An efficiency measure is defined in sec 7.04 in the following way:

*An **efficiency measure** is a measure that operates to decrease the quantity of water required for one or more consumptive uses in a set of surface water SDL resource units, compared with the quantity required under the benchmark conditions of development.*

Note: Examples include:

lining channels to reduce water losses within an irrigation network;

replacement of less efficient irrigation methods with drip irrigation.

Part 2 of Chapter 7 then sets out provisions for the adjustment of SDLs as a result of both supply and efficiency measures, and constraint removal. Relevantly to the objective of recovering a further 450 GL per year, sec 7.09 of the Basin Plan provides that:

The objective for this Part is to allow surface water SDLs to be adjusted to reflect the effects of measures that increase the supply of water or the efficiency of water use, and are notified under this Part, so that:

(a) for efficiency measures — environmental outcomes are increased while maintaining or improving social and economic outcomes; and

...

(c) where constraints on the capacity to deliver environmental water are removed or eased — available environmental water can be used to maximum effect; and

...

(e) the easing or removal of constraints and the addition of 450 GL per year of environmental water above the 2750 GL benchmark conditions of development, under the Commonwealth's program, allow the enhanced environmental outcomes as set out in Schedule 5 to be pursued as compared to the benchmark environmental outcomes.

Note 1: The Commonwealth program to ease or remove capacity constraints and deliver 450 GL of additional environmental water is to improve the environmental outcomes beyond those achievable under the 2750 GL benchmark by a further 450 GL and thus pursue the environmental outcomes set out in Schedule 5 that reflect the results of the 3200 GL per year modelling with relaxed constraints scenario reported in: MDBA (Murray-Darling Basin Authority) 2012, Hydrologic modelling of the relaxation of operational constraints in the southern connected system: Methods and results, MDBA publication no: 76/12, Murray-Darling Basin Authority, Canberra. <http://download.mdba.gov.au/altered-PBP/Hydrologic-modelling-relaxed-constraints-October-2012.pdf>

Note 2: The Commonwealth's program referred to in paragraph (e) is the program to spend \$1.77 billion over 10 years from 2014–15 under the proposed Water for the Environment Special Account.

The reference in Note 1 to Sched 5 of the Basin Plan is a reference to the 'enhanced environmental outcomes' listed in cl 2 of Sched 5, which reflect the outcomes described

in subsec 86AA(2) of the Water Act. Whilst there is significant doubt that these enhanced environmental outcomes can be achieved with a Basin-wide SDL based on a reduction in consumptive take of 3200 GL per year on average, it is clear that even the MDBA's modelling indicates that these outcomes are not achievable without the easing or removing of relevant constraints.¹³

By 30 June 2024, following the so-called 'reconciliation', the MDBA must propose to the Minister any adjustment to be made to the Basin-wide SDL as a result of supply and efficiency measures.¹⁴

Basin States or the Commonwealth now have until 31 December 2023 to notify the MDBA of efficiency measures that should be taken into account under sec 7.11 for adjustment of the SDL.¹⁵ Only efficiency measures that will come into operation by 30 June 2024 may be notified.¹⁶

In order to adjust the Basin-wide SDL as a result of a contribution of water to the environment due to an efficiency measure, the MDBA must be satisfied that this contribution has been achieved with 'neutral or improved socio-economic outcomes' compared to benchmark conditions.¹⁷ The criteria are discussed further below.

The net effect of the efficiency and supply measure contribution cannot result in either an increase or decrease of more than 5% of the total surface water SDL at the reference time — 2750 GL.¹⁸

The MDBA is to determine the supply and efficiency contributions as they are expected to be as at 30 June 2024.¹⁹

Efficiency measures: Criteria for neutral or improved socio-economic outcomes

For any efficiency measure contribution adjustment to the Basin-wide SDL for surface water, the MDBA must be satisfied that those 'efficiency contributions to the proposed adjustments achieve neutral or improved socio-economic outcomes' compared to the benchmark. Those outcomes are evidenced by:

- (i) *The participation of consumptive water users in projects that recover water through works to improve irrigation water use efficiency on their farms; or*
- (ii) *Alternative arrangements proposed by a Basin State, assessed by that State as achieving water recovery with neutral or improved socio-economic outcomes.*²⁰

The neutral and improved socio-economic outcomes test therefore requires only 'participation' by irrigators, farmers or other consumptive water users in efficiency measure projects to be satisfied. This test has been criticized as being inadequate or

inappropriate at least by the Governments of Victoria and New South Wales, who have successfully lobbied for, along with the Commonwealth, additional criteria, a matter addressed later in this chapter. It can be noted now, however, that it is the Commissioner's view that the criteria that appear to have been agreed upon by the Murray-Darling Basin Ministerial Council (**MinCo**) will make recovery of the 450 GL per year of upwater not just impractical (the Productivity Commission's view in its Murray-Darling Basin Plan: Five-year assessment (**2018 Draft Report**)), but so unlikely it has a negligible chance of being recovered.

Perhaps somewhat ironically, for the reasons that follow, it is also the Commissioner's view that further water for the environment should not be recovered through efficiency measure projects in any event. Rather, it should be recovered through the purchase by the Commonwealth, at an agreed price, of water entitlements (either in full, or, usually, in part) from willing vendors, with that water entitlement to be transferred to the Commonwealth Environmental Water Holder (**CEWH**). Such purchases have traditionally been called 'buybacks', the expression used throughout the rest of this chapter.

As described below, efficiency measures are a very expensive means of recovering water for the environment. Compared to the cost of purchasing water through buybacks they are an extravagant expense, making them, absent other real benefits, an improvident policy choice by Government for taxpayers.

There are also real doubts, discussed later in this chapter, whether efficiency measures to date have actually returned the amount of water to the environment that is claimed by the Commonwealth Department of Agriculture and Water Resources (**DAWR**) or the MDBA, and hence whether they could reliably recover a further 450 GL per year of water (or anything approaching that amount).

Further, Commonwealth schemes under which efficiency measures have been funded, and the underlying State schemes under which efficiency measures are approved, are in combination a quintessential example of a sorry lack of accountability and transparency.

Buybacks versus efficiency measures: Socio-economic impacts and other comparisons

The cap on buyback

In 2015, Federal Parliament introduced a 1500 GL cap on the Commonwealth entering into water purchase contracts for water access entitlements.²¹

In the period since the enactment of the Water Act in 2007 until the enactment of the Basin Plan in late 2012, the Commonwealth had purchased about 1100 GL of

water through buybacks. All Basin State governments (including South Australia), and the Commonwealth Government, now appear in favour of efficiency measures and constraints measures as a means of recovering the 450 GL of upwater. This is despite the fact that in its 2010 report entitled ‘Market Mechanisms for Recovering Water in the Murray-Darling Basin’, the Productivity Commission found that purchasing water entitlements from willing sellers was the most effective and efficient means of acquiring water.²² The Productivity Commission also made findings in terms of the disadvantages of subsidizing infrastructure upgrades (which include efficiency measures and constraints measures) which are discussed further below.

It is always somewhat of a curiosity when government requires an expert body to inquire into a matter, make findings and recommendations, only for it to ignore those matters if they are not, for example, deemed politically expedient. Such is its prerogative, of course. In this case, on the evidence given and tendered to the Commission, the Productivity Commission was correct in 2010, and remains correct today.

Benefits of buyback

During the Commission’s site visits, it was not uncommon for the Commonwealth buyback program to be criticized, frequently in emotional terms. The Commissioner makes no criticism of that. Common complaints were that buybacks had:

- cost jobs, due to farmers leaving local areas
- created a ‘Swiss cheese’ effect leaving irrigation suppliers with customers spread out over greater distances, or creating a stranding of irrigation assets
- harmed the social fabric of local communities by, for example, reducing the number of children at schools, and
- damaged local economies, largely through population reduction.

The evidence presented to the Commission leads to the conclusion that buybacks did not have the negative impacts claimed, or at least did not cause the extent of impacts claimed. Moreover, consistent with the Productivity Commission’s view expressed in its March 2010 report, the Commission did not receive evidence or submissions from any relevantly qualified person who favoured efficiency measures as a means of recovering water for the environment ahead of buyback. This was not for want of trying or invitation.

A number of expert witnesses qualified in economics, and who have spent many years researching the effects of water purchases in the Basin, gave evidence to the Commission concerning the benefits of buyback. Those witnesses included Professor Sarah Wheeler, Dr Adam Loch and Dr David Adamson, all from the Centre for Global Food and Resources at the University of Adelaide, and Professor Quentin Grafton of the Australian National University. Their evidence can be summarized as follows:

- buyback is a far cheaper means of recovering water from the environment than efficiency measure infrastructure upgrades — at least 2.5 times less expensive for each megalitre of water recovered
- money received from buyback was almost invariably spent in local communities
- a reduction in debt (and interest payments) also resulted in those who sold entitlements spending more money in local communities, and
- buybacks were a more reliable means of recovering water, largely because of the uncertain issue of ‘return flows’ and because they did not encourage behaviour of irrigators associated with greater risk and hence greater vulnerability (both of these issues are discussed below).²³

None of this evidence was challenged by the oral or documentary evidence of any other witness or in the submissions filed by the MDBA, the DAWR, or the Basin States.

Asserted socio-economic impacts of water recovery

The Victorian and New South Wales Governments (and occasionally the Commonwealth) have asserted on a number of occasions that water recovery generally, and in particular recovery of the further 450 GL of water through efficiency measures, will have negative socio-economic outcomes for their Basin communities. The Commissioner is unaware of any convincing economic or other research which justifies this assertion.

The MDBA has prepared or commissioned the preparation of a number of reports concerning the socio-economic impacts of water recovery in the Murray-Darling Basin. These reports include:

- ‘An Independent Review of the Social and Economic Modelling Inputs to the Northern-Basin Review’, dated 12 October 2016²⁴
- ‘Northern Basin Community Modelling: Economic Assessment of Water Recovery Scenarios’ authored by KPMG, dated November 2016²⁵
- ‘Southern Basin Community Modelling: Preliminary Data Analysis — Chart Pack’ authored by KPMG, dated February 2018²⁶, and
- ‘Northern Basin Review: Technical Overview of the Social and Economic Analysis’ dated December 2016.²⁷

The DAWR commissioned Marsden Jacobs to prepare a report of the economic effects of water recovery in the Murrumbidgee Irrigation Area.²⁸ RM Consulting Group (**RMCG**) was commissioned by various stakeholders within the Goulburn-Murray Irrigation District to study, amongst other matters, the economic impacts of water recovery in that district.²⁹ Mr Rob Rendell, a co-author of the RMCG Report, gave evidence to the Commission.

With the exception of the Marsden Jacobs Report, the other reports tendered in evidence were the subject of significant and detailed criticism by various experts who gave evidence and filed submissions. As a result of this criticism, all authors of these reports were invited to give evidence at the Commission. Only Mr Rendell took up that invitation.

The reports were criticized as being fundamentally misconceived at a basic level. The central tenet of the criticism was that the reports either erroneously attributed negative socio-economic impacts to buybacks, or significantly overstated those impacts. They hence gave the impression that there were good reasons for efficiency measures to be the preferred means of recovering water for the environment. The Commission was told that this impression is false, and is barely the popular view amongst irrigators.³⁰

As to the evidence of a more detailed criticism of the MDBA and the MDBA-commissioned reports, the witnesses expressed the following views to the Commission in oral evidence and submissions:

- Claims in relation to the ‘Swiss cheese’ effect or a reduction in local populations or jobs as a result of water recovery through buyback (or any other means) are not supported by the research. Work conducted by Professor Wheeler and Professor Grafton, amongst others, has shown that the vast majority of irrigators who sold water to the Commonwealth only sold a partial entitlement. Further, of those who sold an entire entitlement, the vast majority maintained delivery rights.³¹
- There is no proportional relationship between a reduction in water use and farm production, as claimed in the reports,³² and no such relationship has been established in any peer-reviewed academic or scientific journal.
- Further, the key relationship to consider would be any relationship between water use reduction and farm revenue. There is an abundance of robust evidence that farmers adapt to reduction in water use.³³

As mentioned above, these criticisms were not directed to the Marsden Jacobs Report prepared on the Murrumbidgee Irrigation District. This report found that any socio-economic impact of buybacks in the Murrumbidgee Irrigation District to be either ‘very small if not neutral’.³⁴

While certain interest groups have sought to attribute negative economic and social impacts to buybacks, they have often failed to acknowledge (let alone dare complain about) what in truth have been some of the real drivers of the job contraction in parts of the Basin where water has also been recovered. These include, amongst other matters:

- technological change and mechanization (for example, round bailing for cotton)
- increased urbanization around local towns and regional centres (through land zoning changes and the like)

- manufacturing downturn in rural areas
- change in soil conditions due to climate change and hence changes in what crops are or can be grown
- fluctuations in commodity prices, and
- fluctuations in costs associated with producing crops.³⁵

Farm numbers have in fact been falling for decades. Rural communities have been losing population and jobs for the same amount of time, and all well before the Basin Plan, which however tends to be ‘blamed for everything’.³⁶

Further, it is curious that water recovery is viewed unfavourably due to its perceived socio-economic impacts, but mechanization and other technological developments that can also reduce employment seem to be the object of encouragement. The history of mechanization can sensibly be seen through the prism of reducing the number of employees per output. It is generally viewed as a good thing when farms become more efficient. However, there has been an anomalous — and probably politically motivated — emphasis placed on the undesirability of job losses due to irrigation cutback, compared with other developments that are regarded as laudable improvements to industry.

Regarding the impact of climate change on reduction in farm revenue (and the numbers of people farming), Professor Wheeler said this:

PROF WHEELER: Yes. So — so climate change impacts, if we assess it through increased — you have increased maximum summer temperatures over time. You have reduced rainfall over time. You have an existence of a drought period, which is an extended period of low rainfall and high temperatures. We know through our modelling that areas that experience greater increases in temperature, and historical changes from — from the mean in rainfall — we know that those areas are going to lose more farms over time.

MR BEASLEY: Yes.

PROF WHEELER: And it is — it is through two potential ways, either a perception from a farmer thinking it’s just getting too hard, you know, “I’m going to sell up and leave,” but there’s also a direct influence on changing farm production in terms of reduced soil productivity, so it becomes harder. You know — ignoring any changes in plant breeding or technology, but it just becomes harder to produce the same crop over time. You’ve got shorter seasons. You’ve got change in, you know, frost patterns that mean certain varieties can no longer be ...

MR BEASLEY: Yes.

PROF WHEELER: To be grown. So these are all the impacts, and so one of my concerns is that a lot of the current modelling that’s been done in the Basin is — is

*concentrating on — on the relationship between reduced water diversions and farm and community changes over time, and we're ignoring the bigger picture of climate change, which, in our modellings, is much more significant in driving out farms than — than water use patterns. So that's a serious concern and one of the reasons we made this submission.*³⁷

The failure of the authors of the reports referred to above to include inputs such as those outlined above was surprising to Professor Wheeler. They are the kind of inputs well-known to economic modellers — in fact, they would be taught to undergraduates.³⁸

Similar concerns were raised by Dr Loch and Dr Adamson, who also criticized the one-dimensional approach of attempting to link reduction in water to a reduction in farming production, with Dr Loch suggesting that the sort of other inputs required to be considered as outlined above would be considered by 'an economist with the standard training'.³⁹

In addition to the criticisms of the socio-economic impact analysis referred to above, the Commissioner was told that there was an important gap in the analysis of the alleged impact. Any negative social or economic impact that might be caused by water recovery, whether through buybacks or irrigation infrastructure upgrades, should not be considered in isolation from the positive economic or social impacts of water recovery for the environment. Leaving aside some of the market-based positive effects of buyback referred to above, there is a non-market based economic value to increased environmental flows. Professor Grafton highlighted this gap in this exchange with the Commissioner during the course of his evidence:

THE COMMISSIONER: So if we're talking socio-economic impacts, you can't actually say they are divorced from enhancement of sustainability and wise use of resources.

PROF GRAFTON: Absolutely not. Indeed, I published papers and others have published other papers that show that there is a very real value, economic value, associated with increased environmental flows. That's a non-market value. It's not like there's a market in a direct sense that we can participate in, only to the extent we can purchase water entitlements. But certainly the non-market value with the improved aesthetic values, improved water quality, improved water bird breeding events, those sorts of things have value and you can measure that in a variety of ways, and those values are very substantial. There's in the multiples of billions of dollars.

So when you talk about wise use and sustainable use, then you not only need to just look at employment issues, important as they are, but you need to look at the broader picture of a whole series of values associated with water, the landscape within the Murray-Darling Basin, and then, of course, relate it back to the taxpayers, because

*the taxpayers are presumably paying these funds to generate a series of values, not just in terms of the irrigation sector, but also generally from the Basin as a whole.*⁴⁰

Equally of course, the economic value of, say, tourism or leisure dollars at various iconic environmental sites that will (it is hoped) benefit from additional environmental water should not be overlooked. Nor too should the spiritual value attributed to extra environmental water to Aboriginal Australians be ignored. A consideration of asserted social and economic impacts of water recovery contained in the reports of the MDBA, RMCG and KPMG referred to above, that look only at, for example, asserted job losses or an asserted reduction in farm production is fundamentally flawed from the outset because it considers only one input of a myriad that are relevant.

Even leaving this aside, based on the evidence presented to the Commissioner, it is wrong to say, as the DAWR does in its submission to the Commissioner, that whilst ‘water purchase, including through open public tenders, would be the lowest financial cost to recover water, this approach is widely recognized as having significant social and economic consequences’.⁴¹ If by ‘widely recognized’ the DAWR is referring to peer-reviewed literature or the evidence of expert witnesses at the Commission, then this statement is mistaken. Further, assertion of such consequences by industry lobby groups does not make them ‘widely recognized’ in the manner DAWR seems to wish to use that term.⁴² A responsible government department should make such a claim only if it was supported by the ‘best available ... socio-economic analysis’, not only because that is what good governance demands, but also because it is the law.⁴³

The DAWR was similarly vague in answering question 117 on notice posed by Senator Rex Patrick in the Australian Senate Supplementary budget estimates hearings regarding the MDBA’s position on the cap on buybacks, when it claimed that ‘our extensive engagement with communities across the Basin has emphasised the significant (but unquantified) social improvements experienced by farmers due to modernised irrigation networks’⁴⁴, that is, through efficiency measures. The meaning of the expression ‘social improvements’ is unknown and unclear, and the assertion that they are ‘significant (but unquantified)’ is equally opaque. To that end, this response by the DAWR is entirely unhelpful. Even if reality was suspended for a moment, and it is accepted that there is some unquantified ‘social improvement’ to farmers (including corporate entity farmers) who have successfully applied for Commonwealth funding for an efficiency upgrade, this is no answer as to why efficiency measures are to be preferred to buyback as a means of recovering water given their far greater cost, and given that there is no evidence to suggest that buybacks have the negative impacts sometimes attributed to them.

Support for efficiency measures as a means of recovering water seems to be a decision based almost entirely on political considerations and not the best available socio-economic analysis.⁴⁵ This much has been admitted by the MDBA to Professor Wheeler, when she was told that it was a ‘political decision’ to ‘stop buyback and support irrigation infrastructure’.⁴⁶

The only challenge to the evidence given by the other expert witnesses referred to above was from Mr Rendell, and he confined his opinion to the Goulburn-Murray Irrigation District. While the Commissioner completely accepts the genuineness of Mr Rendell's views, and appreciates his assistance through his evidence, neither the reports of RMCG nor his evidence provided convincing answers to the criticisms raised by the other witnesses.

Further, neither the submissions of the MDBA, DAWR nor the Basin States contain any, or at least any substantial, answer to the criticisms raised by Professor Wheeler and others referred to above. In fact, the MDBA, according to Professor Wheeler's unchallenged evidence, has no answer to her view that buyback should be favoured over efficiency measure infrastructure upgrades, instead offering only that she fails to understand the 'political process'.⁴⁷ Professor Wheeler is not alone.

Finally, the Commissioner heard evidence that if there are any significant socio-economic impacts due to water recovery, these should be addressed by 'structural adjustment' rather than avoiding water recovery altogether. 'Structural adjustment' in this sense is best described as spending on social infrastructure. Professor Wheeler explained her view, also shared by the Productivity Commission in 2010,⁴⁸ that all water should have been recovered through buyback from the very beginning, with support then provided to those individuals or communities most seriously affected:

We should have gone in, bought all the water back from willing sellers, then see ... where the systems is worse, where did farms end up going and then you go in with your off-farm irrigation infrastructure and you update various irrigation regions as needed. And you have structural adjustment programs also in place for those farms who end up stranded down various channels and it's not economic to get to them ...

...

You compensate them for the fact they have to go to a dryland or you move them elsewhere. You know, it should have been a very much kind of program of buyback first, then upgrade, structural adjustment policies, also invest in other community, health, education, transport, you know, proper structural adjustment processes and we would have had the best impact for environment and rural communities. But we didn't do it. We went into a complete mishmash of both programs over time.⁴⁹

Professor Wheeler also referred to research by Professor Glyn Wittwer and Dr Janine Dixon, estimating that spending on services such as health, education and aged care in Basin communities could generate more than twice the number of permanent jobs compared to spending on irrigation infrastructure.⁵⁰

Any detriment that some might suffer as a result of buyback or efficiency gains should be the subject of urgent and constant political attention to the goal of ensuring that nobody is unfairly shouldering a burden to obtain a benefit for all. The benefit of the Basin

Plan is national, so it should be incumbent on the Commonwealth Government to provide for the necessary social infrastructure spending to help those communities which may be disadvantaged by water recovery.

Overall, the Commissioner is comfortably satisfied that the criticisms levelled at the socioeconomic analysis in the reports referred to above are well made, and that this would be a view shared by competent economists with relevant experience.

Why, then, does the government persist with efficiency measures as a means of recovering water?

The cost of efficiency measures versus buyback

The answer is not that efficiency measures are cost effective. To the contrary, they are ‘at least 2.5 times more expensive than buy-backs’,⁵¹ a matter in relation to which there is no dispute.

Data provided by the DAWR to Professor Grafton and Professor Wheeler for the period 2007–08 to 2017–18 shows that the cost of the Commonwealth purchasing a megalitre of water under the Return The Balance Program (buyback purchases) was \$2026. The cost of purchasing a megalitre of water through efficiency upgrades funded under SRWUIP was \$4970.⁵²

Reliability of recovery through efficiency measures

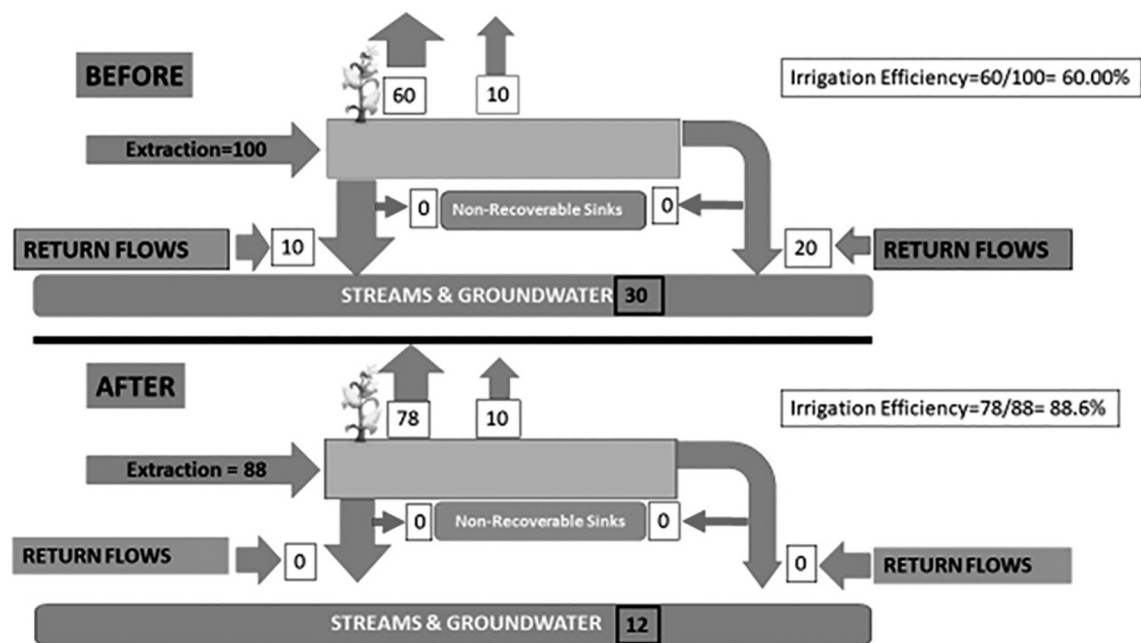
Return flow

Leaving aside this great public expense, concerns about the reliability of efficiency measures as a means of recovering water were also voiced to the Commission. A number of witnesses who gave evidence cast doubt on the government’s claims concerning how much water has been returned to the environment as a result of efficiency measures. Central to these doubts is the well-known concept of ‘return flows’.

A ‘return flow’ is the term used to describe that water taken from rivers for irrigation, but which then returns to the water resource either by run-off, or surface drainage, or via groundwater. Inefficient irrigation practices result in more return flow than efficient irrigation practices. The concern raised by several expert witnesses was that in order to accurately quantify the volume of water recovered for the environment from irrigation efficiency upgrades, some account needs to be taken of the likely amount of return flow prior to the upgrade in water use efficiency.

Return flow is perhaps best illustrated in diagrammatic form. One example was provided to the Commission by Professor John Williams,⁵³ and is set out below.

The uppermost diagram shows an example of a farmer with an inefficient irrigation system, with 20 units of water being lost to production as run-off, and another 10 units going into the groundwater system, resulting in a return flow of 30 units. In the bottom diagram, an example is given of an irrigator who has been the beneficiary of a government-funded efficiency upgrade, which has resulted in the return of 12 units of water to the Commonwealth. However, because of increased efficiency, there is negligible run-off and negligible return of water to the groundwater system. An efficiency measure project such as this, which is designed to return water to the system, in fact takes away 18 units of water from being returned to the water resources via the run-off and entering the groundwater (30 units minus 12 units).



Concerns regarding the issue of return flow are not new. Professor Grafton told the Commission that the earliest published research he had found was from 1964, but that the most considerable body of published work on the issue emerged in the 1990s.⁵⁴ The MDBA and the DAWR have maintained for many years that return flow is not a problem in terms of the reliability of on-farm efficiency measures as a means of recovering water and essentially can be ignored. Despite attempts by Professor Williams and Professor Grafton to engage the MDBA on the issue of return flows, they have been rebuffed with the response ‘[w]e have other priorities’.⁵⁵ Professor Williams has been told that the issue of return flow is ‘important’, but that ‘we don’t think it’s a priority at the moment’.⁵⁶ That attitude seems to have mellowed finally, with the MDBA commissioning a report from the University of Melbourne on, in part, the return flows issue. That report is discussed further below.

Perhaps as a means of indicating why the return flow issue was not a ‘priority’, Professor Grafton has also been told by the MDBA that return flows are in fact ‘negligible’ or that they involve ‘dirty’ or ‘highly saline’ water.⁵⁷ These claims have been made in the

absence of any published work by the MDBA on the issue, and in the absence of any reference to the peer-reviewed scientific literature on return flows, all of which should lead a science-based statutory authority to treat the return flow issue as a priority both to be studied and then managed.

In the 2017 ‘Basin Plan Evaluation’, the MDBA stated that of the 2100 GL of water per year said to have been recovered for the environment, 703 GL has been ‘recovered through infrastructure’.⁵⁸ There is also reference to efficiency measures in the MDBA publications ‘Implementing the Basin Plan’ dated 17 March 2017,⁵⁹ and in the MDBA’s ‘SDL Adjustment Mechanism Draft Determination’ of 2 October 2017.⁶⁰ There is not a word in any of these publications regarding return flow. It is as though a significant branch of scientific research concerning water recovery through efficiency upgrades does not exist. Such an approach risks both unlawfulness and the waste of public funds. The failure to take any account of return flow — particularly prior to an efficiency upgrade — leads to a fundamental problem of not knowing how much water has been recovered through such an upgrade, best described by Dr Loch when comparing these projects to a buyback:

“Under buyback I can be very confident that we have recovered X because an entitlement with a property right and underlying legal structure, etcetera, etcetera have been recovered.” If I have no concept of what was being lost from a farm before a transformation of that productive system has taken place under a water use efficiency investment, I am then saying, “I’ve saved X”. How can I actually account for that in these recovery — I can’t. You simply cannot, with any confidence, account for those figures as a true understanding of what we have done to recover water.⁶¹

Although not a priority for the MDBA, the return flow issue is one that the Commonwealth Government is sufficiently sensitive about that it pressed for and achieved censorship of concerns in this regard by succeeding in having a section on Australia removed from a paper published by the Food and Agriculture Organisation of the United Nations entitled ‘Does Improved Irrigation Technology Save Water?’ (**FAO Report**).⁶² In the first version of that report, the case study on Australia queried the Commonwealth Government/MDBA approach of assuming zero return flow in efficiency measure irrigation upgrades, and summarized a recent publication by Professor Grafton in this way:

- *About USD 2.5 billion of taxpayers’ funds used for improving farm irrigation has primarily benefitted private individuals;*
- *These investments have had no discernible impact in terms of reduced water use on a per-hectare basis, or release of water to alternative users;*
- *The buyback of water rights from willing sellers was the most effective use of taxpayer funds to release water to alternative uses;*
- *Investments in irrigation to raise “crop-per-drop” productivity had failed to deliver water savings on a basin scale.⁶³*

The Commonwealth Government is of course free to comment on a publication such as the FAO Report. This is especially so when such a publication raises an issue concerning the expenditure of Commonwealth funds. Lobbying for the withdrawal of the Australian section of the FAO Report, however, provokes its own adverse comment. What scientific evidence was behind the motivation to seek the exclusion of this section of the report remains a mystery. In Dr Chris Perry's view, the Commonwealth Government presented no more than 'assertions' as to why the report was not accurate, without substantiation by 'science, data, analysis'⁶⁴ or 'the presentation of facts'. It became simpler, Dr Perry felt, to delete the section on Australia, rather than continue a non-science and non-fact based debate.⁶⁵

With the exception of South Australia, neither the MDBA, the DAWR nor the other States have engaged with this issue in their submissions to the Commission. This suggests a lack of ready answer to concerns raised by witnesses mentioned above. It raises real doubts about the reliability of the amount of water said to have been recovered by efficiency measures, or that might be recovered in relation to further efficiency measures.

Further, the Productivity Commission in its 2018 Draft Report has also raised the issue of the reliability of efficiency measures as a means of returning water to the environment (over and above their exorbitant cost).⁶⁶

In response to a request by the Commissioner for clarification of certain matters from its main submission, the South Australian Government stated in its September 2018 response that 'return flows are very site and jurisdiction specific'.⁶⁷ Reference was made to a study prepared in 2009 indicating that return flows have declined significantly since 1993 and 1994, and at least in South Australia have reduced significantly since the 1980s as part of salinity management programs.⁶⁸

The expert witnesses who gave evidence to the Commission acknowledged that not all efficiency measure or irrigation upgrades will potentially be unreliable in terms of how much water has been returned to the environment. In the not particularly common circumstances of a farm being a long way away from a water resource, return flow as run-off can probably be discounted. Equally, run-off water entering a saline aquifer as groundwater can perhaps be discounted to some degree, although it may have the benefit of adding to the flow of a river like the Murray to ultimately flush salt out at the Mouth.⁶⁹

There is also no evidence before the Commission that would enable anyone to state precisely in volumetric terms or even in percentage terms what the impact of return flow might have on the reliability of the claim as to the volume of water returned to the environment as a result of efficiency measures/irrigation upgrades. On the evidence, however, the Commissioner is comfortably satisfied of the following matters:

- return flow is an issue that needs to be accounted for and investigated
- neither the MDBA, the DAWR nor any State has put forward a response of substance to the evidence given by the expert witnesses to the Commission

- the extent to which return flows should be taken into account can only be determined after proper investigation
- from the time in which the Basin Plan was in draft form, until now, the MDBA has effectively ignored this issue, rather than engage with it properly.

Recent expert report on return flow

In October 2018, the Melbourne School of Engineering, Water, Agriculture and Environment Program based at the University of Melbourne published a review entitled ‘Potential Impacts of Groundwater Sustainable Diversion Limits and Irrigation Efficiency Projects on River Flow Volume under the Murray-Darling Basin Plan’ (**Groundwater and Return Flow Impacts Report**).⁷⁰ This report was commissioned by the MDBA, and its authors were asked to address the following two questions:

- 1) Is it likely that irrigation efficiency projects, carried out to achieve Basin Plan recovery targets, will have a material impact on return flow to rivers?
- 2) Is it likely that the Basin Plan Groundwater SDLs will have a material impact on river flow volume?

In sworn evidence given at Senate Estimates on 26 October 2018, Mr Colin Mues, the Head of Science and Knowledge at the MDBA, said that the MDBA decided to commission the Groundwater and Return Flow Impacts Report ‘[w]hen the return flows issue arose’.⁷¹

In the context in which he used it, Mr Mues may have a different understanding of the temporal aspects of the English word ‘when’ than would commonly be the case. Scientific literature concerning irrigation efficiency and return flow has been available in abundance from the 1990s onwards. Scientific controversy surrounding return flows and efficiency upgrades has been known, or made known, to the MDBA since the Commonwealth program for efficiency measures upgrades began, and certainly no later than 2013. Australian scientists have engaged, or attempted to engage, with the MDBA on this issue since that time. For Mr Mues to assert that the Groundwater and Return Flow Impacts Report was commissioned ‘[w]hen the return flows issue arose’ is surprising against that backdrop. In any event, in response to question one, the authors of the report expressed the opinion that ‘the irrigation efficiency projects recover a total of 1179 GL/yr across the Basin, of which 757 GL/yr, or 64%, is transferred to environmental entitlements. These irrigation efficiency projects are found to reduce flow by 121 GL/yr. The reduction represents 10% of the total recovery, or 16% of the recovery transferred to environmental entitlements. An uncertainty range of 90 GL/yr to 150 GL/yr is suggested’.⁷²

Of the authors’ recommendations, those pertinent to return flow are:

- *We recommend that MDBA assess impacts on river flow from other factors such as water buyback, water trading, land use and irrigation changes, and*

climate change. In future reviews of the Basin Plan, the impacts from these factors as well as from groundwater SDLs and irrigation efficiency projects should be explicitly accounted for, including in river modelling that supports the reviews.

- *We recommend that MDBA implement a program for data collection, regular assessment and review of impacts on river flow from groundwater SDLs, irrigation efficiency projects and other factors, building on the frameworks and methods developed in this review.*⁷³

Contrary to the MDBA's claim to Professor Williams, on no view can 121 GL per year of water in the context of the Southern Basin be considered a 'negligible' amount of water. It is an amount of water that needs to be accounted for.

In its submission to the Commission of 8 October 2018, the DAWR asserts that 'preliminary findings' from a recent 'workshop' critique of the methods used by the authors of the potential impacts report were in 'agreement that there is no prima facie case that the impacts of reduced return flows on stream flows has substantially undermined the Basin Plan'.⁷⁴

There is no test of 'substantially undermining' in the Water Act or Basin Plan. The Water Act requires the setting of a Basin-wide SDL that reflects an ESLT. The return flows issue is clearly relevant to that task, and must be taken into account.

Further, the authors of the Groundwater and Return Flow Impacts Report made it plain that this work was only a starting point. They stated that there is:

*a need for more intensive and on-going data collection, regular evaluation and review of the impacts on river flow from groundwater SDLs, irrigation efficiency projects and other factors. A systematic program could be initiated by building on the frameworks and methods developed in this review ... On the impact of irrigation efficiency projects, the program will include the collection of a common set of information from all future irrigation efficiency projects, at both the proposal and completion stages.*⁷⁵

In other words, the issue of return flows has only just begun to be properly investigated in the context of the Basin Plan, despite the best endeavours of Australian scientists over the past five years referred to above. To say that the MDBA has been slow off the mark on this important issue would be too kind a description. The six-year delay in commissioning or undertaking research on this issue remains unexplained, and perhaps cannot be explained in a satisfactory way. Adopting the evidence of Dr Perry, no criticism is made of the MDBA for not knowing the precise volumetric figure for return flows in the Basin that should be accounted for in relation to efficiency upgrades. Rather, as Dr Perry said in his evidence:

I wouldn't criticise anybody for not knowing what the non-recoverable return flow or whatever was. I would criticise them, though, for failing to recognise that it likely exists and making a competent estimate of its magnitude. Right? So we're not talking about knowledge and ignorance. We're talking about doing our best to get these things clarified and sorted out and to put the best labels we can on the various flows that take place when water is used in irrigation or for any other purpose.⁷⁶

Additional vulnerability

Expert witnesses told the Commission that efficiency measure programs can lead to a change in irrigator behaviour. Greater risk is taken in crop production, with evidence of a move towards permanent crops. In the course of criticizing the additional cost of efficiency measures as distinct from buyback, Dr Loch said this:

But the recovery efforts effectively switch gears to efficiency and suddenly we end up spending a lot more money and a lot more time and a lot more effort trying to get to where we want to go and making ourselves exceedingly vulnerable in the future as a result.⁷⁷

The issue of vulnerability was then explained this way:

MR BEASLEY: I assume — and please feel free to correct me and expand on this — but my understanding of reading your work in terms of vulnerability is the analysis of efficiency measures that can cause a change in irrigator or farmer behaviour in the sense of changing to a different crop, including a perennial crop, which has a higher risk. Obviously it needs water every year, unlike an annual where you can grow it one year and not the next and do something else like sell water. And that, because you've moved — if an irrigator or farmer moves in perennial cropping for example it greatly increases their risk if either there's a dry year or to ongoing climate change risks. Is that generally the ...

DR ADAMSON: That's correct.

THE COMMISSIONER: Have we seen — have we seen that shift yet?

DR ADAMSON: Yes.

DR LOCH: Yes. You can — you can see it today in the Riverland where there are hundreds of acres of almonds being planted as we speak.⁷⁸

Efficiency measure infrastructure upgrades are not the only reason behind a shift towards permanent plants such as almonds in parts of the Basin such as the Sunraysia region. Market forces are in play, most notably the returns that can be had from such a crop. Nevertheless, the huge growth in permanent plantings in parts of the Basin that are

reliant on a river subject to large variations in flow historically, and with likely added pressures from climate change, is very concerning.

Disclosure

Given that efficiency measures:

- are vastly more costly to the taxpayer than buyback as a means of recovering water for the environment
- are associated with reliability of recovery concern, and
- encourage great risk taking and hence add economic vulnerability,

one must turn to whether there is some other reason why they are of benefit to the general public, as distinct from the successful people or enterprises that have applied for funding under the various State programs that have been funded through the Commonwealth Government's SRWUIP program (and the businesses involved in the installation or manufacture of water efficiency infrastructure, such as drips, netting or lining).

To inquire properly into this matter, full transparency is required. This involves comprehensive public disclosure of at least the following:

- who has received funding
- how much money was received
- for what new or upgraded infrastructure
- to reduce their water use by how much, and
- in order to return what amount of water to the Commonwealth.

In other words, as witnesses to the Commission have recommended,⁷⁹ a full and complete audit is required to ascertain why Commonwealth money is being spent, and what the precise return is — in particular, how much water is being returned to the environment, and at what cost to the taxpayer, both in real terms, and as compared to buyback.

Sadly, no such transparency or disclosure has existed despite the fact that the money being spent is public money. At the Senate Estimates Hearing for the Rural and Regional Affairs and Transport Legislation Committee in October, Ms Mary Colreavy, Assistant Secretary from the Water Recovery Branch of the Water Policy Division of the DAWR, gave evidence of the processes that applicants must go through to obtain funding from the Commonwealth for a water efficiency program, such as an on-farm project, either directly from the Commonwealth, or through a Commonwealth-funded State administered scheme.⁸⁰ (This information is also available on the DAWR website). This may be some evidence of a process, but it is not a substitute for transparency in relation to approved

projects. This is, from its nature, a matter in which it is to be hoped the Auditor-General will become involved.

On a more positive note, it appears that the DAWR has been listening to the criticism of its lack of disclosure. In relation to the new MDBWI Program, the DAWR has stated that it will publish on its website the following information within 31 days of entering into each contract for efficiency measures:

- in relation to project partners: name of the project owner, start date, end date, program stream, location, value of the project, water price per megalitre and volume of water (nominal and Long Term Average Annual Yield)
- in relation to delivery partners: names and website links of successful tenderers, and
- for the overall program: number of tenders received by program stream, number of successful tenderers by project type, value of successful projects by project type and jurisdiction, amount of water transferred to the Commonwealth, and amount of water contracted to the Commonwealth but not yet transferred.⁸¹

Update on socio-economic modelling

It appears as though, at some time in 2018, the MDBA engaged the University of New England to review ‘the social and economic modelling to be undertaken by the MDBA of the impacts of water recovery on the communities of the Southern Murray Darling Basin’. A report dated 11 July 2018 has since been published (**Final Socio-Economic Review Report**).⁸²

The Executive Summary of this report states that the authors were engaged to review the MDBA’s modelling and to improve it in a ‘critical yet constructive way’.⁸³ It is not known precisely what instructions were provided to the authors for the purposes of the report, or whether any drafts of the report were discussed with the MDBA or subject to discussion with it.

The report in some respects is a review of some of the research and publications of various expert witnesses who gave evidence at the Commission’s hearings, and who provided submissions. A submission by Professor Wheeler et al is expressly mentioned in the Final Socio-Economic Review Report.⁸⁴

There are times when the authors of the report seem to go out of their way — arguably unusually for an independent economic analysis report — to both congratulate the MDBA on its work, and KPMG.⁸⁵ By implication, given the authors’ prior work for the MDBA, the report is self-congratulatory. Given the work done by two of the authors of the Final Socio-Economic Review Report on the MDBA’s socio-economic modelling for the Northern Basin Review⁸⁶ — work criticized by some of the witnesses who gave

evidence to the Commission and who lodged submissions — some might think it prudent to have engaged different experts this time.

Leaving these matters aside, despite the positive comments, it is somewhat remarkable that so many of the recommendations in the Final Socio-Economic Review Report pick up the research, published work, critiques, submissions and sworn evidence of various Commission witnesses such as Professor Wheeler, Professor Grafton, Dr Loch and Dr Adamson. The following ‘updated literature review implications’ (ULRI) in the report are examples:

ULRI8: MDBA should address the issue raised by Wheeler et al. (2018) about investment in health and education providing 2–3 more permanent jobs (Whitwer and Dixon 2013) than spending on irrigation infrastructure.

ULRI9: For completeness MDBA and KPMG should specifically address the issue raised by Wheeler et al. (2018) as to why they did not employ CGE modelling in their Northern and Southern Basin reviews.

ULRI10: The modelling being conducted for the Southern Basin should address the need raised by Wheeler et al. (2018) to model production revenue rather than output and how production revenue does not change proportionately with a change in water availability.

ULRI11: The long-term influences on irrigated farm production (increasing urbanization, temperatures, changing commodity prices, terms of trade and technology) should be considered in the Southern Basin modelling given the claim by Wheeler et al. (2018) that these were not included in the Northern Basin review.

ULRI12: MDBA, KPMG should address in their modelling the issue raised by Wheeler et al. (2018) of the paradox of irrigation efficiency and the rebound effect? (Relates to ULR5&7).

ULRI13: MDBA & KPMG should address the issue of sample selection bias in their modelling of Southern Basin communities, as raised by Wheeler et al. (2018) for the Northern Basin modelling. Related is the inclusion of impacts on nearby areas through spatial modelling to increase number of areas modelled and accounting for areas downstream that would potentially benefit from increased environmental diversions.

ULRI14: Given Wheeler et al. (2018) criticisms of the reports for the Northern Basin modelling, MDBA and KPMG should ensure that they undertake appropriate tests for: endogeneity, collinearity, heteroskedascity and serial correlation or other relevant statistical tests appropriate to the Southern Basin modelling. It is also suggested to make explicit comment on the small size of the samples used and how these could be increased to increase statistical power (e.g. through use of all

SLAs in Southern Basin instead of selected condensed groupings which reduces the sample size).

ULRI15: MDBA and KPMG should ensure that the referencing in their reports is excellent to ensure that data sources and the documents themselves can be reviewed. This is required because Wheeler et al. (2018) argue that inadequate documentation would appear to result in an upward bias in the estimates of economic losses associated with water recovery for the Northern Basin review.

ULRI16: MDBA and KPMG should note that the statement made by Wheeler et al. (2018) as to Blackwell et al. (2016) not highlighting the ‘reflows issue’ is inaccurate because we did identify the reflows issue under LI#15&16 in Table 1.⁸⁷

Notable too is the authors’ recommendation in relation to the Goulburn-Murray Irrigation District Modelling for the need for the MDBA to address the Jeavons Paradox in regard to water use efficiency.⁸⁸

The authors of the Final Socio-Economic Review Report in the main refer to 2018 published work as their sources in relation to their updated literature review, perhaps unintentionally giving the impression to the reader that the issues raised in ULRI 8 to 16 are the result of recent academic effort. In fact, they have been the subject of academic and scientific debate, and peer-reviewed literature, long before 2018. Equally, many are matters raised with the MDBA years ago.

Government submissions

The submissions to the Commission by the MDBA and the DAWR failed to address the issue of efficiency measures and the recovery of the 450 GL of upwater in any substantial or helpful way. The same can be said of the submissions received from the New South Wales and Victorian Governments. Only the submissions and additional answers to questions from the South Australian Government have provided any assistance in relation to the efficiency measures and issues concerning the 450 GL.

Prospects of recovering the 450 GL — Victoria, New South Wales & recent developments

The Rigoni’s Bistro incident

The criteria for establishing socio-economic neutrality or benefit for an efficiency measure have been either ignored or misinterpreted for some time as a means of arguing against the recovery of a further 450 GL per year of water for the environment to ‘enhance’ the South Australian environmental assets referred to in sec 86AA of the Water Act and Sched 5 of the Basin Plan. For example, in a letter dated 17 November 2016 from the then

Commonwealth Minister for Agriculture and Water, Mr Barnaby Joyce, to the then South Australian Minister for Sustainability, Environment and Conservation, Mr Ian Hunter, Minister Joyce said:

If it was genuinely possible to put an additional 450 GL down the river without hurting people, then none of us would have a problem with it. The reality is that it will.

South Australia's default share of the 450 GL target is 36 GL. Does the South Australian Government have a plan for where this water would come from without causing negative social and economic impacts to South Australian communities?

I believe that we are heading into an unprotracted (sic) and unsolvable stalemate, where the funding will stay on the books for a recovery that will be impossible to make in accordance with the legislative requirements — that the recovery must has (sic) positive or neutral social and economic outcomes.

...

My main concern is this — just as you have an understandable desire for one outcome, your colleagues in other states have an equally understandable desire for another regardless of what side of the political fence they are on.

I cannot foresee them agreeing that the additional 450 GL of water can be delivered without significant social and economic detriment.

The hard conversation has to happen about how we resolve this stalemate. I look forward to discussing it with you more at the Ministerial Council.⁸⁹

There is no reliable evidence before the Commission that would support the assertion in that letter that recovery of an additional 450 GL of water would have negative social and economic impacts, or that its consequence would be ‘hurting people’ either economically, socially, or otherwise. Minister Joyce offered no such evidence. Leaving that aside, Minister Joyce’s letter ignores the test of social and economic neutrality in sec 7.17(2)(b) of the Basin Plan. That is no trifling thing, as that section was (and still currently is) the law. The test is satisfied by participation, not the concept of ‘hurting people’. Leaving this also aside, the gist of the letter was such that the Commonwealth’s then position seemed to be that the recovery of 450 GL of upwater for South Australia’s environmental assets was unlikely.

A ‘hard conversation’ took place at Rigoni’s Bistro in Adelaide at the time of the MinCo meeting shortly after this letter was delivered. The South Australian Minister made his and perhaps the then State Government’s views known to his interstate and Commonwealth colleagues in unambiguous terms, with Minister Hunter apparently telling Minister Joyce, in colloquial terms, to leave the jurisdiction.⁹⁰ The stalemate was not resolved.

Ernst & Young report on socio-economic impacts

Perhaps partly as a result of the Rigoni's Bistro incident, in April 2017 the DAWR, on behalf of the MinCo, commissioned the accounting firm Ernst & Young to provide a report on the recovery of the 450 GL of water through efficiency measures and to advise on, amongst other things, the potential socio-economic impacts of such measures. The report that resulted from this engagement (**Ernst & Young Report**), published in January 2018, reaches the conclusion that off-farm and urban efficiency measure projects generally have positive socio-economic impacts, and on-farm efficiency measures generally create at least positive socio-economic impacts for the participating farmers or farming/irrigation businesses. This is because those participating farmers can use water savings to increase productivity and there appears to be limited employment impacts from on-farm efficiency measures. However, the report also concluded that the benefits experienced by participants of on-farm efficiency measures may put non-participating farms and industries at a competitive disadvantage (because modernized irrigators might demand more water to increase production, thereby potentially putting an upwards pressure on the price of water) which could lead to negative socio-economic impacts in their communities.⁹¹ Importantly however, the authors of the Ernst & Young Report found no evidence of such negative socio-economic impacts occurring.

It is notable also that this report queried whether sufficient Commonwealth funds had been set aside to achieve the 450 GL of water for the environment through efficiency measures.⁹² Moreover, the whole premise of the report seems to ignore sec 7.17(2)(b) of the Basin Plan — the definition of neutral or improved socio-economic outcomes.

This is no criticism of the authors of the Ernst & Young Report. Rather, the report appears to have been commissioned by the DAWR on the basis that sec 7.17(2)(b) of the Basin Plan does not exist, and that there is some other test for socio-economic neutrality or benefit.

Perhaps the most curious aspect of the Ernst & Young Report is the way in which it has been received by the Commonwealth, Victorian and New South Wales Governments. Efforts to recover the 450 GL were delayed to obtain this report. The authors conducted what appears to be a thorough review of the evidence and undertook considerable research. No doubt this report cost a considerable amount of public money. Yet, having received it, the Commonwealth Government has essentially ignored its findings, and the Victorian and New South Wales Governments have continued to delay committing to on-farm efficiency measures while requesting new and onerous criteria for the Basin Plan's socio-economic neutrality test, as discussed below.

May 2018 government 'offer'

In May 2018, the Commonwealth Government made a 'without prejudice' offer to the Labor Opposition which, amongst other matters, contained the following clause:

Clause 5: Strengthening SDL Adjustment Mechanism

Announcement of an expression of interest (EOI) for efficiency projects to begin the 450 GL of recovery, utilising the \$1.5 billion in funding from the Water for the Environment Special Account;

New South Wales talking to stakeholders about commencing water recovery under the 450 GL of additional water, through water efficiency projects with neutral or positive social and economic impacts;

Link payments under the national partnership agreement for the delivery of sustainable diversion limits supply measures to states who are able to demonstrate their full cooperation with delivery of efficiency measures as defined under the Basin Plan. Under this approach, state access to supply measure funding would be conditional on the Commonwealth being able to roll out any efficiency measure programs as provided for in the Water Act and the Basin Plan. These arrangements would be set out in the performance milestones under funding agreements with the states:

i The agreements will specify ownership of any assets created by the supply projects, responsibility for costs of ongoing maintenance and operation, and arrangements to ensure transparency for stakeholders of project development and implementation plans.

ii The agreements will also clarify responsibility between Basin states and the Commonwealth for residual water recovery required as a consequence of any reconciliation adjustment by MDBA in 2024.⁹³

This offer, which apparently was accepted by the Labor Opposition, has no contractual standing. It is unlikely that the drafter has thought through, in a meaningful way, what is actually meant by some of the clauses.

Following this government offer, it became clear from public statements made by the relevant New South Wales and Victorian Governments with responsibility for the Basin Plan that they intended to seek a change to the definition of socio-economic impact set out in sec 7.17(2)(b)(i) of the Basin Plan.

June 2018 meeting of the Murray-Darling Basin Ministerial Council

At a meeting of the MinCo on 8 June 2018, a series of ‘commitments’ were made by Basin States regarding efficiency measures. Importantly, the claim has been made that following this meeting Basin governments would commence ‘working together on additional program criteria for on-farm efficiency measures’.⁹⁴

In its submission to the Productivity Commission's 2018 Draft Report, the Victorian Government described the test of socio-economic neutrality in the Basin Plan as 'inadequate' and that it did not 'reflect the real impact that water already taken from the system has had'.⁹⁵ The South Australian Government's position, outlined to both this Commission and to the Productivity Commission, is that the test for socio-economic neutrality in relation to efficiency measures in the Basin Plan should not be amended, although it did support efforts to develop criteria for projects to mitigate risks and maximise benefits.⁹⁶

Proposed new criteria for socio-economic neutrality or benefit

On 15 October 2018, the New South Wales and Victorian Governments released their proposed new criteria for the approval of efficiency measures to recover the 450 GL of upwater. The proposed criteria for an efficiency measure project are as follows:

- identifies potential impacts on the district and explains any benefits
- does not directly increase the price of water
- contributes to the current and future financial viability of irrigation districts
- supports regional economies by not impacting on irrigation jobs now or in the future
- does not have negative third-party impacts on the irrigation system, water market or communities
- is supported by the community
- identifies and improves social and environmental outcomes and does not negatively impact them, and
- identifies, protects and improves Aboriginal values.⁹⁷

December 2018 meeting of the Murray-Darling Basin Ministerial Council

Following the meeting of the MinCo on 14 December 2018, a consultation report by consultancy firm Seftons (**Seftons Report**) was published, along with a set of 'Agreed Criteria'.⁹⁸

Socio-economic criteria

The purpose of the Seftons Report was to 'undertake an independent consultation process to seek advice on how the Commonwealth can best invest in water efficiency projects with neutral or positive socio-economic outcomes'.⁹⁹ The report accordingly contains the outcomes of a series of consultation sessions conducted across the Basin over approximately four weeks.¹⁰⁰

It is not apparent why the Seftons Report was considered necessary or useful for its stated purpose. Insofar as advice can be provided on the social or economic effect of proposed projects, that advice must necessarily be based on logical and empirical analysis. The subjective views of Basin communities are but a component of such analysis, such as that done by Ernst & Young and Professor Wheeler. It would be remarkably ill-advised to formulate policy based solely or largely on the subjective views of communities that, as the Seftons Report itself notes, are affected by a lack of understanding and access to relevant information.

The need for the Seftons Report remains a mystery when regard is given to its findings. The key findings are unremarkable and entirely predictable based on the material already before the MDBA, the Commonwealth, the Basin States and this Commission. As the report itself acknowledges by noting that communities felt ‘over-consulted but not listened to’,¹⁰¹ Sefton’s further, imperfect,¹⁰² attempt at consultation was largely unnecessary. For example, it was already readily apparent that Basin communities are confused and worried about water recovery, and have a significant level of distrust in government efforts to recover water through any means and for any purposes, and particularly for the 450 GL of upwater. Arising from these findings, the Seftons Report contains broad recommendations for future consultation regarding the better provision of information and better engagement with communities.¹⁰³

Many of the 13 Agreed Criteria appear directed towards the recommendations made in the Seftons Report. For example, criterion one requires more comprehensive disclosure of relevant information and materials relating to projects. Criterion two requires project proposals to contain detailed information regarding expected socio-economic benefits and the strategies proposed for increasing those benefits.

However, critical detail is often lacking in the Agreed Criteria that necessarily render their future application a mystery. For example, ‘large projects’ must provide the detailed information about socio-economic benefits discussed above, but there is no definition of ‘large project’. Socio-economic assessments must assess ‘broader regions’, but no detail is given on how those broader regions are defined or assessed.

Further criteria appear to be based on the proposal from New South Wales and Victoria. The deficiencies in that proposal are either replicated or exacerbated in the Agreed Criteria. The requirement that projects ‘not impact negatively on regional jobs’ is broad and uncertain. Does it mean that if one single job is lost, the project cannot proceed? Similarly, the requirement that projects do not ‘reduce the overall productive capacity’ of the region doesn’t explain how that reduction should be measured.

However, more problematic are the criteria that evidence what would appear to be based either on fundamental misconceptions of the operation of the Basin or upon ill-informed political ideology. It would be difficult for an individual project to adequately assess whether it had a ‘direct impact on the reliability of water from cumulative implementation of projects’. However, this criterion appears to be based on the ignorance

of the fact that reliability of water entitlements remains wholly unaffected by the transfer of water entitlements from consumptive users to environmental water holders. Further, the requirement that projects must not directly increase the price of water defies economic logic. A particular transaction in a commodity only directly impacts the price reached in that transaction — it can only necessarily have an indirect impact on the overall price of that commodity. Further, this criterion ignores the economic benefits of the increase in water entitlement prices, as it represents an increase in the capital value of that commodity, as noted by the DAWR's submission to the Productivity Commission. As no explanation for this contradiction has been made, it can only be concluded that the Commonwealth Minister's agreement to this criterion was against DAWR advice.

Finally, whilst many criteria require projects to contain, identify and focus on specific matters, there is no guidance on how these requirements will be assessed and how project proposals can be said to have complied. If, as the communique from the MinCo suggests, this is yet to be determined by the Basin States by 'establish[ing] a process to assess each project against the criteria', the Agreed Criteria are of limited utility until that process is developed and applied.¹⁰⁴

The Commonwealth Minister has described the Agreed Criteria as a 'historic agreement' that meant the Basin Plan 'will be delivered'¹⁰⁵ according to a socio-economic test that 'respects the parameters of the original legislation'.¹⁰⁶ This is disingenuous and misleading. The Agreed Criteria represent a fundamental change from the test in the Basin Plan, and it is not cynical to take the view that these far more onerous and expansive criteria signal the death of any reasonable prospects of recovering probably any of the extra 450 GL of so-called upwater. It is little wonder that the former CEWH, Mr David Papps, told the Commission that 'I would put my house on it that there won't be 450 gegalitres'.¹⁰⁷

Turning to the South Australian Government position, whilst some of these Agreed Criteria can be characterized as being designed to 'mitigate personal risks and maximise opportunities for positive outcomes', the test for socio-economic neutrality under the Agreed Criteria is clearly altered from that which is contained in the Basin Plan. In the absence of any reasoned explanation for this change in position, communicated to this Commission as late as 20 September 2018, it can be inferred that the South Australian Government's agreement to the Agreed Criteria was only reached on the basis of a political compromise.

The South Australian Government's agreement to changes to the socio-economic criteria for efficiency measures should not merely be described as ill-advised. It is nothing short of a capitulation to the interests of the current Commonwealth Government, and those of Victoria and New South Wales. It is so contrary to the interests of South Australians that the decision by the Minister responsible is almost certainly a breach of at least cl 2.5 of the South Australian Ministerial Code of Conduct in that no Minister acting reasonably could consider these changes to the criteria to be anything but totally antipathetic to the

interests of South Australia, and the South Australian environment. South Australia's agreement to these changes should be immediately reversed.

Desalination plant

At this meeting, the MinCo further agreed on a project to 'investigate the contribution' that the Adelaide Desalination Plant, amongst other urban projects, 'could make to support the implementation of a socio-economically neutral 450 gegalitres efficiency measures program'.¹⁰⁸ No further detail accompanies this typically opaque description.

Why the South Australian Minister agreed to this proposal is not clear. This is particularly concerning, given that the relevant South Australian Department received a comprehensive, independent cost-benefit analysis in June 2016, that determined the desalination plant should only be used when temporary water market prices reach a critical price point, namely above \$510 per megalitre.¹⁰⁹ On that analysis, it should therefore not be used as a permanent 'support' to annual water recovery targets. Prior to this MinCo meeting, therefore, either the Minister was unaware of this report, has determined it is deficient in some way or has simply chosen to ignore its existence. All of these scenarios are concerning.

Further, Adelaide's urban water usage, which averages approximately 100 GL per year, represents only about 1.25% of Basin-wide diversions, whilst South Australia's total diversions represents only about 11%. Running a desalination plant for Adelaide's metropolitan water usage, therefore, could have little impact on upstream diversions.

Finally, this renewed focus on the Adelaide Desalination Plant as a means to substantively reduce South Australia's reliance on the Murray is in danger of overlooking the significant ecological and economic benefit that surface-water flows in the Basin provide, including those flows that run through South Australia.

All of these points were made in a compelling fashion in August 2018 in an opinion article by Professor Wheeler.¹¹⁰ Again, prior to this MinCo meeting, either the Minister was unaware of this article and the arguments therein, has determined they are deficient in some way or has simply chosen to ignore them.

Conclusion

For over five years, efficiency measures have been favoured as a means of recovering water for the environment. This is despite:

- the significantly greater cost to the taxpayer than a buyback for each megalitre of water recovered, and
- the concerns raised by (and the failure to investigate) the concept of return flows.

Positive economic outcomes from buybacks — such as the expenditure from sale proceeds in local communities and regional centres — have been ignored. Alleged negative impacts from all water recovery have either not been substantiated, or have been exaggerated.

The socio-economic evidence prepared or commissioned by the MDBA is fundamentally flawed. Assertions of a relationship between water reduction and a reduction in farm production and job losses are simplistic and ignore other relevant factors, unrelated to water recovery, driving change and job or economic contraction in rural communities.

It is highly likely that water asserted to have been recovered for the environment under efficiency measures schemes and infrastructure upgrades has been overestimated to some degree.

Transparency has been inadequate in relation to SRWUIP and State managed infrastructure upgrade schemes. A complete audit is required.

Efficiency measure infrastructure upgrades are a vastly more expensive means of recovering water than buyback. Despite their added expense, they are persisted with even though buybacks have additional advantages, and the negative impacts of buybacks are either mythical, or exaggerated. Further, efficiency measures pose as yet unresolved and yet to be fully determined reliability issues as a result of return flows. Persistence with efficiency measures as a means of recovering water defies logic and common sense, and is fiscally irresponsible. Neither the taxpayers of the Basin nor the millions of taxpayers outside the Basin should be subjected to the wasteful and irresponsible policy of government paying over 2.5 times what it needs to in order to recover water.

If the efficiency measures program is to continue, and those parts of the Basin Plan and Chapter 7 dealing with efficiency measures remain, the Agreed Criteria the subject of the MinCo meeting in December 2018 should be abandoned, insofar as they seek to alter, rather than simply supplement, the test currently in sec 7.17(2)(b)(i) of the Basin Plan. They would result in the near certainty that little or any of the 450 GL of so-called upwater is recovered. If that is their purpose, that aim should be frankly recognized, and politically justified.

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10 Northern Basin Review

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Chapter summary

During the drafting of what ultimately became the *Basin Plan 2012 (Cth)* (**Basin Plan**), concerns about the lack of knowledge in relation to the water requirements for the Northern Basin resulted in an agreement between Basin States that further research be undertaken. Ultimately that agreement was reflected in a note to the Basin Plan in sec 6.06, which set the basis upon which approximately four years of research and investigations were conducted by the Murray-Darling Basin Authority (**MDBA**) into the sustainable diversion limit (**SDL**) as it related to the northern part of the Murray-Darling Basin.

It has never been made clear by the MDBA what power was relied on to undertake the Northern Basin Review (**NBR**). Whilst reference is made by the MDBA to sec 6.06 of the Basin Plan, this provision confers a power to undertake investigations for the purpose of a review, including a review of SDLs. Provisions which do support the research and investigations undertaken by the MDBA are found in secs 172 and 173 of the *Water Act 2007 (Cth)* (**Water Act**), which confers upon the MDBA broad research and investigation functions, including generally into the Basin water resources (para 172(1)(d)).

Regardless of the powers exercised by the MDBA to undertake the NBR, it was incumbent on the MDBA to comply with the requirements of the Water Act in relation to setting and adjusting SDLs, including its requirement to act on the basis of best available scientific knowledge and socio-economic analysis, and ensuring that the SDL reflects an environmentally sustainable level of take (**ESLT**) as expressly mandated by subsec 23(1).

Ultimately, after approximately four years of research and public consultations, the MDBA recommended that the SDL for the Northern Basin be increased by 70 GL. This recommendation has been adopted and amendments to the Basin Plan made reflecting it.

The Commissioner heard evidence from a number of experts and community members, but only the views from irrigator bodies amounted to evidence in support of this, or any, increase to the SDL for the Northern Basin. Notwithstanding a number of invitations made by, and on behalf of, the Commissioner, neither the MDBA nor the Commonwealth provided any substantive response or submission to the Commission in support of an increase to the Northern Basin SDL.

The research undertaken by the MDBA failed to identify the water requirements needed to achieve environmental outcomes in the Northern Basin. The only scientific evidence before the Commissioner is that the environment in the Northern Basin has been compromised and the level of compromise is likely to worsen into the future. The MDBA's own analysis confirmed that an increase to the SDL would result in reduced environmental outcomes. The only available conclusion is that there was and is no scientific justification for the increase to the SDL for the Northern Basin. On the contrary, the evidence strongly supports a decrease to the SDL for the Northern Basin in order for it to comply with the Water Act.

The MDBA's decision in this regard seems to have been based upon the so-called triple bottom line approach. As detailed in Chapter 3, this represents a misconstruction of the requirements of the Water Act. However, even on the basis of a triple bottom line assessment, the weight of socio-economic evidence before the Commissioner did not support a conclusion that Northern Basin communities were so adversely affected by the planned extent of water recovery such that an increase to the SDL was justified.

The Commissioner heard adverse evidence regarding the MDBA's process, including the limited scope of public consultation, the poor availability of information by the MDBA, the unsuitability of the MDBA's modelling and the excessive manipulation of modelling results. In addition to expert witnesses, the Commissioner heard evidence on these issues from Aboriginal representatives, industry representatives, farmers including floodplain graziers and irrigators, and members of the MDBA's own Northern Basin Advisory Committee (NBAC).

On the basis of the evidence heard, and the documentary material tendered, including the MDBA's own reports, the Commissioner considers there were serious and fundamental flaws in the process adopted by the MDBA when conducting the NBR. On the material before the Commission, the decision to increase the SDL by 70 GL disregards substantial and important matters of relevance and lacks an evident and intelligible justification.

Since the NBR was finalized, the MDBA has announced the position of a new role, namely that of the Northern Basin Commissioner. Without sufficient resourcing and powers, including clear statutory powers, the Northern Basin Commissioner will be unlikely to alleviate community concerns arising from the NBR.

Background to the Northern Basin Review

What is the Northern Basin?

The Water Act neither defines nor refers to the Northern Basin. The Basin Plan, however, contains multiple references to the 'Northern Basin', 'Northern Basin region' and the 'Northern Basin zone'. These references are used in relation to specific issues contemplated by the Basin Plan such as the identification of sites, and the determination of areas for the purpose of the shared reductions to the SDL. Common to these references is that the rivers and water resource units in the Northern Basin are those rivers and water resources '*... in the basin upstream of the upstream extent of the Menindee Lakes*'.¹

Purpose of the Northern Basin Review

The Basin Plan, as initially enacted, required 390 GL of water to be returned to the environment from consumptive use in the Northern Basin to achieve the SDL (which must reflect the ESLT). The Basin Plan prescribed the apportionment of 390 GL of

water between each valley and included a shared reduction target to meet environmental objectives in the Barwon-Darling watercourse.

The MDBA asserts that at the time the Basin Plan was enacted the information base for the Northern Basin was less robust than for the Southern Basin.² On this basis governments apparently agreed that further research be undertaken to determine the basis of the SDL for the Northern Basin.³ The agreement referred to appears to relate to a recommendation made by the Murray-Darling Basin Ministerial Council (**MinCo**) in 2012 that the MDBA undertake:

an active program of work to be completed by the end of 2015 to establish the basis for the northern shared SDL and its equitable apportionment. This work may include consideration of any impacts on southern connected Basin water resources and environmental outcomes. This work will be undertaken by the Authority, in consultation with the Commonwealth, New South Wales and Queensland, resulting in a report to Council. If Council finds that this program of work reveals significant new knowledge about the scientific and hydrological basis for the northern shared SDL and its apportionment, Council may request the Authority to undertake a review of the SDL based on the issues that are raised and for any apportionment to be considered following that review.⁴

In response to that recommendation, the MDBA stated it:

supports the Ministers' recommendation that an active program of work be completed by the end of 2015 to establish the basis for the northern Basin shared SDL reduction amount and its equitable apportionment. The Authority is moving to establish a Northern Basin Advisory Committee to advise the Authority on such a work program, which will be developed in consultation with Basin states and the Commonwealth.⁵

Arguably, the scope of the MinCo's recommendation did not envisage a reconsideration there and then of the SDL for the Northern Basin, at least absent further knowledge about the equitable apportionment for the shared reduction to the SDL (namely that part of the water recovery target intended to meet environmental outcomes in the Barwon-Darling). It is possible that a further recommendation was made at some point before the NBR was finalized; however, the basis for any additional recommendation is not apparent. The MinCo's recommendation was adopted by the MDBA in a note to sec 6.06(1) of the Basin Plan that:

the Authority intends to conduct research and investigations by 2015 into aspects of the Basin Plan in the northern Basin, including the basis for the long-term average sustainable diversion limits for surface water and groundwater SDL resource units, and in doing so will draw on local community input that will be sought from relevant local bodies.

The incorporation of this note appears to have become the basis upon which the eventual scope of the NBR was justified.

Functions and powers of the Murray-Darling Basin Authority

Power to undertake the Northern Basin Review

In its various reports, the MDBA has only referred to the NBR having been completed through the review provisions in sec 6.06 of the Basin Plan.⁶ As discussed below, however, the Basin Plan itself does not empower the MDBA to undertake a review, but empowers it to act so as to inform any review. The power to undertake the NBR arises from the MDBA's general powers and functions under the Water Act.

The Water Act

Section 50 of the Water Act confers an obligation on the MDBA to conduct a review in certain circumstances. However, none of those circumstances is relevant to the NBR. Under that section, the requirement for the MDBA to undertake a review of the Basin Plan arises only upon request from either the Commonwealth or all of the Basin States, or otherwise by 2026 should no request be made. However, such a request must be made only in circumstances that are not relevant, and in any event cannot be made within the first five years of the Basin Plan, that is before 2016, which is well after the NBR commenced. Accordingly, section 50 did not permit the MDBA to undertake the NBR.

It is to be noted that subpara 172(1)(d)(i) specifies a function on the MDBA 'to support, encourage and conduct research and investigations about the Basin water resources, including research and investigations about ... using the Basin water resources in an equitable, efficient and sustainable manner'. This provision, as noted above, did empower the MDBA to conduct the NBR, significantly in the context of sustainable use.⁷

Power to amend the Basin Plan

Part 2, Div 1, subdiv F (secs 45–48) of the Water Act provides a mechanism through which amendments to the Basin Plan may be made.

In preparing an amendment under these provisions, the MDBA is required to consult with the Basin States, Basin Officials Committee and Basin Community Committee.⁸ The MDBA can also undertake such other consultation as it thinks appropriate.⁹

Sections 23A and 23B of the Water Act also provide a mechanism for the MDBA to adjust SDLs for water resource areas. In effect, this provision enables the Basin Plan to be amended without requiring an amendment pursuant to subdiv F. Chapter 7 of the Basin Plan sets out requirements for a SDL adjustment proposed under secs 23A and 23B.

The Northern Basin Review

History of the Northern Basin Review

The NBR was carried out between 2012 and November 2016. During this period the MDBA undertook research into the hydrology, ecology and socio-economic impacts of water recovery in the Northern Basin. As a consequence of that research the MDBA published various reports to inform its recommendations as to the water recovery target and SDL for the Northern Basin.

Process for the Northern Basin Review

In 2012, the MDBA established the NBAC pursuant to sec 203 of the Water Act. The NBAC was made up of 11 members, some of whom gave evidence before the Commissioner. It is apparent that the NBAC members had deep connexions to Northern Basin communities as well as experience in the planning and management of Northern Basin water resources. Through its membership the NBAC canvassed a range of perspectives, including environmental, Aboriginal, local government and industry.

The NBAC's Terms of Reference were to advise the MDBA on matters including:

- the development and implementation of an MDBA Northern Basin Work Program
- community proposals intended to achieve water savings and/or improve environmental outcomes in the Northern Basin
- changes to management rules
- water related environmental management and cultural practices.

In undertaking these functions, the Terms of Reference specifically contemplated the NBAC advising the MDBA on matters including:

- improved modelling or ecological analysis
- ways of delivering environmental outcomes more efficiently
- implications for SDLs
- social, economic, and environmental issues.¹⁰

The NBAC presented findings to the MDBA in October 2016 in its report entitled 'Finding the balance: Final report of the Northern Basin Advisory Committee' (**NBAC Report**).¹¹ The NBAC Report concluded that water recovery is, by itself, insufficient to ensure ecological outcomes are achieved.¹² To this end, the NBAC recommended that 'toolkit measures' be implemented in addition to water recovery. The NBAC defined toolkit measures as:

*a collection of measures in addition to water recovery under the Basin Plan that can contribute to the environmental objectives of the Plan while minimising negative economic and social impacts.*¹³

Whatever else may be remarked about the metaphor ‘toolkit’, it should be clear that these measures were not proposed as tantamount to, let alone substitutes for, the recovery of water by way of fixing a compliant SDL.

The NBAC did not comment on how much water ought to be returned to the environment or whether it supported any amendment to increase the SDL for the Northern Basin. The NBAC’s recommendations emphasized its concern for the protection of environmental water.

It is also apparent that the NBAC was concerned about the hydrological modelling and socio-economic research relied upon by the MDBA, and how this was to be used to inform the MDBA’s recommendations regarding any change to the water recovery target.¹⁴ To this end, the NBAC recommended that hydrological models relied upon by the MDBA be correct, credible, and defensible,¹⁵ and the MDBA convincingly explain the rationale for water recovery.¹⁶

Outcome of the Northern Basin Review

On 22 November 2016, the MDBA published its report entitled ‘The Northern Basin Review: Understanding the economic, social, and environmental outcomes from water recovery in the Northern Basin’ (**the Northern Basin Report**).¹⁷ The Northern Basin Report recommended the Basin Plan be amended to reduce the water recovery target for the Northern Basin by 70 GL, namely from 390 GL to 320 GL,¹⁸ and thus increase the SDL by the equivalent amount.

The MDBA acknowledged that the increase to the SDL would reduce environmental outcomes in the Northern Basin as well as flows into the Menindee Lakes and South Australia by, respectively, 10–15 GL and 5–10 GL.¹⁹ Notwithstanding the environmental and downstream consequences resulting from an increase to the SDL, the MDBA based its recommendation on a ‘triple bottom line’ approach²⁰ having regard to the effects of water recovery on 21 communities.²¹

The recommendation to increase the SDL was made conditional upon commitments from the Commonwealth, New South Wales, and Queensland Governments to implement a number of toolkit measures.²² The adoption of toolkit measures was purportedly based upon community feedback that ‘taking water is not the only solution’.²³ The MDBA expressed confidence that the adoption of toolkit measures would minimise the reduction of environmental outcomes.²⁴ The MDBA acknowledged that the implementation of toolkit measures ‘... are not within our remit’²⁵ and that barriers to their implementation included the need for funding arrangements.²⁶ The MDBA provided general guidance as to what the toolkit measures could involve.²⁷

In undertaking the NBR, the MDBA reported that it ‘considered the latest knowledge on climate change, surface and groundwater connectivity and the outcomes of environmental watering’.²⁸ There is no reference to any climate change risk assessments in the Northern Basin Report or any of the associated reports. The only reference to how climate change informed considerations of the SDL relates to the 114-year long-term climate record and a general description of the Basin Plan’s adaptive approach to climate change.²⁹

It is noted that on 9 November 2018, the MDBA published a report entitled ‘Hydrologic assessment of flow changes in the northern Basin’.³⁰ The purpose of the report is to assess flow changes in the Northern Basin due to climate change and variability as well as river regulation and development. Having regard to the requirements mandated by sec 6.06(3) of the Basin Plan, the impact of climate change upon flow changes across the Northern Basin would have been highly relevant to the analysis and outcomes of the NBR. No explanation has been provided why this analysis was completed only after the amendment to the Basin Plan was made to increase the SDL for the Northern Basin. This report is discussed in further detail in Chapter 6.

Implementation of the Northern Basin Review

The MDBA’s recommendation that the Basin Plan be amended was progressed through consultation with the public and Basin States, undertaken from 22 November 2016 until 24 February 2017.³¹ Given that the MDBA had released the Northern Basin Report itself on its website on 22 November 2016, it seems the MDBA regarded it as compliance with the obligations to provide a plain English summary of the proposed amendment that includes the scientific and socio-economic analysis upon which the amendment is based. This is slightly surprising, given the nature of the report.

On 11 May 2017, the proposed amendment was provided to the MinCo for comment and in-principle support was offered for the toolkit measures, provided that funding was made available and there were no negative third party impacts.³² To reflect the in-principle support for the toolkit measures, the *Basin Plan Amendment Instrument 2017 (No. 1)* (Cth) (**the 2017 amendment instrument**) proposed the addition of a note at sec 6.04(3) of the Basin Plan:

The Northern Basin SDL was based on:

(a) the economic, social and environmental outcomes of the Northern Basin Review; and

(b) commitments from the Commonwealth, Queensland and New South Wales Governments to implement ‘toolkit’ measures that will deliver improved environmental outcomes in the northern Basin.³³

The explanatory memorandum accompanying the 2017 amendment instrument reinforced that the increase to the SDL ‘... is made on the basis that the Australian, New South Wales and Queensland Governments have committed to implementing a number of toolkit measures designed to improve water management’.³⁴ Ultimately the amendment instrument was disallowed on 14 February 2018.

On 28 June 2018, the Minister for Agriculture and Water Resources, Mr David Littleproud, instructed the MDBA, pursuant to sec 49AA of the Water Act, to prepare an amendment to the Basin Plan which was the same in effect as the 2017 amendment instrument.³⁵ The 2018 amendment instrument was adopted by Minister Littleproud on 2 July 2018.³⁶ No disallowance motion in relation to the 2018 amendment instrument was made. The amendment has now taken effect. As a consequence, the SDL for the Northern Basin has been increased by 70 GL and the water recovery target reduced from 390 GL to 320 GL. The note to sec 6.06(1) of the Basin Plan was repealed on the basis that the NBR has been completed.³⁷

On 11 September 2018, Mr Mick Keelty AO APM was appointed by exercise of executive power (not pursuant to statute) the Northern Basin Commissioner for a three year term. Commonwealth funding will be made available to fund the position and one support person.³⁸ In its submission responding to the Productivity Commission’s Draft Report on the Basin Plan, the Department of Agriculture and Water Resources (**DAWR**) stated:

*The Northern Basin Commissioner has a wide-ranging remit, and will report annually to the Commonwealth Water Minister on progress across a number of areas including the roll-out of toolkit environmental works and measures, and on the implementation of compliance commitments in the northern Basin.*³⁹

The DAWR further stated that the Northern Basin Commissioner will audit and report on matters including knowledge and information requirements, engagement with Aboriginal communities, and the protection of environmental flows. The Northern Basin Commissioner will report to the Commonwealth Water Minister and those reports will apparently be made available to Basin governments and the public.⁴⁰

In itself, the appointment of the Northern Basin Commissioner, and the task of the Office, are likely to be beneficial to accountable implementation of the Water Act.

As at the time of writing this report, no final agreement between the States and the Commonwealth has been identified in relation to the implementation of toolkit measures.⁴¹ No agreement is expected (at least) until the first half of 2019.⁴² In the MDBA’s submission to the Commissioner, the MDBA outlined what work had been undertaken in relation to the implementation of toolkit measures. This includes State policies relating to shepherding and protecting environmental water and that an intergovernmental working group has been established.⁴³ In its submission to the Productivity Commission, the DAWR stated that ‘[t]he Commonwealth, New South Wales and Queensland Governments are

working together to finalise governance arrangements for a consistent and co-operative implementation of toolkit measures in the northern Basin'.⁴⁴ Intergovernmental arrangements are not easy to conclude, especially at the level of detail appropriate for the auditable expenditure of public money for stated aims (such as environmental outcomes). Nonetheless, time passes.

Merits of the Northern Basin Review

The Murray-Darling Basin Authority's evidence

As no-one from the MDBA was willing, or permitted, to give evidence before the Commissioner, the MDBA's position in relation to its recommendation to reduce the water recovery target in the Northern Basin by 70 GL must be construed from its published reports as well as its written submission to the Commission. Key elements are discussed below.

Environmental Outcomes Report

The MDBA has produced a report summarizing the environmental outcomes of the NBR (**Environmental Outcomes Report**).⁴⁵ This report was based on a number of reviews, which in turn produced technical reports, almost exclusively focussed on two catchments: the Condamine-Balonne and the Barwon-Darling. On its website, the MDBA explains that these catchments were identified as having 'a lower information base' than other catchments,⁴⁶ but no explanation was provided for why none of the remaining seven catchments in the Northern Basin were reviewed.

The Environmental Outcomes Report discloses that, even under the highest water recovery scenario of 415 GL, only 24 of the 43, or approximately 56%, of the Northern Basin flow indicators are met. Between 20–22 or between 47–51% of the flow indicators are met under the three modelled scenarios of 320 GL recovery.⁴⁷ Significant environmental risks were identified under all modelled scenarios. These include connectivity flow targets not being met for the Culgoa, Barwon-Darling, or the Border Rivers, and flow indicators not being met for habitat opportunities for waterbirds in the Narran Lakes Ramsar wetland. The report states that it 'may be possible to reduce the severity' of these risks through the toolkit measures,⁴⁸ however, the discussion of those measures, and how they are said to mitigate those risks, is too vague to permit any sensible appreciation of the reality or likelihood of that supposed possibility.⁴⁹

The Environmental Outcomes Report does not disclose any reason why, given the flow indicator results discussed above, additional and greater recovery scenarios were not modelled. Nor does the Environmental Outcomes Report provide any analysis or conclusion as to whether any of the water recovery scenarios reviewed represents an ESLT. Instead, the report explains that it should be read in conjunction with the other

reports relating to the NBR, and that any decision to amend the SDL is ‘based on finding a balance between social, cultural and economic impacts using a triple bottom line assessment’.⁵⁰

Hydrological modelling for the Northern Basin Review

The MDBA undertook a hydrological review⁵¹ for the purpose of improving its understanding of the hydrology of the Northern Basin, based on different water recovery scenarios, from the time the SDL was set in 2012.⁵² The MDBA states that in undertaking this review it relied upon hydrological models which were the same as those developed in the preparation of the Basin Plan, including for the Paroo,⁵³ Warrego,⁵⁴ and significantly the Barwon-Darling.⁵⁵

In relation to the model for the Barwon-Darling, the model represented 2007–08 levels of development and did not reflect the extraction rules under the applicable water sharing plan under New South Wales law. The explanation offered by the MDBA was that New South Wales provided the updated modelling too late for its inclusion in the NBR.⁵⁶ The hydrological modelling report recognized that environmental water delivery is expected to increase inflows into the Barwon-Darling, resulting in increased extraction opportunities from that system,⁵⁷ and that the annual cap limit on entitlement holders will not protect specific flow events from extraction.⁵⁸

The hydrological modelling report identified significant private storage capacities in the Northern Basin including an estimated 1582 GL in the Condamine-Balonne alone.⁵⁹ No explanation is provided as to how significant private storages impacted the modelling.

Adjustments were made to the modelling to ensure ‘environmental demands did not have any unintended impacts [on] third party reliability’.⁶⁰ This is a somewhat disturbing instance of how the MDBA has apparently made critical decisions under the Water Act, in clear defiance of its plain requirements. (The third party protection contemplated by the arrangements to fund the toolkit measures did not, of course, alter the effect of the Water Act in relation to SDLs.) As explained in Chapter 3, it is simply not the case that the ascertainment of a SDL, overall or for a particular area such as the Northern Basin, can be made by reference to, let alone in deference to, the demands of irrigation farming. Those demands are available to be met — optimised, so to speak — from the water in excess of that necessary to avoid compromising the environmental values of the Basin water resources. And as explained in Chapter 2, this environmental parameter is probably crucial to the effective enactment of the Water Act under the Commonwealth’s external affairs head of legislative competence.

It follows that it could not have been proper for the MDBA to have injected into the modelling of the environmental outcomes of a putatively increased SDL in the Northern Basin, the requirement that no so-called ‘third party’ suffer any reliability detriment. That would invert the legislated priorities.

Despite efforts to obtain details of this misguided alteration of modelling for environmental outcomes, they remain obscure. No explanation is available about, and none could be such as to justify, the mystery of how this protection of third party reliability could be quantified or otherwise inserted into the operative algorithm. Could it really be that water is to be made available to restore the environment only if no pre-existing enjoyment of irrigators' advantages would thereby be diminished? Who could suppose that rule is to be found in the Water Act?

That these questions cannot be answered from the public record, and that no explanation has been given to those who have asked for it, is a telling demonstration of the MDBA's chronic unfitness to meet its clear statutory requirements for transparency. The requisite science cannot proceed in secrecy. The desirable community involvement is defeated by bureaucratic arrogance. The NBR constitutes a failure of the MDBA that transcends the particular SDL issues with which it dealt.

The Northern Basin Review technical overview of the social and economic analysis

The MDBA's socio-economic analysis assessed three inputs, namely community-level modelling, floodplain grazing modelling, and the results of an Aboriginal socio-cultural capitals survey.⁶¹ To inform its analysis, the MDBA states that it engaged in 'extensive consultation with the communities',⁶² which is qualified as directed to 'the effect reduced water availability has on the area of irrigation ...'.⁶³ This included consultation with irrigators to address anomalies between community-level modelling and 'real-world outcomes'.⁶⁴

The community-level modelling considered the impact of water recovery on 21 communities, chosen as purportedly representative of the Northern Basin. The MDBA explains that the community-level modelling was limited to the impact of water recovery on irrigation⁶⁵ and modelled only those irrigation communities likely to be affected by water recovery. As a consequence, the MDBA did not model six out of 21 selected communities, namely Bingara, Brewarrina, Coonabarabran, Chinchilla, Gilgandra, and Nyngan, due to their low reliance on irrigated-agriculture.⁶⁶ Instead, information from those communities was used to provide 'context' to the communities affected by water recovery.⁶⁷ In short, the MDBA's socio-economic analysis revealed that:

- one community (Brewarrina) may benefit from increased water recovery due to the expected gains to floodplain graziers⁶⁸
- five communities (Bingara, Chinchilla, Gilgandra, Nyngan, Coonabarabran) were unlikely to be affected as no water recovery was expected⁶⁹
- six communities (Boggabri, Gunnedah, Goondiwindi, Mungindi, Narrabri and Walgett) were likely to experience a 'quite small' effect from water recovery indistinguishable from other drivers of change⁷⁰

- five communities (Bourke, Moree, Wee Waa, Trangie and Narromine) are likely to experience modest effects of water recovery, but the effects of the Basin Plan are a portion of the underlying changes to employment in those communities⁷¹
- four communities (Collarenebri, Warren, St George, and Dirranbandi-Hebel) are likely to experience more significant effects on employment from water recovery.⁷²

Several other qualifications are apparent in the MDBA's analysis. For instance, in relation to the community of Trangie, opportunities exist to convert irrigated fields into dryland cropping.⁷³ No explanation is provided as to how this was considered in the context of the adverse effect (including militating against the adverse effect) of water recovery on employment in Trangie. Further, the MDBA concluded that irrigation production is likely to be higher in communities such as Trangie and Narromine⁷⁴ as a consequence of investment in infrastructure. A benefit identified by the MDBA of such investment is the potential for long-term 'labour savings'.⁷⁵ The MDBA noted that:

For properties where new irrigation systems were installed, experience to date indicates the requirements for watering labour might fall by 75%. The effect might be significantly greater if all operators were to adopt the more efficient delivery system.⁷⁶

It is not clear how many irrigation jobs are estimated to be lost in Trangie or Narromine as a consequence of investment in infrastructure as opposed to water recovery. In addition, the MDBA concluded that other drivers of change unrelated to the Basin Plan are likely to positively impact Narromine and be three times greater than the effects of water recovery.⁷⁷

In relation to the four communities most likely to be affected by water recovery, other drivers of change were also identified.⁷⁸ Further, water recovery in Collarenebri and Warren was completed before the Basin Plan was enacted.⁷⁹

In relation to the floodplain grazing modelling, which was limited to the Condamine-Balonne catchment only, the MDBA concluded that an increase in environmental water recovery had significant potential to benefit floodplain graziers. The MDBA found that upstream development reduced annual stocking rates for graziers in some years 'by up to 50%'⁸⁰ and that increased environmental water recovery may assist graziers to regain up to one third of production and lost profits.⁸¹ The MDBA acknowledged this has the 'potential to enhance the demands for seasonal workers'.⁸² The MDBA noted, however, that the benefits are relatively small compared to the production value of cotton from a similar volume of water.⁸³

In relation to the results of the Aboriginal socio-cultural capitals survey, the MDBA concluded that the results from the survey showed 'a compelling case for the argument that maximising environmental watering in the northern basin addresses more than environmental concerns'.⁸⁴ The survey is discussed in further detail below.

The MDBA concluded that the benefits to floodplain graziers and Aboriginal communities from increased water recovery were ‘indirect’.⁸⁵ It is not explained why these benefits should be considered any less direct than the implications of water recovery on irrigation communities. No attempt was made to numerically quantify the jobs that may be gained from an increase in environmental water recovery to Aboriginal communities or floodplain graziers and how this may offset jobs lost in irrigation.

Our Water, Our Life: An Aboriginal Study in the Northern Basin

The MDBA undertook a study in relation to the importance of environmental water to Aboriginal Nations in the Northern Basin. For the purpose of informing its study, the MDBA formed a partnership with the Northern Basin Aboriginal Nations (NBAN).

The study was conducted through a survey of 202 Aboriginal persons between the ages of 15 and 84 across three Northern Basin communities: Brewarrina (122 respondents), St George (70 respondents), and Dirranbandi⁸⁶ (11 respondents).⁸⁷ There was an even gender split between respondents.⁸⁸ The survey was developed in consultation with the NBAN Board, academics, and the views of survey participants.⁸⁹ The feedback from the participants in relation to the survey was largely positive, however, the participants expressed that they would have liked opportunity for further comment.⁹⁰

NBAN considered that the results confirmed the significance of returning water to Country. NBAN expressed the view that the mismanagement of water was contributing to the destruction of Aboriginal culture.⁹¹ NBAN assessed increased environmental allocations to be important to restore Aboriginal culture.

In the MDBA’s analysis, the study demonstrated a direct causal relationship between water and Aboriginal people’s socio-cultural lives.⁹² The MDBA concluded that returning flows to Country was significant for many aspects of life for Aboriginal people. The MDBA acknowledged these findings were consistent with information in its Aboriginal submissions database,⁹³ but considered the study quantified for the first time the value of water to Aboriginal communities.⁹⁴ The MDBA concluded that current flows are unacceptable to Aboriginal communities and that increased environmental watering will benefit Aboriginal health and well-being across the Northern Basin.⁹⁵

Community Consultation Report: Northern Basin Review

The MDBA’s Community Consultation Report: Northern Basin Review (**Consultation Report**) is a summary of feedback obtained during consultation in the Northern Basin throughout 2016.⁹⁶ The MDBA states that a key topic during public consultations was in relation to the triple bottom line decision-making framework and how the MDBA would balance social, economic, and environmental needs.⁹⁷ No further explanation is provided as to how social, economic, and environmental needs were to be balanced. The MDBA noted that concerns were raised that Broken Hill, Menindee,

Wilcannia, and other downstream towns should have been included in the MDBA's consultation and research.⁹⁸ The MDBA does not address this concern.

Concern that Narran Lakes was not receiving enough water due to upstream pumping is mentioned on multiple occasions.⁹⁹ The MDBA merely noted that improving environmental outcomes was a key objective of the Basin Plan.¹⁰⁰ The value of environmental water in creating more reliable low-flows and river health was generally accepted by communities, and was a key concern for Aboriginal communities in particular.¹⁰¹ The MDBA states that it works closely with Aboriginal representative groups in all work that it does.¹⁰²

Concern was also raised regarding the protection of environmental water. Upstream users felt it was unfair that water sold by their communities was being pumped slightly further downstream, and users towards the end of the Northern Basin wanted to ensure that it was not extracted before reaching them.¹⁰³ To this end, frustration was directed at the Barwon-Darling extraction rules.¹⁰⁴ The MDBA directed recommendations to State water authorities to protect low-flows, especially in catchments like the Condamine-Balonne and Barwon-Darling.¹⁰⁵

The need for low-flows was frequently discussed, in particular by 'downstream communities',¹⁰⁶ some of which wanted to see an increase to the water recovery target. The MDBA noted that further water recovery in the Condamine-Balonne is expected to provide downstream economic benefits.¹⁰⁷

The MDBA heard varied positions about the extent to which toolkit measures should be considered a substitute for water.¹⁰⁸ The MDBA acknowledged that toolkit measures are not within their remit and the implementation is dependent on government commitments.¹⁰⁹

The Consultation Report frequently cites the demand for, and better understanding about, particular research and science.¹¹⁰ Frustration was directed at the MDBA for being slow to respond, or not responding at all.¹¹¹ Many participants expressed disillusionment with water policy. Meetings with 'downstream communities' saw a strong sentiment that water management is failing users and is guided by politics.¹¹²

Evidence of witnesses before the Commissioner

Scientific basis for reduction to water recovery

Expert witnesses expressed concern about the MDBA's modelling that showed environmental targets could not be satisfied with a water recovery volume of 415 GL.¹¹³ The Wentworth Group of Concerned Scientists (**Wentworth Group**) highlighted some of these concerns in its submission to the MDBA, including in relation to the Condamine-Balonne floodplain and the Macquarie Marshes.¹¹⁴ The Commissioner was assisted in

interpreting the MDBA's assessment that '... regardless of water recovery scenario, a level of environmental risk will remain in the northern basin'¹¹⁵ as meaning that the environmental outcomes in the Northern Basin are seriously compromised.¹¹⁶

Professor Richard Kingsford gave evidence that the Condamine-Balonne floodplain — the biggest floodplain in the Basin — is dying, and will continue to die over the next 100 years.¹¹⁷ He also gave evidence of serious long-term issues around the ecological sustainability of the Narran Lakes to support the breeding of colonial water birds.¹¹⁸ In Professor Kingsford's opinion there is scientific consensus that the Macquarie Marshes is in 'terrible shape' such that the Commonwealth has notified the Ramsar Secretariat of a likely change, by way of degradation, to its ecological character.¹¹⁹ The Commissioner was directed to the apparent lack of consideration given by the MDBA to peer-review papers on subjects relevant to the environmental outcomes in the Northern Basin.¹²⁰

In relation to the MDBA's modelling of environmental outcomes, expert witnesses expressed concern about the connexion between the scenarios modelled for environmental outcomes. The witnesses did not understand and could not explain how the final models affected flow targets because it was not reported.¹²¹ Witnesses also expressed concern about the lack of clarity regarding the number of input variables in the modelling. In Professor Kingsford's opinion, the MDBA's modelling underestimated the impacts of diversions on the systems.¹²² The Wentworth Group expressed the same concern.¹²³

The lack of scientific understanding about floodplain-dependent ecosystems and what happens to the water that reaches floodplains was identified as a particular concern. According to Professor John Williams, the floodplains are '... the engine room for those riverine ecosystems'.¹²⁴ Professor Kingsford agreed with this description and added that the floodplains are where ecology of those systems, including most of the river biota, plants, animals, and micro-organisms occur.¹²⁵ However, it was apparent to Professor Kingsford that the MDBA's models made only '... a binary guess at what happens once the water gets out on to the floodplain'.¹²⁶

From a scientific perspective, the information provided by the MDBA did not identify how much water was actually needed in the Northern Basin in order to meet all environmental targets.¹²⁷ Further, the MDBA's analysis does not fully extrapolate on the level of degradation and restoration likely to occur in the Northern Basin.¹²⁸ Ultimately, the expert evidence was that decisions made in relation to the Northern Basin were likely to '... lock us in to a very long-term degradation in that system'.¹²⁹ Despite numerous invitations made by and on behalf of the Commissioner, this evidence was unchallenged.

No witness could identify how environmental outcomes were genuinely included as part of the MDBA's triple bottom line assessment.¹³⁰ No explanations of weighting, priorities or discounting could be discovered.

Hydrological modelling

The Commissioner heard evidence that modelling generally for the Northern Basin is more challenging than for the Southern Basin because there is less data to use in calibrating models.¹³¹ The evidence was that the IQQM hydrological model used for Northern Basin catchments was intended to be used to measure irrigation diversions, not environmental outcomes.¹³²

Specific evidence was heard in relation to the modelling for the Barwon-Darling River given the significance of flows (particularly low-flows) in that river to the achievement of environmental outcomes as well as for downstream users. In relation to the Barwon-Darling, the modelling was not reliable to measure low-flows¹³³ and did not reflect current extraction rules.¹³⁴ The difficulties associated with modelling low-flows in the Barwon-Darling have long been known. A 1996 scientific assessment panel for environmental flows for the Barwon-Darling River recommended urgent investment in modelling for low-flows in the Barwon-Darling be undertaken.¹³⁵ It does not appear that anyone ever either acted upon or rejected this recommendation.

The model used for the Barwon-Darling was recommended by an independent auditor for provisional accreditation under the Murray-Darling Basin Agreement only until the end of 2014.¹³⁶ Some of the concerns with the model related to its failure to account for significant growth in on-farm storage.¹³⁷ Provisional accreditation lapsed as the deficiencies in the modelling had not been addressed.¹³⁸ The Barwon-Darling model was unaccredited at the time of undertaking the NBR.¹³⁹ Correspondence from the MDBA sent after the provisional accreditation lapsed indicates it was not treating updated and accredited modelling as a priority.¹⁴⁰

In his final review, the MDBA's Independent Modeller advised that the Barwon-Darling model had the '... potential to discredit the hydrologic modelling ... within the whole basin'.¹⁴¹ The modelling was accepted only on the basis that the MDBA 'was aware of the model deficiencies and would also [u]tilise other non-modelling procedures and information when recommending revised SDLs for the Northern Basin ...'.¹⁴² In puzzling contrast, in its submission to the Commissioner, the MDBA stated that the Independent Peer Reviewer concluded that the modelling 'was appropriate and contained no major weaknesses'.¹⁴³

In addition to concerns about the integrity of the models, the Commissioner also heard evidence about the integrity of the modelling process, including recollection of pick-a-box whereby modellers would select inputs based upon desired outcomes.¹⁴⁴ Members of the NBAC developed a suspicion that the MDBA was optimising the sequence of model runs that they were putting together.¹⁴⁵ Recommendations were made to the MDBA that steps be taken to foster confidence that the modelling could be independently supported.¹⁴⁶ This included a request for a statistical analysis as to how frequently the modelled flows would be likely to occur. No such recommendation was pursued by the MDBA.

Modelled estimates also changed in relation to the impact of an increased SDL for the Northern Basin on flows into the Menindee Lakes and South Australia. Although initial versions estimated a reduction of flows into the Menindee Lakes of 35 GL and to South Australia of 20 GL, several subsequent revisions were made to these figures. Ultimately, the position advanced by the MDBA was that the reduction of flows into the Menindee Lakes and South Australia would be limited to only 7 GL and 4 GL, respectively.¹⁴⁷ The Commissioner was directed to the evidence given by the MDBA in response to questions from the Rural and Regional Affairs Senate Committee, namely that the reason for the variation to the figures relating to the Menindee Lakes and South Australia was that the toolkit measures were still being modelled on 22 November 2016, following the release of the Northern Basin Report.¹⁴⁸

Toolkit measures

Witnesses agreed that more than a ‘just add water approach’ was needed to achieve environmental outcomes in the Northern Basin.¹⁴⁹ The expression ‘toolkit measures’ was developed by the NBAC in an attempt to include non-water measures to assist in achieving environmental outcomes in the river system. This was on the basis that the management of rivers involves a range of matters not all expressly contemplated by the Water Act, including landscape management.¹⁵⁰ The toolkit measures were certainly not intended as a substitute for environmental water or to minimise the reduction of environmental outcomes.¹⁵¹

When questioned as to how toolkit measures could be used to assist environmental outcomes, the NBAC members agreed that the correct approach would be to first determine what the environmental outcomes that should be achieved were, and then to consider how those outcomes could be achieved using tools other than water.¹⁵²

No witness gave evidence that toolkit measures could achieve equivalent environmental outcomes in substitution for water recovery. No witness was able to direct the Commissioner to any material with a scientific explanation (or at least a scientifically informed explanation) for how the projected consequences of the so-called toolkit measures would be capable of achieving equivalent environmental outcomes following a reduction of 70 GL in the amount of water required to be recovered for the environment in the Northern Basin, so as to comply with the ESLT requirement.¹⁵³

In relation to specific toolkit measures identified by the MDBA, Professor Kingsford could not identify any ecological reason why the mitigation of cold water pollution could be proposed as a substitute for water recovery as it presented a completely different threat to the health of the river system.¹⁵⁴ Associate Professor Jamie Pittock’s evidence was that ‘[t]here’s no scientific justification for saying 70 gigalitres equals fish passage devices on weirs. They’re apples and oranges’.¹⁵⁵ As he said, the toolkit measures relating to the protection of environmental water ‘... are simply what any professional water manager

should do'.¹⁵⁶ He accordingly, and cogently, found it '... offensive that incommensurable environmental activities are being traded off ...'¹⁵⁷ against each other.

Serious concerns have been raised regarding how any toolkit measures would be implemented, including that the proposed measures were unfunded and multi-jurisdictional.¹⁵⁸ The Wentworth Group considers that environmental outcomes are likely to worsen because the toolkit measures cannot be guaranteed.¹⁵⁹

Protection of environmental water

The MDBA's position on the protection of environmental flows is said to be that they will be protected by the SDL on a long-term average basis, which is assumed in the modelling.¹⁶⁰ The Commissioner also received evidence that the MDBA recognized that increased environmental inflows may result in more frequent opportunities for take, as pumping thresholds may be exceeded more often.¹⁶¹ The MDBA did not provide any response to this evidence. That is unfortunate, given the considerable public interest in environmental water not bearing its character as such. In particular, there needs to be real attention paid to the damaging resentment caused by upstream perceptions of downstream conversions of environmental flows into irrigation opportunities.

Socio-economic evidence

The Commissioner received evidence and submissions from irrigator groups in support of the MDBA's recommendation to increase the SDL in the Northern Basin¹⁶² based upon the socio-economic impacts of water recovery. The NSW Irrigators' Council considered that the MDBA analysis was the best available work that assessed the economic impacts of the Basin Plan.¹⁶³ Cotton Australia was clear in its position that water recovery should have stopped at 278 GL, while asserting that nonetheless they respected the MDBA's research and final recommendation.¹⁶⁴

In terms of independent analysis supporting this conclusion, a KPMG report commissioned by the MDBA concluded water recovery had impacted upon employment in the Northern Basin. That report characterizes the impact on employment as 'relatively small' overall.¹⁶⁵ The report considered water recovery was the only relevant variable factor in relation to employment in Northern Basin communities.

Professor Sarah Wheeler, on the other hand, gave evidence that water availability is not the only variable impacting upon employment in Northern Basin communities. She stated that considering only one variable to determine the impact on employment ignores basic economic principles and falsely assumes a proportional relationship between water use and farm production.¹⁶⁶ Many other drivers of change relevant to an assessment on employment in rural communities were identified in evidence, including commodity prices, temperature, rainfall,¹⁶⁷ and mechanisation.¹⁶⁸ According to Professor Wheeler, modelling capacity was available which would have allowed the MDBA to

have better regard to a range of drivers of change.¹⁶⁹ Further, evidence was given before the Commissioner of the adaptability of farmers in the Northern Basin.¹⁷⁰ This includes cotton farmers who plant alternative crops in order to minimise the risks associated with variable water availability¹⁷¹ — a typical characteristic of the Northern Basin.

Another criticism of the MDBA's socio-economic analysis was the apparent selection bias,¹⁷² namely that specific consideration was given to the economic impacts of reductions in water availability based on communities most likely to be affected.¹⁷³ Compounding this was the failure of the MDBA to consider benefits to downstream agriculture with an increased return of environmental water.¹⁷⁴

The failure to consider benefits of more water for the environment was emphasized by a number of witnesses before the Commissioner, including the estimable Macquarie Marshes Environmental Landholders Association (**MMELA**). The MMELA provided a report it commissioned regarding the positive impact of increased environmental flows to their economic output.¹⁷⁵ Professor Kingsford also considered that potential benefits of increased environmental water recovery could include ecotourism.¹⁷⁶

Having regard to matters including the MDBA's incomplete consideration of economic principles, impaired rigour in the modelling used, and possible sample selection bias, the Commissioner shares the lack of confidence in the results of the MDBA's socio-economic findings, expressed by Professor Wheeler.¹⁷⁷

The NSW Irrigators' Council considered the criticism of the MDBA analysis to be 'deeply flawed'.¹⁷⁸ In this regard, the NSW Irrigators' Council stated that the MDBA tried to separate the impacts of structural change from the impact of the Basin Plan.¹⁷⁹ No specific evidence was provided as to how the MDBA attempted to do this. There are no doubt genuine differences of opinion at play in this controversy, but the fact remains that the MDBA has not taken the opportunity to justify its position — it would not be fair to the MDBA nor to the NSW Irrigators' Council to treat the latter as the former's proxy in this Commission.

Aboriginal witnesses

Mr Fred Hooper, Chair of NBAN, Mr Rene Woods, Chair of the Murray Lower Darling Rivers Indigenous Nations (**MLDRIN**) and Mr William Mooney, Executive Officer of MLDRIN, gave evidence that NBAN and MLDRIN opposed the 70 GL reduction in the Northern Basin.¹⁸⁰

Mr Hooper spoke of a shift in attitude, upon the appointment of the former Minister, Mr Barnaby Joyce, to the water portfolio, away from a holistic, whole of Basin approach to a focus on specific sites, namely Dirranbandi, St George, and Warren, and the economics of irrigated agriculture in those towns.¹⁸¹

Mr Hooper recalled asking the MDBA for a socio-economic assessment of Aboriginal people in the Northern Basin to which the MDBA responded by offering to provide a more limited socio-cultural survey.¹⁸² Despite meeting with the MDBA, NBAN was unaware of the intention to reduce water recovery in the Northern Basin, which was only revealed once the proposed amendments were publicly released.¹⁸³ Mr Hooper could not recall any explanation of how the toolkit measures could substitute for water so as to justify the 70 GL reduction in water to be recovered.¹⁸⁴

NBAN's submission to the MDBA emphasized that the 390 GL target for water recovery in the Northern Basin should be increased to 440 GL in light of climate change research or at least be increased to 415 GL.¹⁸⁵ NBAN's clear preference was that if water recovery is not increased that, at a minimum, the water recovery target remain at 390 GL.¹⁸⁶ Included in the basis for NBAN's position was that:

- each community that participated in NBAN-run workshops opposed a reduction to a 320 GL water recovery target
- the MDBA lacked requisite data and science around Aboriginal environmental outcomes based on both the 390 GL and 320 GL targets
- the MDBA's own research determined environmental water to be significant to Aboriginal people¹⁸⁷
- a reduction to environmental water would have an adverse effect on Aboriginal people that would exceed the social and economic impacts of the 390 GL recovery upon businesses and landowners.¹⁸⁸

Mr Hooper considers that the MDBA rejected a large majority of NBAN's submission.¹⁸⁹

In its submission to the MDBA, MLDRIN expressed that it did not have confidence that a 390 GL target would produce sufficient outcomes.¹⁹⁰ MLDRIN also expressed concern that some of the toolkit measures were already existing requirements such as the proposed commitment to better engage with Aboriginal people.¹⁹¹

MLDRIN emphasized that environmental flows were crucial to protecting and maintaining cultural values and supporting the well-being of Aboriginal people.¹⁹² MLDRIN referred to the MDBA's 'Our Water, Our Life' Report which demonstrated the cultural significance of natural surface water flows and groundwater resources.¹⁹³ MLDRIN gave evidence that no explanation was provided as to how the findings of the Aboriginal cultural survey report were considered as part of the NBR.¹⁹⁴

MLDRIN further submitted to the Commissioner that the MDBA's decision-making framework '... failed to meaningfully incorporate or account for First Nations' views or objectives as communicated through consultation and research activities'¹⁹⁵ and that the Northern Basin amendments '... fundamentally disregarded the Australian Government's

obligations, stipulated in international agreements and domestic law and policy, to respect, preserve and maintain traditional knowledge'.¹⁹⁶

The only explanation provided to MLDRIN by the MDBA as to how 70 GL of water could be substituted by toolkit measures was the minimal difference in environmental outcomes between a modelled 320 GL and 390 GL water recovery target once the toolkit measures had been incorporated into the modelling.¹⁹⁷ It is speculative, on the part of the MDBA, to take that position in light of the modelling issues discussed above. The unfair result is to visit all the risk of the modelling being unacceptably unreliable or unrealistic on the Aboriginal communities and interests. It could not seriously be suggested that the avowedly flawed modelling was in any proper sense superior to the emphatic statement of traditional knowledge and cultural preference.

Northern Basin Advisory Committee and community engagement

The evidence shows that the MDBA was actively engaged in meetings with NBAC staff, including meetings between the NBAC and the MDBA's Independent Modeller. NBAC meetings were usually held in the presence of multiple members of the MDBA's staff, including modellers, policy makers, and sometimes scientists.¹⁹⁸ Albeit the MDBA was heavily engaged in the NBAC's meetings, the presence of multiple MDBA staff did not appear to assist the NBAC's request for information.¹⁹⁹ This includes the NBAC's concerns about how socio-economic research was going to be accounted for. The NBAC was regularly frustrated about the late provision of information by the MDBA in advance of meetings. Information that was provided was often lacking in detail.²⁰⁰

The NBAC members acknowledged the MDBA shared modelling scenarios involving water recovery targets at 278 GL, 320 GL, 390 GL and 415 GL.²⁰¹ The witnesses informed the Commissioner that the MDBA's analysis did not reveal a significant difference in environmental outcomes between the modelled water recovery scenarios.²⁰² Having regard to the modelled outcomes, NBAC members expressed concerns about a reduction in the water recovery target.²⁰³ To this end, the NBAC was concerned by a lack of detail regarding modelling assumptions. There was also concern that the modelling was not reflecting the knowledge and experiences with northern rivers held by communities, including NBAC members.²⁰⁴ The MDBA was informed of community concerns about the modelling by members of its own staff.²⁰⁵ There is no evidence that any attempt was made to explain the modelling to communities. The evidence before the Commissioner was that the MDBA considered the modelling was too complicated to explain to communities.²⁰⁶

The concerns about the MDBA's engagement with the NBAC is reflected in the submission by Mr Mal Peters OAM, former NBAC Chair, made during the public consultation process for the proposed reduction in environmental water recovery. His concerns include whether there was a genuine commitment from the States to implement toolkit measures,²⁰⁷ and that the MDBA's modelling was not undertaken having regard

to the best available science.²⁰⁸ The undated response from the MDBA generally rejected Mr Peters' concerns but did not expressly address the issues raised.²⁰⁹

More broadly, the Commissioner heard evidence that there was a lack of community confidence in the review process.²¹⁰ Although some support for the MDBA's level of community engagement was voiced by a few witnesses,²¹¹ there was significant frustration expressed about the information that was made available for public review during the NBR process and about the fact that information was provided to some segments of the community for early comment and input, and not to others.

Compounding these concerns, the Commissioner heard evidence of the MDBA's failure to make publicly available relevant reports. For instance, the MDBA's hydrological modelling report is dated January 2016 and was finalized well in advance of any recommendations being advanced by the MDBA in November 2016. However, that report was not released until January 2017 — well after the public consultation process in relation to the proposed amendment commenced on 22 November 2016, and after NBAC had provided its report. No explanation has been provided by the MDBA about why this report was not provided well in advance of, or at latest by the commencement of the public consultation process. The Commissioner accepts the conclusions of the witnesses who claimed that they had been given insufficient time to understand the report, which haste negatively impacted upon their ability to meaningfully participate in the public consultation process.²¹²

Discussion

Given the importance of the functions exercised by the MDBA in respect of the NBR, and their impact on the Murray-Darling Basin, the Commissioner is concerned that, notwithstanding the numerous, albeit vague, references to its genesis in MDBA reports and other materials, the source and extent of agreement to conduct the NBR remains unclear, as are the statutory functions the MDBA considered it was exercising. Despite these issues now being well in the past, this observation contributes to a broader concern regarding the MDBA's appreciation, and application, of its legislative function. That concern has ongoing implications in the context of the MDBA's role in the implementation of the Basin Plan.

In the immediate context, two things are nonetheless clear. First, the primary impetus behind the NBR was a desire to improve the knowledge that existed at the time the Northern Basin SDL was set. Second, in the exercise of any functions to amend that SDL, the MDBA was required to ensure that any such amendments complied with the Water Act, including the requirement to act on the best available scientific knowledge and socio-economic information, and that any amended SDL reflect an ESLT.

Notwithstanding the purpose of the NBR, it is apparent that the reports prepared by, or on behalf of, the MDBA were based on little new research or information regarding the

ecology or hydrology in the Northern Basin. The environmental analysis was based upon research into only two catchments in the Northern Basin. The hydrological modelling relied upon models developed in preparation of the Basin Plan.

This limited investment in further knowledge is further compounded by the fact that the ecological research into the Barwon-Darling, one of the two catchments considered, was based on a pre-existing model that the MDBA itself acknowledges did not reflect current extraction rules. Further, the only available conclusion from the Independent Modeller's report was that the model was fundamentally flawed and plainly not fit for purpose, let alone on a long-term basis. That conclusion is supported by the numerous concerns regarding that modelling, raised both in evidence before the Commissioner and as made known to the MDBA during the NBR. The MDBA's submission that the Independent Modeller concluded the model was 'appropriate and contain[ing] no major weaknesses' is, at best, a fundamental misunderstanding of the conclusions of that report and, at worst, a clumsy attempt to mislead the Commissioner. It is plainly wrong. The deficiencies in the MDBA's modelling may explain the lack of significant differences in environmental outcomes, regardless of the MDBA's modelled water recovery scenario.

Further, there is no reason why updated modelling for the Barwon-Darling could not have been included as part of the NBR. It was provided to the MDBA in June 2016, well in advance of the NBR having been finalized in November. There was no statutory time limit in which the NBR was required to be finalized and no Ministerial Direction to this effect.²¹³ In order to be satisfied that the decisions were being made on the basis of the best available scientific information, the MDBA could have extended its artificially imposed timeframe to ensure its modelling was up-to-date. The only available inference is that the MDBA chose not to do so. The undisputed scientific evidence before the Commission demonstrated that the environment in the Northern Basin has been seriously compromised and there is likely to be a worsening of this degradation. An increased SDL in the Northern Basin will reduce environmental outcomes. The MDBA's own assessment accepts this to be true. There was no scientific evidence to support a reduction of environmental water based on the implementation of toolkit measures, which in any event has seen little progress to date. Having regard to the requirements of the Water Act, including the requirement to act on the basis of best available scientific knowledge, and the requirement that the SDL must reflect an ESLT, the Commissioner considers the MDBA's recommendation for an amendment that increased the SDL by 70 GL lacks an evident and intelligible justification.

The Commissioner's review of the MDBA's socio-economic analysis arouses concern about its approach to assessing socio-economic impacts associated with water recovery. The MDBA selected 21 communities to be representative of the Northern Basin, and then proceeded to exclude five when it was demonstrated they were not likely to be adversely affected by water recovery. The MDBA then disregarded the unambiguous benefits to floodplain graziers and Aboriginal communities from increased water recovery, dismissing them as somehow 'indirect' and, in respect of floodplain grazing, as

meriting less weight than the productive value of cotton. It is not apparent how either of these effects were any more ‘indirect’ than other effects, nor how productive value was incorporated in the MDBA’s analysis in this instance or in respect of other communities.

Whilst some witnesses supported the socio-economic analysis conducted by the MDBA, the Commissioner prefers the well-considered and well-researched evidence of Professor Wheeler as to the limitations of the MDBA’s analysis. The Commissioner finds that the MDBA improperly assumed a proportional relationship between water availability and employment, and either ignored or improperly took into account other important economic factors aside from water recovery. Contrary to para 21(4)(b) of the Water Act, the MDBA did not base the NBR’s increased SDL on ‘the best available ... socio-economic analysis’.

With respect to consultation, whilst the MDBA appeared to be willing to adjust its modelling to reflect real world experiences, this approach appears to have been largely confined to the irrigation sector. There is no indication from the MDBA’s reports that the same level of consultation was adopted with respect to the hydrological or socio-economic modelling of other community sectors, nor in relation to the environmental research explored through the scientific community.

Instead, the MDBA’s approach to consultation in the NBR has led to understandable and significant distrust on the part of community members, Aboriginal leaders, scientists, economists, and even the MDBA’s own NBAC. The MDBA was well aware of, and comprehensively failed to address, community concerns regarding access to information and the impact of an increase to the SDL. The MDBA’s effective dismissal as ‘indirect’ of the clear benefit of increased water recovery to Aboriginal communities and floodplain graziers amounts to a disrespectful failure to conduct an authentic and transparent consultation process. The MDBA’s response to the concerns raised regarding the protection of environmental water is tantamount to an admission that environmental water is knowingly being used to improve the reliability of water to irrigators.

The entire NBR process has contributed to a serious level of mistrust among significant stakeholders regarding the ability and intent of the MDBA to implement the Basin Plan in a proper and transparent manner. As a consequence, there should remain worrying concerns regarding the MDBA’s ability to deliver the other complex and demanding requirements of the Basin Plan unless, and until, it can be seen to be confronting and addressing its critical mistakes of the past.

Although the position of the Northern Basin Commissioner was created to restore public faith and confidence in water reform across the Northern Basin, unless that Office has the ability to address the root cause of public distrust, the situation may worsen. The limited funding, the lack of clearly defined functions, and that the position appears subject to Ministerial control and direction, lead to the conclusion that this role is unlikely to achieve its stated purpose.

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Note

The Commissioner notes the Murray-Darling Basin Authority's (MDBA) Water Resource Plans (WRPs) Part 14 guidelines statement (**Part 14 Guidelines**):

There are different preferences for naming inherited identities of original peoples living in the Murray-Darling Basin and their connections to Country. For example, some prefer Ancestral ownership, others Sovereign or Traditional ownership. Also, some prefer the term Aboriginal while others prefer Indigenous. Others again prefer First Nations peoples. The Water Act (2007) (Cth) and the Basin Plan (2012) uses the term Indigenous to refer to matters that relate to Aboriginal people. To avoid disrespect, the term Aboriginal is used throughout this guideline to refer to matters that relate to the broad demographic group. The term Traditional Owners is used to refer to those with recognised cultural authority to speak for Country. The exception is where specific sections from the Water Act or Basin Plan are directly quoted, when naming formal instruments, and in the Akwé: Kon Guidelines (which refer to indigenous communities in relation to culturally distinct groups affected by colonisation). In all other instances the term Aboriginal is used.¹

The Commissioner has decided to adopt the same approach, noting also that the South Australian Government adopts the term 'Aboriginal' in preference to 'Indigenous' on the advice of the former South Australian Aboriginal State-wide Advisory Committee.²

The Commissioner asks Aboriginal people reading this chapter to be aware that reference is made to the names of people who are deceased.

Introduction

The *Water Act 2007* (Cth) (**Water Act**) and *Basin Plan 2012* (Cth) (**Basin Plan**) contain various provisions referring to the special interests of Aboriginal Australians in relation to the water resources of the Basin. As part of his inquiry, the Commissioner sought and received evidence to assist in understanding the meaning and effect of these provisions in light of the Term of Reference directing inquiry into whether it is likely that the objects of the Water Act and purposes of the Basin Plan will be realized.

The Basin Plan begins with an Acknowledgement of the Traditional Owners of the Murray-Darling Basin (**Basin**), in which the MDBA:

*recognises and acknowledges that the Traditional owners and their Nations in the Murray-Darling Basin have a deep cultural, social, environmental, spiritual and economic connection to their lands and waters. The Authority understands the need for recognition of Traditional Owner knowledge and cultural values in natural resource management associated with the Basin. Further research is required to assist in understanding and providing for cultural flows.*³

Evidence provided in the short time of the Commissioner's inquiry has revealed a dimension to the Water Act's integral concept of sustainable use that is vital to the identity and future of Aboriginal people in the Basin. This dimension demands not only better understanding, as suggested by the Basin Plan, but better articulation and real, practical implementation in the scheme of the Water Act and Basin Plan in order to move past the current stage of simple acknowledgment. If this were to happen there might be a stronger alignment of water resource management policies and practices, currently being developed under the Basin Plan through WRPs, with the Water Act's core object of sustainable use.

The Basin Plan's Acknowledgement also quotes Ngarrindjeri Elder, Mr Tom Trevorrow (now deceased), when speaking in connexion with the cultural ceremony of Ringbalin in 2010:

*our traditional management plan was don't be greedy, don't take any more than you need and respect everything around you. That's the management plan — it's such a simple management plan, but so hard for people to carry out.*⁴

Background

History and culture

As part of his inquiry, the Commissioner visited various regions of the Basin, beginning with a 'Welcome to Country' at the Murray Mouth by Ngarrindjeri Elder, Mr Major Sumner. Mr Sumner is the Cultural Director of Ringbalin, a ceremony of

cultural significance to Aboriginal people across the Basin. In 2010, in response to his dismay at the degradation of his traditional country — the Lower Lakes and Coorong — Mr Sumner led the revival of the ancient travelling ceremony. He has said:

*In 1899 there was a big ceremony at Raukkan and people came from all over South Australia, Victoria and New South Wales. It was not until 1999, a hundred years later, that the next Ringbalin was performed at Raukkan, but more than 10,000 people came for that ceremony. Like the rivers, we are all connected.*⁵

Referred to in full as the Murrundi Ruwe Pangari Ringbalin (River Country Spirit Ceremony),⁶ Ringbalin has been undertaken as an annual event each year since 2010. It involves a week or more of ceremonies, staged along the Basin's waterways, at which traditional owners meet, dance, and share stories. In 2017, Ngarrindjeri dancers met with other traditional owner groups at ceremonies in Brewarrina, Bourke, Mount Gundabooka, Wilcannia, Menindee, Mildura, Wentworth, Renmark and Murray Bridge. A report of the closing ceremony at Goolwa in 2017 quoted Mr Sumner:

“It's about the spirit of this land, it's about the spirit of the river and the stories that we tell our children” ... “[They are] stories that need to be passed on — about the river, about creation of the land that we live in.” ... “These waterways are our lifeblood — we've got a word for all the animals, ngatji, [it] means friend [and] if we don't look after the water in the river our friends will die — when they die we die.”

He said the swan egg dance was a favourite of his, a performance based on stories passed down from elders about not taking all the eggs.

“That's something that we learnt, never to be greedy. We learn that ... our children learn that.”⁷

Ringbalin provides a window into the continuing significance of the fundamental connexion of traditional owners in the Basin to their land and waters, and to each other.

Understanding

It is perhaps fair to say that there is little understanding in the broader Australian community of the importance of the water resources of the Basin to its traditional owners.

The coming of European people to Australia almost 250 years ago saw the beginning of the broad scale dispossession and displacement of Aboriginal people from their country through violent conflict, forcible removal and disease. It was not possible or appropriate within this inquiry to examine the history and effects of this clash of cultures on Aboriginal people, and there are other places where these are recorded and described. However, in the context of the views of Aboriginal people about the scheme for managing water resources in the Basin, these facts have emerged as immediately relevant. That is, it is apparent to the Commissioner that contemporary Australian society has a considerable

way to go in understanding Aboriginal culture, and the significance of water resources within it. At the same time, and partly because of that lack of understanding, it is clear that our laws do not clearly recognize or provide for Aboriginal values and interests in water resources. In her seminal work ‘Overturning *Aqua nullius*: Securing Aboriginal Water Rights’, Dr Virginia Marshall says: ‘The continued devaluation of Aboriginal ways of understanding and relating to an Aboriginal environment impedes reconciling past injustice’.⁸

Dr Marshall provides a valuable ontological perspective, highlighting the depth and complexity of the relationship of Aboriginal people with their land and waterscapes. Insights such as these can help build the understanding needed to bridge the gap between non-Aboriginal and Aboriginal participation in the legal and administrative scheme for water use and management in the Basin (and more broadly).

Clearly, there is a great deal to be learnt from an ecological perspective in understanding Aboriginal values and approaches:

*Aboriginal communities relate to and contemplate value in the environment as integral to Aboriginal identity in a way that articulates both communal and individual belonging to country. The land, the waters and the creation stories are the essence of Aboriginal identity, where ‘sacredness’ particularises an inherent relationship to the environment unique to Aboriginal peoples.*⁹

*From an Aboriginal perspective, the importance of characterising water through contextual layers of creation stories remains paramount to understanding traditional law obligations ... Aboriginal laws articulate the rights and interests of Aboriginal communities as they have always existed in the creation narrative.*¹⁰

The Commissioner has noted the deep significance of water on many levels, and in a myriad of ways, to the lives of Aboriginal peoples of the Basin, through the representative groups and individuals who assisted the inquiry to understand their perspectives with thoughtful and thorough explanations.

Comprehensive evidence was received from the two leading representative organizations for Aboriginal interests in water resources in the Basin, the Murray Lower Darling Rivers Indigenous Nations (**MLDRIN**) and the Northern Basin Aboriginal Nations (**NBAN**).

MLDRIN is a confederation of 26 traditional owner groups from across the Southern Basin (Barapa Barapa, Barkandji, Dhudhuroa, Dja Dja Wurrung, Latji Latji, Maraura, Mutti Mutti, Nari Nari, Ngarrindjeri, Ngaywang, Ngintait, Nyeri Nyeri, Tatti Tatti, Ngunawal, Taungurung, Wadi Wadi, Wamba Wamba, Waywurru, Wegi Wegi, Wergaia, Wiradjuri, Wolgalu, Wotjabaluk, Yaitmathang, Yita Yita and Yorta Yorta).¹¹ MLDRIN sees its role as working to advance the rights and interests of these groups in the management of the Basin river system.

NBAN represents 22 traditional owner groups (Barkandji (Paakantyi), Barunggam, Bidjara, Bigambul, Budjiti, Euahlayi, Gamilaroi, Githabul, Gunggari, Gwamu (Kooma), Jarowair, Kambuwal, Kunja, Kwiambul, Maljangapa, Mandandanji, Mardigan, Murrawarri, Ngemba, Ngiyampaa, Wailwan, Wakka Wakka)¹² in relation to natural resource and water management in the Northern Basin.¹³

The Commissioner also received evidence from the Ngarrindjeri Regional Authority (through Mr Grant Rigney) representing the Ngarrindjeri Traditional Owners and Native Title Claimants of the River, Coorong and Lower Lakes in South Australia; the Yorta Yorta Nation Aboriginal Corporation (through Ms Monica Morgan) representing the Yorta Yorta Family Groups descended from the Original Ancestors of the Yorta Yorta Peoples of the Murray and Goulburn Rivers region in Victoria; and the Barkandji Traditional Owners and Native Title holders (through Mr William (Badger) Bates) of the Darling River in Western New South Wales.

There are significant ontological differences between Aboriginal and non-Aboriginal cultures, which the Commissioner understands to be profoundly relevant to reforming the management of any aspect of land, water and natural resources in Australia in a way that recognizes and provides for Aboriginal interests, values and cultural identity. The Commissioner was assisted by the witnesses who, in addition to addressing specific aspects of the Terms of Reference, offered some perspectives into the meanings that the water resources of their country holds for them, as set out below.

Ngarrindjeri

Ngarrindjeri are part of the water. It is life, gives life and is living. The cultural and spiritual relevance for Ngarrindjeri of water as a source of life and as part of the living body is that it flows, within, around and, through Ngarrindjeri country. The exercise of Ngarrindjeri cultural rights and the fulfillment of Ngarrindjeri responsibilities include being interconnected with and being part of the living water. The flow of water forms part of the interconnectedness of Ngarrindjeri to our country and the failure of water to flow into our country impacts upon our exercise of rights and our fulfillment of responsibilities as custodians of the land, water and sky. ...

The Meeting of the Waters is a fundamental aspect of the Ngarrindjeri world where all things are connected, whether they are living, from the past and/or for future generations. The Meeting of the Waters makes manifest core concepts of Ngarrindjeri culture that bind land, body, spirit, and story in an integrated, interfunctional world. The principles that flow from this cultural system are based upon respect for story, country, the old people, elders and family. The pursuit of these principles is contingent upon maintaining a relationship with country. The violation of these respect principles are manifest through the destruction of Ngarrindjeri Yarluwar-Ruwe (a concept that embodies the connectedness and

interfunctionality of our culture) and their effect upon the behaviours and survival of ngatji (the animals, birds and fish). According to these principles and contingent beliefs the “environment” cannot be compartmentalised: the land is Ngarrindjeri and Ngarrindjeri are the land. All things are connected and interconnected. Ngarrindjeri philosophy is based on maintaining the integrity of the relationship between place and person. It is the responsibility of the living to maintain this continuity. The past is not and cannot be separated from the here and now or the future. To break connections between person and place is to violate Ngarrindjeri culture. The objective in undertaking activities upon Ngarrindjeri country should be to not cause violence to Ngarrindjeri culture.¹⁴

Barkandji

Our Barka means everything to us, it is our mother. It is who we are. We take our name from it, Barkandji means people belonging to the Barka. The Barka was created when Kuluwarra let the Ngatji (Rainbow Serpent) out of his waterbag up near Bourke, and the Ngatji lives in it still. Thirri also shaped the channel, bends and islands of the river after the Ngatji went thru [sic] with the water. The Ngatji looks after us and we have to look after it, it is our traditional job to look after the Ngatji and the river and the other surface and sub-surface waters of the Barka and its floodplains.

The Barka gives us healthy food and medicine, it gives us wood to make our artefacts, reeds to weave, it is where we go as families to swim, boat, camp, picnic, fish, go yabbing, and prepare and cook our traditional food. It is where we relax and enjoy our homeland ...

The river is our memory, we walk along it and remember our history and our ancestors by looking at the marks and places.

I walk along the river and climb down to cut a boomerang out of a bent red gum or black box tree root, then sit on the riverbank and cut it out and shape it. When I do something like this I am looking after my river and my country, I can hear my old people talking to me, I can feel the slight breeze made by them moving around. It is what makes me who I am. Without water in our river the trees will die and there will be no more roots to cut out and make boomerangs. At night on the river I listen to the fish jumping up and I am happy. Or I hear the sound of the swans flying north to meet the fresh water coming down. From this I know when the fresh water is coming and how much, I feel life is right.¹⁵

Northern Basin Aboriginal Nations

We are the Traditional Owners for the Sovereign First Nations of the Northern Murray Darling Basin. Our people and the Basin land and waters have a relationship that spans all time. We have always been here, and we will always be here.

We acknowledge our ancestors, our elders and their role in maintaining healthy, rivers and wetlands and caring for all of the animals and plants under each Nations cultural LAW. We note the damage that has occurred in their lifetime, and ours, to our natural and cultural heritage.

We are one with our lands and waters, and damage to our Mother Earth is damage to us all, our children, and our children's children. Our water is our lifeblood, and all of us depend on healthy rivers and wetlands.¹⁶

Yorta Yorta

Cummeragunja mean my home and is on the Murray River; Dhungula in my Yorta Yorta language.

We see these great waters as our creation story of Mother Earth, Father sky and the great serpent who creates the river channel and valley. Yorta Yorta story of creation is linked to the creation of all the rivers like the Barka aka Darling River; within a vast water basin known today as the Murray Darling Basin.

I was taught that and saw how the season of the year and the flows of the rivers were interconnected. The river was spoken of as having a life of its own as being an entity unto itself. When the duck weed came down in early spring then the swan eggs were ready, when the early flushes from the autumn rains meant that the cod were breeding. I saw the leeches which were used as a medicine sucking out bad blood and puss from sores, of the cygnets and other baby birds such as pelicans and ducklings floating down the rivers in their hundreds. Of hearing of the hundreds of Murray Cod which passed by our banks in a sea of black splashing water finding a fallen gum tree waiting for flood waters which created the perfect conditions to spawn. Sadly my children will only hear of this as a past memory but not experience it as themselves as the Dhungulla was changing, it was dry in the winter and flooding in the summer. Seasons were upside down and there was a long drought coming.¹⁷

What has been lost

As other chapters of this report show, the Water Act and Basin Plan have necessarily drawn the focus of the Commissioner's inquiry to the ecological degradation that has occurred over time to the biodiversity and ecosystems of the Basin. Yet, throughout his inquiry, there have been pressing reminders of the damage and loss simultaneously

suffered by the Aboriginal peoples of the Basin to their culture and way of life as a result of the over exploitation of Basin water resources.

In this context, over exploitation is intended to refer to the practical, legal and administrative actions of the colonies, then the States, that resulted in the respective governments taking complete control over the waters of the Basin and authorizing their taking and use in the manner, and to the extent, that has resulted in the overallocation and overuse of today. These actions are part of the broader history of the losses suffered by the Aboriginal peoples in Australia following British colonization:

*The introduction of the colonial use of the land, waters and natural resources for exploitation was not compatible with Aboriginal resource use. British colonisation imposed British values that were antithetical to Aboriginal laws and value. Subsequent fierce competition over time disempowered Aboriginal peoples from exercising their customary rights and interests ...*¹⁸

As Dr Marshall notes, the push by colonists for control over land and natural resources, in competition with Aboriginal communities, resulted in frontier violence and the forced displacement of Aboriginal people from their traditional lands and waters.¹⁹

The colonies managed water resources in an ‘ad hoc’ fashion until irrigation commenced in the late 1880s. Special legislation was enacted to support irrigation schemes, and gradually all States replaced the common law system of riparian rights with comprehensive laws that vested all rights to water in the States and provided for the granting of various kinds of statutory authorizations or entitlements to take water (see Chapter 1). What may be called the Western view of ‘natural resources’ that has become dominant in Australia since colonization is essentially based on Western concepts of utility and economics, supported by an associated framework of legal rights. The gulf between that view and the view of traditional Aboriginal culture and society about the natural world could hardly be more immense.

The vast gap between these views, and the legal rights and interests, of Aboriginal Australians and non-Aboriginal Australians was finally recognized by the High Court of Australia in *Mabo v Queensland [No. 2]*.²⁰ The majority found that previous decisions about the existence of native title in Australia had been based on the factual mistake that the principle of *terra nullius* applied. As a result, the High Court held that native title could, and did, exist. They also drew the legal conclusion that the failure in prior legal decisions to recognize Aboriginal rights and interests in land was an ‘unjust and discriminatory doctrine of [a] kind [that] can no longer be accepted’.²¹ Much political and legal debate ensued. The *Native Title Act 1993* (Cth) was enacted, and amended in 1998 following the further important High Court decision in *Wik Peoples v Queensland*.²² The numerous native title claims and resulting case law produced over the past 25 years has resulted in a complex area of jurisprudence.

Although Australian law now envisages that native title may exist in both land and waters,²³ the threshold requirements for the success of a claim are significant. They include that claimants must prove sufficient ongoing connexion with the claimed area through the continued exercise of traditional, pre-sovereignty laws and customs,²⁴ and that native title has not been extinguished by past inconsistent grants. Claims seeking to establish native title in respect of inland waters, perhaps not surprisingly, have been significantly fewer than claims in respect of land only, and have had limited success.

The extinguishment of native title in relation to land adjoining a river may have the practical effect of breaking the connexions with the river necessary to assert native title interests in the waters of the river. Another hurdle is the fact, as noted earlier, that every Basin State has abolished common law riparian rights with the introduction of statutory schemes governing the use and allocation of water. Nevertheless, native title has been found to exist in respect of some sections of river in the Basin, but only of a non-exclusive nature.

For example, after an 18-year legal process, the Barkandji people successfully claimed native title in relation to a number of areas in far Western New South Wales, with two Consent Determinations made by the National Native Title Tribunal in 2015 and 2017. Native title was found to exist in various designated exclusive and non-exclusive interest areas — one non-exclusive area being a 400 km stretch of the Darling River north of its junction with the Great Darling Anabranch. The rights determined to exist include the right to take and use the water for personal, domestic and communal purposes (including cultural purposes); the right to have access to, maintain and protect sites of significance to the Barkandji and Malyangapa People under their traditional laws and customs; and the rights to teach on, and hunt and fish in, the non-exclusive areas. These rights are subject to the exercise of specified ‘other interests’, to the extent of any inconsistency, including the rights of the holders of certain listed water licences or permits granted under the *Water Act 1912* (NSW) and the *Water Management Act 2000* (NSW); and the rights and interests of the MDBA.²⁵

The Commissioner received significant evidence of the plight of the Darling River system, particularly downstream of Bourke, as a result of the expansion of irrigation drawing upon the upstream tributaries. The effects on the riverine and wetland ecosystems of the Darling River, as well as on local communities, have been discussed elsewhere in this report (see Chapters 7 and 14). The effects for the Barkandji people have been severe, with the added dimension of cultural and spiritual damage:

Our elders are passing away because of the desecration and damage of our River. The crime rate is going up, and our young people are turning to drugs and alcohol because of their sorrow for what has happened to our river. We know the crime rate goes up when the river goes down. We can't teach culture without our Darling River flowing. The Darling River is our life blood, it is our mother, just like the land. We, the Barkandji People, feel that when you take the water from the River, we have

*nothing. We are the baaka wimpajas (the Darling River Black people), we have to protect the ngatji (Rainbow Serpent), who is the creator of the land and the rivers.*²⁶

Barkandji Elder Mr Bates has argued that the value of his peoples' native title rights, intended to enable the exercise of traditional customs and cultural obligations involving access to, and use of, the river and its resources, have been diminished because of insufficient flows due to the extent of upstream extractions for irrigation.²⁷

The 'future act' regime established by the Native Title Act regulates how governments and third parties can affect native title rights, including by providing some procedural rights and, in sec 24HA, rights to compensation. However, these kinds of remedies are still little tested; and are diversionary in nature. They do not solve the original problem for native title holders. When the critical significance of the Barka to the essential identity and well-being of the Barkandji People is considered, the option of litigation to gain some possible monetary compensation is difficult to see as just or even realistic.

NBAN's submission indicates a strong hope, especially in light of more recent cases such as *Akiba on behalf of the Torres Strait Regional Seas Claim Group v Queensland (No 2)*²⁸ that native title law will provide a basis to support and protect the interests of Aboriginal people in relation to some water resources. NBAN indicated that, in its view, water laws enacted by Basin States simply control access to water rather than grant rights that have the effect of extinguishing native title and, further, that most express an intention not to affect native title. Accordingly:

*NBAN is of the view that native title rights and interests, once determined, would have a primacy, requiring water resource plans to be rewritten in a manner which adjust for the native title.*²⁹

Nevertheless, NBAN notes that native title rights are likely to be non-exclusive 'where access to water has been regulated and accessed' but that in 'non-regulated water sources with very little extraction ... exclusive native title rights may still be established'.³⁰ The Commissioner understands this statement refers to physically unregulated water resources, of which there are few. At the same time, all Basin water resources are subject to laws regulating extraction and diversion and, on the evidence received by the Commissioner, these activities are extensive across all Basin water resources. The result is that the existence of water resources where exclusive native title rights may exist is unlikely.

Basin State legislative schemes for managing and regulating water resources are all different. The relevant laws in Victoria and the Australian Capital Territory do not make any reference to native title rights or Aboriginal rights or interests in water resources. The other Basin States make the following provisions:

- Section 207 of the *Natural Resources Management Act 2004* (SA) provides that nothing in that Act affects native title.
- Section 2 of the *Water Act 2000* (Qld) provides that a purpose of that Act is sustainable management of water resources, which para 2(2)(d) says is management that ‘recognises the interests of Aboriginal people and Torres Strait Islanders and their connection with water resources’. Section 45 provides that the Minister must prepare a draft water plan for an area and in doing so must consider, amongst other things, the interests of any Aboriginal or Torres Strait Islander parties in relation to the water resources of the plan area. Section 95 authorizes a person who is an Aboriginal or Torres Strait Islander party for an area of the State to take or interfere with water for ‘traditional activities or cultural purposes’. Notably, cultural purposes is defined to exclude commercial purposes, and traditional activities are defined as hunting, fishing, gathering or camping; performing rites or other ceremonies; and visiting sites of significance.
- Section 55 of the *Water Management Act 2000* (NSW) authorizes a native title holder to take and use water in exercise of their native title rights (but not to construct a dam or bore, or to construct a water supply work unless on land they own) without an access licence, water supply work approval or water use approval.

One aspect of native title law that has more recently emerged and that may provide some helpful synergies with the development of rights to cultural flows under the Basin Plan scheme is that of the potential for native title rights to be exercised for commercial purposes. In 2013, the High Court in *Akiba on behalf of the Torres Strait Regional Seas Claim Group v Commonwealth of Australia* held that colonial, State and Commonwealth legislation enacted since 1877 to regulate fishing in the relevant offshore claim area were not inconsistent with, and therefore did not extinguish, non-exclusive native title rights to take marine resources for any purpose including commercial purposes.³¹ In that case, native title was found to include traditional customs regarding trade. However, as the Australian Law Reform Commission (ALRC) observed in an issues paper in 2014:

*Generally speaking, Aboriginal and Torres Strait Islander ‘connection’ with land and waters established by reference to traditional law and custom translates into particular rights and interests with regard to land and waters. Some commentators suggest that such an approach to the legal construct of native title may allow for excessive fragmentation, and thereby, partial extinguishment of native title, as individual elements of the ‘bundle’ may be extinguished separately. The potential for fragmentation of native title rights and partial extinguishment may impact the capacity for commercial uses of native title rights and interests.*³²

Notably, the final report of the ALRC of its review of the *Native Title Act 1993*, published in 2015, included the recommendation that subsec 223(2) be repealed and substituted with a provision that expressly provides that native title rights and interests may comprise a right that may be exercised for any purpose including commercial and non-commercial.³³

In light of this, the Commissioner considers the Basin States should review their water resource laws to remove any self-limiting impediments to the exercise of native title rights should they otherwise be found to exist in relation to water. While the South Australian and New South Wales laws may be sufficiently broad in their recognition and support of the taking and use of water in exercise of native title rights, the Queensland law appears to be unnecessarily restrictive in excluding commercial activities. Some express recognition and support could be afforded by Victoria and the Australian Capital Territory, to avoid doubt.

Perhaps in light of the ongoing complexities of native title law, MLDRIN's submission to the Commissioner on this point is salient. MLDRIN makes clear that it considers native title processes unsatisfactory for Aboriginal people to realize their values and interests in water resources:

Native title, in particular, has largely been held to vest in land. As a consequence, key rights and interests, including procedural rights such as the right to negotiate under the future acts regime applies more readily to native title interests in land. Native title in respect of water is a more unsettled proposition and likely extends at most to rights analogous to private (eg domestic, ancillary) rights in water.

*In fully allocated water systems such as the MDB there is little scope for First Nations to exercise native title rights in relation to waters, including those waters that by custom, tradition or spirituality are centrally connected to culture and its revitalisation.*³⁴

National Water Initiative

The 2004 National Water Initiative (NWI) enlivened thinking about Aboriginal interests in water resources, and offered a new approach. It was the first policy initiative by Australian governments to give express and specific recognition to identifying and addressing those interests, by including these principles:

52. The Parties will provide for indigenous access to water resources, in accordance with relevant Commonwealth, State and Territory legislation, through planning processes that ensure:

- i) inclusion of indigenous representation in water planning wherever possible; and*
- ii) water plans will incorporate indigenous social, spiritual and customary objectives and strategies for achieving these objectives wherever they can be developed.*

53. Water planning processes will take account of the possible existence of native title rights to water in the catchment or aquifer area. The Parties note that plans may need to allocate water to native title holders following the recognition of native title rights in water under the Commonwealth Native Title Act 1993.

*54. Water allocated to native title holders for traditional cultural purposes will be accounted for.*³⁵

The National Water Commission (NWC) was established as part of the NWI to monitor and report on the progress of States in achieving NWI objectives. In a report prepared for the NWC in 2009 on Indigenous participation in water planning, Dr Sue Jackson of CSIRO acknowledged the new impetus given by these principles, but noted some drawbacks — the discretionary nature of the principles; the lack of guidance about implementation; and the emphasis placed on protecting customary values and protecting native title, with the associated complexities that native title law brings to the realization of Aboriginal interests and values in water.³⁶ The report concluded that (at that time) the NWI Indigenous access provisions had received little attention, and that States were still in the early stages of formally recognizing Indigenous peoples' relationships with water resources across the spectrum of values and uses.³⁷

Other observations in the 2009 report included that '[a]n important prerequisite to meeting Indigenous water needs is a greater general awareness of Indigenous concepts of 'country', the nature and extent of Indigenous interests in water, and their relationships to other Indigenous values, such as identity'.³⁸ Relevant to this, the report noted the importance of resourcing Indigenous organizations to research and develop their own methods for identifying Indigenous knowledge and interests so as to enable these to be incorporated appropriately into water resource plans, rather than relying on government agencies to conduct consultation about these matters. Without this, there is 'a substantial risk that the NWI will not benefit Indigenous Australians'. A further important observation was the call by some groups, in particular by MLDRIN, for policy action to provide economic benefits to Indigenous people through reforms to water management. MLDRIN was calling for a 'cultural flow' to sustain Indigenous values and interests, as distinct from an exclusive focus on environmental flows.³⁹ Evidence received by the Commissioner clearly indicates that these challenges and concerns are still very much alive. The NWI was a policy advance that set the scene and provided a range of foundational principles for the legislative scheme of the Water Act and Basin Plan. Given the comprehensive nature of the new legal scheme, and its basis in relevant international agreements, the Commissioner understands the elevated expectations of Aboriginal people that the scheme would mean a further advance towards addressing their interests and values in Basin water resources.

Water Act

The objects of the Water Act, set out in sec 3, include 'to give effect to relevant international agreements' (to the extent they are relevant to the use and management of the Basin water resources); and, 'in giving effect to those agreements, to promote the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes'.

The Convention on Biological Diversity⁴⁰ (**Biodiversity Convention**) to which Australia is a party, is one of the relevant international agreements referred to in the objects of that Act. The commitments in the Biodiversity Convention provide constitutional bases for the Water Act's ecological goals of achieving sustainable use of Basin water resources and the conservation of its associated biodiversity (see Chapters 2 and 3). At the same time, the Biodiversity Convention makes specific provision for the protection of indigenous interests in 'biological diversity' and 'biological resources' (defined terms). In the preamble, the Contracting Parties make clear that the reasons for entering into the Biodiversity Convention include:

*Recognizing the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components.*⁴¹

Article 2 provides these two key definitions:

"Biological diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.

"Biological resources" includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

Each of these concepts is the subject of a substantive provision involving the interests of Indigenous people.

First, art 8 concerns the conservation of traditional knowledge, innovations and practices relevant to the conservation and sustainable use of biodiversity. This is about the protection and equitable sharing of the benefits of traditional knowledge in natural resource management and biodiversity conservation. The Contracting Parties commit to 'in-situ conservation' of biodiversity and ecosystems, including (as far as possible and appropriate) to:

8(j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.

The second provision, in art 10, is more specifically concerned with protecting traditional uses of biological resources ie of living organisms within ecosystems (eg plants, animals):

10(c) Protect and encourage customary use of biological resources in accordance with traditional cultural practise that are compatible with conservation or sustainable use requirements ...

The Biodiversity Convention's Conference of Parties (**CoP**) has made a series of decisions, including the adoption of guidelines, to assist the interpretation and implementation of arts 8(j) and 10(c). These are discussed later in this chapter in the context of the Basin Plan.

The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (**Ramsar Convention**)⁴² is also a relevant international agreement providing a constitutional foundation for the enactment of the Water Act. While the agreement itself does not refer to the interests of Indigenous people in the protection and management of wetlands of international significance, again there are resolutions by the CoP that do so, and these are discussed below, in the context of the Basin Plan.

The way in which the Water Act addresses, and seeks to implement, the provisions of these relevant international agreements is through a set of provisions which may be summarized as obligations to 'engage' the Indigenous community about Basin water resources, and to 'have regard' to their views.

Section 21 sets out the general basis on which the Basin Plan is to be developed, and subsec 21(4) sets out matters to which the MDBA and the Minister 'must have regard' in exercising their powers and performing their functions with respect to the Basin Plan. They include: 'social, cultural, Indigenous and other public benefit issues'.⁴³

Section 22 sets out the matters that the Basin Plan 'must include'. Subsection 22(1) Item 1 requires a 'description of the Basin water resources and the context in which those resources are used' including information about 'the uses to which Basin resources are put (including by Indigenous people)'.⁴⁴

Subsection 22(1) Item 11 requires the Basin Plan to include the requirements that a WRP must comply with for it to be accredited. Subsection 22(3) elaborates on this by listing 11 specific matters in relation to which the Basin Plan must impose requirements for a WRP to be accredited, including:

*having regard to social, spiritual and cultural matters relevant to Indigenous people in relation to the water resources of the water resource plan area in the preparation of the water resource plan ...*⁴⁵

The MDBA's functions include 'to engage the Indigenous community on the use and management of Basin water resources ...'⁴⁶ Appointments to the MDBA Board require a

high level of expertise in one or more of certain listed fields, one of which is ‘Indigenous matters relevant to Basin water resources’.⁴⁷

The Commissioner notes that there is no requirement for membership of the MDBA Board to include an Aboriginal person. Representation of Aboriginal interests is dealt with by the requirement that the Basin Community Committee establish an Indigenous water subcommittee with a membership comprising ‘at least 2 Indigenous persons with expertise in Indigenous matters relevant to the Basin’s water resources’,⁴⁸ meaning that although Aboriginal people are represented in an advisory capacity in Basin water management, they have no guaranteed place at the main decision-making table.

The Commissioner notes that, following the meeting of the Murray-Darling Basin Ministerial Council (**MinCo**) on 14 December 2018, it was announced that:

Recognising that Aboriginal people are the traditional custodians of the Murray-Darling Basin, Ministers agreed that there should be a standing Aboriginal member appointed to the Murray-Darling Basin Authority. The Aboriginal member on the Board would be appointed on the basis of their skills and expertise regarding indigenous matters. They would not be appointed to represent particular regions or organisations.

The Commonwealth Minister agreed to seek an amendment to the Water Act 2007 (Cwlth) to create this new position.⁴⁹

The Commissioner considers this a welcome, albeit belated, initiative. The current proposal lacks detail concerning the process for selection and appointment, and it is hoped that appropriate and timely consultation with peak representative Aboriginal organisations is undertaken in relation to relevant proposed amendments to the Water Act. The matter of representation on the MDBA Board is discussed further in Chapter 17.

A further proposal of the MinCo is to establish a ‘Community of Practice to share information, build Aboriginal water policy skills, and identify gaps and opportunities’ with a cross-section of Aboriginal perspectives represented, as well as ‘state and Commonwealth government officials’. It is unclear at this stage what kind of body this is intended to be, although it might be assumed to be statutory. The Commissioner considers it may well be useful but is of the view that its operations and resourcing should not detract from, or cut across, the work of wholly Aboriginal-based representative organisations such as MLDRIN and NBAN.

Basin Plan

Chapter 10 of the Basin Plan sets out WRP requirements, and Part 14 of that chapter addresses the matters referred to in sec 22 of the Water Act. The language of ‘have regard’ is repeated in these provisions:

10.52 Objectives and outcomes based on Indigenous values and uses

(1) A water resource plan must identify:

(a) the objectives of Indigenous people in relation to managing the water resources of the water resource plan area; and

(b) the outcomes for the management of the water resources of the water resource plan area that are desired by Indigenous people.

(2) In identifying the matters set out in subsection (1), regard must be had to:

*(a) the social, spiritual and cultural values of Indigenous people that relate to the water resources of the water resource plan area (**Indigenous values**); and*

*(b) the social, spiritual and cultural uses of the water resources of the water resource plan area by Indigenous people (**Indigenous uses**);*

as determined through consultation with relevant Indigenous organisations, including (where appropriate) the Murray Lower Darling Rivers Indigenous Nations and the Northern Murray-Darling Basin Aboriginal Nations.

(3) A person or body preparing a water resource plan may identify opportunities to strengthen the protection of Indigenous values and Indigenous uses in accordance with the objectives and outcomes identified under subsection (1), in which case the opportunities must be specified in the water resource plan.

10.53 Consultation and preparation of water resource plan

(1) A water resource plan must be prepared having regard to the views of relevant Indigenous organisations with respect to the matters identified under section 10.52 and the following matters:

(a) native title rights, native title claims and Indigenous Land Use Agreements provided for by the Native Title Act 1993 in relation to the water resources of the water resource plan area;

(b) registered Aboriginal heritage relating to the water resources of the water resource plan area;

(c) inclusion of Indigenous representation in the preparation and implementation of the plan;

(d) Indigenous social, cultural, spiritual and customary objectives, and strategies for achieving these objectives;

(e) encouragement of active and informed participation of Indigenous people;

(f) risks to Indigenous values and Indigenous uses arising from the use and management of the water resources of the water resource plan area.

...

*(2) In this section, **registered Aboriginal heritage** means Aboriginal heritage registered or listed under a law of a Basin State or the Commonwealth that deals with the registration or listing of Aboriginal heritage (regardless of whether the law deals with the listing of other heritage).*

10.54 Cultural flows

A water resource plan must be prepared having regard to the views of Indigenous people with respect to cultural flows.

10.55 Retention of current protection

A water resource plan must provide at least the same level of protection of Indigenous values and Indigenous uses as provided in:

(a) a transitional water resource plan for the water resource plan area; or

(b) an interim water resource plan for the water resource plan area.

In addition, when preparing the Basin-wide environmental watering strategy and the annual environmental watering priorities, the MDBA ‘must have regard’ to certain matters, where they relate to achieving the Basin’s overall environmental objectives, and in each case these matters include ‘Indigenous values and Indigenous uses’.⁵⁰

Consultation on water resource plans

The key obligations of Basin States are essentially to ‘have regard’ to Indigenous views about a range of matters. In the preparation of WRPs, these matters may be summarized as:

- objectives and outcomes based on Indigenous values and uses (sec 10.52)
- consultation and preparation of WRPs relevant to native title matters; registered Aboriginal heritage; Indigenous representation and the encouragement of active and informed participation; social, cultural, spiritual and customary objectives, and strategies for achieving these objectives; risks to Indigenous values and uses (sec 10.53)
- cultural flows (sec 10.54)
- retention of the current level of protection of Indigenous values and uses (sec 10.55).

Evidence received by the Commissioner focussed on the question of the extent and adequacy of consultation with Aboriginal people in the Basin about WRPs, in terms of both procedure and substance. Each of these is discussed in turn, followed by a separate discussion of the meaning of cultural flows and the way this matter is being, and may be, addressed.

Procedural matters

Murray-Darling Basin Authority Guidelines

The MDBA has produced a 26 page document comprising guidelines ‘to assist Basin State governments to develop WRPs in accordance with Basin Plan water resource plan requirements ... in particular sections 10.52–10.55’ (**Part 14 Guidelines**).⁵¹ The Part 14 Guidelines themselves state that they were prepared in response to a recommendation by the Independent Review of the Water Act (**Independent Review**) initiated by the Commonwealth Government in 2014 and undertaken by a panel of experts chaired by Mr Eamonn Moran PSM QC. The recommendation was that the guidelines should be prepared and should draw on the Akwé: Kon Guidelines.

The Part 14 Guidelines state that they build on a series of MDBA position statements about WRP requirements. One is MDBA Position Statement 14A, which says:

MDBA uses its Aboriginal Engagement Principles, which are consistent with the Convention on Biological Diversity’s Akwé: Kon Guidelines, to guide our engagement with Traditional Owners. It is anticipated that Basin States will undertake similar approaches for their Aboriginal engagement processes. MDBA has interpreted this guideline, with respect to water resource planning, to require:

- *a planned approach to properly engaging Traditional Owners (e.g. adequate time, appropriate venues and resources) that results in an Indigenous Engagement Strategy that guides preparation of the water resource plan*
- *identification and involvement of appropriate Traditional Owners throughout all stages of the water planning process*
- *Traditional Owners are properly notified of the opportunity to be involved in the water resource planning process, (e.g. print, phone, electronic and personal media and town meetings)*
- *information about water resource planning processes and content provided is clear to Traditional Owners*
- *use of appropriate tools and mechanisms for recording, understanding and incorporating Aboriginal objectives and outcomes.*⁵²

The Part 14 Guidelines are reasonably comprehensive, and set out suggestions with respect to each of the four main provisions in Part 14.

Concerning the requirement to identify objectives and outcomes based on Indigenous values and uses, the Part 14 Guidelines suggest that consultation be informed by the NWC's report on Aboriginal involvement in water planning and the MDBA Aboriginal Partnerships Action Plan. The document notes that there should be clear identification of the relevant water resources in a way that is 'fully understood and accepted by the relevant TOs [traditional owners]', and that the values and uses relevant to the objectives and outcomes should be brought to light through consultation 'in a culturally sensitive way'. Methods may involve an Aboriginal Waterways Assessment, Use and Occupancy Mapping or Aboriginal Submissions Database in conjunction with consultation.

Section 10.52(3) of the Basin Plan requires that if opportunities to strengthen the protection of Aboriginal values and uses are identified, those opportunities must be specified in the WRP. The Part 14 Guidelines note that there is no obligation to go further than this, although there may be opportunities, through collaboration and coordination, to combine or link water resource management with other areas of planning and management to protect Aboriginal values and uses. Obvious examples relate to access to waterways, the improvement of which may involve land use and planning laws; and care of native vegetation or landscape features, which may involve other natural resource management laws. The Part 14 Guidelines indicate that any action beyond identification of opportunities for increased protection is 'voluntary', and sec 10.52(3) 'effectively provides a statutory mechanism that can serve as support for such arrangements'.⁵³

In relation to sec 10.53 regarding requirements for consultation about specified matters in preparing WRPs, the Part 14 Guidelines state that Basin States should seek the views of traditional owners early in WRP development; that if it is appropriate, they should revisit those views during the development process; and that they should 'demonstrate proper, genuine and realistic consideration of views'.⁵⁴

In the Part 14 Guidelines, the MDBA notes the 'ongoing challenge for Aboriginal organisations to engage multiple and repeated times with governments for a range of purposes' and urges Basin States that information gathering in preparation for consultation should be 'as comprehensive as possible, and include relevant information from other government agencies'. An intention that Basin States base their consultation on the Akwé: Kon Guidelines is reflected in the MDBA statement:

*The quality of consultation is typically defined by considerations for comprehensive participation, opportunity for all relevant stakeholders to speak and have respectful acknowledgement of points of view, and a fair-minded and balanced reflection of the information provided. Best practice would have sufficient time and resources to ensure thorough efforts to identify and engage all relevant stakeholders.*⁵⁵

Position Statement 1B

It is significant that the MDBA's Part 14 Guidelines advise that, in assessing Basin States' compliance with the requirements that they must have regard to the views of

Aboriginal people in respect of the matters in secs 10.52–10.55, the MDBA will consider how the information obtained is reflected in the WRPs. The Part 14 Guidelines advise that an explanation of the approach, tools or information used in the preparation of the WRP should be provided, as well as descriptions of what information was ascertained and explanations of how it is addressed by or incorporated into the WRP. In this respect, the Part 14 Guidelines are inconsistent with the MDBA’s separate position statement about what it considers the requirement to ‘have regard to’ means for the purposes of WRP development. Called ‘Position Statement 1B Interpreting ‘have regard to’⁵⁶ the Statement says that the requirement means ‘that the relevant decision-maker must give those matters proper, genuine and realistic consideration’. However, it goes on:

The appropriate way to ensure proper consideration of a matter will vary depending on the context of the requirement, including any additional obligations associated with that requirement.

The Position Statement then sets out three categories of requirements:

Category A — a requirement to have regard to a specified matter, with no additional requirements

Category B — a requirement to have regard to a specified matter, with an additional requirement that the water resource plan describe or explain how that requirement was complied with

Category C — a requirement to have regard to a specified matter, with an additional requirement to include specified additional material in the water resource plan, depending on the outcome of regard being had.⁵⁷

The matters to which regard must be had in preparing WRPs are variously assigned to these categories. The matters concerning Indigenous values and uses are placed in Category A. The effect is that the MDBA considers that the duty of Basin States is at the minimum level of ‘have regard’, with no need for WRPs to describe or explain how it was met or to include any other additional material.

While these Statements are not binding, they nevertheless assert an opinion, intended to be followed by Basin States, that the views of Aboriginal people about the many aspects of Basin water resources that are vitally and intrinsically important to them do not demand the attention and action that some other interests demand; that their views need not be described in WRPs or explanations given by governments about the response to the views in the WRPs. It is unclear how the MDBA arrived at the categorization that it did, or the reasons for differentiating at all between matters to which regard must be had.

The Commissioner considers Position Statement 1B to be an administrative mistake. Whilst it is hoped that it is treated as such, it is a matter of fact that it is suggestive of discriminatory treatment, and it must be understood as disrespectful to Aboriginal people.

Aboriginal views about the Part 14 Guidelines

When asked by the Commissioner whether the Part 14 Guidelines document was something it commended and supported, MLDRIN's response was that it considers the document a 'useful tool to encourage appropriate engagement' which lays down some 'basic procedural' matters such as recognizing the 'autonomy of indigenous organisations identifying objectives and outcomes, and the timing and conduct of consultations'.⁵⁸ However, several key concerns remain, namely, that:

- the Part 14 Guidelines do not adopt the Akwé: Kon Guidelines requirements for provision of adequate financial, technical and human resources to enable Indigenous participation. MLDRIN says: 'As far as we're aware, this key provision (eg technical and expert resourcing) has not be [sic] made available to indigenous organisations in WRP preparation, despite the highly technical and complex nature of the issues'.⁵⁹
- the Part 14 Guidelines create no legal obligation to accommodate the views and positions of Indigenous people and organizations, as is the case with the 'deep consultations' model adopted in Canada. Such a model, for which MLDRIN advocates, requires decision-makers involved in consultation to engage in dialogue and accommodation:

Accommodation requires a preparedness on the part of water planners/decision-makers to shift their position or terms and also to actually do so. It does not necessarily mean indigenous organisation would have any veto rights over a plan/decision as a whole. It does mean outcomes or terms can and will be changed as a consequence of discussions. It is analogous to a right to negotiate.

*... if these guidelines were binding, they would provide an improvement on the current provisions of the Basin Plan, but they would NOT provide an adequate framework for consultation and inclusion of First Nations' rights and interests in water resource planning.*⁶⁰

It is clear there is a danger in the legislation simply requiring that governments 'have regard' to Indigenous views about specific matters in preparing WRPs without providing any procedural requirements or safeguards, or creating any obligation to give any weight to the views expressed. The Commissioner considers that this danger has been realized with the publication of the MDBA's Position Statement 1B and with the evidence that, in some parts of the Basin, insufficient time and resources have been provided to conduct what might reasonably be expected to be procedurally fair consultation.

Aboriginal views about consultation in practice

Experience of procedural inadequacy

Evidence of concerns raised with the Commissioner by traditional owner groups about the procedural aspects of WRP consultation have been touched upon in Chapter 12, particularly in terms of the inadequate time provided for thorough, considered consultation.

In its submission to the Commissioner, NBAN called for greater use of the Akwé: Kon Guidelines in strategic assessments such as the WRPs, and said:

NBAN notes that the Conference of the Parties requested governments to use the Voluntary Guidelines and encouraged them to initiate a legal and institutional review with a view to exploring options for incorporation of the guidelines in national legislation and policies.

...

NBAN has already corresponded with the NSW Government in a joint letter with MLDRIN regarding their views of the inadequacy of the current Water Resource Planning process to comply with Part 14 of the Basin Plan, and clauses 10.52, and 10.54 (Appendix 2).

To outsource those requirements in a limited consultancy on a short time frame and say that the outcomes have been delivered in good faith is highly questionable.⁶¹

In their written submission, MLDRIN summarized a range of concerns about, and referred to instances of, consultation that they consider to be inadequate, especially due to the giving of insufficient notice of meetings and insufficient time to consider the relevant issues and have input. For example:

one Traditional Owner group in the Northern Basin received only one week's notice of workshops dedicated to consultation for WRP development in their area ... NSW DPI staff have indicated that some Nations may not even have workshops, given the constrained timelines. DPI staff have also indicated that it is likely that some draft WRPs will go out for public exhibition before consultation with relevant First Nations has been completed.⁶²

...

... In Victoria, delayed consultation activity, due to competing priorities and policy development, meant inclusion of First Nations objectives and outcomes in the Wimmera-Mallee WRP (WMWRP) occurred in an ad-hoc and unsatisfactory way.

...

The Victorian government has taken the view that the requirement to 'have regard to' matters equates to a requirement for general consideration only, with no substantive response or measures provided in the formal text of the WRP. This minimalistic approach has the affect [sic] of weakening the efficacy of the WRP.⁶³

Inadequate representation

The Commissioner recognizes the importance of ensuring that consultation by the MDBA and other government agencies is undertaken with the right representative groups, and that traditional owners have the opportunity to be represented on their own terms. Mr Bates of the Barkandji gave evidence that his people are not adequately represented and listened to by the MDBA, and indicated that this is not helped by the artificial division of the Basin into Northern and Southern regions, neither of which align with the Barkandji's geographical and cultural associations:

They put me on MLDRIN last year when they know my grandmother comes from the upper Darling and I come from Wilcannia, which is not in MLDRIN area. I asked if I could transfer to NBAN because that is more my country. NBAN said no because Barkandji were on MLDRIN so they couldn't be on NBAN as well ... Barkandji is a huge language group made up of 8 dialects, but we can only be on MLDRIN. But all the small groups around Brewarrina etc. are all individually represented on NBAN, even though they belong to the one language group. So as it stands MLDRIN says it only goes up to Menindee, and NBAN says it stops at Bourke. That means most of the Barkandji people along the Barka are not even represented by anyone, especially my people from Menindee up to Wilcannia and up to Bourke.⁶⁴

Mr Bates also gave evidence that the MDBA had not correctly identified the Barkandji People as traditional owners of country on the MDBA's published maps for groundwater areas:

If you look on the MDBA webpage and look for their maps that show what traditional groups should be consulted over Water Sharing Plans, there are two maps, one for groundwater and one for surface water. The groundwater map covers the Darling Alluvial Plains from Bourke down to Wentworth, the shallow aquifers along our river, lakes and floodplain, the shallow aquifers that our Ngatji lives in. On this map we Barkandji are not in the list that needs to be consulted, it only lists the groups to the north of us. In effect this map says we Barkandji are not the traditional people of the Barka, even though we have a determined Native Title claim over most of it. The surface water map does list us, over the river itself, but with other groups.⁶⁵

MLDRIN also raised its concern with the Commissioner that, despite the Barkandji Peoples' attempts to seek action about the parlous state of their traditional waters of the Darling River, including through public protests and lobbying State and Commonwealth Governments, 'Barkandji people's views have been consistently marginalised in negotiations over water sharing and management'.⁶⁶

Minimum standards for fair consultation

In MLDRIN's submission, relevant obligations in the Biodiversity Convention and resolutions under the Ramsar Convention require a standard of consultation that has neither been incorporated into the Water Act nor met in practice:

*It is intended, as a matter of policy, that consultation is guided by reference to broad environmental and cultural assessment provisions contained in the Akwé: Kon Guidelines, endorsed by the CoP of the Biodiversity Convention.*⁶⁷

According to MLDRIN, this invokes certain minimum procedural requirements:

*The policy of consultation is focused on clear planning, notice and information to Indigenous communities, opportunities to express views, and the recording and documentation of views and information from communities. Arguably, this is an elaboration of the common law position in respect of the content of consultation, which includes, minimally, information, notice and opportunity to participate in decision-making.*⁶⁸

MLDRIN's submission raises a question about the status of the 'have regard to' requirements in the Water Act and Chapter 10 of the Basin Plan from an administrative law perspective, and whether the obligations created by the Basin Plan are amenable to any legal remedies in the case of a breach. The suggestion raised by MLDRIN is that the Water Act and Basin Plan create a statutory requirement about an administrative decision-making process that may be amenable to being supplemented by common law principles of procedural fairness.

It is clear that the Water Act requirements to 'have regard to' certain matters are duties — the MDBA and Minister 'must' have regard to certain matters; and the Basin Plan 'must' include certain requirements for WRPs. The Basin Plan then provides that the WRPs 'must' identify, and 'must' be prepared having regard to, specified matters. Given that the information to be ascertained, in fulfilling the statutory requirements to 'have regard to' the views of Aboriginal people, is within the special knowledge and preserve of the traditional owners in each WRP area in the Basin, the relevant provisions clearly create duties to consult. The proper carrying out of a statutory duty to consult with traditional owners could be considered in an administrative law context.

It has become a settled principle of statutory construction in Australia since the High Court decision in *Kioa v West*⁶⁹ that the legislature intends that procedural fairness be afforded to those whose rights or interests are affected by administrative decisions.⁷⁰ The presumption may be rebutted by express words excluding such processes,⁷¹ but that is not the case with the Basin Plan provisions. However, although the presumption may apply to decisions of a non-adjudicative nature (albeit less readily than to adjudicative decisions) it generally only applies to decisions affecting individuals, as opposed to large groups,⁷² and generally not in the context of a statutory duty to consult. In such cases,

the courts are reluctant to intervene to impose any additional common law procedural fairness tests.⁷³ For these reasons, decisions by Basin State governments about the content of WRPs following consultation with representative Aboriginal groups may not be readily open to challenge on procedural fairness grounds, although perhaps it cannot be entirely ruled out.

‘More than consultation’

MLDRIN considers the Water Act and Basin Plan should provide a stronger policy directive for the obligations to consult, reflecting art 8(j) of the Biodiversity Convention or (perhaps, and) adopting something of the ‘deep consultation’ model developed in Canada for negotiations between Aboriginal societies and the Crown about natural resources decision-making. According to MLDRIN, this would require governments ‘to act generously and respectfully and take a broad purposive approach to engagement with Aboriginal organisations in respect of water planning and water resources management’.⁷⁴

The Commissioner heard evidence from Ms Morgan, noting her experience as a member of MLDRIN, a facilitator of consultations between the Murray-Darling Basin Commission about environmental flows for The Living Murray initiative,⁷⁵ and as a delegate at various national and international forums including about Indigenous rights to water. She referred to consultation being used as a ‘tokenistic concept’, and her view that it should be considered always in the context of international human rights principles of engagement, such as that of ‘free prior informed consent’.⁷⁶ In this context, the Commissioner was referred to a discussion paper published in 2004 by the Australian Institute of Aboriginal and Torres Strait Islander Studies of which Ms Morgan was a co-author: ‘Indigenous Rights to Water in the Murray Darling Basin’, which said:

*More than consultation, Indigenous peoples have called for substantive involvement in policy and decision-making, as well as direct involvement in environmental management. In international law, a measure of whether Indigenous peoples enjoy equal rights in respect of effective participation in public life is to ensure that ‘no decisions directly relating to their rights and interests are taken without their informed consent’. Informed consent requires more than mere consultation, it requires meaningful roles in the process and power in determining the decisions and outcomes.*⁷⁷

The Commissioner notes that the recommendations of the Independent Review, which led to the preparation of the Part 14 Guidelines, included a recommendation that, after 1 July 2019 ‘the case to amend section 22(3) to include a new section that reflects existing Basin Plan water resource plan requirements dealing with Indigenous values and uses should be considered’.⁷⁸ The Commonwealth Government response was: ‘The Government will also seek to amend the Act to require that water resource plans are prepared having regard to Indigenous values and uses’.⁷⁹

While such a step would at least elevate consultation requirements to the status of statutory requirements, without more it would leave the manner in which consultation is conducted, and what action is taken as a result of consultation, as matters of unfettered discretion. The Commissioner considers the interests and values of Aboriginal people in respect of the Basin's water resources deserve more than basic or superficial consultation.

Mr Hooper gave evidence to the Commissioner that, in accord with NBAN's submission to the 2014 Independent Review, NBAN considers that sec 10.53(3) of the Basin Plan should be amended to require that the Akwé: Kon Guidelines apply to consultation under that provision, to ensure that Basin States 'properly consult and give appropriate time and appropriate resources to engaging Aboriginal people'.⁸⁰

The Commissioner considers the Part 14 Guidelines represent the minimum that should be expected of consultation by Basin States in relation to the way in which water resource plans address 'Indigenous values and uses' in the relevant water resources. However, these should be statutory requirements, and they should be strengthened to better reflect the Akwé: Kon Guidelines. As a relevant international agreement, the Biodiversity Convention provides a sufficient basis to enliven the necessary constitutional powers to enable the Commonwealth Government to legislate to amend the Water Act to incorporate key provisions of the Part 14 Guidelines as requirements.

Cultural flows

The concept of 'cultural flows', referred to in sec 10.54 of the Basin Plan, emerged independently of the Water Act as a response to traditional owners seeking to gain legal and practical recognition of their interests in the rivers of the Southern Basin.

In 1998, in the process of their long pursued native title claim over lands and waters in the region of the Murray and Goulburn Rivers, the Yorta Yorta people called a meeting of Elders of other traditional owner groups from along the Murray (Dhungala) River and Darling (Baaka) River.⁸¹ This was the genesis of the co-operative of MLDRIN, established to represent the interests of Aboriginal people in water values and ownership in the Southern Basin.

In 2007, at a meeting in Echuca, MLDRIN devised a statement about Aboriginal interests and values in water. In nine separate articles, the statement defines cultural flows and cultural flow outcomes and sets out mechanisms for delivering those outcomes and determining the quantity of cultural flows. This became the Echuca Declaration, adopted by MLDRIN and NBAN at a joint meeting in 2010. Article 1 provides:

*"Cultural Flows" are water entitlements that are legally and beneficially owned by the Indigenous Nations of a sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations. This is our inherent right.*⁸²

Although the Water Act does not refer to cultural flows, the concept is incorporated into the Basin Plan, in sec 10.54. However, this provision simply creates an obligation for Basin States to consult about cultural flows in the process of preparing WRPs. The real work of defining and advocating for recognition of cultural flows has been left to traditional owners, while Basin State governments have a discretion about whether, and how, to provide for them.

Research

MLDRIN informed the Commissioner that it has been a principal research partner in a project established in 2011 to ‘investigate and demonstrate processes required to quantify Aboriginal water needs (for cultural, social, economic and environmental purposes) and to identify options for acquiring water to provide cultural flows’⁸³ — the National Cultural Flows Research Project (**NCFR Project**).⁸⁴ The NCFR Project was extensive and complex work undertaken as a collaborative effort by MLDRIN, NBAN and the Northern Australian Indigenous Land and Sea Management Alliance, with academic and practical research contributions by various consultants and organizations and funding from the MDBA, the Commonwealth Environmental Water Office, NWC and the Commonwealth Department of Families, Housing, Community Services and Indigenous Affairs. In June 2018, the NCFR Project released a set of three reports:

- ‘Dhungala Baaka: Rethinking the Future of Water Management in Australia’⁸⁵
- ‘A Pathway to Cultural Flows in Australia’ (**Pathways**)⁸⁶
- ‘Cultural Flows: A Guide for First Nations’ (**Guide**).⁸⁷

The first of these three reports summarizes the development of the concept of cultural flows, the genesis of the NCFR Project, and the structure and content of the project. The final reports represent the findings from three phases; a desktop (literature review); the results of field studies in relation to two selected test sites (the Gooraman Swamp and Toogimbie Wetlands) involving ecological characterizations and hydrological and hydraulic modelling reports, as well as guides for both communities and water managers; and a design for legal and policy reform to integrate cultural flows into current systems.

While the NCFR Project reports are not lengthy, the Commissioner notes the extensive scientific, technical and practical work that informs them. The reports themselves synthesize research results (in various detailed reports available on the NCFR website) and provide useful explanations of the idea of cultural flows, why they are important and how they may be achieved.

The two case studies were of the Gooraman Swamp near Weilmoringle in the Northern Basin, involving the Nari Nari Tribal Council; and the Toogimbie Wetlands near Hay in the Southern Basin, involving the Murrawarri Provisional Council of State. They are powerful examples of the potential multiple benefits of water being allocated for cultural flows. Both selected sites are surrounded by irrigated agricultural properties.

At Toogimbie, over 15 years, with the use of a Cultural Access Licence, '[a]ctive eyes, thought processes and First Nations' knowledge have come together with the best of western science and environmental management practices'. The result is that *Gweeargal* (Lignum) Shrubland has been restored and 'the cultural landscape has been transformed, providing lateral connectivity between a flood plain and the parent river'.⁸⁸ At Gooraman Swamp on the Darling River floodplain, surrounded by cotton farms, traditional owners have been involved in monitoring and evaluating the effects of floods and dry periods on the behaviour of the floodplain ecosystem and especially the River Red Gum (*Eucalyptus camaldulensis*), a sacred species.

Key findings from the case studies included:

The process of defining the water requirements for a cultural flow is tantamount to enabling Aboriginal water management. This remains a core goal of national water reform. Enabling Aboriginal water management through the mechanism of a cultural flow creates legitimacy for Aboriginal water management objectives that are otherwise marginalised in water planning decisions.⁸⁹

The Pathways document sets out three ways in which the Echuca Declaration may be implemented through law and policy: by creating or acquiring water rights for Aboriginal organizations, by increasing their influence in water landscapes, and by changing governance arrangements. These are relatively high-level perspectives about possible approaches to water management reform, for consideration by Aboriginal leaders and governments. At the more practical level of identifying objectives and values for the purposes of WRP development, as required by the Basin Plan, the Guide document will be helpful to traditional owners and water managers.

The reports of the NCFR Project identify the significance of cultural flows for Aboriginal culture, health and well-being,⁹⁰ as well as broader positive effects, such as augmenting Western scientific knowledge about Basin ecosystems and improving the environment on a landscape scale with associated benefits for other landowners. However, they also highlight the challenges to accommodating cultural flows into the current legal and administrative system for water resource management. One is the gap in understanding, on broader social and political levels, of what Aboriginal culture means, and what it needs from and can contribute to the health of the Basin water resources. A further, related challenge is in the current absence of commitment on the part of Basin States to provide for cultural flows in a way that goes beyond the kinds of usufructuary rights generally associated with native title rights and interests.

For example, the water for the Toogimbie Wetlands cultural flows study was provided via seasonal allocations to a 'Cultural Access Licence' under the Murrumbidgee Water Sharing Plan made pursuant to the *Water Management Act 2000* (NSW). Such licences, however, do not allow the use of water for commercial purposes, unlike licences such as for irrigated farming. This means that the Nari Nari may not obtain commercial benefit from the biological resources that may grow through the application of the water.

This is a strong point of contention for Aboriginal owners advocating for cultural flows. The NCFR Project says:

First Nations require the permanent and ongoing ownership of water for cultural flow purposes that has the same status as commercial water rights, and with the flexibility to ensure the long term development of sustainable enterprises.

Permanent and on-going water allocation is required to continue the rehabilitation of the natural flood plains and for strengthening the community of custodians who have a cultural obligation to manage it.⁹¹

The desire to be granted legal water rights to achieve cultural flows was a common refrain in evidence to the Commission by Aboriginal witnesses, echoing consistently the Echuca Declaration's reference to 'water entitlements that are legally and beneficially owned by Indigenous Nations'.⁹²

Mr Fred Hooper, Chair of NBAN, gave evidence that 'cultural flows' is a term intended to encompass all the many interests and values in water that are particular to Aboriginal people, especially cultural obligations, and that those interests and values are not mutually exclusive but overlapping.⁹³ Mr Hooper said that NBAN's hope is that the NCFR Project's Guide would be used by NBAN to determine the cultural flow requirements of the traditional owner groups it represents. That is, using the Guide, they would identify the most important areas and their water requirements for those areas for cultural, environmental and economic purposes, and 'the idea of that is that then we can have a collective view of the northern Basin on the watering requirements'.⁹⁴ Mr Hooper also made clear that in NBAN's view, this process should be built into the system for allocating all available water in the same way that, under the Water Act and Basin Plan, ecological and corresponding hydrological assessments must be undertaken to determine environmental watering requirements for WRP areas, which in turn are used to determine sustainable diversion limits (SDLs) for consumptive use — thus cultural flow requirements would have priority over consumptive uses such as irrigation. In NBAN's view, the entitlements created for cultural water should be held by a specially created entity in the form of an Aboriginal water trust or cultural water holder.⁹⁵

Ms Morgan also gave evidence to the effect that cultural flows should be factored into water resource planning as the subject of broad allocation principles:

Well, I think that a culture flow needs to have — if we are going to have a river that's going to survive and maintain First Nations or any Aboriginal peoples' relationship to the river, and if the consumptive user portion is not going to be lowered, then what we are going to have to do is call for a cultural flow allocation, absolutely.⁹⁶

On behalf of the Ngarrindjeri, Mr Rigney gave evidence that cultural water in the form of water allocations is a key goal for his people and has been the subject of extensive research. In oral evidence, the Commissioner was referred to a report to the CSIRO,

produced as a collaborative effort by the Ngarrindjeri Regional Authority, Flinders University and Charles Sturt University, about the values of water to the Ngarrindjeri. One of the recommendations noted by the Commissioner is:

That allocations of cultural water to Indigenous Nations in the Murray-Darling Basin be supported and understood as critical in the rehabilitation of the lands and waters that provide the foundation for Indigenous wellbeing. Indigenous Nations need to make their own decisions about how Indigenous allocations are used.⁹⁷

Mr Rigney confirmed that for the Ngarrindjeri, the need for cultural flows is not focussed on any particular volume. In line with the evidence of Mr Hooper, Mr Rigney confirmed that the aim of cultural flows is to achieve ecological outcomes for the land and ‘an outcome for the people’.⁹⁸ Like Ms Morgan, Mr Rigney emphasized that having sufficient flows of water in Ngarrindjeri country that Ngarrindjeri people have a central role in managing ie ‘cultural flows’ is essential for well-being, cultural identity and self-determination.

Water resource plans

While not establishing any statutory basis for Aboriginal water rights, the Water Act and Basin Plan contemplate that they may be created or provided for, and enable Basin States to do so. A former senior officer in the Murray-Darling Basin Commission and then MDBA, Mr Jason Alexandra said in evidence before the Commissioner that he considered the Basin Plan represents a missed opportunity:

I think one of the issues that the Basin planning process failed to really address is Indigenous — an Indigenous share of water.

... whether we call it a cultural flow or not — I guess my concern is that we — through the Water Act we have the Commonwealth involving itself in a fundamental re-organisation of water in the Basin, and I think there’s one or two lines in it that says it should take into account Indigenous interests.

... And yet my view is, if we are talking about a fundamental re-alignment — if you like — or re-assignment of property rights — it was an — a substantive opportunity to deal with those Indigenous concerns about them not being granted any of the rights or whatever. Call it cultural flows; call it economic rights, whatever.⁹⁹

In relation to WRPs, MLDRIN submitted to the Commissioner:

Water resource plans represent an opportunity to accommodate First Nations law, interests and aspirations through provision of cultural flow entitlements, or other commitments to progress provision of cultural flows. To date, States have not allocated water resources or funding to acquire water entitlements to address the rights and aspirations asserted in the Echuca Declaration.¹⁰⁰

The only WRP accredited under the Basin Plan to date is Queensland's Warrego-Paroo-Nebine Water Resource Plan for Surface Water Area 20.¹⁰¹ This instrument states that it builds on Queensland's Water Resource Plan 2016 (Warrego, Paroo, Bulloo and Nebine). Section 13 of the latter provides that:

Indigenous outcomes for water in the plan area are:

(a) availability of water for traditional owners who are dependent on water resources in the plan area to achieve their economic and social aspirations; and

(b) maintenance of flows of water that support water-related cultural and recreational values of traditional owners.

However, secs 22 and 23 make it clear that water for these purposes is subject to the discretion of the Chief Executive under the Queensland legislation to grant entitlements to take unallocated water in a plan area, and that the total average annual volume for such grants is limited. Mr Hooper characterized the action by the Queensland Government, approved by the MDBA, to have regard to Aboriginal interests and values in water in WRP planning, in this way:

And that clearly goes to giving regard to, you know, Aboriginal values and uses of First Nations values and uses within that system and then saying, "Yes, we have had regard to it, but we are going to put it at the bottom of the pile and we will come back to it at a later stage".¹⁰²

According to the evidence of Mr Bates of the Barkandji People, they are still waiting:

Barkandji people at Wilcannia, Menindee and Bourke have been asking for cultural flows, but we can't even get anyone to give us any answers.¹⁰³

Of other WRPs in the process of the development for accreditation by the MDBA, only one was available for viewing at the time of writing,¹⁰⁴ viz the South Australian Murray Region WRP. Section 5.14 of this draft instrument 'Addressing Chapter 10 Requirements', details over some 17 pages the work undertaken to date in relation to Aboriginal values and uses:

Having full and proper regard to Aboriginal values and uses and more precisely, representing Aboriginal water interests in SA water resource planning, is an iterative process that will require investment in Aboriginal Nation capacity over time, beyond the development of WRPs under the Basin Plan. The intent of the SA Murray Region WRP is to have regard to Aboriginal values and uses by committing to continued meaningful engagement with Aboriginal Nations in the development, review and implementation of the State's water resource management processes and instruments.¹⁰⁵

The WRP records a system of engagement with some 11 Aboriginal groups over time that is relatively well-developed and thorough when considered in the context of the Basin. The WRP states that previous engagement by the State government with the Ngarrindjeri ‘has generated a range of innovative approaches that have influenced South Australia’s approach to Aboriginal engagement in WRP development’, including through the use of Cultural Knowledge Agreements and the integration of well-being and cultural values into water resource risk assessments.¹⁰⁶ The Commissioner heard from Mr Rigney about the power of the Kungun Ngarrindjeri Yunnan (‘listening to Ngarrindjeri people speaking’) Agreement entered into between the Ngarrindjeri Regional Authority and the South Australian Government in 2009, which has been foundational in developing the current level of engagement with Aboriginal groups being undertaken for WRPs in South Australia.¹⁰⁷

However, it appears that provision of cultural flows is still under consideration. The WRP refers to cultural flows meaning different things to different people, and notes the outcomes of the NCFR Project. There is a statement of commitment by the South Australian Government that it will work to implement the Project findings ‘within the South Australian context’ and:

*The South Australian Government will pursue opportunities for water entitlements that are legally and beneficially owned by Nations for prescribed water resources. The pathways to achieving this will differ for each water resource, depending on whether a resource is fully allocated or not.*¹⁰⁸

This statement touches on what is perhaps the ‘elephant in the room’ for all Basin States — where will water for cultural flows come from, in a largely overallocated system? Or, perhaps more accurately, who will pay for it?

One option is the innovative suggestion of NBAN, to effectively require a reassessment of the SDLs for water resource areas to ensure that they not only reflect an environmentally sustainable level of take that ensures environmental water requirements are met but also they include an allowance for cultural water requirements. If this is considered too radical, then purchasing water is the obvious alternative. Interestingly, the Commonwealth Government made an offer of financial support for this option in its ‘Without Prejudice Government Offer’ announced on 7 May 2018,¹⁰⁹ although apparently in circumstances of political exigency.

The Commissioner received considerable evidence in the form of written submissions, oral evidence and comprehensive published research, about the importance of cultural flows to Aboriginal people in the Basin. The statement in the Basin Plan’s Acknowledgment of the Traditional Owners of the Murray-Darling Basin that ‘[f]urther research is required to assist in understanding and providing for cultural flows’ may have been true in 2012. Moreover, it is accepted that, as the South Australian Government noted, different people may see cultural flows in different ways. But it is a diverse and variable Basin, and all needs across the Basin are necessarily diverse. This seems no

excuse for lack of action where there is a need, and it is difficult to see why there should not now be, after at least six years of research and planning, some real provision for real water rights for cultural purposes incorporated into Basin State water management regimes — particularly in areas of severe need, such as the lower Darling River. If one considers the resources that have been expended on adjusting SDLs through complex ‘supply measures’ proposals, investment in ‘water efficiency’ projects and so on, it appears unconscionable that, as the Chair of NBAN said, cultural flows have been put ‘at the bottom of the pile’.¹¹⁰

Conclusion

The overwhelming evidence of the Basin’s traditional owners is that its waterscape is intrinsic to their cultural identity. They have deep, valuable cultural knowledge about the behaviour of its ecosystems that should be employed centrally in the co-operative Federal scheme established by the Water Act for its restoration and management. Key evidence from representative witnesses is that, not only is a central role their right and responsibility, it is essential to the well-being of their people.

Both MLDRIN and NBAN urged that a human rights-based approach to water resource management is called for in the Water Act and Basin Plan scheme; if not as a legal imperative then as a moral one.¹¹¹

The absence in the Water Act and Basin Plan of any clear or express reference to the relevance of international obligations in the Biodiversity Convention to the role of Aboriginal people in the Basin’s biodiversity is striking. The evidence received by the Commissioner indicates a failure to give real effect to these relevant international obligations.

A stronger legal platform for the role of Aboriginal people in managing Basin water resources is required. In addition to embedding into the legislative scheme some stronger consultation provisions, aligned with the Akwé: Kon Guidelines, the Commissioner considers a legislated recognition and rationale for Aboriginal involvement in water resource management is required.

The Commissioner is of the view that NBAN’s proposal for an amendment of the Water Act has merit and should be adopted:

NBAN recommends that, in order to more consistently give effect to the CBD, such as Article 8(j), there could be an amendment to section 21 of the Water Act, to ensure consistency with how the biodiversity elements of the convention are treated within the Water Act and how the Act treats the cultural rights of Aboriginal Peoples.

...Insert new Section 21(2)(a)(iii)

*“the fact that the cultural rights of Aboriginal People have been adversely impacted, as a result, and require special measures to ensure consistency with relevant international agreements”.*¹¹²

Opportunities to develop a coherent, constructive means by which Aboriginal people in the Basin can contribute more fully to the restoration and sustainable use of the Basin’s water resource and biodiversity are still being missed. It is necessary for the MDBA and the Commonwealth and Basin State governments to now meaningfully and respectfully engage and consult with traditional owners (in accordance with the Akwé: Kon Guidelines) on the issue of cultural flows. The significance of this resonates in the impromptu explanation given by Mr Rigney, when asked in a hearing before the Commissioner about the aims of the Ngarrindjeri in seeking cultural flows:

Well, the environmental goals are — you know, I don’t think you need to be Blind Freddy to see that. We want to reset these biodiversities and the ecologies in our country. We want to see our fish spawning as they once were, our animals coming back down to drink. Fresh quality water out of the Coorong, not this super saline stuff that we’re living in today’s environment. It’s slowly dying. You can smell the impact of what’s happening in the Coorong and people in the city don’t get to see that. They live within their four walls and not seeing what degradation is happening to country. What happens to country happens to you.

To me as a person, as a Ngarrindjeri, I am that tree, I am that rock, I am that plant. I cannot be separated from it. It is me and I am it. This is the difference in our societies; we don’t see what others are seeing. Unfortunately, we have to live in this world where it’s about capitalism, it’s about economics. We are forced into that process. Yes, they are mechanisms that they tried to assimilate. We know the history, but we don’t teach the history, we don’t teach the truth in this country. We like to hide it. We like to keep it away. What we are trying to do is build our agency to build that truth. We have this process in Australia called reconciliation. What the hell is that?

*Me as a Ngarrindjeri, I don’t need to reconcile with no person in this country. It’s about non-Indigenous people reconciling with the First Peoples of this land. It’s about telling the truth. Then we can actually have reconciliation as a people moving forward. We believe we have a pathway. If we have allocation of water we can reset the processes for our people. We can reset history for our people and this is what we’re about, this is why we fight for it, because it’s not just about Ngarrindjeri, it’s about our community, and we know white fellas are never going to go away. How do we live in synergy with each other to have happiness? How do we live with our country and have happiness? We believe we have pathways to do that. We want to be recognised for our rights, our human rights, and we want to be recognised as Ngarrindjeri.*¹¹³

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Introduction

The statutory scheme established by the *Water Act 2007* (Cth) (**Water Act**) was enacted in response to the national imperative to return the water resources of the Murray-Darling Basin (**Basin**) as a whole to sustainable levels of use and ecological health and, in doing so, promote uses of water resources that optimise social, economic and environmental outcomes.¹ The *Basin Plan 2012* (Cth) (**Basin Plan**) is the blueprint for achieving this.

However, in recognition that it is a large and variable system, and that the States retain control over the waters and environments within their territories, the scheme relies on this vision to be implemented at the local level through water resource plans (**WRPs**). All jurisdictions in the Basin — New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory (**Basin States**) — must follow the blueprint of the Basin Plan in the ongoing, day-to-day regulation and management of their water resources through WRPs.

The Commissioner is charged with answering two questions about WRPs. First, is it likely that all WRPs required by the Water Act and Basin Plan will be ready to come into operation by the due date of 1 July 2019? Second, is it likely that they will be consistent with, and give effect to, the objectives of the Water Act and the purposes of the Basin Plan?

Given the paucity of WRPs to examine in either accredited or draft form, the extent to which WRPs will meet those requirements and thereby give effect to the purposes of the Basin Plan and the objects of the Water Act is in large part a matter for conjecture. However, what can be examined is the way in which certain matters that are foundational to WRPs, particularly the sustainable diversion limits (**SDLs**), have been addressed in the Basin Plan and have influenced the development of WRPs. Further, the process of developing WRPs has been underway for almost six years and the experience during this period, especially through consultation conducted with Basin communities, may be seen as indicative of the likely quality of some WRPs. There are also mechanisms in the legislative scheme for correction and improvement of WRPs, and the potential for these is considered.

Statutory requirements

In accordance with the Water Act, the Basin Plan creates a composite of water resource areas and water accounting periods that align, as far as possible, with the areas and accounting periods already provided for by the relevant State water management laws.² For each water resource area there must be a WRP³ that must ‘provide for the management of the water resources’ of the relevant area.⁴ More specifically, it must also be consistent with the Basin Plan, including:

- the requirements for WRPs specified in the Basin Plan, and
- any ‘long-term annual diversion limit’ applying to the relevant water resources.⁵

WRPs may be (and are expected to be) prepared by the States and accredited by the Minister in accordance with sec 63 of the Water Act, but if that does not happen, the Murray-Darling Basin Authority (**MDBA**) may exercise the ‘step-in’ powers in sec 68 to develop the WRPs for adoption by the Minister under sec 69.⁶

The water resources to which the WRPs apply may be any combination of all, or a specified part or share of, the surface water resources, groundwater resources or a particular watercourse, lake or aquifer in the relevant water resource plan area.⁷ The Basin Plan identifies 14 surface water areas, 14 groundwater areas and five combined surface and groundwater areas,⁸ and has designated a financial year as the water accounting period for every area.⁹

Being based on a Basin State’s existing scheme for managing the use and protection of its local water resources, it is intended that WRPs are able to reflect the unique characteristics and requirements of each water resource and its associated environment, including its topography, hydrology, climate and ecosystems, the patterns and dependencies of local use and applicable State laws about that use. In this way, a WRP is the local manifestation of the Basin Plan in operation. Its implementation ensures the standards for sustainable use set by the Basin Plan are met, especially through its SDL which, together with all other water resource area SDLs, make up the Basin-wide SDL.

Although it requires consistency with the Basin Plan, the Water Act acknowledges that WRPs need to reflect local requirements and are expected to build on local legal instruments. It provides that, in determining whether a WRP is consistent with the Basin Plan, ‘regard must be had to the legislative framework within which the water resource plan operates’¹⁰ and it enables a proposed WRP to be constituted by two or more instruments.¹¹

The MDBA explains in its ‘Handbook for Practitioners: Water Resource Plan Requirements’:

Given existing arrangements in each Basin State, a WRP prepared by a Basin State is likely to consist of several documents setting out the interrelated water management arrangements for each WRP area. It may incorporate documents prepared under various state laws such as water plans and strategies, bulk entitlements, relevant regulatory instruments, water quality improvement plans, and aspects of broader strategies or plans.

States currently undertake most of the relevant arrangements through their primary water management legislation. Other laws, such as environmental protection laws for some aspects of water quality management, or broader natural resources management and catchment management arrangements, may also be relevant.¹²

Putting aside any relevant environment protection laws and natural resource management laws that may come into play, even a brief review of Basin States' laws specific to the use of water resources reveals an array of different instruments and rules:

- Queensland has a scheme of water plans, water use plans and resource operations plans
- New South Wales has water sharing plans
- in Victoria, water is largely managed via a system of bulk entitlements granted to water authorities
- the Australian Capital Territory has a scheme of rules and ministerial decisions made under its relevant statute, and
- South Australia has water allocation plans which form part of broader natural resource management plans.

The Commissioner notes the complexity of the task faced from the outset by Basin States, the MDBA and Basin communities — a complexity brought about by the diversity of the water resources and physical environments across the Basin, the differences between existing Basin States' legislative regimes, and the breadth of the requirements to be met and changes to be made in order to achieve WRP accreditation.

The Water Act requires the Basin Plan to specify the requirements that a WRP must comply with to be accredited or adopted by the Minister, including as to:

- (a) the identification of the WRP area
- (b) the incorporation, and application, of SDLs
- (c) the sustainable use and management of the water resources within the SDLs
- (ca) having regard to social, spiritual and cultural matters relevant to Indigenous people in relation to the water resources, in the preparation of the WRP
- (d) the regulation of interception activities with a significant impact
- (e) planning for environmental watering
- (f) water quality and salinity objectives
- (g) trading and transfer rules for water rights
- (h) broad approaches to the way risks to the water should be addressed
- (i) metering the taking of water and monitoring the water resources
- (j) reviews of the WRP and amendments arising from those reviews
- (k) the scientific information or models on which the WRP is to be based.¹³

Chapter 10 of the Basin Plan expands on this list, providing further detail about each of the 12 requirements, and adding a further requirement — that of describing how the water resources will be managed during specified extreme events.¹⁴

The other key requirement of WRPs derives from the Water Act requirement that the Basin Plan sets the ‘maximum long-term annual average quantities of water that can be taken, on a sustainable basis’ from the Basin as a whole and from the water resources of each water resource area. These averages are the ‘long-term average sustainable diversion limits’ and each must reflect an ‘environmentally sustainable level of take’ (ESLT).¹⁵

SDLs come into operation on 1 July 2019.¹⁶ While the Water Act requires the Basin Plan to set a SDL for each water resource area, it requires the WRP to be consistent with a ‘long-term annual diversion limit’¹⁷ specified in the Basin Plan. The quantity of this limit is the sum of the SDL and any ‘temporary diversion provision’ (TDP) ie a temporary additional quantity to assist water users in the transition to SDLs. However, TDPs are an artefact of history and have never been employed. The Basin Plan took five years to develop. When finally enacted in November 2012 it allowed a further seven years before SDLs would come into effect, and set the TDP for all water resources in the Basin at zero.¹⁸ This means that the long-term annual diversion limits in WRPs will be, in fact, the SDLs.

The process of making adjustments to the SDLs for certain water resources following the Northern Basin Review (by *Basin Plan Amendment Instrument (No 1) 2018* (Cth)) and the approval of the package of ‘supply and efficiency’ measures (by *Basin Plan Amendment (SDL Adjustments) Instrument 2017* (Cth)) has had a significant and, in the Commissioner’s view, deleterious impact on the timing of WRPs and their likely effectiveness in achieving their purpose.

Timing of WRPs

According to subsec 54(1) of the Water Act:

There is to be a water resource plan for each water resource plan area.

WRPs must be either proposed by the relevant Basin State and accredited by the Minister under sec 63, or made by the MDBA in exercise of the ‘step in’ power in sec 68 and adopted by the Minister under sec 69.

The legislative scheme provides some flexibility with regard to the timing and process for the making and coming into operation of WRPs, with Part 11 of the Water Act providing transitional arrangements which may be adapted by means of regulations. Pursuant to sec 241, Basin State plans have been prescribed as transitional WRPs by the *Water Regulations 2008* (Cth) for all water resource plan areas. These plans are ‘taken to have been accredited’ by the Minister for the purposes of the Water Act’s accreditation

provisions, and the substantive WRP requirements in sec 54 do not apply until after they cease to have effect, on 30 June 2019.¹⁹ From 1 July 2019, sec 54 will require there to be WRPs for all water resource plan areas,²⁰ and, at the same time, the SDLs for each WRP area will take effect.

On 8 December 2018 the *Water Amendment (Water Resource Plan Accreditation) Regulations 2018* (Cth) (**WRP regulations**) commenced. They amend the *Water Regulations 2008* (Cth) and have been made in anticipation of WRPs not being submitted and accredited by 1 July 2019.

The WRP regulations create a clear condition for the triggering of the ‘step-in’ provisions in sec 68 of the Water Act. They do this by prescribing, for the purposes of para 63(9)(a) and (b) of the Water Act, the time within which the steps for the proposal and accreditation of WRPs must occur. They specify that a proposed WRP must be submitted by 28 February 2019 unless an extension is sought by the relevant Basin State of either two months (until 30 April 2019) or 10 months (until 31 December 2019) and is granted by the MDBA by written notice. This means that, for the purpose of the MDBA exercising the power to ‘step-in’ and prepare a WRP itself, the condition of a Basin State’s failure to submit a proposed WRP within the prescribed time will have been met.²¹

A second effect of the WRP regulations is, in accordance with para 68(6)(a) of the Water Act, to provide a process for the exercise of the step-in power. This includes mandatory consultation by the MDBA with each Basin State within which the relevant water resource area or an adjacent water resource area is located.²²

The WRP regulations do not affect the coming into effect of the SDLs on 1 July 2019. This will happen irrespective of whether WRPs have been accredited or adopted. However, if WRPs are not in operation by 1 July 2019, the Basin States have indicated that they ‘will enter into agreements with the Commonwealth to ensure that other key accountability and transparency requirements under the Basin Plan are also operative from 1 July’ and will ensure the relevant WRPs are submitted and accredited by 31 December 2019.²³

While the legislative scheme clearly provides a means by which Basin States may transition to WRPs, and does not prescribe a date by which this must happen, the current arrangements outlined above, including the new WRP regulations, foreshadow a delay of up to six months for the accreditation or adoption of some WRPs. Moreover, if WRPs are not in place by 1 July 2019, the current provisions indicate that in the case of those water resource plan areas there will be neither a transitional WRP nor a WRP, albeit a statutory requirement to comply with the relevant SDL, a notified timeframe for submission of the WRP, and ‘agreements’ between the Basin State and Commonwealth about how other Basin Plan requirements will be met from 1 July 2019. In the Commissioner’s view, this is not in the spirit of the Water Act and is obviously an unsatisfactory and uncertain state of affairs.

Evidence regarding progress towards WRPs being accredited by 1 July 2019 is based on the information provided to the Commissioner by the Basin States and the MDBA via their submissions, the draft report by the Productivity Commission titled ‘Murray-Darling Basin Plan: Five-Year Assessment Report’ published in August 2018 (**2018 Draft Report**) and the ‘Murray-Darling Basin Compliance Compact Interim Assurance Report 2018’ published on 21 December 2018 (**Compliance Compact Report**).

Evidence of progress to date

At the time of writing, the MDBA’s quarterly report recorded progress in WRP development as:

One WRP accredited:

- Warrego-Paroo-Nebine — Queensland

One WRP in the accreditation phase:

- South Australia Murray Region — South Australia

Three WRPs in the assessment phase:

- Wimmera-Mallee (groundwater) — Victoria
- Wimmera-Mallee (surface water) — Victoria
- Eastern Mount Lofty Ranges — South Australia

Sixteen WRPs in the ‘late assist’ phase:

- Australian Capital Territory (surface water)
- Australian Capital Territory (groundwater)
- Lachlan Alluvium — New South Wales
- Lachlan (surface water) — New South Wales
- Macquarie-Castlereagh Alluvium — New South Wales
- Gwydir (surface water) — New South Wales
- Gwydir Alluvium — New South Wales
- Macquarie-Castlereagh (surface water) — New South Wales
- Murrumbidgee Alluvium — New South Wales
- New South Wales Border Rivers (surface water) — New South Wales
- Queensland Border Rivers Moonie — Queensland
- Condamine Balonne — Queensland

- River Murray — South Australia
- Northern Victoria — Victoria
- Goulburn-Murray — Victoria
- Victorian Murray — Victoria

Twelve WRPs are at the ‘assist’ phase, all of which are in New South Wales.²⁴

What the States have said

The Basin State governments all responded to the Commissioner’s inquiry in the form of written submissions. With the exception of the New South Wales Government, whose submission does not address the topic,²⁵ all governments made statements about whether their WRPs will be ready to come into operation by 1 July 2019. Relevant extracts are:

Victoria:

*Victoria’s WRPs will be submitted to the MDBA for accreditation before the Sustainable Diversion Limits come into effect, on 1 July 2019, notwithstanding some issues regarding timing and consistency of feedback from the MDBA, which has impacted on drafting timelines.*²⁶

Queensland:

*The Warrego-Paroo-Nebine WRP was accredited on 15 June 2017 ... The remaining Queensland basin catchments WRPs for the Condamine-Balonne, Border Rivers and Moonie plan areas are on track to be completed by early 2019, in time for the Commonwealth minister’s expected accreditation by the due date of 30 June 2019.*²⁷

South Australia:

*The South Australian Murray Region WRP was submitted to the Authority on 8 January 2018. ... the Department is confident that the Eastern Mount Lofty Ranges WRP will be submitted to the Authority for accreditation in early September 2018 ... the South Australian River Murray WRP should be submitted to the Authority for a full assessment in February 2019.*²⁸

Australian Capital Territory:

*To ensure that there is coordination with New South Wales and their Murrumbidgee River Water Resource Plan the timing of the ACT’s water resource plans has been aligned with both now due to be accredited by June 2019 ... The ACT is confident that it can provide its water resource plans by the required date.*²⁹

In its submission to the Commission in September 2018, the MDBA said that the WRPs for South Australia, Queensland and the Australian Capital Territory are ‘likely’ to meet the timeline for accreditation, but that this is ‘less certain’ for Victoria and New South Wales.³⁰

The most recent evidence available about progress is the Compliance Compact Report. In it the MDBA said of New South Wales’ WRPs:

*In terms of upcoming priorities, the MDBA is concerned that NSW will be unable to complete all of its WRPs by 30 June 2019, and recommends that NSW, MDBA and the Australian government develop contingency arrangements for this possibility.*³¹

However of Victoria’s WRPs it said:

*Victoria’s WRPs are on track, and expected to meet the due date of 30 June 2019. This is to be commended.*³²

Reasons for delay

The MDBA volunteered in its submission to the Commission that responsibility for the delays ‘lies with both sides’.³³ It did not elaborate on how it had contributed to the delays. However, the Productivity Commission has referred in its 2018 Draft Report to complaints by some Basin States that MDBA interpretations of Basin Plan requirements for WRPs were often not practical or ‘fit for purpose’, and that the timeliness and consistency of feedback from the MDBA is a continuing problem. According to the Productivity Commission, the MDBA acknowledged some of the concerns and said it had made efforts to address them, which was confirmed by the Queensland and South Australian Governments as having resulted in an improved process.³⁴

A more worrying reason for the delay suggested by the MDBA is what it described as a slowness on the part of Victoria and New South Wales to commit to, and engage in, the process of developing WRPs. The MDBA said that Victoria has held some ‘long standing policy differences’ [with the MDBA] but that good progress has been made to resolve them, while New South Wales has ‘substantially improved its level of engagement and commitment’ in the past 12 months.³⁵

It is a matter of lively concern that two Basin States should be perceived by the MDBA to have displayed a lack of full commitment to a process that is required by law and is so fundamental to the success of the Water Act and Basin Plan. The position becomes more concerning when the connexion is drawn with the sustainable diversion limit adjustment mechanism (**SDLAM**) process, something to which the MDBA expressly drew the Commissioner’s attention:

Other factors behind the delays include the large amount of staff resources — both MDBA and Basin State — tied up in work to progress the SDL Adjustment

*Mechanism and the Northern Basin Review. The WRPs are complex, highly technical documents, meaning that the WRPs are taking longer than anticipated to develop.*³⁶

The Productivity Commission highlights this factor in its 2018 Draft Report (discussed in more detail below), noting that in its submission to the Productivity Commission, the MDBA said work on the SDLAM and the Northern Basin Review ‘became almost all-consuming, absorbing the time and energy of government processes’.³⁷

It is piquant, so to speak, that the development of WRPs, the primary legislative mechanisms by which SDLs and other water resource reforms are to be implemented, should be subordinated to the development of measures designed to increase SDLs without achieving any recovery of real water, and before the initial SDLs have commenced or been tested. When the demerits of the SDLAM scheme are appreciated (see Chapter 7), its ‘absorbing’ pursuit at the expense of a thorough, considered development and timely implementation of the mechanism designed to bring SDLs into operation — the WRPs — appears even more offcourse.

A more detailed analysis of the WRP process is provided in the 2018 Draft Report.³⁸ The Commissioner generally accepts and endorses the Productivity Commission’s assessment. In particular, the Commissioner notes the Productivity Commission’s identification of the reasons for the process of developing and accrediting WRPs being behind schedule. A key reason, as identified by the MDBA, is the reluctance by some States to engage fully in the process. Also identified as contributing factors are:

- time taken by States and the MDBA to develop and communicate policy positions and accreditation requirements
- too few resources dedicated to the task, in the case of both States and the MDBA
- disruption caused by departmental restructuring and staff turnover — this is understood by the Commissioner to have affected New South Wales in particular³⁹
- the need to acquire new knowledge and skills for some WRP requirements, and
- the significant absorption of necessary government time and energy into the SDLAM and Northern Basin Review processes.⁴⁰

These factors, all of which can be said to have been within the discretion and control of the relevant governments, have diverted attention, resources and commitment away from what all Basin States must always have known would be the complex and vital work of developing WRPs, without which the objects of the Water Act and purposes of the Basin Plan cannot be achieved.

Developing WRPs is preternaturally a complicated and challenging task. The Basin States each have their own resource management and water allocation regimes, and the relevant instruments and arrangements in place when the Basin Plan came into operation were at different levels of coverage and development. Moreover, a web of intersecting

requirements must be met by Basin States, through a process of updating, combining or adding to their current instruments, in order to achieve WRP accreditation.

In its submission to the Commissioner, the Commonwealth Department of Agriculture and Water Resources drew attention to its statement in a submission to the Productivity Commission, in which it said that while it did not consider the statutory time limit for accreditation of WRPs should be extended, there was room under the statutory framework to ‘accommodate late WRPs’.⁴¹

The MDBA submitted to the Commissioner that if WRPs are not developed in time it will work with the relevant governments on contingency arrangements to ‘protect key elements of the reform — such as SDL accounting and protection of environmental water’.⁴²

In the Compliance Compact Report, in which the MDBA reports on progress made in implementing commitments of the MinCo made in June 2018, it is emphasised that WRPs are ‘central’ to implementing the Basin Plan, and that the MDBA has committed additional resources to its accreditation function to assist Basin States in developing WRPs.⁴³

The Productivity Commission is clearly of the view that if outstanding work to finalize WRPs is rushed in order to meet the promised due date, the quality of those WRPs will suffer. The Commissioner emphatically agrees with this view.

Issues arising in WRP development

Achieving ESLTs

The task of determining the ESLT for the water resources of each WRP area is complex. It must be based on the best available scientific knowledge about the ecological condition, and requirements for a return to ecological health, of the water-dependent ecosystems within the WRP area.

A primary concern is that WRPs will be required by the Basin Plan to implement SDLs that do not reflect ESLTs determined in accordance with either the requirements of the Water Act or the best available science (see Chapters 3, 5 and 6). This fundamental problem is compounded by the subsequent dubious increases in SDLs due to the Northern Basin Review amendments and the SDLAM amendments to the Basin Plan.

The real test of the ESLT determinations made in 2012 and, in many cases, amended through the adjusted SDLs, will be in the implementation of WRPs and their companion longterm environmental watering plans (**LTWPs**).

A WRP must ensure the SDL is not exceeded, including through water allocation and other take and usage rules. They must also provide for the management of planned environmental water (water retained in the system and not subject to water rights), and ensure that environmental watering actions occur consistently with the Basin environmental watering strategy and the local LTWP, and with regard to the views of local communities.⁴⁴ A LTWP for a WRP area must identify the priority environmental assets and functions in its WRP area in accordance with criteria specified in the Basin Plan, the ecological objectives and targets for those assets and functions, and the environmental watering needed to meet them.⁴⁵

The results of WRPs (including compliance with SDLs) and LTWPs in operation over time, measured by assessing progress in meeting ecological objectives and targets, will ultimately indicate whether ESLTs have been correctly determined. The process of adaptive management, by which corrections and improvements can be made, is considered at the end of this chapter.

Achieving SDLs

The requirement that, via WRPs, the States must introduce into their water management laws new, reduced limits on the extraction and diversion of water is a very significant step. The Water Act and Basin Plan make express provision for managing the perceived risks to governments and individuals of changes to water access entitlements.

Implementing change — the risk assignment framework

The need to address overallocation and reduce levels of take has been acknowledged for many years, but negotiations between the State and Commonwealth Governments about how this should be done have inevitably focussed on the risks — political, legal and financial — of reducing levels of take, including by the generally unpalatable method of altering statutory entitlements.

The Intergovernmental Agreement on a National Water Initiative⁴⁶ (NWI) included agreed principles for both addressing overallocation and assigning and managing the risk associated with what, at that time, was anticipated as likely reductions to allocations. In particular:

- Clause 48 — Water access entitlement holders must bear the risk of reduced or less reliable allocations of water due to seasonal or long-term change in climate and periodic natural events such as bushfires and drought.
- Clause 49 — Until 2014, water access entitlement holders must bear the risk of reduced or less reliable allocations due to ‘bona fide improvements in the knowledge of water systems’ capacity to sustain particular extraction levels’. After 2014, such risks arising under ‘comprehensive water plans’ in operation are to be shared as follows: the first 3% reduction is to be borne by users; the next 3% is to

be shared in the proportion one third by State/Territory Governments and two thirds by the Commonwealth Government; and any reductions above 6% are to be shared between State/Territory and Commonwealth Governments equally.

- Clause 50 — Governments are to bear the risks of any reduced or less reliable water allocation not previously provided for, arising from changes in government policy (eg new environmental objectives).

Building on these national principles, an updated risk assignment arrangement has been included in the Water Act and Basin Plan legislative scheme. Through the introduction of SDLs, a reduction in use — if not allocation — by 1 July 2019 will be required by law in relation to surface water resources across the Basin through water resource-specific WRPs.⁴⁷

Risk of reducing levels of take — SDLs

The Water Act provides that if there is a reduction in the SDL for the water resources of a WRP area, the amount of the reduction must be specified by the Basin Plan, as a quantity of water per year.⁴⁸ The Basin Plan must also specify how much of the reduction is attributable to changes in Commonwealth Government policy (**Commonwealth Government policy component**) and how much to improvements in knowledge about the ESLT for the relevant water resources (**new knowledge component**).⁴⁹ However, in working out these amounts, any reduction that is due to climate change and periodic natural events is to be disregarded.⁵⁰ In other words, water users and the environment will bear that risk, in line with NWI cl 48.

The Basin Plan must also specify the Commonwealth's share (if any) of the reduction.⁵¹ This will comprise all of any Commonwealth Government policy component, plus a proportion of the new knowledge component of a SDL reduction in any 10-year period.⁵²

If the relevant Basin State has not applied the NWI risk assignment framework at all relevant times, the Commonwealth's share will be two thirds of so much of the new knowledge components of the SDL reduction as exceed (in aggregate) 3% of the relevant diversion limit but do not exceed 6%, and 50% of so much of the new knowledge components as exceeds (in aggregate) 6% of that limit.⁵³ If the Basin State did apply the risk assignment framework, the Commonwealth's share includes all of such of the new knowledge components as exceeds 3% of the reduction in the relevant diversion limit.⁵⁴

If the Basin Plan specifies a Commonwealth share of a SDL reduction, the Commonwealth 'must endeavour to manage the impact' on water access entitlement holders and 'may take steps to ensure' they do not suffer a reduction to, or a change in the reliability of, their water allocations.⁵⁵ If a water access entitlement holder nevertheless suffers a reduction to, or change in the reliability of their allocations, they may qualify for a payment in accordance with a determination by the Minister based on

a calculation of how much of the reduction in market-value is reasonably attributable to the Commonwealth's share. In making the determination, regard must be had to any steps taken by the Commonwealth to ensure the reduction in allocation or change in reliability was avoided.⁵⁶

Notably for the coming into effect of WRPs and their SDLs on 1 July 2019,⁵⁷ a reduction to SDLs for the purposes of risk assignment includes a reduction in the amount of water authorized to be taken under a transitional or interim WRP as a result of the coming into effect of the SDLs.⁵⁸ The Basin Plan must specify the 'long-term average limit' on the quantity of water that can be taken under a transitional or interim plan immediately before it ceases to have effect. Chapter 6 of the Basin Plan provides that these long-term average limits are the 'baseline diversion limits' (**BDLs**),⁵⁹ which apply to SDL resource units up until the SDLs come into effect on 1 July 2019. For the purposes of the risk assignment provisions, the SDL is taken to be reduced if, when a transitional or interim WRP ceases to have effect, the relevant 'long-term average limit' (the BDL) is greater than the SDL. The amount of the reduction is the difference between the BDL and the SDL.⁶⁰ The Basin Plan specifies that 100% is attributable to Commonwealth Government policy, and, accordingly, that the Commonwealth's share of the risk of this reduction is 100%.⁶¹

It is significant that the Commonwealth has accepted full responsibility for the risk of any reduction in the allocations to water access entitlement holders that may result from the introduction of SDLs. In the context of the current requirement that Basin States implement WRPs to give effect to SDLs, it is also salutary to note the considerable efforts made by the Commonwealth, from well before the introduction of the Basin Plan, to avoid the need for such reductions. The first endeavour was the program of voluntary 'buybacks', by which the Commonwealth sought to reduce the overall volume of water that could be taken for consumptive use, and thereby ensure the SDLs would be achieved, by purchasing entitlements for environmental use. When this floundered as a result of strong resistance from some irrigation communities, these efforts were cut short by a legislated cap on the total volume that could be purchased by the Commonwealth.⁶²

Perhaps the Commonwealth could have treated these efforts as a sufficient 'endeavour to manage the impact'⁶³ of the coming SDL reductions, and left it to Basin States to ensure compliance with SDLs by (permanently) reducing allocations under their respective water management laws. Arguably the cost of any compensation payable by the Commonwealth would be commensurate with the costs of purchasing the equivalent volume of water for the environment. Nevertheless, this option has been avoided in favour of the legally and scientifically questionable, complex and protracted SDLAM scheme.

In any event, efforts to avoid reductions to water access entitlement holders' allocations have had serious implications for both the timeliness of WRPs and the likelihood that they will achieve the objectives of the Water Act. Both matters are discussed further below, but first some brief consideration is given to the possible effect

on WRPs and their development of the provision in the risk assignment framework for the risk of possible changes in the reliability of allocations.

Risk of changes in reliability

In addition to addressing the risk of reduced diversion limits, the Water Act provides for the assignment of the risk of any changes to the reliability of water allocations in relation to particular water resources that are due to ‘a change to the Basin Plan’.⁶⁴

The relevant provisions⁶⁵ largely mirror those applying to reduced diversion limits. They include the requirement that the Basin Plan must specify the nature of any changes in reliability; the extent to which any changes are attributable to Commonwealth Government policy changes and/or to new knowledge about the relevant ESLT; the Commonwealth’s share of the changes in reliability as calculated in accordance with the NWI provisions and any regulations, and the requirement for certain Commonwealth responses to an identified Commonwealth share in a changed reliability — which may include payments to affected water access entitlement holders.

In response to this, sec 6.14 of the Basin Plan simply specifies that nothing in the Basin Plan ‘requires’ a change in the reliability of water allocations such as to trigger the risk assignment provisions in the Water Act. This provision does not prohibit changes in reliability; in fact, it suggests that such changes may occur. Rather, it implies that if change in reliability does result, the conclusion cannot be drawn that any requirement in the Basin Plan is the reason for that change. Any such change is in the discretion of the Basin State under its own laws and therefore the relevant State must assume full responsibility for any risk. The MDBA has elaborated on this in its ‘Position Statement 1H’, in which it defines the reliability of water allocations as ‘a measure of the consistency or likelihood of an amount of water being allocated to a particular class of water access entitlements across the 1895–2009 historical climate conditions throughout the course of a water year’.⁶⁶

Risk of climate change

Another issue for Basin States is that of adapting levels and methods of water use to climate change. As a major influence on future water availability, climate change is discussed in detail in Chapter 6. Basin States are faced with the fact that the SDLs for water resource areas do not reflect an ESLT that accounts for the effects of climate change from 1 July 2019 onwards. When water availability reduces from time to time but also, as the consensus of scientific opinion asserts, more often, annual allocations to water access entitlement holders will necessarily be reduced more often.

In its Position Statement 1H, the MDBA expressly states that it will only consider a change in reliability to have occurred as a result of differences between a Basin State’s existing water management arrangements and those in a WRP presented for accreditation, but expressly not as a result of (amongst other things) ‘changes to the tool or method

being used, the climate or inflow information being input or the assumptions made about users' behaviour where there are no other associated rule changes'.⁶⁷

While the position statement is less than pellucid, the overall effect appears to confirm that the Commonwealth, via the MDBA, has resolved that any external effects on water availability, whether natural (eg climate change) or not (eg users' behaviour), and any resulting change in reliability are, from a risk point of view, something for the Basin States or water entitlement holders to deal with. However, the fact that the MDBA did not include climate change in the determination of ESLTs and SDLs means that the inevitable risk of reduced reliability of allocations has been left entirely with the Basin States and water entitlement holders.

Changes in the reliability of allocations is a problem associated with the traditional expectation of fixed volume allocations at a specified level of reliability. The Commissioner heard evidence about alternative models for managing levels of take and the allocation of water that are designed to deal with future variability, including as a result of climate change. In particular, Professor Mike Young outlined a model⁶⁸ for variable systems that defines a consumptive pool of a variable size based on the volume of water available from time to time. Entitlements to take water comprise a fixed number of shares in the pool, and water available to the pool on a seasonal basis is allocated to the shares from time to time. Such an approach commends itself for close consideration by policy makers.

While the Water Act and Basin Plan have defined SDLs as long-term average volumes of water, this does not prevent Basin States from moving to more adaptive and flexible allocation methods within their own water management regimes in order to adapt to increasing variability in the volumes available, so long as the resulting allocations fit within the Basin Plan's SDLs. Whether Basin States will tackle the reality of climate change and other impacts on the variability of Basin water resources in such a direct way remains to be seen, but the current experience of water reform does not augur well. Nevertheless, some on the land who depend on a secure water supply are concerned that the changes to allocation rules being proposed in the current WRP development process are inadequate to deal with the broader problem of reducing availability of water. Mr Stuart Le Lievre, a grazier from Western New South Wales told the Commissioner:

I don't know whether you call it climate change, climate variation and everything else but the bucket is no longer there and therefore sustainability of all businesses — it's just not irrigation and everything else has to develop around that ... And I honestly don't believe there should be compensation for that. It's just a sustainability issue. But the rules change. Every time the sustainability is under the hammer the rules seem to change. So therefore we have got a 2012 Barwon-Darling Water Sharing Plan that does what? It basically opens up a big can of worms, but now the sustainability of those businesses is now under question because the water never has been available.⁶⁹

Another example of concerns about water resource variability, and the adequacy of future models and rules to deal with it, was expressed by graziers Mr Robert and Mrs Katharine McBride:

There is a need for community and environmental water requirements to be based on long term watering plans, and not current flawed models. It should also be noted that models using long term averages in the Northern Basin should not be used, given variability and change in irrigation practices in recent years.⁷⁰

Consultation

Good consultation is essential in the development of the WRPs, in terms of both affording due process and ensuring WRPs are as effective as possible in meeting the objectives of the Water Act and Basin Plan in the longer term. Consultation is a means by which WRPs can be designed to meet local environments and needs, incorporate important local knowledge, and support compliance through ensuring that those affected or interested understand the rationale for rule changes and how they will work in practice.

As noted by the Productivity Commission, this is especially relevant where rule changes may affect the reliability of entitlements (ie allocations) or planned environmental flows. If those who may be affected are not afforded adequate opportunities to be heard and have real input into the development of new rules, this ‘risks undermining community trust in both the usefulness and legitimacy of WRPs and acceptance of the rules they impose’.⁷¹

Rule changes

The Productivity Commission enumerates various concerns raised by participants in its inquiry about inadequate consultation on WRPs. Unsurprisingly, many concerns focussed on the lack of sufficient consultation about rule changes, and the modelling assumptions in the calculation of SDLs. The Commissioner heard similar concerns. For example, a representative of the Australian Floodplain Association said in evidence:

We’re told the modelling, you know, is all correct and all honky dory, and you know, as it is confusing. It just doesn’t add up. Practically, it does not add up and it gets frustrating, and then they bring in, you know, the corporate culture business on top of it which clouds anything, that can happen, you know, third party impact or whatever ... And I’ve got no idea where all this stuff is coming from.⁷²

A similar lack of confidence was expressed in a submission by the Murray Valley Private Diverters, which believes that the departmental changes and associated loss of corporate knowledge in New South Wales means there is ‘a high risk that decisions may be taken that undermine the property rights of irrigation entitlements and risks (sic) factors are not adequately understood or consulted on within the restructured departments’. They

point to operational changes in relation to Menindee Lakes and the River Murray as examples of where that risk is evident.⁷³

The most common concern in the evidence received by the Commissioner, from a diverse range of interested parties, related to insufficient time to undertake development of WRPs in a way that would meet their particular expectations, including as to process and content.⁷⁴ The National Irrigators' Council (NIC) said in a submission to the Commissioner in April 2018 that its members who are involved in WRP development reported that the process 'is bordering on chaotic' because of the significant change to departmental structures and staff, and the pressure of dealing with the compliance issues arising from media reports in 2017. Apart from those challenges, the NIC said it has 'serious reservations' about the MDBA being able to process a large number of WRPs in the time left, reporting that its members 'lack confidence in the WRP process'.⁷⁵ In its submission the New South Wales Irrigators' Council also expressed its concern that the current deadline for accreditation will result in WRPs that are 'sub-optimal'.⁷⁶

Environment Victoria submitted to the Commission that, not only is the structure of draft WRPs (in Victoria) highly complex, comprising hundreds of pages and difficult documents for the public to engage with, but 'tightening timelines mean that Victoria will not be able to provide a three-month public consultation period for future WRPs as they did for the Wimmera-Mallee. This is a serious concern as the issues are complex and likely to be contentious ...'.⁷⁷

Connectivity

While noting that WRPs must be developed to suit each particular water resource plan area in what is a diverse system, the Basin Plan also recognizes the need to meet the Water Act's overarching objectives across the Basin in a way that reflects the connectedness of rivers and their environments — in other words, that rivers and their dependent ecosystems do not recognize State or WRP area boundaries. A requirement of WRPs in sec 10.05 of the Basin Plan is that they must 'be prepared having regard to the management and use of any water resources which have a significant hydrological connection to the water resources of the water resource plan area'.

In the same vein, sec 10.27 of the Basin Plan requires that if surface water is connected between two separate water resource plan areas, '[t]he water resource plan for each of the areas must provide for the coordination of environmental watering between the 2 areas'.

When connectivity is not adequately considered, the needs of users within an upstream WRP area may be prioritized over a range of needs downstream, including environmental and critical human water needs. That this disconnect is significantly occurring in the development of WRPs for areas along the length of the Darling River and its tributaries was emphasized by various participants in this inquiry, through submissions

and in hearings. Its importance as a flaw in the process for the detailed governance of the Basin water resources cannot be overstated.

The Australian Floodplain Association claimed a general absence of the necessary recognition of surface water connectivity between the Northern Basin and Southern Basin in proposals for draft WRPs.⁷⁸ In addition, Mr and Mrs McBride submitted:

*There has been limited communication with relevant stakeholders in downstream WRP regions regarding the impacts of upstream WRPs in NSW. There has also been limited communication with pastoral communities along the Lower Darling regarding the region's own WRP.*⁷⁹

A representative of the Australian Floodplain Association and member of the local Stakeholder Advisory Panel (SAP) for WRP development in the Barwon-Darling Watercourse WRP area, Mr Justin McClure, said that while the relevant government agency engaged in discussion about 'connectivity' at a collective meeting with all the SAPs in New South Wales in December 2017, there was 'no definitive action' for establishing connectivity in the WRP. He indicated that the concept of connectivity was, even at that late stage, not necessarily understood or accepted by the SAPs in other WRP areas, particularly upstream.

Communities along the Darling River are particularly affected by current rules that apply upstream to enable the taking of water at low levels of flow under opportunistic 'low reliability' entitlements. This deprives ecosystems and communities downstream of the benefits of the low-flows that are otherwise so important in a naturally ephemeral river system and on which downstream environments, and people, rely. In the context of a legislative scheme designed to protect and restore Basin water resources, the significance of the degradation that has occurred to the Darling, especially downstream of Bourke, cannot be overstated, nor can the signs that the rules that will form part of upstream WRPs may not be sufficiently reformed to stop the activity leading to this degradation. As discussed in Chapter 7, this threat is of huge national social importance. The Lower Darling surely cannot be written off as an unfavoured gutter.

Mr Alan Whyte, a farmer on the Lower Darling, gave evidence of the recent increasing frequency of the Darling simply ceasing to flow in his region, and of emergency works being undertaken on and near his property to create levees to hold back pools of water in anticipation of another 'cease to flow' event in December 2018. The town of Wilcannia has held protests about the parlous condition of the Darling. Its predominantly Aboriginal population has suffered the loss of their river's health acutely. Barkandji elder Mr William (Badger) Bates describes it as his people's 'life blood'.⁸⁰

A group of farmers near Menindee Lakes on the Lower Darling are concerned that the matter of upstream and downstream connectivity along the Darling River system is not being seriously addressed in the WRP process. They stated:

The Lower Darling Horticulture Group submits that the MDBA should not accredit any Water Resource Plan for the Barwon-Darling River and Northern Basin tributaries that do not provide for the protection of ecologically significant flows to Menindee and for the environment, water quality and the critical water needs such as town water, stock and domestic and high value irrigation needs in the Lower Darling River. Unless the Water Resource Plans for the Barwon-Darling and Northern Basin tributaries do address connectivity and take into account the water quality and environmental impacts on the Menindee Lakes and Lower Darling River downstream, then the MDBA should use 'step-in' provisions in the Water Act 2007, to ensure these issues are addressed.⁸¹

Ms Rachel Strachan, part of the Lower Darling Horticulture Group, gave evidence that at a State-wide SAP meeting in June 2018, an interactive session ensued whereby people broke into four small groups to discuss the merits of connectivity. Ms Strachan was concerned that this exercise demonstrated that considerations of connectivity remain in their infancy in the context of WRPs.⁸²

An interesting statement made by Barwon-Darling Water in its submission to the Commissioner highlights the need for caution in balancing the design of WRPs in a way that reflects local characteristics and requirements, and the need to recognize connectivity:

We feel it is important that differences in water resource areas are recognised in the WRPs and that the WRP do not become generic policy documents. They should be developed locally, and implemented with flexibility to allow adjustment over time.⁸³

Recognizing the differences between local WRP areas is absolutely not the same as advancing the needs of those areas at the expense of others in connected WRP areas. Connectivity is a matter that transcends, or perhaps yokes together, local needs. It is about fairness and equity across the system. When understood in this way, it should not be considered as an obstacle to meeting the requirements of different local environments and communities that are connected by, and rely on, the same surface water system.

Aboriginal interests

Chapter 10 Part 14 of the Basin Plan specifies the way in which WRPs must be developed to meet the Water Act requirement that this be done 'having regard to social, spiritual and cultural matters relevant to Indigenous people in relation to the water resources'.⁸⁴ To assist all parties in this task, the MDBA has published its Water Resource Plans Part 14 Guidelines (**Part 14 Guidelines**). These make it clear that the focus is on the process, not on the ultimate result in terms of WRP content, but nevertheless, a range of steps should be followed:

MDBA will not be assessing the validity or merit of the Aboriginal objectives and outcomes and associated values and uses identified in WRPs. However, it

is anticipated that States use the following to guide their consultation with TOs [Traditional Owners]:

- *a planned approach to properly engaging TOs (e.g. adequate time, appropriate venues and resources)*
- *identification and involvement of appropriate TOs*
- *TOs are properly notified of the opportunity to be involved in the water resource planning process, (e.g. print, phone, electronic and personal media and town meetings)*
- *clear information about water resource planning processes and content is provided to TOs*
- *use of appropriate tools and mechanisms for recording and understanding Aboriginal objectives and outcomes.*⁸⁵

Evidence received consistently by the Commissioner from peak representative Aboriginal bodies and traditional owners was to the effect that the ‘having regard to’ requirement is highly problematic in terms of the discretion it leaves to decision-makers (MDBA and Basin States) — as highlighted in the Part 14 Guidelines — about the extent to which the Aboriginal objectives and outcomes identified through consultation are included in WRPs. This concern is examined further in Chapter 11.

Irrespective of the way in which such matters are or are not incorporated or otherwise recognized in WRPs, some concerns were raised with the Commissioner about the adequacy of the consultation undertaken in terms of process — noting that the substantive purpose of the required consultation may naturally influence how the process is conducted. For example, the Murray Lower Darling Rivers Indigenous Nations (MLDRIN), the peak representative body for Aboriginal groups and traditional owners in the Southern Basin in relation to water resources, gave evidence that while engagement had been ‘pretty good’ in some Basin States,⁸⁶ not all had fully complied with the MDBA Part 14 Guidelines.⁸⁷ The Chair of MLDRIN, Mr Rene Woods, explained the importance to Aboriginal stakeholders of timely, meaningful and respectful consultation:

we are hoping that through consultation with the water resource plans there is plenty of time and adequate time to do engagement, build the relationships with First Nations people, have a deeper discussion ...

That [is] not just come in, engage on an hour or two, sit down and then take off again to the next First Nations group. MLDRIN would like to see ... a lot of consultation, giving First Nations groups plenty of time to read through documents and understand what their objectives are and where the water objectives are heading within the water resource plans. There’s also the timing. So states don’t just rock up on the doorsteps of First Nations groups and say, “We want to sit down with you and listen to your objectives”. There needs to be lead-up time to make sure that

*First Nations groups have the adequate time to sit down and process that data, that they are — the states are coming to — to ask them. So that's an informed decision at the end of the day. The rushed timings, left to do the water resource plans is not adequate enough.*⁸⁸

As MLDRIN explained, each WRP area covers the country of multiple traditional owner groups.⁸⁹ It also observed that different Basin States have different approaches to consultation, and noted that the Part 14 Guidelines are not binding.⁹⁰

The Northern Basin Aboriginal Nations (NBAN) is the peak body representing traditional owner groups in the Northern Basin in relation to water resources. In making a recommendation to the MDBA about accreditation of the draft WRP relating to the Nebine, Paroo, Bullo and Warrego Rivers, NBAN's Chair, Mr Fred Hooper, wrote that '[o]verall we felt that the requirements of Chapter 10 Part 14 of the Basin plan was met, however it took 3 attempts to include and get it right'. He said that traditional owners were not consulted at all in the first round, and little more was done in the second round. Moreover, '[w]e found that during the process Aboriginal Protocols were not followed in all cases and there was no feedback to the people that were involved in the consultations'.⁹¹

The 2018 Draft Report echoes these concerns, noting that some Aboriginal groups consider that the short times they have been given have resulted in unreasonable and culturally inappropriate pressure.⁹²

One clear exception to this general concern was the experience of the Ngarrindjeri people, whose representative body, the Ngarrindjeri Regional Authority (NRA), said in its submission:

*Ngarrindjeri consider the engagement process they have developed with the SA Government provides well-developed structures and practices to support equitable and effective Ngarrindjeri engagement and participation in the implementation of the Murray-Darling Basin Plan and is the preferred approach to engagement with Ngarrindjeri.*⁹³

Local views and local knowledge

Given the vast area and variability of the Basin's water resources, and water-dependent environments and communities, water management is necessarily complex, and knowledge about it is neither consistent across the Basin, nor static. The introduction of changes in regulation requires understanding and social acceptance to be effective. Proper consultation should enable the incorporation of relevant local knowledge, which is often also of a specialized nature, such as the deep understanding of local biodiversity and ecosystem functions that is part of the cultural heritage of local traditional owners, as described by the NRA.⁹⁴

Even without the time pressures applying to the current WRP process, there are inherent challenges in conducting the sort of consultation that would engender real understanding, engagement, and a general level of confidence around the Basin when relying solely on the respective government departments located (with the exception of the Australian Capital Territory Government) in capital cities on the coast, outside the Basin.

It is to be hoped that there are ways to do things better, and achieve a better result.

Remedies and responses

The Murray Darling Association is an organisation representing about 100 of the 167 local councils around the Basin. The Chief Executive, Ms Emma Bradbury said in evidence ‘that local government has a very direct capacity to broaden out that consultation, both the outcomes of the consultation and the consistency of its nature’.⁹⁵ (She also contended that local government should have a formal, legislated role in decision-making under the Basin Plan.)

The Mildura Rural City Council made the same point about the potential for local councils to support and improve consultation on WRPs:

Local government has no formal role, nor responsibility for the development or delivery of the Water Resource Plan for our local area, however there would be benefit in MRCC being involved, if the opportunity arose, to provide broader community input and support for the completion of the plans within the agreed timeframes.⁹⁶

At the same time, the Commissioner notes that Basin States’ legislative schemes for water resource management, either directly, or in conjunction with other catchment management or natural resource management schemes, generally do provide for local representative bodies to be involved in regional information collection, monitoring and consultation about local water management and planning, amongst other activities. Examples range from the integrated Natural Resource Management Boards in South Australia, which also have a statutory role in drafting and consulting on the water resource planning process and are independent of the Minister,⁹⁷ to the water management committees that may be established by the Minister from time to time in New South Wales to represent a local water resource area and advise the Minister including, if required, on the preparation of water sharing plans and water management plans.⁹⁸

The extent to which each Basin State’s water resource planning laws already do, or should, provide a formal process for consultation on changes to the scheme of rules for managing and allocating water is not examined further in detail here.

In the context of the WRP development process it suffices to observe that State governments are familiar with the need to afford due process to persons affected by

decisions made under land use, development and planning laws. This experience is clearly relevant also to water resource planning laws. In conducting consultation on changes to their existing water resource management instruments to achieve WRP accreditation, governments must meet any relevant statutory requirements concerning due process that may be built into their water resource planning regimes. Whether or not this has been the case, the Commissioner cannot but note the significance of the changes proposed by the WRP process and the many concerns expressed about the adequacy of consultation in some areas (particularly New South Wales). This may be indicative of, on the one hand, potential action by aggrieved parties for judicial review of the final decisions made (generally by Ministers) about the ultimate content of the relevant instruments and, on the other hand, a need to review the adequacy of relevant water resource planning laws to ensure that thorough, appropriate consultation processes are in place.

Implementation

The methods for ensuring the effective implementation of WRPs can be divided into measures for ensuring compliance, such as monitoring and enforcement, and adaptive management processes for reviewing and, if necessary, improving WRPs by amendment.

Compliance

As legislative instruments under the relevant State and Territory laws, WRPs are enforceable in accordance with those laws by the relevant State or Territory regulators.

The Act provides for the concurrent operation of obligations under the Basin Plan and WRPs.⁹⁹ As well as being enforceable under the relevant Basin State law, the obligation to comply with WRP requirements, including SDLs, is also given effect as an obligation under the Act (to the extent of the same constitutional limits as outlined in relation to Basin Plan obligations). Thus, the Basin Officials Committee, an agency of a Basin State, an operating authority, an infrastructure operator or the holder of a water access right must not act, or fail to act, inconsistently with the WRP.¹⁰⁰

Part 8 of the Water Act provides for the enforcement of the provisions of the Act. The MDBA is the designated ‘appropriate enforcement agency’ in relation to the provisions of the Water Act concerning the management of Basin water resources, including the Basin Plan and WRP obligations.¹⁰¹

The scope of the obligation to comply with the SDLs in WRPs, and thus the scope of the MDBA’s enforcement powers, will turn on the facts and circumstances of any given case but the constitutional basis for the Water Act gives the Commonwealth, through the MDBA, considerable reach into water extraction activities, especially when they are part of a commercial activity or affect environmental watering activities (see Chapter 2).

However, the MDBA has been clear that it will adopt a ‘risk-based approach’ to compliance and is committed to working co-operatively with parties.¹⁰²

A key element of the MDBA’s monitoring of compliance is the annual reports that Basin States will be obliged to provide on their own compliance with ongoing WRP obligations.¹⁰³ Methods for determining compliance with SDLs are set out in the Basin Plan¹⁰⁴ and the MDBA says these will draw on the processes and methods in the relevant WRPs for determining annual permitted take and actual take.

Adaptive management

The other form of monitoring that will be critical to the effectiveness of the Basin Plan and WRPs in achieving the overarching objectives of the scheme is ecological monitoring. The relative condition of the ecosystems of the Basin, and the key elements by which each WRP’s ESLT is measured, must be monitored and measured for changes over time. Careful analyses of the results must be undertaken, and assessments made, based on the best available science of the causes of change, or lack of change. Where indicators do not improve as required, it must be possible to determine the reasons. These may be one or a combination of reasons — a failure to comply with SDLs or a failure to undertake environmental watering in accordance with LTWPs, or, more systemically, that the LTWP requires some change or correction or the SDL is not correct ie it does not reflect an ESLT.

It is accepted that WRPs cannot be perfect. In fact, as human artefacts and products of science and policy, they will emerge as being deficient in a number of ways. Adaptive management, relying on continuous, well-resourced monitoring and scientific analysis will be essential. The MDBA describes adaptive management in this way:

A cornerstone of the strategy for managing water resources in the Basin is adaptive management — ‘learning as you go’ by trialling techniques, monitoring, and making changes as needed.

Water managers must be flexible and dynamic to ensure the best possible outcomes are achieved. This is the modern way of managing natural resources.

Adaptive management allows governments and communities to adjust their approach in response to current climatic conditions, new information and local knowledge when planning for the future.

The features of this approach are planning, management, monitoring and evaluation. Adaptation can happen at any one of these stages.¹⁰⁵

An example of adaptive management in the management and allocation of water resources through a local water resource planning instrument can be seen in the Water

Allocation Plan for the Prescribed River Murray Watercourse in South Australia (**River Murray WAP**).

The River Murray Watercourse in South Australia has been prescribed under that State's water management laws since the 1990s. A succession of water allocation plans (**WAPs**) have operated, and have been updated and amended, over time.¹⁰⁶ Changes have been made to improve water management, including to meet the requirements of broader instruments as they have been introduced, such as the NWI; the Murray-Darling Basin Agreement including its various schedules implementing rules for salinity and water quality, water trading, and the cap on diversions; and, more recently, the Water Act and Basin Plan. Other imperatives for change over the years have been growing environmental concerns, changing irrigation requirements and events such as the Millenium Drought. In response to some of these changes, the River Murray WAP has also been amended in recent years¹⁰⁷ to move towards a system of allocation that is intended, as far as possible, to adapt water usage to increasing variability in water resource availability in a manner reflecting recommended models such as explained in evidence before the Commissioner by Professor Young, and discussed earlier in this chapter. In the current River Murray WAP, different consumptive pools for specific purposes have been created, the volumes of which depend on seasonal water availability. Water access entitlements have become shares in the relevant pools, and water is allocated from the pools to the shares on a seasonal basis.

An aspect of the River Murray WAP illustrating the adaptive management in which river managers, landholders, the South Australian Department for Environment and Water (**DEW**) and its predecessor departments, the SA Murray-Darling Basin Natural Resources Management Board (**NRM Board**) and the South Australian Environment Protection Authority (**EPA**) have been engaged collaboratively over the past decade is the development of Environmental Land Management Allocations (**ELMA**). ELMA is a class of water allocation only available to be taken in the Lower Murray Reclaimed Irrigation Areas (**LMRIA**). The LMRIA historically comprised 5200 hectares of flood irrigated farmland on the floodplain of the Lower River Murray, almost all of which was used for dairy production. Following the introduction of the cap on diversions it became clear that the flood irrigation and land use practices there were inefficient with water and resulted in significant levels of pollutants entering the river, something the EPA has been monitoring for many years. A program of restructure and rehabilitation in the LMRIA over several years resulted, by 2008, in approximately 1000 hectares of land being retired from irrigation and 22.2 GL of water being committed to environmental use. It was agreed under the Murray-Darling Basin Agreement that this component of South Australia's entitlement flow would be dedicated to use in the LMRIA for the environmental purpose of what is effectively soil conservation, which, in turn, has other beneficial environmental effects. The experience of the drought taught river managers and landowners in the Lower Murray that the use of ELMA on the 'swamp' areas adjacent to the river helps to minimise the effects of high saline groundwater levels, the cracking of the soils and the emergence of acid sulfate. Under the current River Murray WAP, ELMA water is part

of an ‘All Purpose Consumptive Pool’ and may be allocated annually for application on land in the LMRIA in accordance with strict conditions, which have been refined through review of the previous WAP and in light of landholders’ experience of its use and effects and research and monitoring by the DEW, NRM Board and the EPA.¹⁰⁸ The draft River Murray WAP includes provisions for the ELMA, with the condition that it may be used to:

Contribute to the protection of environmental land and infrastructure of the LMRIA including by:

- i. Reducing soil salinization as a result of saline groundwater discharge*
- ii. minimising oxidation of acid sulfate soils, and*
- iii. minimising cracking and movement of soils.¹⁰⁹*

The development of the ELMA allocation, along with many other changes to the way water is allocated in the South Australian River Murray (such as the use of a consumptive pool model) demonstrate that adaptive management works, and can be employed in WRPs to reflect important lessons learnt in the regulation and management of the local water resources to better conserve, and where possible, improve the ecological health of local water resource environments.

The objectives of the Basin Plan and WRPs are ambitious, and while adaptive management should not be used as an excuse not to begin with the best possible WRPs, it will be absolutely necessary as a tool for testing, correcting and improving the effectiveness of WRPs.

Conclusion

As indicated earlier in this chapter, Basin States must bring their existing water resource management laws and instruments into alignment with the requirements of the Basin Plan, so that the objectives of the Water Act and the purposes of the Basin Plan can be achieved. These requirements are based on 12 key areas of focus set out in the Water Act, and when detailed in the Basin Plan they become some 54¹¹⁰ detailed obligations, objectives and targets. The Commissioner has not examined the content of all of these individually, or how they are likely to be addressed. It is simply not realistic to do so while WRPs are still being developed. However, the course of this inquiry has shown, including through the process of consultation and general public debate, that some WRP requirements have emerged as subjects of particular concern. A number of these have been highlighted in a paper recently published by the Wentworth Group of Concerned Scientists (**Wentworth Group**), in which they argue that WRPs should comply with nine criteria. All of these are in fact Basin Plan requirements, except one which seeks the implementation of recommendations made by various inquiries into compliance in water resource management undertaken in 2017.¹¹¹ The Commissioner agrees with the Wentworth Group about these nine ‘criteria’, but notes that the Water Act requires

these requirements to be met in any event, along with numerous others, for WRPs to be accredited.

Some WRP requirements have come to the Commissioner's attention as concerning because of the complexity or contentiousness involved in their articulation and inclusion in WRPs. They are discussed in more detail in specific chapters — in particular, the calculation of SDLs (in various chapters); activities that appear to lack sufficient measurement and regulation such as the interception of water (Chapter 14); the challenges of protecting and enhancing environmental watering between different WRP areas and different jurisdictions (Chapters 13 and 16); and the need for public confidence and scientific rigour in the assessments and decisions by the MDBA and the Basin States in the development and administration of WRPs including through making information publicly available for review and testing (Chapters 17 and 18).

It is unlikely that all WRPs will be comprehensive and well-prepared, and demandingly accredited, by 30 June 2019. It is noted that increased effort is being applied in these later stages, but over the six years since the Basin Plan came into effect the effort has overall been disappointingly inadequate for the complex and critical task of ensuring that legal and administrative instruments for water resource management across the Basin are fit for the purpose of putting into effect the Water Act's scheme.

Regulatory change is not an easy process, and this is a particularly complex scheme. But with the futures of Basin communities and industries unacceptably uncertain, and the very survival and functioning of the Basin's ecology in the balance, the WRPs — the essential mechanisms by which the system will be managed on a daily basis, and that have the potential to return it to sustainability — deserve proper time, attention, resources and commitment. The historical diversion of these into the effort of changing the settings on which WRPs are to be based, through mechanisms such as SDLAM, has effectively and regrettably diminished the potential of WRPs for effective change — at least in the short-term.

When WRPs are accredited, it is certain they will not be perfect. That is, within reasonable limits, in the nature of things. At the same time, the objects and purposes they are intended practically to help achieve cannot be achieved quickly. Whether WRPs are working as intended by the Water Act and Basin Plan can only be judged through long-term scientific monitoring and assessment and appropriate adjustment of WRPs as necessary over time. This will require a very much greater level of commitment to those objects and purposes than governments have shown to date.

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13 Environmental Watering & Outcomes

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Introduction

Returning the water resources of the Murray-Darling Basin (**Basin**) from overallocation and overuse to sustainable levels of use is the first part of the strategy comprising the *Water Act 2007* (Cth) (**Water Act**), *Basin Plan 2012* (Cth) (**Basin Plan**) and water resource area plans (**WRPs**). A significant, and complementary, part of the strategy is the management of environmental water — all water that is part of the natural system as well as water recovered from consumptive use for the environment.

The Water Act defines environmental watering as ‘the delivery or use of environmental water to achieve environmental outcomes’, and environmental water as either ‘held environmental water’ or ‘planned environmental water’.¹ When considered in this holistic way, environmental watering is about the considered and strategic management of all surface water in the system that is not subject to consumptive use. It involves planning and operational measures to ensure that environmental water is stored, allowed to flow or released in ways and at times that achieve optimum outcomes for the maintenance and improvement of the system’s ecosystems and the conservation of its biodiversity.

The concept of environmental watering emerged in the late 1990s following recognition that overallocation was damaging Basin environments and the introduction of the Cap on Diversions. The Living Murray program (**TLM**), established in 2002 through the Murray-Darling Basin Ministerial Council (**MinCo**), was the first concerted, joint effort by the Commonwealth and Basin States to acquire a portfolio of water entitlements dedicated to the environment and to engage in a program of environmental watering. According to the 2011 Murray-Darling Basin Authority (**MDBA**) publication ‘The Living Murray Story’, the concept of environmental watering:

encompasses quantity (enough water flowing into and staying in the system), timing (flows at the right times of year or critical points in the ecological cycle) and location (water reaching the parts of the river system that most need it).²

As discussed in Chapter 3, the imposition of long-term average sustainable diversion limits (**SDLs**) is the mechanism by which quantities of water diverted for consumptive use are to be reduced to sustainable levels.³ The SDL for the water resources in each WRP area must reflect an environmentally sustainable level of take (**ESLT**).⁴ The ESLT is established by identifying the relevant water resource’s key environmental assets, key ecosystem functions, productive base and key environmental outcomes, and then determining the associated water requirements.⁵

It is axiomatic that in achieving SDLs the resulting reduction in water for consumption equates to an increase in water for the natural system. In theory, SDLs could be achieved by Basin State governments exercising powers under their water resource management laws to permanently reduce the volumes of water that may be allocated to entitlements. This would result in more water being left in the system as ‘planned’

environmental water. However, this option has been resisted by the Commonwealth and Basin States, as discussed in Chapter 12. Instead it was decided that water entitlements would be acquired by the Commonwealth through direct purchase or through funded efficiency measures involving the transfer to the Commonwealth of an agreed efficiency dividend in the form of an entitlement and/or allocation. These legal entitlements are ‘held’ environmental water.

Environmental watering is about planning for, and delivering, water recovered for the environment through the SDL process in coordination with the system’s planned environmental water to achieve the ecological outcomes identified by, and under, the Water Act.

The assessment of water needs at the water resource level in order to determine the ESLT produces a range of environmental outcomes and measures that need to be met. Actually meeting them can be assisted through planned environmental watering. The achievement of ESLTs and all the elements by which they are measured are key to the objectives of the Water Act and the purposes of the Basin Plan. How environmental watering is conducted, and the results being achieved are, therefore, germane to the Commissioner’s inquiry.

Planning

The Water Act and Basin Plan establish a set of nested responsibilities and obligations in relation to environmental watering planning, including coordination and delivery, from the Basin-wide level to the water resource area level. The scheme also provides for monitoring and evaluation, which are essential for determining whether the objectives and targets by which an ESLT is measured, are being achieved.

Environmental watering plan

The Basin Plan must include an environmental watering plan, the purposes of which are, in essence, to safeguard existing environmental water, plan for the recovery of additional environmental water, and coordinate the management of environmental water with a view to protecting and restoring the environmental assets and water-dependent biodiversity of the Basin water resources.⁶ The environmental watering plan must include:

- overall environmental objectives
- targets by which to measure the achievement of the objectives
- an environmental management framework for planned and held environmental water
- methods to identify environmental assets that will require watering

- principles and methods to determine priorities for applying environmental water, and
- principles for applying environmental water.⁷

The environmental watering plan is set out in considerable detail in Chapter 8 of the Basin Plan. The ‘overall environmental objectives’ are:

- to protect and restore the Basin’s water-dependent ecosystems
- to protect and restore the ecosystem functions of those ecosystems, and
- to ensure that water-dependent ecosystems are resilient to climate change and other risks and threats.⁸

The targets by which achievement of the objectives are to be measured are set out in Sched 7 as a series by reference to time. The first targets are to avoid any loss or degradation to the listed indicia (below) until 30 June 2019. The second targets are to achieve improvement in the same indicia (with the addition of community structure of water-dependent ecosystems) from 1 July 2019. The indicia are:

- flow regimes (including specified flow levels or types eg low, high, over-bank etc)
- hydrologic connectivity between the river and floodplain and between hydrologically connected valleys
- river, floodplain and wetland types including the condition of priority environmental assets and priority environmental ecosystem functions
- condition of Coorong and Lower Lakes ecosystems and Murray Mouth opening regime
- condition, diversity, extent and contiguousness of native water-dependent vegetation, and
- recruitment and populations of native, water-dependent species including vegetation, birds, fish and macroinvertebrates.

The ‘environmental management framework’ set out in the Basin Plan includes requirements for a ‘Basin-wide environmental watering strategy’ (**BEWS**) to be prepared by the MDBA⁹ and for ‘long-term watering plans’ (**LTWPs**) for WRP areas to be prepared by Basin States.¹⁰ In addition, annual environmental watering priorities must be prepared — for the Basin by the MDBA,¹¹ and for each WRP area by the relevant Basin State.¹² The framework also includes principles to be applied in environmental watering¹³ and a mechanism by which the MDBA can coordinate the recovery of additional environmental water.¹⁴

Basin-wide environmental watering strategy

The purpose of the BEWS is to identify Basin-wide environmental watering priorities over the long-term, help coordinate the management of environmental water, including by guiding the development of consistent LTWPs, and explain the context in which the Basin annual environmental watering priorities will be set.¹⁵

The MDBA published the BEWS in November 2014, explaining it as:

*[The MDBA's] best assessment of how four important components of the Basin's water-dependent ecosystems are expected to respond over the next decade, given current operating rules and procedures. This includes making the best use of all water — including held, planned, environmental and consumptive water en-route — to achieve these objectives (noting that other variables like climate, fire, complementary actions or certain rules may affect the outcomes in some places). The four components: river flows and connectivity; native vegetation; waterbirds; and native fish have all declined appreciably because of the way we capture, divert and manage water. They are also good indicators of the health of river systems, and respond to environmental watering.*¹⁶

The BEWS articulates the environmental outcomes that the MDBA considers are achievable through the broader water reform effort, including the recovery and management of environmental water, the implementation of the Constraints Management Strategy, and the development of WRPs.¹⁷ The BEWS must be reviewed every five years, so a new BEWS may be expected to be published in late 2019.¹⁸

Long-term watering plans

The most localized prescription of environmental outcomes is found in the LTWPs which the Basin Plan requires each Basin State to prepare for each of its surface water WRP areas.¹⁹ A LTWP must identify the priority environmental assets and priority environmental functions in its WRP area in accordance with the criteria in Schedules 8 and 9 of the Basin Plan. It must then identify the ecological objectives and targets for those assets and functions, together with the environmental watering requirements for meeting them.²⁰ Clearly, LTWPs relate closely to their companion WRPs (discussed separately, below), in that WRPs must support the carrying out of the environmental watering aims of LTWPs through the more general scheme of rules for allocating and managing water in the WRP area.

LTWPs must be published no later than 12 months after the BEWS, or otherwise as agreed by the MDBA.²¹

To date, six LTWPs have been published — for the Victorian Murray, Northern Victoria, Wimmera-Mallee, Warrego-Paroo-Nebine, SA River Murray and Eastern Mount

Lofty Ranges. The MDBA and Basin States have agreed that the remaining 14 LTWPs will be published at the same time as their relevant WRPs by 30 June 2019.²²

By way of example, the LTWP for the South Australian River Murray, which covers the River Murray and its floodplains from the State's border to the Murray Mouth, was published in November 2015.²³ It was developed by the then Department of Environment, Water and Natural Resources with input from representative Aboriginal groups including the Ngarrindjeri Regional Authority (NRA), regional stakeholder groups such as the Nature Foundation of South Australia and the River Murray Advisory Committee, and a range of scientific experts.²⁴ This LTWP identifies three priority environmental assets: the Coorong, Lower Lakes and Murray Mouth; the South Australian River Murray Channel, and the South Australian River Murray Floodplain.²⁵ Each of these has a set of ecological objectives and targets. For example, for the South Australian River Murray Channel 16 ecological objectives and 29 ecological targets were identified, based on work undertaken with the Goyder Institute for Water Research and many years' knowledge and experience from previous programs such as TLM. The objectives and targets relate to abiotic processes, water quality, biofilms, vegetation, wetlands, groundwater and fish. A corresponding set of seven environmental watering requirements was specified, describing the desired flow regime and its discharge, duration, timing, average return frequency and maximum interval between events.²⁶

The LTWP states that the ecological character of each of the three Ramsar-listed wetland and floodplain complexes in the WRP area was taken into account by aligning each critical component and process identified in the ecological character description of each wetland with at least one ecological object and target for the relevant priority asset.²⁷

A draft of the updated SA River Murray Water Allocation Plan, the final version of which is intended to serve as the area's WRP, was published for consultation in late 2018. Chapter 3 provides a broad platform for the operation of the LTWP. It summarizes the environmental water requirements of the representative water-dependent ecosystems of the River Murray Prescribed Watercourse 'based on the current level of scientific knowledge and understanding', the capacity of the environmental water provision in the WRP made to meet those requirements and the potential for 'other water' to be used to support the LTWP and 'actions that can be undertaken and supported through principles in the plan to assist in achieving environmental outcomes'.²⁸

Annual environmental watering priorities

The purpose of annual watering priorities for the Basin is to give effect to the BEWS. The aim is to identify priority environmental assets and priority ecosystem functions that have Basin-scale significance for watering, or whose watering will require complex arrangements, during that period; and identify potential for synergies in environmental watering activities.²⁹ These have been published each year since 2013–14.

The MDBA explains in its 2018 Basin Environmental Watering Priorities document that the priorities are based on the overall Basin Plan ecological objectives and targets, in the four main themes of river flows and connectivity, native vegetation, waterbirds, and native fish. However, rather than set simple annual priorities, the MDBA has said it has moved to ‘rolling, multi-year priority frameworks that cover each resource availability scenario’. The aim is to achieve outcomes over a three to five year period, and to guide water managers to do this under different water availability ‘scenarios’. In this way, the annual watering priorities can be more adaptable to prevailing climatic conditions and changes in water resource availability.³⁰

The environmental watering plan also requires Basin States to identify, for each surface water WRP area, annual priorities for the watering of priority environmental assets and priority ecosystem functions, based on the expected quantities of planned and held environmental water for the relevant water accounting period.³¹

Water resource plans

WRPs are the legal and administrative instruments — or collection of instruments — by which much of the work of the Basin Plan will be done. Importantly, but amongst other functions, they comprise the rules for water allocation and taking, as well as for general management and operation of the physical system and environment. They therefore form the fundamental platform for the planning and carrying out of environmental watering in accordance with the LTWP and BEWS. The former Commonwealth Environmental Water Holder (CEWH), Mr David Papps, said in his submission to the Commission that the role of WRPs in protecting ‘planned’ or ‘rules-based’ environmental water ‘cannot be overstated’.³² The current CEWH said in its submission:

*The Basin Plan was based on modelling which made assumptions about protecting environmental water from extraction and allowing it to be used to build on flows throughout the river system. Without such protections being implemented more water would need to be recovered to achieve the same outcomes.*³³

WRPs must be developed in a way that supports environmental watering. Mandatory requirements for WRPs in relation to planning for environmental watering are detailed in Chapter 10 of the Basin Plan. They must be consistent with the environmental watering plan and contribute to its overall environmental objectives. They must also be consistent with the BEWS, and be prepared having regard to the most recent LTWP and the views of local communities.³⁴ To assist in this, a WRP must:

- identify the planned environmental water in the WRP area and associated rules and arrangements relating to that water
- establish and maintain a register, published on a website, of held environmental water for the WRP area, including the characteristics of that water.³⁵

As with all water generally, planned environmental water is owned by the Basin States in whose jurisdiction it occurs, and as determined by the Murray-Darling Basin Agreement. In the Southern Basin, in particular, where the surface water system is highly physically regulated, the delivery of planned environmental water is tied up with the delivery of water for consumptive use and is subject to a range of complex operational rules and external factors. Nevertheless, just as the system for the physical and legal regulation of Basin surface water is managed for the benefit of consumptive users, so the system must now, under the Basin Plan, be adapted to ensure that environmental watering is supported and protected.

To support the management of water in the system in achieving environmental objectives, the Basin Plan requires that where surface water is connected across WRP areas, the WRPs must provide for the coordination of environmental watering between the two areas.³⁶ This is the issue of ‘connectivity’ about which the Commissioner heard from witnesses who raised it as a matter of concern and contention in the process of the development of some WRPs, discussed in Chapter 12.

The Basin Plan also requires some protection of planned environmental water by WRPs but, presumably in recognition of the fact that this is basically all the water in the system after consumptive entitlement requirements are met and is owned by the Basin States, it goes only so far as to require that there be ‘no net reduction in the protection of planned environmental water from the protection provided for under State water management law immediately before the commencement of the Basin Plan’.³⁷ Nevertheless, this is an important threshold to which Basin States should be kept, and upon which future improvements for the environment may be built. Mr David Harriss, a former senior water management bureaucrat in New South Wales from 2006–14, said in his evidence:

When I was in the Office of Water it was incredibly unpopular to restrict access to supply for the northern irrigators, in order to maintain Broken Hill’s water supply. But in so doing we were also looking after the high security users in the Lower Darling and, to a certain degree, the environment of the Lower Darling.

At the same time, the river upstream had been dry, so water users wanted access to those small freshes. This caused immediate conflict.

... I advised that this should not happen — that if someone is short on water, they should go to the market and buy it. In fact, in both of those years when the season finished there was still unused water in some people’s accounts, so there was a market. The Minister agreed with me but the decision was incredibly unpopular with the Member for Barwon and the people up north.

I think it was in the last couple of years that the NSW government decided to relax some rules and to convert C class licences to B class licences, allowing more access to water at lower flow levels.

In addition, after I left the Office of Water, the government decided not to put on the embargoes on a couple of the small flow events in the Barwon-Darling, despite the supply for Broken Hill in the Menindee Lakes being less than 18 months. As a result, there's now less water coming into the lakes particularly in dry periods.³⁸

In his submission to the Commissioner, Mr Papps also observed some difficulties, until recently, in gaining the protection of held environmental water by local water management laws in New South Wales:

the NSW Government's approach to its obligation to protect environmental water (through crediting return flows, shepherding and the like) was wholly unsatisfactory. And in relation to the particular issue around environmental flows in the Barwon-Darling, I note with real pleasure the recent use of Ministerial embargoes by NSW to successfully protect Commonwealth environmental water from legal take. I also note that I had requested this action by NSW a number of times to be told unequivocally that the use of Ministerial embargoes would never happen and I should negotiate directly with irrigators to purchase protection of Commonwealth water. I can only assume that media and public scrutiny led to a change in policy by the NSW Minister.³⁹

The event referred to by Mr Papps is referred to as the Northern Connectivity Event by the MDBA, and is a good example of the level of co-operation and coordination required for environmental watering, as well as regulatory action by the relevant Basin State necessary to protect, or 'shepherd' the water (in this case, the imposition of a temporary water restriction on all relevant water access licences). The event occurred in April 2018 and involved the release from Northern Basin storages of water held by two different environmental water holders (25 GL of CEWH water and 7.2 GL of New South Wales' Office of Environment and Heritage (OEHS NSW) water) into the Barwon-Darling system, with the aim of it reaching at least Wilcannia. The MDBA reviewed the event and lessons to be learnt, noting the various agencies involved (the new New South Wales Natural Resources Access Regulator, MDBA, Department of Industry (NSW), WaterNSW, the Commonwealth Environmental Water Office (CEWO) and Department of Primary Industries (NSW)) and stating:

the review also identified opportunities for improvement, particularly in the areas of: formalising processes and procedures (including inter-agency governance arrangements); regulating stock and domestic access; and communication strategies for managing future events.⁴⁰

The 'Murray-Darling Basin Compliance Compact Interim Assurance Report 2018' published on 21 December 2018 states that:

Ensuring that water resource plans appropriately provide for the protection and management of environmental water is one of the most significant tools available

to enable the MDBA to have a future role in compliance and enforcement relating to environmental watering.⁴¹

The MDBA considers that its WRP accreditation process is adequate assurance that the MDBA's commitments to protecting and managing environmental water are being met. It is hoped that this will be borne out in due course, as WRPs are accredited and their effectiveness is tested in practice.

Delivery

The MDBA has an overarching role in the planning and oversight of environmental watering, not only at the Basin-scale, but also in conjunction with the Basin States and other relevant parties through the BEWS and annual environmental watering priorities for the Basin.

In implementing the environmental watering plan, the MDBA must develop 'periodic environmental watering schedules' (**EW schedules**) in consultation with holders of environmental water (eg the CEWH); the managers of planned environmental water (this essentially means the States), and the owners of environmental assets.⁴² According to the Explanatory Memorandum to the *Water Bill 2007* (Cth), the EW schedules:

are consensual and facilitative agreements ... that seek to ensure that the use of environmental water available from diverse sources is coordinated so as to maximise the environmental benefits of environmental watering.⁴³

In addition to being responsible for planned water, Basin States also generally have some held environmental water eg the Victorian Environmental Water Holder is an independent statutory body responsible for managing Victoria's own environmental water entitlements including a dedicated water account for the Barmah-Millewa Forest; and the OEH (NSW) purchases and holds water entitlements for the benefit of targeted wetlands and river systems.

TLM water entitlements are held and managed by the MDBA on behalf of the Basin States' partnership and represent an important and relatively large portfolio. In agreed proportions, the Commonwealth and Basin State governments have invested \$650 million in acquiring proportionate volumes of approximately 500 GL in water entitlements for environmental watering purposes, but with a focus on six 'Icon Sites' in the Southern Basin.

The pre-eminent owner of held environmental water is now the CEWH. The CEWH undertakes a pivotal role in the Water Act scheme in holding the water recovered by the Commonwealth Government towards the achievement of SDLs and using that water to undertake environmental watering. An examination of the CEWH's operations is helpful

to understanding how environmental watering is conducted generally in the Basin, and is likely to develop.

Commonwealth Environmental Water Holder

The Water Act establishes the statutory position of the CEWH. Its functions are to manage the Commonwealth environmental water holdings (**water holdings**) and to administer the Environmental Water Holdings Special Account,⁴⁴ and it must perform those functions for the purpose of protecting or restoring the environmental assets of the Basin, (and areas outside the Basin where the Commonwealth holds water) so as to give effect to relevant international agreements.⁴⁵ The CEWH is assisted by a dedicated group of staff within the Department of the Environment and Energy, referred to as the CEWO.

Water holdings are defined as Commonwealth-held water access rights, water delivery rights, irrigation rights or similar rights relating to water (**water rights**), as well as any interests in, or in relation to, such rights.⁴⁶

The CEWH's water holdings comprise water rights acquired by the Commonwealth Government towards the environmental water recovery target produced by the setting of the Basin-wide and water resource area SDLs — essentially through its so-called 'bridging the gap' measures. These include the acquisition of water rights through direct purchase from willing sellers (the now ceased 'buyback' scheme) and the Commonwealth Government's current programs for funding water efficiency projects in exchange for a proportion of the water 'saved' in the form of water rights.

As at 31 October 2018, the CEWH's water holdings comprised a total of 2 711 051 ML of registered entitlements (ie ongoing water access rights) with a long-term average annual yield of 1 862 774 ML (ie allocations).⁴⁷

The CEWH's function of managing its water holdings includes the power to acquire, dispose of and otherwise deal with water rights, to maintain an up-to-date record of its holdings, and to make water available from its water holdings through contracts and arrangements for either the taking or use of water under its entitlements or the undertaking of work to enable that taking or use.⁴⁸ These functions must be undertaken, and powers exercised, consistently with the BEWS, any operating rules made by the Minister (see discussion of trading below), and any EW schedules made by the MDBA to which the CEWH is a party.

Trading

In disposing of water holdings, the CEWH must be reasonably satisfied that the disposal meets the objectives of the environmental watering plan and any applicable EW schedules, and that either the water or the water holding cannot be carried over into the next accounting period or is likely to be reduced if not disposed of.⁴⁹

The CEWH is also able to sell water holdings if the proceeds are used to acquire other water holdings or, if the disposal is of a water allocation, to undertake ‘environmental activities’.⁵⁰ The Commissioner notes the qualification that only the proceeds of an allocation, ie temporary water rights, can be applied to environmental activities, meaning that such activities cannot be funded by a reduction in the CEWH’s ongoing water entitlements portfolio. The nature of the activities that might be funded by allocation sales is described broadly as ‘environmental’ but the Commissioner notes the overarching imperative that the CEWH’s functions are aimed at the protection and restoration of Basin environmental assets. The Commissioner is encouraged by the CEWH’s clear commitment to exercise this power in a manner that appears to be aimed as nearly as possible at achieving the environmental objectives and targets outlined in the environmental watering plan set out in the Basin Plan (eg fish passages, regulators and community-based activities to rehabilitate wetlands and riverbanks) but not to fund projects that should otherwise be funded by governments.⁵¹

In the exercise of its ‘dealing’ functions, the CEWH is not subject to direction by the Secretary of the Department or the Minister.⁵² This is obviously critically important to ensure the CEWH’s environmentally focussed activities in the water market are independent of any government influence.

The need for the CEWH to be independent, and for the public to understand its role and the purpose of its water holdings, was recently highlighted when calls were made in public political debate for CEWH water to be transferred to irrigators to use in growing pasture during the current drought.

In an interview with 2GB radio, the Commonwealth Government’s Special Drought Envoy and former Water Resources Minister, Mr Barnaby Joyce, said:

a national emergency requires emergency power. We have a large water resource owned by the government. It’s called the Commonwealth Environmental Water holder and it’s used to water environmental assets. In a national emergency, which is this drought, surely that water should be used to grow the fodder to keep the cattle alive to keep the cash flow in the town. When people say, ‘Oh well, the legislation won’t allow you to do that’. Well, change the legislation, that’s what we have a parliament for.⁵³

The Commissioner agrees with the response from the Chairman of the MDBA Board, Mr Neil Andrew AO, in a media release responding to calls such as Mr Joyce’s. Mr Andrew defended the policy behind the rules in the Water Act that prevent the CEWH from selling water rights unless it is satisfied that to do so ‘will not diminish environmental outcomes’ on the grounds that ‘[t]hese are the right rules if we want to ensure the Basin will be healthy in the long term’. He also pointed out various dangers associated with the CEWH putting water on the market for sale (assuming the law was not changed to enable this) in order to achieve outcomes for a particular sector of the agricultural industry. To do so would distort the market. Other holders of water rights (ie irrigators) manage their

entitlements in an adaptive way during drought by choosing not to use their allocations to grow a crop and seeking to sell them as a means of alternative revenue, so for the CEWH to enter the market would jeopardize their returns. Indeed, Mr Andrew said ‘there is water available to buy right now — at market rate — from those who choose to sell’. Moreover, if CEWH allocations were put on the market, they would be available to the highest bidder, not necessarily one sector, and to impose price or purchasing restrictions would distort the market.⁵⁴ Mr Andrew did not mention it, but this would also be contrary to the Basin Plan water trading rules, specifically sec 12.09 which says:

*A person may take and use water under a water access right free of any restriction arising from the fact that the person acquired the water access right by way of trade.*⁵⁵

The CEWH itself has been clear about its role in the water trading market, and transparent about its activities, publishing quarterly updates on its trading intentions and monthly displays of its current holdings.⁵⁶

The Commissioner considers the CEWH’s public expressions about its role evince a clear understanding of, and adherence to, the overarching objectives of the Water Act and the purposes of the Basin Plan.

Delivery of Commonwealth Environmental Water Holder Water

While the CEWH has considerable planning, coordination and transactional responsibilities, it obviously cannot itself carry out the operational work involved in environmental watering ie the releases and manipulation of flows, and the ongoing monitoring, involved in ‘river operations’. For this it must rely extensively on a network of partnerships and contractual arrangements. The CEWH lists on its website some 56 ‘delivery partners’, including Basin State Environmental Water Holders and Managers (three in Queensland, three in New South Wales, one in Victoria and one in South Australia), river operators (two in Queensland, seven in New South Wales, 11 in Victoria and one in South Australia), monitoring and evaluation bodies (three universities and one ecology consultant), catchment specific organizations (eg environmental organizations, community groups and traditional owner bodies) as well as key Commonwealth Government agencies (MDBA and the Bureau of Meteorology).⁵⁷

The CEWH’s role in environmental watering is pivotal in developing and achieving the objectives of the environmental watering plan, both as a holder of water itself but also as a leader in the Basin-wide, cross-jurisdictional scheme. The scheme is necessarily a co-operative effort requiring both a Basin-wide view and significant local engagement to ensure local knowledge, feedback and co-operation. The Commissioner has observed that the CEWH appears to have embraced this role and has already built a good network of relationships.

An internal audit report of the Australian Government in relation to CEWH operations, dated 17 October 2017, was recently made public in an answer to a Question on Notice in the Senate by Senators Hanson-Young and Patrick.⁵⁸ The report sets out an assessment by Ernst & Young of risks to the CEWH's ability to meet its statutory obligations posed by arrangements with Basin States.⁵⁹ It identifies, as noted by the Commissioner, that the CEWH relies heavily on non-binding agreements and its relationships with Basin States in the effective carrying out of its watering objectives. This must be accepted as an inherent characteristic of environmental watering generally, and the Commissioner notes the effort and commitment required by all parties to establish the trust and co-operation necessary for the scheme to work successfully.

In 2012, the CEWH established a five-year agreement with Nature Foundation SA for the delivery of up to 10 GL of environmental water annually, the first such agreement between the CEWH and a non-government organisation for the outsourced delivery of environmental water. In early 2018, the agreement was extended for a further 12 months.⁶⁰

Water has been delivered to more than 80 sites, mostly on private land in order to complement other government projects.⁶¹ This has been guided by a Five-Year Watering Strategy and annual watering schedules, reflecting the priorities of the Basin-wide environmental watering plan, and the MDBA and South Australian Government's annual watering priorities.⁶² Water is transferred from the CEWH to Nature Foundation SA following the provision of environmental watering proposals outlining the sites to be watered and the volume required.⁶³

Localism

Nature Foundation SA emphasized to the Commissioner that its management of environmental water on behalf of the CEWH represents an approach that facilitates 'localism'. Mr Hugo Hopton, Nature Foundation SA, explained 'localism' as an approach based on the idea that communities should 'have a hand in influencing' the management of their local environment, and that programs for environmental works and water delivery should be informed by the unique knowledge of local communities. It also generates community support for environmental management. Mr Hopton added:

*our experience in South Australia is that you can't have good business without good environment and if you don't have good environment and good business then you don't have good community.*⁶⁴

Ms Natalie Stalenberg of Nature Foundation SA, said:

the Water for Nature Program works very closely with the network of Landcare groups in the Riverland and the Murray lands. So we believe that it's better to utilise existing community networks than trying to go in as an organisation and to recreate those networks. And also there's the local knowledge there as well. So we work — at the moment we work with Berri Barmera Landcare who hires an irrigation

*technician for us. We also work with Riverland West Landcare and are utilising their services to engage the community at Cadell where we're also working with the Central Irrigation Trust to hopefully deliver environmental water this season. And then further south we work with Goolwa to Wellington Local Action Planning Association.*⁶⁵

Nature Foundation SA has commented that the introduction by the CEWO of Local Engagement Officers has been 'particularly successful' by fostering 'local connections to engage with landholders to create more watering projects'. In addition, it described the CEWO's community workshops as 'very successful and well-attended'. However, it also considered that additional funding should be provided to the CEWO in order to increase existing activities, facilitate more public workshops, invest in technologies such as drones and animations in order to provide more graphic illustrations of environmental watering's benefits, and spread stories about successful environmental watering actions.⁶⁶

The Commissioner notes that, in addition to fostering localism to achieve its objectives, the CEWH has committed to a 'good neighbour' approach. The CEWH website outlines this as involving the aim of avoiding harm from watering events, using local knowledge, negotiating consent to watering events, being treated the same as all other water entitlement holders, and being flexible about asserting rights to channel capacity where there are competing demands.⁶⁷

Working with traditional owners

Traditional owners have a vital relationship with the water resources of their traditional Country, and have significant specialist knowledge about local ecosystem functions and requirements (see Chapter 11).

The CEWH has demonstrated a commitment to build relationships with local traditional owners and to utilize their knowledge and skills in order to achieve environmental outcomes, while also supporting environmental watering that achieves cultural benefits ('cultural flow') eg by improving the habitat of and providing refuge for animals with special cultural significance, supporting the growth of vegetation traditionally used in bush medicine, craft, ceremony artefacts and food sources, and supporting the maintenance and preservation of spiritually significant sites.⁶⁸

Importantly for the development of environmental watering practices that are both based on the best available science and that optimise social and economic outcomes, including cultural outcomes for Aboriginal Australians, the CEWH has partnered with a range of organizations representing traditional owners in different areas of the Basin. For example:

- with the NRA, an agreement was entered into in 2015 to enable the NRA to propose watering events that, if approved, it may undertake directly with water allocations transferred to it by the CEWH

- a Memorandum of Understanding has been under development with the Ngiyampaa-Wayilwan people since 2016, aimed at identifying opportunities for collaboration and the use of CEWH water on Country
- a collaborative arrangement is in place with the Nari Nari Tribal Council and the OEH (NSW) to deliver CEWH water to Toogimbie Indigenous Protected Area, overseen by Nari Nari Rangers, and
- work with the Maraura and Barkandji Traditional Owners has been undertaken to monitor changes in ecological and cultural values from environmental water delivered to significant creeks and wetlands on the Tar-Ru Lands.⁶⁹

Constraints

The further development and future success of environmental watering to achieve the objectives of the Basin environmental watering plan, and thereby the objects of the Water Act, is inhibited by certain physical constraints as well as other operational constraints such as Basin States' water allocation and delivery rules. The nature and effect of constraints is discussed in detail in Chapter 8. They have obvious implications for the future success of the Basin environmental watering plan.

Mr Papps said in his submission that he had 'concerns' about constraints and the lack of action by Basin States to assist to overcome them.⁷⁰ In evidence before the Commissioner, he explained the difficulty of achieving desired downstream environmental watering when, for example, the volume of water required to deliver the desired outcomes will result in some overbank flows and flooding of properties on the way. He said:

it would be unwise of any Commonwealth Environmental Water Holder to knowingly flood private land

... one of the most fundamental things that needs to be established between the Commonwealth program and private landholders is trust and this goes to the heart of that trust. They know that it won't happen.⁷¹

Monitoring and evaluation

The Water Act and Basin Plan contain a variety of requirements for the MDBA, CEWH, the Department of Agriculture and Water Resources (**DAWR**) and Basin States to monitor, evaluate and report on regarding the Basin Plan's environmental outcomes.

Statutory obligations

Murray-Darling Basin Authority

The Water Act provides that the MDBA's core functions include to:

- measure, monitor and record the condition of water-dependent ecosystems of the Basin
- support and conduct research and investigations about the Basin water resources, and
- collect, analyse and interpret information about Basin water resources and water-dependent ecosystems, and to disseminate such information to the extent the MDBA considers it desirable to do so.⁷²

Chapter 13 of the Basin Plan adds further detail to these responsibilities, requiring the MDBA to apply specific 'principles' in carrying out monitoring, namely that the findings from monitoring and evaluation should enable decision-makers to use adaptive management; that the best available knowledge (including scientific), evidence and analysis should be used where practicable, and that, to the extent possible, there should be open access to the information collected, used in, or generated by monitoring and evaluation.

The MDBA must also undertake the following reporting actions:

- an evaluation of the effectiveness of the Basin Plan against the targets and objectives in its Chapters 5, 8, and 9 and provide a yearly report (and it has published a Basin Plan Annual Report each year since 2014)⁷³
- advice to the MinCo about the impacts of the Basin Plan before the end of 2020⁷⁴
- a 10-year review of the Basin Plan.⁷⁵

Furthermore, Sched 12 of the Basin Plan requires the MDBA to report every five years on the protection and restoration of water-dependent ecosystems and ecosystem functions in the Basin, including for the purpose of strengthening their resilience in a changing climate; the extent to which the Basin Plan has affected environmental as well as social and economic outcomes in the Basin; the achievement of environmental outcomes by reference to the targets in Sched 7; the fitness for purpose of the Basin water resources, and progress towards the water quality targets in Chapter 9.

Finally, Chapter 13 of the Basin Plan requires the MDBA to conduct a review of the environmental watering plan, and assessment of the monitoring, evaluation and reporting capacities relevant to the chapter, no later than five years after the Basin Plan commences. The MDBA has indicated that these matters will form part of its 2020 review.

Basin States

From 2020, Basin States will be required to report on the achievement of environmental outcomes at an asset-scale every five years. In support of this obligation, WRPs must specify the monitoring of water resources that will be undertaken for the purposes of meeting its reporting obligations.⁷⁶

The South Australian Government has told the Commissioner that it is confident that its own monitoring arrangements are sufficient to enable it to report on environmental outcomes in relation to its environmental assets. Its proposed approach is to report on the ecological objectives and targets identified in each of its three LTWPs, with the aim of addressing three key matters: the extent to which expected environmental outcomes are being achieved; the reasons for any failure to achieve them; and the extent to which the provision of water in line with environmental water requirements is contributing to the expected outcomes. As previously noted, there are only six LTWPs in place. South Australia's LTWP for the River Murray WRP area was prepared in 2015, and the South Australian Government has informed the Commissioner that this was tested in 2017 and the lessons learnt shared with the MDBA and other Basin States.⁷⁷

Commonwealth Environmental Water Holder

The CEWH must provide the Minister with an annual report on its operations, and the report must be tabled in Parliament. It must include particulars on achievements against the objectives of the environmental watering plan, information about any disposals of CEWH water holdings and the purpose for which the proceeds have been used.⁷⁸

Environmental watering in practice — progress and gaps

Environmental watering plan

As part of its Basin Plan Evaluation 2017 (**2017 Evaluation**), the MDBA noted that the environmental watering plan has, for the most part, been implemented effectively. However, it identified a number of shortcomings and opportunities for improvement, based on feedback from environmental water holders and managers:

- some of the Basin-wide expected environmental outcomes are difficult to address in some catchments. For example, it is difficult for environmental watering to reach some areas of the floodplain within current operating constraints
- some of the environmental assets identified, such as significant waterbird sites, are not always manageable with environmental water
- there is a need for improved integration between different sets of expected outcomes, such as those relating to flows and vegetation, or vegetation and waterbirds. There

is an absence of objectives for ecosystem functions, which would help link flow to ecosystem responses

- water management strategies for native vegetation and waterbirds are not as detailed as those for fish. Some strategies could be updated to reflect subsequent research, and
- climate change adaptation mechanisms are not detailed.⁷⁹

In relation to the setting of Basin annual watering priorities, feedback to the MDBA has indicated that improvements could include:

- developing more specific priorities
- increasing transparency by outlining more clearly how Basin-wide datasets have been applied to develop priorities
- identifying alternative priorities for different climate and resource scenarios from those predicted
- re-sequencing publication dates to ensure Basin States can adopt Basin priorities in their own planning, and
- incorporating longer term outcomes and multi-year priorities.⁸⁰

The Commissioner has not received any evidence suggesting that the Basin Plan's prescribed ecological objectives and targets were not appropriate when selected, or that, after six years, they need to be revised. The Commissioner accepts, then, that they continue to represent important and appropriate ecological aims for the Basin Plan, but notes that until LTWPs are introduced and implemented there are significant gaps at the local level in the scheme for environmental watering.

Current monitoring arrangements

Although the Water Act and Basin Plan identify the environmental outcomes that are to be pursued, assign responsibility to the MDBA for monitoring Basin-scale outcomes, and specify a regime of periodic reporting and review, the specific character or design of programs that might fulfil those obligations are largely left to the discretion of the responsible parties.

The MDBA, CEWH and Basin States administer a variety of programs to monitor and evaluate the actions taken to improve the Basin's ecological health. For example:

- Monitoring has continued under TLM to record the ecological condition of six Icon Sites along the River Murray where environmental water has been delivered and environmental works and measures have been constructed since 2002, and reports for each site have been published annually since 2006.

- Additionally, over the past three years, Basin States and the Commonwealth have collaborated on a range of projects as part of the Joint Venture Monitoring and Evaluation program. Projects delivered in 2017–18 included improving fish monitoring tools, establishing a fish genetics project capable of testing the location of fish spawning, completing a Basin-wide microchemistry map to trace fish movements, and further developing the Basin-wide spatial stand condition tool for vegetation.⁸¹
- Another notable program is the Long Term Intervention Monitoring (**LTIM**) overseen by the CEWO, which commenced in 2014. It involves the ongoing monitoring of, and compilation of annual reports on, the ecological responses to the CEWH’s environmental watering at seven ‘select areas’. These results are also aggregated to develop annual Basin-scale evaluations of the outcomes of the CEWH’s environmental watering in relation to hydrology, stream metabolism and water quality, ecosystem diversity, vegetation diversity, fish and genetic diversity. In addition, a report is published each year assessing the overall impact of CEWH’s environmental watering on the three overall Basin Plan environmental objectives: biodiversity, ecosystem function and resilience.⁸²
- Basin States also conduct a large number of their own monitoring programs. For example, in South Australia, wetland monitoring is carried out by the statutory South Australian Natural Resources Management Board for the SA Murray-Darling Basin, in partnership with local action planning associations, Landcare groups and community groups.⁸³ The Commissioner heard evidence about the monitoring undertaken by Nature Foundation SA.

Gaps in monitoring

In its reports summarizing the main findings of the 2017 Evaluation in relation to outcomes for native fish, native vegetation, river flows and connectivity and waterbirds, the MDBA identified a variety of critical gaps or deficiencies in monitoring and data collection to date, which prevented a more comprehensive assessment of progress to date. For example:

- there is no Basin-wide native vegetation monitoring program, making it difficult to determine progress towards maintaining recruitment of River Red Gums, Black Box or Coolibah at the Basin-scale⁸⁴
- there is no widespread mapping, monitoring or reporting of Lignum Shrubland vegetation⁸⁵
- information gaps made it difficult to determine if there have been periods of growth of vegetation that closely fringe the Basin’s main river corridors⁸⁶
- there is no consistent dataset providing evidence of the current condition of five of the 25 key native fish species in the Basin⁸⁷

- the Basin-wide fish survey is limited in its capacity to demonstrate population structure for less abundant and widespread species,⁸⁸ and fish surveys need to be improved to understand the distribution and abundance of short-lived freshwater species⁸⁹
- the existing hydrological dataset to monitor environmental water under the Basin Plan contains substantial gaps and uncertainties⁹⁰
- a standard, non-model based approach to assessing baseflows is needed⁹¹
- the existing framework is inadequate for detecting the quantum of hydrological change that can be attributed to the Basin Plan⁹²
- current arrangements do not allow explicit tracking of environmental water through the Barwon-Darling, so there is insufficient data to quantify improvements in connectivity⁹³
- it was difficult to quantify the contribution of the Basin Plan to maintaining levels in the Lower Lakes due to a lack of data about how much environmental water moves through to the end of the system.⁹⁴

Proposals for improved alignment and coordination

The MDBA has suggested that some gaps in monitoring arrangements could be addressed by improving collaboration and coordination between the relevant bodies. In a submission to the Productivity Commission, the MDBA noted that ‘developing a clear evaluation outcome from the current disparate and ‘holey’ sources of data is difficult’, and:

The principal approach used by the MDBA has been to define a project, commission it and then collect the evidence from on-ground data gathering programs. However, the Basin is too big, the MDBA budget is too small and there are too many players for this to be a sound basis for our evaluation and reporting.

We need to better leverage a small budget, improve the capacity to do future evaluations by pivoting the MDBA environmental monitoring and evaluation from commissioning to aggregating and analysing information from a range of external sources.⁹⁵

The MDBA suggested that a more effective approach could involve identifying possible partners for collaboration, such as universities, co-operative research centres and State agencies; determining what data is available and where the gaps lie, and developing a network in which the MDBA can access and synthesize shared data from others’ research, rather than commissioning its own.⁹⁶

It is evident that the many and disparate monitoring programs throughout the Basin would benefit from an improved alignment in their purpose and outputs. Consistency with relevant Basin Plan requirements could also be improved. For example, the MDBA

has expressed concern that there is no suitable framework outlining how asset-scale information will be consistently reported by Basin States, and evaluated by the MDBA, to meet the requirements of Sched 12 of the Basin Plan.⁹⁷ In addition, since many of the Basin States' current asset monitoring programs were established prior to the Basin Plan, in many cases there are no explicit links to the BEWS or the priority assets and functions to be described in the LTWPs.⁹⁸ Similarly, an independent review of the structure, progress and effectiveness of the CEWO's LTIM found that its evaluation framework is not entirely consistent with the BEWS.⁹⁹

The MDBA has also identified the need for improvements in how monitoring data, once obtained, is used to inform Basin-scale evaluations and adaptive management. Specifically:

- at individual sites, monitoring is informing water use, but regional and Basin-wide datasets are not being as well integrated to provide broader insights¹⁰⁰
- there has been a large focus on annual reporting by the MDBA, Basin States, the DAWR and the CEWH, but reports produced under Sched 12 of the Basin Plan are 'still treated largely as a reporting obligation, rather than an evaluation of Basin Plan implementation',¹⁰¹ and
- the reporting requirements prescribed by the Basin Plan, and the guidelines to the annual and five-yearly reporting, should be reviewed to ensure they are yielding information useful for adaptive management.¹⁰²

The MDBA has recently taken a number of steps to address these challenges. One is the proposed development of a revised monitoring and evaluation framework to 'more clearly identify the evaluation purpose, themes, questions and approach, and define a process for aligning questions and information requirements'.¹⁰³

The South Australian Government informed the Commissioner that the MDBA is consulting with Basin State governments, the CEWH and the DAWR about the proposed new framework, (expected to be completed by November 2018), and understands it will provide for the reporting and aggregation of asset-scale information, and identify the specific questions to be used in evaluating the outcomes and effectiveness of the Basin Plan.¹⁰⁴ Once the new framework is agreed with Basin States, the MDBA proposes to collaborate with them to develop an Engagement Plan for the 2020 Evaluation, to ensure clarity is required and by when, and to assist jurisdictions with project planning and allocating resources.¹⁰⁵

The MDBA has informed the Productivity Commission that the development of a Basin Science Platform is in progress, and that it is implementing a Knowledge Acquisition Strategy that facilitates co-operation between Basin governments. However, the MDBA noted that even if these strategies were to be implemented, additional funding will be needed to adequately address the identified gaps in knowledge.¹⁰⁶

Lack of funding

Mr Papps submitted that the Commonwealth and Basin States must significantly increase their funding for long-term ecological monitoring in order to properly understand the outcomes achieved over time.¹⁰⁷ He noted that, although the CEWO's own LTIM represents contemporary best practice in Australia, and has just enough funding to facilitate adaptive management, 'it really needs, in order to be as good as it can be, a greater investment in funds'.¹⁰⁸ More generally, Mr Papps commented that 'there is no way to do the job that is being asked of any environmental water manager, let alone the CEWH, without proper ecological monitoring'.¹⁰⁹

Other witnesses lamented the discontinuation of one of the Basin's most successful condition monitoring programs, the Sustainable Rivers Audit (SRA). The SRA, coordinated by the MDBA on behalf of the Basin States and managed by an independent group of river ecologists, reported on the condition of key ecosystem components and overall river health.¹¹⁰ Its two reports, which provided 'report cards' for each of the Basin's 23 river valleys, were published in 2010 and 2012. However, in 2012 the New South Wales Government cut 60% of its funding contribution to the joint management of the River Murray system and, shortly after, Basin governments decided to discontinue the SRA.¹¹¹

Dr Celine Steinfeld of the Wentworth Group of Concerned Scientists (**Wentworth Group**) submitted that, 'without the ability to track the condition of the Basin it is not possible to understand the ecological changes at a valley and Basin scale'.¹¹² In Associate Professor Jamie Pittock's view, no program of commensurate independence and scientific rigour has replaced the SRA, and its absence represents a 'major failing'.¹¹³ Similarly, Mr Peter Cosier stated:

*Managing the health of the Murray-Darling Basin rivers without the Sustainable Rivers Audit would be like trying to manage the Australian economy without the national accounts. It's just not possible.*¹¹⁴

In a similar vein, Dr Anne Jensen observed that the SRA's discontinuation has prevented a thorough assessment of whether the Basin Plan requirement that there be no further decline in respect of prescribed environmental targets is being met.¹¹⁵

Independence of evaluations

In evidence, the Wentworth Group highlighted the importance of engaging independent experts to undertake evaluations of the Basin Plan. There is a concern that the current monitoring and reporting regime enlists the MDBA as the primary evaluator of its own progress towards achieving environmental outcomes, or as the entity responsible for contracting and funding external reviews.

In the final report for its inquiry into National Water Reform, the Productivity Commission recommended that the Commonwealth and State and Territory governments should establish arrangements for independent auditing, at least triennially, of environmental watering programs and their contribution to environmental outcomes. It was suggested that regular, accurate and unbiased assessments could increase the effectiveness and efficiency of environmental water delivery.¹¹⁶

The Commissioner heard evidence about the significant barriers faced by members of the independent scientific community who wish to be involved. Dr Jensen described the reality that many scientists working in this field are highly dependent on funding from government sources. That funding has been reduced considerably in recent years, and is rarely committed to long-term initiatives. Rather, scientists have to ‘jump through so many hoops’ to obtain funding that is generally only provided on a short-term, project-to-project basis.¹¹⁷ In Dr Jensen’s view, this has the consequence of discouraging young scientists from seeking out this important work:

*It certainly affects the recruitment of project officers in the field, in natural resource management. ... I suspect we’re heading towards a situation where we don’t have the long-term data records such as those we get from someone like David Paton ...*¹¹⁸

Nature Foundation SA also told the Commissioner that it perceived a deficiency in funding for local monitoring, noting that it is very difficult for local groups to access funding to monitor environmental outcomes at a site-scale.¹¹⁹

The Commissioner has noted evidence to the effect that the current programs for monitoring and evaluation are insufficient to enable a confident assessment of progress to achieving environmental outcomes. It appears that, if current gaps and lack of coordination are not remedied, a proper accounting of the Basin Plan’s effectiveness will not be possible when future reviews are undertaken. In the meantime, these deficiencies may be limiting the capacity of water managers to realize the full benefits of adaptive management.

Environmental outcomes to date

Restoring and protecting the Basin’s ecology will require a long-term commitment. However, there is evidence available of some outcomes observed to date.

Evidence of the Murray-Darling Basin Authority

It is widely accepted that environmental watering has generated some positive ecological responses. The MDBA and CEWH have provided many examples of localized benefits to particular sites in the Basin where environmental water has been delivered. The Wentworth Group’s November 2017 assessment of progress towards environmental outcomes concluded that, following the delivery of almost 9000 GL of environmental

water in the first four years of the Basin Plan's implementation, the Basin's environment was in a better condition than it would have been without the Basin Plan.¹²⁰

The 2017 Evaluation has been the most comprehensive assessment to date as to progress in achievement of the intended Basin-wide environmental objectives and targets. In aggregating a broad mixture of previous monitoring results, the MDBA has been optimistic, stating that, given the information available, early signs indicate the Basin Plan will produce some positive long-term outcomes.¹²¹ Broadly, it identified that the rate of waterbird decline has reduced, and there are many clear signals that native fish and vegetation have responded positively to environmental water.¹²² However, in particularizing the state of progress towards the BEWS's 36 outcomes expected by 2024, the MDBA revealed a mixed record. It found that progress towards 14 outcomes was 'on track', for 10 it is 'too early to tell', and for 12 there is 'insufficient evidence'.¹²³

At a more limited scale, in May 2018 the MDBA published an Icon Site Condition Report that provides a high-level assessment of the overall performance to date against objectives for the six TLM Icon Sites. While thin on detail, its overall conclusion is that the past 10 years of monitoring provides strong evidence that, when environmental water has been delivered, the health of Icon Sites has improved.¹²⁴ Nevertheless, the breakdown of results does not present a uniformly positive picture, as outcomes have varied between sites. In 2016–17, of the site-specific objectives assessed:

- Lower Lakes, Coorong and Murray Mouth: three were met, seven partially met, and two not met
- Chowilla: seven were met, seven partially met, two not monitored, and one inconclusive
- Lindsay-Mulcra-Wallpolla: two were met, four partially met, one not met, and one not monitored
- Hattah Lakes: seven were met, one partially met, one not met, and one not monitored
- Koondrook-Perricoota: two were met, one partially met, four not met, and one not monitored
- Gunbower: six were met, three partially met, two not met, and one not monitored, and
- Barmah-Millewa: six were met, two partially met, one not met, and two not monitored.¹²⁵

In evidence, Dr Jensen criticized this report for tending to overstate the levels of achievement. For example, in relation to the Lower Lakes, Coorong and Murray Mouth, an overly generous definition of 'partial' achievement has been applied.¹²⁶ Footnotes indicate that, of the two vegetation objectives purported to be partially met, only 25% of targets were met for the first, and only 20% of local targets were met for the second.¹²⁷ This can explain why the headline results did not accord with Dr Jensen's own observations of

the region's health. A/Professor Pittock also described the report as a 'public relations exercise' that presented findings ambiguously, and glossed over important information such as the areas of wetlands that had been restored compared to those that had not.¹²⁸ This report, it follows, does not represent the desirable standard of accurate, transparent and informative reporting required by the Water Act.

The Commissioner considers the MDBA's findings, while tending towards the positive, are certainly not the basis for a confident assertion that the Basin Plan's expected outcomes are likely to be achieved.

Other expert evidence

Other expert evidence before the Commission has highlighted some areas of ongoing concern. Experts have identified examples of key sites within the Basin, including Ramsar-listed wetlands, whose condition has not improved, or may have declined, since the Basin Plan's implementation.

Professor Richard Kingsford offered the Commissioner a range of evidence suggesting that the Basin Plan is currently not likely to achieve its intended environmental outcomes.

First, in his written submission Professor Kingsford expressed concern about the Narran Lakes Nature Reserve, a Ramsar-listed wetland that owes that status to its importance for the breeding of colonial waterbirds. Recent research has predicted that, under current conditions, the Basin Plan will generate large flows capable of facilitating Ibis breeding only one year in 6.71 years. This is an improvement on the status quo but a reduction of 59% from pre-development periods. Professor Kingsford considers that this fails to meet the Commonwealth's Ramsar obligations in relation to the site, and is likely to necessitate a notification of changed ecological character under art 3.2 of the Ramsar Convention.¹²⁹ Furthermore, research published in 2017 indicates that although 2800 GL of environmental water recovery will likely lead to an overall increase in waterbird abundance by 18% over pre-Basin Plan levels under current conditions, this improvement is likely to be reduced to only 1% under the 2030 median climate change scenario.¹³⁰ Viewed in this way, current progress to achieving environmental outcomes could be substantially negated by a changing climate.

Second, Professor Kingsford considers the four flow targets for the Macquarie Marshes, supposedly met under a model of 320 GL of environmental water recovery in the Northern Basin, do not adequately represent the complexity of the flooding regime required to support the site's ecological values. Professor Kingsford's view is that the MDBA's recent decision to revise down the environmental water targets for the Macquarie Marshes by 12 000 ML per year did not appear to account for the large volume of evidence, beyond the results of simplistic modelling, that the site is in a state of very

poor health.¹³¹ As a result, despite projections that the MDBA targets will be met, there is some doubt that the health of the Macquarie Marshes will improve satisfactorily.

These concerns about the state of Ramsar sites appear to be recognized, at least in a broad sense, by the MDBA. It acknowledged in a 2017 report that:

*Although water has been delivered to all manageable Ramsar sites since the implementation of the Basin Plan, the ecological character of some sites may still be at risk. This may mean Ramsar sites are not being inundated with sufficient frequency, constraints may be limiting the area of the floodplain which can be inundated, or other factors may be impacting the site.*¹³²

Third, Professor Kingsford drew the Commissioner's attention to the poor health of the Darling River. A series of studies published by the MDBA in 2018 in relation to low-flows in the Barwon-Darling, intended to inform the development of the Barwon-Darling LTWP, identified alarming risks to the region. It found that periods of low or no-flow downstream of Bourke have been significantly longer since 2000, and in some instances this has not improved since the Millennium Drought.¹³³ This has increased the risk of algal blooms in the Darling River.¹³⁴ Reduced periods of low-flow will continue to jeopardize the conditions necessary to maintain populations of native fish and other aquatic biota, support regular breeding, maintain water quality and provide longitudinal connectivity through the Barwon-Darling.¹³⁵ The report concluded that in order to sustain the ecological health of the Barwon-Darling, there is a need to minimise the duration of longer, very low and no-flow periods.¹³⁶ In order to do that, changes to Basin State water management and allocation rules or practices will be required to ensure the protection of environmental water to increase the likelihood of achieving ecological targets.

Finally, as discussed in Chapter 7, Professor Kingsford also raised concerns that the proposed supply measure at the Menindee Lakes increases the risk to critical populations of waterbirds and Golden Perch.¹³⁷ In that way, the implementation of the Basin Plan may well in fact further degrade an already vulnerable region.

The continuing vulnerability of the Coorong and Lower Lakes region, one of Australia's most important wetland areas, is a subject on which the Commissioner received evidence from a range of independent ecological experts. Taken together, this evidence raises serious doubts about the efficacy of the current Basin Plan to achieve its purposes.

The Wentworth Group gave evidence that the current availability and management of water is inadequate to maintain the ecological character of the Coorong, Lower Lakes and Murray Mouth.¹³⁸ Dr Jensen considers that the interim targets for the Basin Plan, requiring no loss or degradation in the Coorong, Lower Lakes and Murray Mouth, are not being met.¹³⁹

Associate Professor David Paton AM provided comprehensive evidence about his concerns relating to the Coorong. For example, since the end of the Millennium Drought,

the abundance of some shorebird species appears to have recovered, although other waterbird species have not.¹⁴⁰ He explained the importance of the Coorong in various ways, including:

So things like birds ... will come and aggregate onto the Coorong in dry periods, during the droughts, but they will come there in summertime when they're largely ephemeral wetlands, dry, but they will go back and breed next year when they refill. And so the Coorong becomes this critical refuge for both migratory shore birds from other countries which come to its shores, but also for many of our water birds. And the irony is in the middle of the Millennium Drought the Coorong and the Lower Lakes were absolutely critical. They probably housed 95 per cent of the birds, from the estimates I have heard, of ...

... It's the absolute refuge. It's the last place. It's — the one place that you should be looking after is this wetland.¹⁴¹

A/Professor Paton's own monitoring surveys have indicated lower numbers of waterbirds in 2017 than in the preceding two years.¹⁴² Since 2013, the Coorong's Southern Lagoon has experienced increasingly serious outbreaks of filamentous green algae, likely due to increased nutrient and reduced salinity levels. This has negatively impacted the resilience of *Ruppia Tuberosa*, and has prevented access to food and habitat resources for the many shorebirds that depend on the Coorong.¹⁴³ In A/Professor Paton's opinion, current management actions and the volumes of environmental water being returned to the Coorong and Lower Lakes under the Basin Plan are unlikely to be sufficient to support the needs of waterbird populations.¹⁴⁴ He emphasized the fact that, although salinity levels in the Lower Lakes and Coorong have tended to be the subject of most focus, water levels, and the insufficiency of flows to achieve them often enough, are a significant problem.

So when you talk about ... balancing salinity and water level, water level has hardly been dealt with within the Murray-Darling Basin Plan, and there's a fundamental issue for the Coorong, and that is the flows that used to come were enough to lift the water level and keep the water level up through the Coorong through spring and into early summer, and then they drop.¹⁴⁵

'Enhanced environmental outcomes' and the Coorong

It is clear from all the evidence received by the Commissioner that a Basin-wide environmental water recovery target of 2750 GL is highly unlikely to be sufficient to restore the Coorong and Lower Lakes to a sustainably healthy condition.

The Commissioner was referred by the South Australian Government to its submission to the MDBA on the draft Basin Plan in April 2012, recommending that the MDBA should undertake further modelling of water recovery amounts greater than 2750 GL with constraints relaxed and removed.¹⁴⁶ The other Basin States did not support this, but South Australia lodged a Notice of Disagreement under sec 43A of the Water Act,

and on 29 June 2012 the MinCo requested the MDBA to model and assess the benefits of recovering 3200 GL of water for the environment with relaxed constraints.¹⁴⁷

Further modelling was undertaken by the MDBA and although, as the South Australian Government told the Commissioner, it did not have access to the modelling itself, the South Australian Government undertook its own analysis based on the outputs produced by the MDBA to test whether certain water recovery scenarios would satisfy the South Australian Government's identified environmental water requirements. According to the resulting report 'South Australian Government Science Analysis of Additional Basin Plan Modelling':

*In South Australia, water recovery of 3200 GL and relaxing constraints is the only scenario that achieves the MDBA's 80 000 ML/day environmental water requirement. Flows of this size over 30 days are important for fish and bird breeding and to support red gum forests and lignum shrub lands.*¹⁴⁸

In its submission to the Commissioner, the South Australian Government said the 450 GL to be recovered from efficiency measures will be 'critical' to delivering the outcomes set out in subsec 86AA(2) of the Water Act and Chapter 8 of the Basin Plan and to 'enhancing outcomes for the Coorong and Lower Lakes and the floodplain in South Australia regardless of whether constraints are addressed'.¹⁴⁹

The detail of the water recovery scenario modelling and results, and the subsequent decisions made over the past six years, including following the sustainable diversion limit adjustment mechanism amendments, are examined elsewhere in this report. The essential point is that the South Australian Government has consistently urged for a Basin Plan that will deliver additional water to the environment, Basin-wide, in the order of not less than 3200 GL. South Australia's reasoning is based on the research of its own scientists and those of the Goyder Institute for Water Research,¹⁵⁰ and the environmental water requirements and the salinity targets for the Lower Lakes and the Coorong that it has consistently held to be essential.¹⁵¹ The other jurisdictions, in contrast, have deemed some of these requirements and targets to be aspirational, and somehow not on the same level of importance as other Basin environmental requirements. This is evidenced by the description in sec 86AA of the Water Act of the outcomes that may be achieved with the recovery of an additional 450 GL as 'enhanced environmental outcomes'.

A recent report from an Expert Panel (including A/Professor Paton) commissioned by the Goyder Institute for Water Research says in its executive summary:

The Coorong is considered to be the most important waterbird wetland in the Murray-Darling Basin. It has been degraded to the point where it is at risk of losing key elements which make it such an iconic wetland of local, national and international importance.

On top of a long-term decline in the condition of the site due to water extractions, the Coorong was substantially degraded during the Millennium Drought. Several characteristics of the Coorong have undergone a substantial and sustained change. Most notably this has included large reductions in the abundances and [sic] some waterbirds, particularly fairy tern and migratory shore birds. This is associated with the prevalence of filamentous algae that is preventing aquatic plants from completing their life-cycle and interfering with the ability of waterbirds to feed on both plants and invertebrates in mudflats. The system is now in a vulnerable state and may have little capacity to absorb continued and cumulative environmental stress resulting from water extractions and changes in climate.¹⁵²

The Expert Panel Report concerns immediate threats to the South Lagoon and the options available to water managers to optimise conditions to support its ecology in the short-term, including the use of current environmental flow provisions, barrage operations, Murray Mouth dredging and the use of flows from the south-east of South Australia. However, the Expert Panel emphasizes that these are recommended as short-term actions, to be employed ‘in addition to environmental water recovery and successful implementation of the Murray-Darling Basin Plan’.¹⁵³ When the Expert Panel says that the Coorong is currently in a vulnerable state¹⁵⁴ and may not cope with ‘continued and cumulative environmental stress’ from water extractions and climate change, surely this is exactly the kind of threat of ‘serious or irreversible environmental damage’ that the principles of ecologically sustainable development,¹⁵⁵ to be applied in administering the Water Act, demand action to prevent.¹⁵⁶

Conclusion

It is clear from the evidence received by the Commissioner that the water recovery program and environmental watering undertaken since the introduction of the Basin Plan has helped to improve the health of the Basin’s ecosystems. There have been some positive environmental outcomes in some water resource areas. But it is early days in a long-term strategy. In ecological terms, the full implications of responses to environmental watering are simply not possible to determine in the short term, and in any event require very careful expert assessment and interpretation. In light of the independent expert evidence referred to above, the Commissioner is concerned that some reports of results by the MDBA are eliding inauspicious results in order to present a falsely positive picture.

The Water Act, Basin Plan and the BEWS articulate a set of environmental objectives and targets that are ecologically comprehensive on a broad scale. Basin States must reflect these broad targets at the local, water resource area scale in their LTWPs and supporting WRPs. Many LTWPs and their supporting WRPs are still being developed, and the implementation of these more specific, directed strategies are vitally instrumental to the full implementation of the broader Basin strategy. Broader improvements to the condition of Basin ecosystems, as indicated in the examples given by the experts heard by the

Commissioner, are dependent on the urgent implementation of the LTWPs and WRPs that will provide for local restorative action across the Basin. The setting of annual watering priorities allows the lessons of adaptive management to be regularly incorporated into Basin-wide and local planning, which the Commissioner considers to be an effective, and necessary, approach.

Knowing whether those objectives and targets are being achieved is contingent on effective monitoring and evaluation. The evidence of the MDBA itself, as well as other witnesses, clearly calls for the expansion and improvement of monitoring programs. This will require a substantial increase in funding by governments, as will the work necessary to improve linkages between programs and to align them with statutory requirements, and to collect and analyse large volumes of monitoring data and research outputs. Rather than decreasing funding and abolishing the SRA, governments should be strengthening their commitment to effective monitoring programs. The calls of the MDBA and other experts for more resources have been clear, and should be acted upon.

The ‘best available scientific knowledge’ cannot seriously be limited by the arbitrary scope of whatever work happens to be produced — it surely implies that public funds will be allocated to permit enough such work to continue. The MDBA’s functions in relation to ‘research and investigations about the Basin water resources’ expressly include a role to ‘support, encourage and conduct’ those activities (para 172(1)(d) of the Water Act). Money is needed on an assured and prolonged basis — ie as a core recurring expenditure — in order for the MDBA to perform its proper lead agency tasks with respect to the evidence-based restoration and protection of the Basin water resources.

It is also evident that evaluating outcomes should not be a task left to the MDBA alone. The status quo lends itself to the publication of reports, such as the 2017 Evaluation and Icon Site Condition Report, which can blur the line between substantive analysis and the language of public relations. Credible evaluation requires independent analysis by disinterested experts, and a culture that embraces peer-review and transparency as hallmarks of the best available science.

The Water Act and Basin Plan’s scheme for environmental watering, through water recovery and other methods, has now been embarked upon, and some positive results are being achieved. The planning and operational elements have been slow to start, with the essential WRPs and LTWPs mostly yet to be approved as elements that will work within, and contribute to the whole. At the same time, there is a great deal of room for improvement to ensure the scheme works effectively, and this will require a much greater level of commitment and funding by the Commonwealth and Basin State governments.

The surface water system of the Basin has become highly engineered. But there is no going back to pre-development. The dams, weirs and barrages are now all essential for the maintenance of the activities on which the way of life of many Australians depend. But the natural landscapes and environments have not only been modified or ‘regulated’,

they have been, too often, degraded. That is a central premise of the Water Act (subpara 21(2)(a)(i)).

We know that without working to restore sufficient levels of flow, in the right ways and in the right amounts, we will jeopardize the survival of the connected ecosystems that make up the whole. Environmental watering, as required by the Water Act, is the way in which our engineered water resource system can be adaptively managed and assisted to survive and maintain a level of resilience to enable it, at the very least, to avoid collapse.

While the national vision manifested by the Water Act to bring the Basin's water resources back to relative health is admirable, the execution to date of the Basin Plan is disappointing. Basin States have been slow to implement it, and the resources invested in it inadequate. But another concern sits behind these — the lack of real commitment to get the overall Basin Plan settings right, based on science.

It is a generally accepted truism that a river dies from the mouth. The evidence heard by the Commissioner is that this is still an imminent risk for the Murray-Darling Basin system, because, despite the science available to inform it, the current Basin Plan is unlikely to return sufficient flows to the Murray Mouth and the Coorong. A/Professor Paton told the Commissioner:

You know, this is not new about flows coming in and what the risks are. You know, [they have] been suggested since the '70s, some of these proposals. They've been put on hold while new information is meant to be collected, governments were meant to be collecting that information. It hasn't happened and it's like we're just revisiting the same issues time and time again, and the fundamental reason for that I believe is that we have failed to invest in the science to give you the knowledge and the understanding to actually get the best outcome for the Coorong. And that has to stop.

Governments have to start investing in science to solve the problems that they are going to get, which are only going to get worse because the quantity of water coming back is less than what might be needed, and because climate change is very likely to change that as well. So for me, if I was saying there's a message that people need to appreciate and government agencies need to appreciate, is you've got to start investing in the science. Not doing scientific assessment at the last minute so you can tick off a box that you've done it, and that's what's been going on for not just the last five years, since the Plan ... It has been going on for decades.¹⁵⁷

This is distinctly not a matter of one particular Basin State's interests. It is a matter of national interest and international interest, through Australia's treaty obligations.

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14 Interception Activities

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Chapter Summary

This chapter explores some specific issues identified throughout public consultations and in evidence before the Commissioner involving consideration of the overlap between water management and land use planning laws, and the inter-relationship between Commonwealth and State authorities responsible for their enforcement. Although State legislation,¹ policies,² and instruments³ are relevant to the matters discussed herein, it is beyond the scope of this chapter to provide a detailed analysis of them.

The issue of floodplain diversions⁴ was frequently raised before the Commissioner as a significant concern for many communities. Although floodplain diversions are most prevalent in the Northern Basin, concerns were also raised in Broken Hill, Mildura and Renmark.⁵ Based on the evidence before the Commissioner, significant increases in floodplain diversions have resulted in large unaccounted volumes of water being extracted from flows over floodplains. This raises serious concerns about compliance with the long-term cap on diversions (**Cap**), the assessment of sustainable diversion limits (**SDLs**), and the achievement of environmental and community outcomes.

This chapter will focus on jurisdictions where floodplain diversions are most problematic, namely New South Wales and Queensland. The response of the State governments invites consideration of their contributions to full and proper implementation of the *Water Act 2007* (Cth) (**Water Act**) and *Basin Plan 2012* (Cth) (**Basin Plan**). As for the Murray-Darling Basin Authority (**MDBA**), its approach to floodplain diversions is obviously key to its role in administering the Basin Plan in these regions.

Community concern was also expressed in New South Wales in relation to the *Water Sharing Plan for the Barwon-Darling Unregulated and Alluvial Water Sources 2012* (NSW) (**WSP**). Low pumping thresholds and increased pump sizes have produced significant community resentment and a sense that irrigation interests have been favoured to the detriment of the environment and the communities. A serious re-evaluation of these rules is needed before the finalization of the water resource plan (**WRP**) for the Barwon-Darling.

Finally, community concern has been expressed regarding the substantial expansion of particular crops and the effect such expansion may have on the use of the Basin's water resources. This concern has been primarily raised in Victoria regarding the increase in planting of permanent crops, particularly almond trees, around the Sunraysia region, but concerns have also been expressed regarding the expansion of plantings in the North of the Basin, such as cotton.

Interception activities

Definitions and scope

Interception activities are defined by the Water Act as ‘the interception of surface water or groundwater that would otherwise flow, directly or indirectly, into a watercourse, lake, wetland, aquifer, dam or reservoir that is a Basin water resource’.⁶ Interception activities include commercial forestry, farm dams and bores, as well as floodplain diversions.⁷

The Basin Plan defines floodplain diversions as ‘the taking of water from a floodplain, including after it leaves a watercourse during a flood’.⁸ Floodplain diversions may originate from ‘local runoff that has not yet entered the main channel of a river, or from water that has overflowed from the main channel of a stream during a flood’.⁹ Floodplain diversions may occur through works purposely built to pump water off floodplains or via works built for multiple purposes such as levees, conveying works and off-river storages.¹⁰ The analysis offered in this chapter does not necessarily specify how floodplain diversions have occurred, although some specific examples are provided.

History of accounting for floodplain diversions

Cap on diversions

As discussed in Chapter 1, the growing awareness of the environmental consequences of the over extraction of water resources produced an agreement between contracting governments to impose a long-term average Cap. At the time the Cap was agreed the contracting governments included New South Wales, Victoria and South Australia. The Australian Capital Territory and Queensland joined later, with Queensland joining in July 2008.¹¹

The Cap is reflected in Sched E of the Murray-Darling Basin Agreement (**MDB Agreement**). The purpose of the Cap was to establish a limit on the volume of surface water used for consumptive purposes ‘(including, without limitation, water from waterways and distributed surface waters) in order to protect and enhance the riverine environment’.¹² The Cap was not intended to limit water resource development.¹³

The Cap defines diversions by reference to ‘the formula entered in the Diversion Formula Register for that river valley’.¹⁴ The Diversion Formula Register (**Register**) is established pursuant to cl 4 of the MDB Agreement. The formula entered in the Register may be amended from time to time by the MDBA.¹⁵ A review of the development of the formula reveals that floodplain diversions were not initially included. The current formula, adopted by the MDBA on 8 November 2011, introduced floodplain diversions for each water resource area in New South Wales and Queensland.¹⁶ Floodplain diversions are

therefore diversions for the purpose of the Cap. Bringing floodplain diversions into the Cap is consistent with the context of the MBD Agreement more broadly, which defines diversion as including ‘abstractions, impoundings and appropriations of water that reduce the flow of a river’¹⁷ — such definition being sufficiently broad to encompass floodplain diversions.

The Cap also defines the ‘baseline conditions’ against which compliance with the Cap is to be measured.¹⁸

In the case of New South Wales, the baseline conditions means ‘the level of water resource development for rivers within the Murray-Darling Basin (**Basin**) as at 30 June 1994’¹⁹ (with some allowance made for the Pindari Dam in the Border Rivers).²⁰ Water resource development is determined by reference to matters including ‘the infrastructure supplying water’²¹ and ‘trend in the level of demand for water within and from the Murray-Darling Basin’.²² It is unclear what is meant by ‘trends in the level of demand’. Subject to any evidence in relation to the trends in demand for water resource development as at 30 June 1994 (which has not been provided to the Commission), it is apparent that the level of water resource development for the purpose of the Cap must be referenced against development that existed as of 30 June 1994. That is not to say that the Cap is the volume of water that was used in 1993–94. It is the water that would have been used with the infrastructure that existed in 1993–94 taking into account weather and hydrological conditions.²³

In the case of Queensland, the baseline conditions means ‘the conditions set out for each river valley in the Resource Operation Plan (**ROP**) first adopted by the Government of Queensland in that river valley and published in the Queensland Government Gazette’.²⁴ The ROPs for the three WRP areas that form Queensland’s component of the Basin were developed and adopted at different times. The ROPs for the Moonie and Warrego Rivers were first notified in the Queensland Government Gazette on Friday, 20 January 2006.²⁵ Section 3 of each ROP defined the commencement date for the ROPs as the first business day after being notified in the Gazette — that day being Monday, 23 January 2006.²⁶ The ROP for the Condamine-Balonne River was first notified in the Gazette on Friday, 12 December 2008.²⁷ Section 1 of the Condamine-Balonne ROP provides that it commenced on Monday, 15 December 2008.²⁸ It is noted that the MDBA’s 2010–11 annual report stated that the Cap for the Condamine-Balonne was set during 2010–11.²⁹

National Water Initiative

The 2004 Intergovernmental Agreement on a National Water Initiative (**NWI**), agreed to by the Council of Australian Governments, laid out the requirements for water access entitlements and planning frameworks to ‘protect the integrity of water access entitlements from unregulated growth in interception through land-use change’.³⁰ The ‘interception’ referred to in the NWI includes ‘intercepting and storing of overland flows’.³¹ The NWI recognized that interceptions ‘present a risk to the future integrity of

water access entitlements and achievement of environmental objectives' if not subject to planning and regulation.³² The NWI required all Australian jurisdictions to assess the significance of interceptions on water resources and apply appropriate planning and management measures to protect the integrity of access entitlements and environmental objectives.³³ It was agreed that States would implement measures in relation to water interceptions by 2011, including that significant interception activities be recorded, licensed, and a robust compliance and monitoring system be implemented.³⁴

Water Act

Chapter 3 discussed the requirement of the Water Act to establish an environmentally sustainable level of take (ESLT). As discussed in that chapter, the premise of the Act is to ensure that the environment is not 'compromised' having regard to the legislated fact that Basin water resources have been overallocated. Establishing the volume of water required for the environment must be determined independently from any volume of water used for consumptive purposes. It is only once the ESLT is established, based on the criteria prescribed in the Water Act, that the SDLs may be set for each water resource area. Of course, SDLs must reflect an ESLT.³⁵

Importantly, the Water Act requires the ESLT be established by having regard to interception activities.³⁶ Accordingly, any further information that emerges regarding floodplain diversions will necessarily require a reconsideration of the ESLT.

Given the relevance of interceptions to the ESLT, the Water Act requires the Basin Plan to identify the risks to the condition or continued availability of the Basin water resource arising from them.³⁷ As the risks associated with, and management of, interception activities must ultimately be managed under WRPs, the Water Act requires the Basin Plan to state, for the purpose of accrediting WRPs, those requirements that relate to the regulation of interception activities with a significant impact on the sustainable use of water resources, whether on an event by event basis or cumulatively.³⁸ The Water Act contemplates that WRPs may require water access rights to be held for specific kinds of interception activities.³⁹

Section 172 of the Water Act expressly provides that the MDBA's functions and powers include measuring, monitoring and recording floodplain diversions.⁴⁰

Basin Plan

Risks of floodplain diversions to Basin water resources

Objectives of the Basin Plan include to protect and restore connectivity between water-dependent ecosystems by ensuring that 'ecological processes dependent on hydrologic connectivity laterally between watercourses and their floodplains (and associated wetlands) are protected and restored' (sec 8.06(3)(b)(ii)).

The Basin Plan recognizes that interception activities may compromise Basin water resources. The risks identified include insufficient water, or water of unsuitable quality for environmental, economic, social, cultural, Indigenous and other public benefit uses.⁴¹ The only strategy identified in relation to such risks is to improve upon the knowledge of the impact on Basin water resources from ‘interception activities, land use change, floodplain harvesting and peri-urban and industrial take’ (sec 4.03(3)(h)).

The Basin Plan shifts the onus onto Basin States to manage interception activities through WRPs, which are required to be prepared having regard to the current and future risks of interceptions to the condition and continued availability of water resources (sec 10.41). WRPs must list the types of interception activities with the potential to significantly impact upon water resources (sec 10.23(1)). In giving consideration to whether the interception activity is likely to have a significant impact, regard must be had to the location and projected growth of the activity (sec 10.23(3)). If a WRP identifies interception activities likely to have a significant impact it must set out a process for monitoring that activity (sec 10.24) and detail the action to be taken if that activity is compromising environmental watering requirements (sec 10.25).

Baseline diversion limits

The Basin Plan sets out the baseline diversion limits (**BDLs**) for each water resource area by reference to a formula. The BDL formula ultimately specifies the long-term limit on the quantity of water that can be taken under a transitional or interim plan immediately before the SDL has effect on 1 July 2019. The establishment of the BDLs are part of, and relevant only to, the risk assignment provisions under the Basin Plan. The BDLs are not relevant for the purposes of establishing the ESLT or SDLs. BDLs are discussed in more detail in Chapter 12.

The Commissioner was not directed to any agreement or provision in the Water Act or Basin Plan that permits the BDLs to exceed the Cap under Sched E of the MDB Agreement. Thus, for example, a reference in the BDL to the level of take for a water resource as at 30 June 2009 could not, in the case of New South Wales, exceed diversions as at 30 June 1994.

Treatment of floodplain diversions

Murray-Darling Basin Authority

The MDBA must account for floodplain diversions to establish SDLs (which must reflect an ESLT). Accounting for floodplain diversions is necessary for ongoing compliance and cap reporting.⁴²

The Guide

The Guide to the proposed Basin Plan (**Guide**) proposed that SDLs would capture all forms of water extraction.⁴³ Interception activities would necessarily be limited by SDLs.⁴⁴ The Guide stated that WRPs would be required to specify which types of water access rights, including for interception activities, would be accounted for.⁴⁵

The Guide recognized that floodplain diversions are ‘less well measured’.⁴⁶ That was something of an understatement. It stated that floodplain diversions were generally quantified by ‘using a specified hydrologic model’⁴⁷ but it ‘will be important that the data and accuracy of floodplain [diversions represented] in hydrologic models are improved over time’.⁴⁸ No estimate was provided in the Guide about reductions to water run-off due to floodplain diversions.

The lack of knowledge in relation to floodplain diversions was identified as a ‘high priority’ and it was recommended that improved knowledge for floodplain diversion estimates be obtained. It is noted that high priority risk management strategies should be implemented within six months of the Basin Plan or WRP coming into effect.⁴⁹

Establishing the ESLT and Basin Plan assumptions

In establishing the ESLT, the MDBA does not, however, appear to have obtained any such new information or knowledge about floodplains or floodplain diversions. The approach evidenced in the Guide appears to have remained unchanged. The MDBA subsequently asserted that prior to the making of the Basin Plan it undertook two projects to estimate floodplain diversions, namely on-ground monitoring and remote sensing, which the MDBA claimed made significant progress in relation to floodplain diversion estimates.⁵⁰ Following the making of the Basin Plan, the MDBA left arrangements for floodplain diversions to be ‘implemented by the Basin states’.⁵¹

At the time the Basin Plan was made it was estimated that interceptions accounted for 2733 GL⁵² without specifying the contribution, if any, of floodplain diversions to this volume. It was only in its 2017 Report on Cap Compliance that the MDBA confirmed that the Basin Plan assumed floodplain diversions accounted for 210 GL.⁵³

In its submission to the Commission, the MDBA acknowledged serious compliance issues relating to floodplain diversions.⁵⁴ This was also identified by the Productivity Commission.⁵⁵ Despite the MDBA being on notice that floodplain diversions give rise to serious compliance issues, this does not seem to have provided any impetus for the MDBA to exercise its powers to monitor or measure them.⁵⁶

New South Wales

New South Wales’ ‘Floodplain Harvesting Policy’ was first released in May 2013 (**2013 policy**).⁵⁷ It appears that little progress was made in implementing the 2013 policy

prior to the 2017 Ken Matthews Investigation, discussed in more detail in Chapter 16. Since Mr Matthews' final report in November 2017, significant materials have been released by the New South Wales Government.⁵⁸ The materials are largely repetitive. A consultation period in relation to the 2013 policy was held between March and June 2018.⁵⁹ A revised policy was released in September 2018 (**2018 policy**). The 2018 policy is largely identical to the 2013 policy.

The main features of the 2018 policy are that a 'supply work approval' and a 'floodplain harvesting access licence' are required in order to legally take water via floodplain diversions. Only works constructed on or before 3 July 2008 will be eligible for approval.⁶⁰ A floodplain harvesting licence will not necessarily be issued for the full volume of water capable of diverting or historically diverted as of the 3 July 2008 cut-off. The 2018 policy exempts 'floodplain [diversions] from specified licensing and approvals requirements of the [*Water Management Act 2000* (NSW) (**WM Act**)]',⁶¹ presumably until the 2018 policy is fully implemented. It is noted that floodplain diversions includes rainfall run-off.⁶²

To implement the 2018 policy the New South Wales Government will first assess applications for supply works approval. This will involve capacity and environmental assessments. The advertising and appeal provisions of the WM Act will not be applied to supply work approval applications.⁶³ Information obtained will be used to inform and refine modelled floodplain diversion estimates.⁶⁴ It is proposed that a committee of irrigation stakeholders be established 'to maximise the robustness of the modelling and ensure that parameters relating to farm operations accurately reflect actual behaviour to the greatest degree feasible'.⁶⁵ Water sharing plans will then be amended to make provisions for floodplain diversions, including rules limiting account balances and carryover.⁶⁶ Floodplain harvesting access licences will then be issued. Metering will be required to monitor floodplain diversions. The metering will be rolled out over a three-year period.

Under the 2018 policy, permanent trade in floodplain diversion entitlements is to be permitted subject to it being demonstrated that the vendor has decommissioned his or her floodplain diversion infrastructure.⁶⁷

Workshops were held in Dubbo, Sydney and Tamworth between Monday, 8 October and Friday, 12 October 2018. The purpose of those workshops was to provide further information about monitoring and auditing of floodplain diversions,⁶⁸ specific accounting rules applicable to regulated rivers,⁶⁹ as well as in relation to modelling and data collection.⁷⁰ A further round of workshops is expected to occur in early to mid-2019, at which time the New South Wales Government proposes to present the outcome of an independent review, model calibration results and revised floodplain diversion results.⁷¹

In November 2018, the New South Wales Government released its 'Draft Floodplain harvesting and auditing strategy'⁷² for consultation. The strategy proposes that floodplain diversion be recorded daily during a flow event, weekly during the irrigation season (1 October to 28 February), and monthly for all other times including for 'direct

temporary storage'.⁷³ It is proposed that the recording of floodplain diversions include the date, the storage level, the storage volume, a reason for a change in volume and the details of the person who reviewed and recorded the storage level.⁷⁴ Reports must be provided to WaterNSW within one month of the end of a 'floodplain harvesting or rainfall event'. An annual report must be submitted one month after the conclusion of the financial year.⁷⁵ Records of floodplain diversions must be kept for at least 10 years. Maintenance and calibration of gauge boards are to occur every 10 years.⁷⁶ Independent verification will be undertaken to establish whether the self-reporting falls within 'reasonable limits of accuracy'.⁷⁷ There is no guidance as to what is meant by 'reasonable limits of accuracy.' Records will be independently verified, which may involve use of satellite images, farm water balance calculations and direct comparisons between licence holders.⁷⁸ It is expected that 10% of licence holders will be audited each year, subject to resources.⁷⁹ The Natural Resources Access Regulator will be responsible for monitoring compliance and enforcement.⁸⁰ Trade of floodplain diversion entitlements will not be permitted in unregulated river water sources until licences have been issued. An exception is proposed for the Barwon-Darling.⁸¹ No explanation is provided to justify why an exception for the Barwon-Darling is proposed. Evaluation and review of the approach will occur over the first two years, and if necessary a revised approach will occur in the third year.⁸²

It is apparent that New South Wales proposes to account for floodplain diversions by increasing the BDL for water resource areas. The New South Wales Government has said:

The Basin Plan allows for BDL estimates to be revised whenever a demonstrably better estimate is available. The hydrological models used for the original BDL estimates represent river diversions and flows accurately; however, the floodplain harvesting diversions were not well represented.

*The Floodplain Harvesting Project remedies this with an unprecedented investment in data and modelling to quantify these floodplain processes more accurately. This allows limits to be correctly estimated, and accounting arrangements to be put in place to meet these limits.*⁸³

The proposed increases to BDLs will be based on simulated diversions for the 2008–09 level of development.⁸⁴ A revised BDL model has so far only been released for the Gwydir regulated river system. The revised model proposes to increase the BDL by 132 GL.⁸⁵

Queensland

Floodplain diversions are required to be licensed pursuant to the *Water Act 2000* (Qld) and in accordance with the applicable Queensland WRPs and ROPs. As an example, in the Warrego-Paroo-Nebine, a person may take 'overland flow' under certain prescribed circumstances, including under a water licence⁸⁶ or 'if the works that are used to take the

water are existing overland flow works.⁸⁷ Existing overland flow work authorizations may be granted a water licence. For the purpose of granting a licence, any existing works must be clearly identified,⁸⁸ and consideration must be given to the average annual volume of water the person was allowed to take.⁸⁹ A water licence to take overland flow water must state at least one of the following — the maximum rate at which the water may be taken and volume of water that must be stored, the volumetric limit for the water and the average annual volume for the water.⁹⁰

Approvals for infrastructure to harvest and store floodplain diversions are determined in accordance with Queensland planning laws.

Information is not readily available that accounts for the volume of floodplain diversions in Queensland. The WRP for the Warrego-Paroo-Nebine accredited under the Basin Plan by the MDBA on 15 June 2017 states only that floodplain diversions are estimated to be small and are contained in the estimate for the BDL.⁹¹ It is not expected that there will be any further increase to floodplain diversions in the water resource area.⁹² No proposal has been identified to change BDLs due to floodplain diversions.

Evidence before the Commissioner

Environmental impacts of floodplain harvesting

Contrary to the submission by the Queensland Government,⁹³ the Commissioner does not agree that the Northern Basin Review (**NBR**) provided new information about floodplain watering requirements. As discussed in Chapter 10 of this report, there is a lack of scientific understanding about floodplain-dependent ecosystems and what happens to the water that reaches floodplains. This was identified as a particular concern in the NBR in which the MDBA failed to demonstrate the volume of water needed to achieve environmental outcomes in the Northern Basin,⁹⁴ including for the Condamine-Balonne floodplain, the Macquarie Marshes⁹⁵ and for the sustainability of the Narran Lakes, for example, to support the breeding of colonial water birds. The Commissioner heard expert evidence that the MDBA's models made only 'a binary guess at what happens once the water gets out on to the floodplain'.⁹⁶ In Professor Richard Kingsford's opinion, the uncertainties of current hydrological modelling, including in relation to floodplain diversions, contribute to an undermining of the Water Act and Basin Plan.⁹⁷

Notwithstanding the gaps in knowledge, the Commission was directed to significant research in relation to the importance of floodplains to the ecology of rivers and ecosystems that 'rely on over-bank flows'⁹⁸ in specific areas. This research has demonstrated that the natural behaviours of Australian rivers and floodplains are being adversely impacted by floodplain diversions, raising serious concerns regarding the sustainability of many rivers, particularly in New South Wales.⁹⁹

Professor Kingsford has researched the impact of floodplain diversions on the ecological condition of the Barmah-Millewa Forest, Moira Marshes, Chowilla Floodplain, Macquarie Marshes and Gwydir Wetlands.¹⁰⁰ His research has demonstrated that floodplain diversions have alienated wetlands by reducing the frequency and volume of flows to them¹⁰¹ resulting in a ‘loss of connectivity’ changing aquatic systems to terrestrial ecosystems.¹⁰² Professor Kingsford observed that this has resulted in declining populations of fish, water birds, snakes, leeches and flood-dependent plants,¹⁰³ reductions of gastropod snails — affecting many other species that feed on invertebrates,¹⁰⁴ the replacement of aquatic vegetation by terrestrial vegetation¹⁰⁵ and a declining population of River Red Gums.¹⁰⁶

The Wentworth Group of Concerned Scientists (**Wentworth Group**) gave further evidence of the ecological impact of floodplain diversions. Dr Celine Steinfeld has documented the consequences of floodplain structures that hold water on floodplains for longer than would occur under natural conditions.¹⁰⁷ Dr Steinfeld observed that water maintained in off-river storages has killed River Red Gums. Floodplain diversions are therefore not only preventing water from reaching floodplains, they may also be inundating some areas with too much water for too long.¹⁰⁸ It is apparent that, depending upon the configuration of the structures on floodplains, floodplain diversions can have very different effects.¹⁰⁹ It is fundamental that ‘the local context and geomorphology of the landscape’ be understood so that an informed assessment can be made as to how floodplain diversions will impact the local ecology.¹¹⁰ Associate Professor Jamie Pittock gave evidence that the environmental impacts of floodplain diversions are likely to extend to many of the environmental works proposed under the projects for the sustainable diversion limit adjustment mechanism, discussed in Chapter 7.¹¹¹

Socio-economic effect of floodplain diversions

Professor Kingsford gave evidence that floodplain structures in the Northern Basin are contributing to ‘changing flow regimes, which is affecting agriculture downstream’.¹¹² Economic opportunities lost due to reduced floodplain flows was explored in Chapter 10, and include eco-tourism and floodplain grazing.

Not only do floodplain diversions deny economic opportunities across the Northern Basin, left unregulated they are ‘one of the most significant threats to water security in the Northern Murray-Darling Basin’ to both licence holders and downstream states.¹¹³ Witnesses informed the Commissioner that they considered the growth in floodplain diversions in Queensland and northern New South Wales has contributed to a reduction of small flows through the Barwon-Darling system, including in the Lower Darling.¹¹⁴ It is also apparent that floodplain structures may cause considerable nuisance to neighbouring properties. The tort of nuisance is discussed briefly in Chapter 8.

The Commissioner heard evidence from Mr Chris Lamey, whose experience provided valuable insight in this area. Together with his father, Mr Lamey owns a

farming property outside Toobeah, approximately 70 kilometres west of Goondiwindi in Queensland, growing mainly barley, wheat and chickpeas, and depending on conditions, cotton and sorghum in some years.¹¹⁵ Mr Lamey's property is on a floodplain bordering the McIntyre River, and rather than irrigating, the property ordinarily receives beneficial flooding that would occur approximately every 18 months, lasting for approximately five days each time. Mr Lamey explained that if a flood were to persist on his property for much longer than that, it could detrimentally affect the soil and ruin crops.¹¹⁶

However, from late 2012, Mr Lamey and his family observed increased development on the neighbouring property. In 2013, a bridge was constructed across the McIntyre River. Because the bridge did not span the width of the river, earthworks were built to fill the gap. This has the effect of constricting the flow of the river, particularly during flood events, potentially causing a greater holding back of floodwaters.¹¹⁷ Further, from 2011 Mr Lamey observed the construction of earthworks creating ridges of earth between 40–60 centimetres high that would be capped with gravel.¹¹⁸ These earthworks had the potential effect of a levy bank.

Following this development, Mr Lamey's property experienced significant flooding. Previously, the highest recorded flood at the property occurred in January 2011, measuring a level of 10.84 metres at the gauge on the bridge in Goondiwindi, which caused floodwaters to persist for about three weeks. However, in August 2016, a flood measuring 7.5 metres persisted on Mr Lamey's property for several weeks.¹¹⁹ A second flood occurred in September 2016 with the same effect.¹²⁰ A third flood occurred in March/April 2017.¹²¹ Overall, Mr Lamey states that during the 2016–17 financial year, his property was unusable for cropping due to inundation and waterlogging for a total of 110 days.¹²² Mr Lamey noted that it was unusual that the flooding not only occurred so frequently and for significantly greater periods of time, but that it was only his property and one other that were affected by these additional floodwaters.¹²³

Understandably concerned, Mr Lamey made persistent and concerted attempts to make enquiries about his situation with various local, State and Commonwealth Government agencies. Mr Lamey provided an extensive and detailed chronology of those attempts to the Commission.¹²⁴ It is unnecessary to detail that chronology in this report — a chronology of correspondences and contacts spanning a little over two years but consisting of 12 pages, in some ways makes its own point. However, even a limited exposition of the nature of the responses given to Mr Lamey demonstrates their deficiency, and Mr Lamey's frustration and concern is unsurprising and warranted.

For example, in response to Mr Lamey's initial enquiries regarding the construction of the bridge, having not received any notice or warning of its construction, he was advised by New South Wales officials that upon inspection in July 2014, it was determined it did not need development approval. From 2016, Mr Lamey made attempts to contact the relevant Queensland agency. He was finally given a contradictory response two years later in September 2018 that whilst development approval wasn't necessary for the bridge

constructed, Mr Lamey would not be able similarly to build a bridge without development approval.¹²⁵ This contradiction remained unexplained.

Regarding the earthwork construction, Mr Lamey was advised by the Goondiwindi Council in October 2016, that it had written to his neighbour advising that the earthworks were illegal structures and that they required removal. Following the floods in August and September 2016, Mr Lamey began contacting the Goondiwindi Council on a regular, weekly basis to attempt to find out whether any development applications had been made with respect to the earthworks. He was eventually provided with some documentation in December 2017, not by the council, but by the neighbour himself.¹²⁶ The Goondiwindi Council finally provided him with electronic copies of a development application dated August 2017 over a year later in September 2018.¹²⁷ It is an understatement that such a glacial response to reasonable, not vexatious, requests for information is wrong.

Mr Lamey has sought redress in civil proceedings, and whilst his family received disaster relief in October 2016, it did not include compensation for the loss of any crops or property.

Mr Lamey's experience would appear symptomatic of the potentially substantial impacts that are incurred by floodplain diversions, not only on the surrounding ecosystems, but to neighbouring agricultural development. Mr Lamey's experience also represents a case study in the haphazard and inadequate management of floodplain diversions, notwithstanding this significant impact on the management of the Basin's water resources.

Measurement of floodplain diversions

There are long-standing concerns about the growth of water storages in Queensland and New South Wales and the impact it will have on alternative consumptive and environmental uses.¹²⁸ A witness described floodplain diversions as 'the elephant in the room' including in terms of what it means for SDLs.¹²⁹ The Northern Basin Advisory Committee (NBAC) recommended that floodplain diversion policies be finalized as soon as possible.¹³⁰ The NBAC considered it was important to know how much water is being intercepted to establish BDLs.¹³¹

Witnesses agreed that floodplain diversions should be measured and licensed within the Cap.¹³² Witnesses expressed concern about how this would be achieved.¹³³ Importantly, before floodplain diversions can be licensed the volume of water being extracted must be known. At a minimum, a genuine attempt must be made to estimate the component of diversions attributable to on-farm storages in order to properly manage the Basin's water resources.¹³⁴

The volume of water diverted

Mr Andrew Close, former MDBA senior modeller, informed the Commission that in developing the Basin Plan, MDBA modellers included an estimate for floodplain diversions.¹³⁵ However, Mr Close stated that that estimate may need to be reconsidered.¹³⁶ The MDBA's own research suggests that the estimate (of 210 GL) used to inform the Basin Plan was wrong. The MDBA has reported that up to 1582 GL of water may be held in private storages in the Condamine-Balonne alone.¹³⁷ Evidence was also provided to the Commissioner indicating that the New South Wales Government has acknowledged that floodplain diversions have been 'grossly underestimated',¹³⁸ and may account for up to 600 GL in the Gwydir.¹³⁹ Further research conducted by Dr Steinfeld concluded that there are hundreds of kilometres of floodplain works in the Macquarie.¹⁴⁰ Notwithstanding requests made by witnesses about the actual volumes of water diverted, the quantity of water being diverted from the floodplains remains unknown.¹⁴¹

Methods to measure floodplain diversions

Professor Kingsford recommended a sequential analysis using historic aerial photography and satellite imagery of structures and that an audit should be completed valley by valley identifying the timing, location and size of the structures.¹⁴² The Wentworth Group agreed.¹⁴³ It was suggested that on-farm storage be immediately metered. This would not necessarily account for irrigators who pump diverted water straight onto crops.¹⁴⁴ Mr Close suggested that an estimation of floodplain diversions could also be done by remote sensing.¹⁴⁵ This method would not be particularly expensive in the long-term.¹⁴⁶ Cotton Australia submitted that while there may be some difficulty in metering floodplain water,¹⁴⁷ it could be measured to a relatively high degree of accuracy.¹⁴⁸ Mr Michael Murray from Cotton Australia provided an example of measuring of floodplain diversions on the Lower Balonne. Mr Murray informed the Commission that all storages on the Lower Balonne have been surveyed, and a buoy is used to measure the rise and fall in storage, thus measuring the volume of water extracted from the river.¹⁴⁹ The Wentworth Group also recommended a suspension of storage growth and pump size and that any growth in interceptions be offset by a reduction in consumptive water use.¹⁵⁰

Concerns about current State proposals

Professor Kingsford was concerned that the approach by New South Wales is to 'grandfather' floodplain structures, which are potentially diverting environmental water for irrigation purposes in circumstances where the amount being diverted is not known.¹⁵¹ Professor Kingsford is concerned the policy will affect assumptions relating to BDLs.¹⁵² The Wentworth Group agreed.¹⁵³

Professor Kingsford considered that licensing floodplain diversions is complicated by the location of structures and frequency of inundation. States will need to consider these factors when providing volumetric licences attached to approved works.¹⁵⁴ Finally,

Professor Kingsford stressed that floodplain diversions need to consider the reality of a drying river environment, otherwise licensing this activity will likely prioritize extraction over the environment, resulting in further overallocation.¹⁵⁵ His view is that the continued growth of floodplain development without auditing demonstrates a lack of commitment by the New South Wales Government to comply with the Cap.¹⁵⁶

The Murray-Darling Basin Authority proposal

Dr Emma Carmody from the New South Wales Environmental Defenders Office submitted that the MDBA proposes to raise SDLs by the corresponding increase to BDLs determined by the States.¹⁵⁷ In support of this, Dr Carmody tendered correspondence from the MDBA that stated:

An increase in the BDL to account for a wider range of water use will not impact the amount of water returned to the environment under the Basin Plan. If the BDL is changed, the SDL will also be changed to reflect the additional water use. This will not impact the achievement of environmental outcomes. NSW is expected to bring forward improved estimates of BDLs for floodplain harvesting in conjunction with its Water Resource Plans.¹⁵⁸

Mechanisms to adjust the SDL have been discussed in Chapters 7 and 10.

Dr Carmody queried whether the MDBA's proposed approach was consistent with the requirements under the Water Act that the SDL reflect an ESLT.¹⁵⁹ Dr Carmody submitted that it would be incorrect to increase the SDL as a result of increasing the BDL, and the reverse should probably occur.¹⁶⁰

The Commissioner was informed that the Commonwealth had purchased water diverted from floodplains, but that as the on-farm infrastructure has not been decommissioned, that water remains locked on the property from which it was purchased.¹⁶¹ This issue was also identified by the Productivity Commission.¹⁶²

Discussion

Regulation of floodplain diversions is long overdue. The action taken so far fails to match the expectations of the NWI. At the time the Basin Plan was enacted significant further work was needed in relation to how much floodplain water was being diverted and the implications of this for floodplains, rivers, wetlands and communities. The ESLT, SDLs, BDLs and water recovery targets for each water resource area were evidently established without an understanding of these matters. Even accepting that there was insufficient information available at that time, a precautionary approach to setting the SDLs would indicate that they not be set at the same level as the ESLT, nor that the ESLT selected be at the very limit of what the environment might be able to tolerate.

The response of the Queensland and New South Wales Governments, to account for the impacts of floodplain harvesting, including that of the MDBA, has been slow and remains incomplete. No explanation has been provided that could justify the delay in dealing with this issue. It is apparent that floodplain diversion policy decisions have the potential to exacerbate detrimental impacts on wetlands, waterbird breeding,¹⁶³ the health of flora¹⁶⁴ and fauna,¹⁶⁵ as well as ‘social well-being and economic livelihoods’.¹⁶⁶

In Queensland, a legal framework appears to have been in place for some time, at least to some extent, to regulate the construction of floodplain infrastructure. In addition, water licensing laws have been amended to require volumetric licensing of floodplain diversions. However, as the experience of Mr Lamey demonstrates, these laws seem not to have been properly implemented.

On the face of it, the water management and land use planning laws in Queensland, properly implemented, should already yield sufficient information in relation to the volume and growth of water diverted and stored off floodplains. The lack of readily accessible information in this regard raises transparency concerns.

In New South Wales, it is frankly remarkable that a floodplain diversion policy has still not been implemented. Although the policy has been revised, it reveals no substantial change that could justify the failure to implement it. There is no objection, in principle, to the approach canvassed by New South Wales that would require floodplain diversions to be licensed and floodplain structures to be approved, having regard to the impact of diversions and the construction of infrastructure upon the environment and downstream users by reference to a Floodplain Management Area Plan. There are, however, significant shortcomings with other aspects of the policy.

It is not clear why New South Wales proposes to assess only those works constructed on or before 3 July 2008. New South Wales risks breaching the Cap should the volume of floodplain diversions licensed be determined by reference to water resource development as of 3 July 2008 and not 30 June 1994. It is not clear how the New South Wales Government will confirm what works were in place as of 3 July 2008 as compared with how much water was capable of extraction by way of floodplain diversions as of 30 June 1994. Absent any information publicly available in this regard, community concerns that licensed floodplain diversions will breach the Cap and contribute to overallocation are well-founded.

Given the level of public scepticism about the relationship between the New South Wales Government and irrigation groups, it is remarkable that the policy proposes to remodel the long-term average level of take by consulting with irrigators only. This approach is contrary to the recommendations made by Mr Matthews. The same is true regarding the proposal not to advertise applications for supply works approval. The approval of large on-farm infrastructure is a matter of significant public interest. There is no justifiable reason why such applications should not be publicly known and, if

necessary, subject to community objection, particularly having regard to the potential nuisance caused by these structures.

The requirement to meter and monitor floodplain diversions, as expressed in the policy, appears to be significantly less sophisticated and reliable than the options canvassed by witnesses. It is unacceptable that the basic level of metering demanded under the policy will take three years to roll out. Again, the delay in metering has been the subject of criticism in other investigations and seriously undermines the credibility of the New South Wales Government's determination to deal with this problem. Further, it is disappointing that the floodplain diversion policy indicates no attempt to account for a possible climatic shift and the likely reality of a drying river system as a consequence of climate change.

One initiative, however, for which the New South Wales Government should be commended is its commitment to improving knowledge about, and modelling of, BDLs. Measures to improve upon existing knowledge are always to be encouraged. Inevitably, improved knowledge enables further discourse and contributes to improved policies. In the case of BDLs, improved knowledge directs further consideration to the risk assignment provisions under the Basin Plan, namely has consumptive water use been sufficiently or excessively reduced to achieve the SDL, which must reflect the ESLT? Of course, reassessing the BDL is just one part of this equation and needs to be accompanied by improved knowledge in relation to the ESLT requirements for the water resource area, having regard to the volume of water diverted from floodplains. Without this, any additional information about BDLs may be futile.

The New South Wales Government has so far only released a revised BDL to account for floodplain diversions in the Gwydir. The revised BDL model for the Gwydir is not accompanied by any updated scientific knowledge about the ESLT in that area. Evidently, further information of this nature is required in all areas where proposals to increase the BDL will be made. This information will be vital for WRPs. WRPs cannot be prepared in a manner that complies with the Basin Plan if the BDL is not assessed against the environmental watering requirements for those areas to ensure the continuing obligation to reflect an ESLT is satisfied.

In relation to the MDBA, the very significant difference between the Basin Plan's assumption of 210 GL to account for floodplain diversions, and the likely reality of that figure being significantly greater, means that either the work purportedly completed by the MDBA before the Basin Plan was enacted was inaccurate, or significant resource development has occurred since 2012, raising grave concerns about compliance by Basin States and the MDBA. It is plain that the calculation of the ESLT did not have regard to floodplain requirements, as repeatedly illustrated by the Guide, the ESLT Determination Report, and most recently the NBR. In this regard, the MDBA could have expected Basin States to provide more accurate information about floodplain diversions during the four years of study undertaken for the NBR (by which time floodplain diversions should have

been monitored in accordance with the NWI), or it could have exercised its own powers to do so. It makes a nonsense of the NBR for the MDBA to propose to increase SDLs once again, based on floodplain diversions that the MDBA had ample opportunity to assess.

Ultimately, the MDBA's proposal to increase SDLs by reference to increases to BDLs is unjustifiable. The Water Act intrinsically links SDLs to the ESLTs for each water resource area (SDLs must reflect an ESLT). The Water Act does not mention BDLs at all. Given the lack of information and informed modelling about the water requirements for floodplains, the MDBA cannot determine a change to SDLs. Any proposal to do so necessarily assumes that the ESLT can be determined (to increase) by reference to changes in consumptive use. That is plainly wrong. The ESLT must be established independently from consumptive use, not because of it. Should no re-examination of the ESLT occur then, firstly, there can be no basis upon which SDLs could be adjusted, but secondly, the only logical result would be to decrease SDLs as extractive entitlements will need to be further reduced to meet the ESLT. This may have significant and unwarranted implications for communities. The point is (in theory) that a change to the BDL does not necessarily result in a change to the ESLT or SDL, either by way of increase or decrease, but the only way this can be determined is if further research is undertaken to properly understand the watering requirements for floodplains having regard to the amount of water that is now understood to have been diverted from them.

Should the ESLT be reconsidered (albeit no such proposal has been identified), it may be permissible to increase the SDL if it is demonstrated that the volume of water being extracted from floodplains has no impact upon the watering requirements. However, it remains possible (or perhaps likely) that, by reference to new BDLs which have regard to the volume of water being extracted from floodplains, additional reductions from extractive entitlements may be required to achieve the ESLT.

The proposed treatment of floodplains by the Basin States and the MDBA has the potential to further undermine the original, and any future, assessment of the ESLT.

Barwon-Darling Water Sharing Plan

Background

As indicated above, the Commissioner heard evidence about concerns with the management of the Barwon-Darling River (**Barwon-Darling**). The Barwon-Darling is both perennial and ephemeral, and has been described as the 'artery of the outback'.¹⁶⁷ Flows into and extractions from the Barwon-Darling are subject to considerable annual variability. The current water sharing arrangements for the Barwon-Darling are governed by the WSP made pursuant to the WM Act.

Development of WSP

In October 2011, a draft WSP was placed on public exhibition. In accordance with the WM Act, recommendations were made to the Minister to amend the draft WSP following the public exhibition period. The WSP was declared pursuant to sec 50 of the WM Act and took effect from 4 October 2012. The WSP contained amendments to the draft WSP. It has been suggested that at least some of the amendments were in addition to those recommended to the Minister.¹⁶⁸ It is unknown which amendment(s) this suggestion relates to. The key differences between the draft and finalized WSP include:

- removal of total daily extraction limits
- removal of 450% limit on take over three consecutive years, and permitting carryover of 300% each year
- removal of the Ministerial discretion to remedy a breach of the Cap
- access to ‘no flows’ and ‘low-flow’ pumping thresholds
- introduction of an imminent flow rule allowing pumping to occur before the pumping threshold is satisfied
- extension of the period to convert licences with different pumping conditions, and
- permitting trade in share components between licences with different pumping conditions.¹⁶⁹

It was also identified that pump size limits for A Class licences under the *Water Act 1912* (NSW) of 80–150 mm in diameter were increased under the WM Act to permit A Class pumps of 600–660 mm in diameter.¹⁷⁰ The WM Act contained no prohibition on the storage of water extracted at low-flows.

In 2018, the New South Wales Government made several amendments to the WM Act following an investigation by Mr Matthews. Most of the amendments relate to compliance issues, which are discussed in more detail in Chapter 16. One significant amendment, however, was the inclusion of a Ministerial power to embargo pumping of flows for environmental purposes pursuant to sec 324 of the WM Act. An amendment was also made to the WSP to remove provisions relating to individual daily extraction limits (IDELs). IDELs had not, in any event, been implemented under the WSP.

Evidence before the Commissioner

There are long-standing concerns about flow, particularly low-flow, in the Barwon-Darling. As discussed in Chapter 10, it does not appear that any further research was done to inform policy development about water sharing arrangements in the Barwon-Darling following the 1996 Scientific Assessment Panel Report.

The Commissioner received evidence that the extraction rules under the WSP have resulted in decreased flows, no flows and increased duration between flow events for communities below Bourke, resulting in a worsening of environmental and social outcomes.¹⁷¹ This includes witnesses such as Ms Rachel Strachan and Mr Alan Whyte who attribute changes to the WSP to a reduction in small or low-flows in the Lower Darling.¹⁷² Ms Strachan also gave evidence that communities on the Lower Darling only found out about the changes to the WSP once they had been implemented. In Ms Strachan's view this demonstrated poor consultation and a lack of consideration of the connectivity of the river system, resulting in considerable impacts on stakeholders along the Lower Darling.¹⁷³ Ms Strachan gave evidence to the effect that this approach does nothing to engender confidence that issues such as connectivity will be dealt with appropriately in the development of WRPs.¹⁷⁴

Witnesses attribute the reduction in flows specifically to the lowered cease-to-pump thresholds and increased pump sizes.¹⁷⁵ These changes are seen as significant as even a 'small amount of extraction can have a big impact on a low flow'.¹⁷⁶ Increased carryover entitlements were also noted to be of concern, albeit it was accepted that carryover will necessarily be limited by water availability and the volume held in a licence holder's water account.¹⁷⁷ Witnesses expressed concern about the failure of the WSP to include any specific mechanism to protect environmental water, including on an event-by-event basis, making it susceptible to extraction upon entering the Barwon-Darling.¹⁷⁸ The Commissioner heard some evidence about how environmental flows were actively managed on an event-by-event basis before the WSP was declared.¹⁷⁹

It was put to the Commissioner that the changes to the WSP may have been made to satisfy irrigation demand.¹⁸⁰ Evidence from irrigator bodies suggested that changes to the WSP were made to compensate them for a significant reduction in their water entitlements.¹⁸¹ Whilst it appears true that irrigation entitlements along the Barwon-Darling have been significantly reduced, the Commissioner understands flows in the Barwon-Darling were rarely sufficient to enable those entitlements to be fully realized. In other words, the WSP made no significant change to water availability or use for the purpose of irrigation.

The Commissioner also heard evidence from irrigator groups rebutting assertions that the reduction in flows in the Barwon-Darling were a consequence of the WSP extraction rules. Instead, they suggested that natural inflows into the Barwon-Darling have been lower over the past six years when compared to the long-term average and that, as a consequence, water availability for all water users has necessarily been lower.¹⁸² In this regard, it was submitted that irrigators extracted only 110 GL on average over the past six years, being less than the long-term average permissible under the WSP.¹⁸³ It was also submitted that the environment receives 94% of inflows in the Barwon-Darling.¹⁸⁴ This statistic was qualified by reference to the long-term average only. It does not reflect those years where inflows were lower than the long-term average. It seems that, more often than

not, inflows into the Barwon-Darling, particularly this century, have tended to be less than the long-term average, sometimes significantly less.¹⁸⁵

Given the highly variable nature of flows in the Barwon-Darling, witnesses informed the Commissioner that it was overly simplistic and problematic to rely upon a long-term average¹⁸⁶ to represent flows or determine how water should be shared.¹⁸⁷

Protection of environmental water case study

Between April and May 2018 the Commonwealth Environmental Water Holder (CEWH) and the New South Wales Government coordinated a release of an environmental flow along the Barwon-Darling. This release of water was added to a previous unregulated flow to provide connectivity through the river system to protect and support native fish. This initiative was referred to as the ‘Northern Connectivity Event’.¹⁸⁸ To protect environmental water from extraction for the purpose of the Northern Connectivity Event, the New South Wales Minister embargoed pumping in the Barwon-Darling for environmental purposes pursuant to sec 324 of the WM Act.¹⁸⁹ It was the first time this power had been exercised. Had it not been exercised, environmental water may have been lawfully extracted as the flow threshold for pumping would have been satisfied, at least in some river zones.¹⁹⁰

The Northern Connectivity Event received support across the community. However, irrigator bodies expressed concern that the event would have been more complex had the embargo operated in circumstances where a natural flow occurred at the same time, thereby preventing irrigators from accessing their share of water. Irrigator bodies recommended that ‘more active management of environmental flows and water sharing on the Barwon-Darling’ occur in the future.¹⁹¹

The CEWH considered that the Northern Connectivity Event was an important mechanism for increasing understanding of the benefits of water connectivity for fish, in-stream habitats and water quality.¹⁹² The CEWH concluded that the event exceeded flow targets, produced successful interagency co-operation, effectively protected environmental flows and elicited a positive community response.¹⁹³ The lessons learned from the Northern Connectivity Event will inform future action.¹⁹⁴

Discussion

It is apparent that the development of the WSP was not informed by an understanding of the ecological and ‘downstream’ community impacts of extracting low-flows in the Barwon-Darling.

It is very likely that a decrease in natural inflows into the Barwon-Darling has contributed to a reduction in flows needed for the environment and communities, and that, as a result, irrigation extractions have also been less than the long-term average. This

serves to illustrate why it is problematic to base water sharing arrangements on long-term averages, particularly in highly variable systems. As explored in Chapter 6, the fact that the Basin may be experiencing a climatic shift renders the use of long-term averages almost meaningless. However, there is little doubt that the extraction rules under the WSP are impacting upon the environment and communities downstream of Bourke. It is not possible, based on the evidence before the Commissioner, to attribute or distinguish the impacts of the WSP as against the reduction of natural inflows. Obviously, further research in this regard is needed. That further research has been needed since 1996.

Concerns that the WSP was tailored to suit irrigation interests and has thereby fuelled community dissatisfaction and suspicion are understandable. Based on the evidence provided to the Commission, there appears to be some support for the assertion that irrigators have benefited far more significantly than other stakeholders.

The successful completion of the Northern Connectivity Event is encouraging and serves to reinforce the need for further and better research, and for intergovernmental co-operation. Undertaking further research has clear and appreciable benefits to inform decisions and assist communities. There is no reason why this research could not have been undertaken earlier, ideally before the WSP was finalized. Nevertheless, that research may still be undertaken, preferably before the finalization of the WRP for the Barwon-Darling. This may allow for matters of significant public interest and concern (such as pumping thresholds, pump sizes, carryover entitlements and mechanisms for the protection of environmental water) to be either reconsidered or clearly and rationally explained. It is noted that some of these matters, such as the protection of environmental water, are intended to be considered as part of the ‘toolkit measures’ arising from the NBR. It is nevertheless a matter that the New South Wales Government and the MDBA can consider specifically in the context of the rules governing water extractions in the Barwon-Darling. All witnesses appeared to agree that more active management of environmental flows is needed. The Commissioner considers the very genuine, tangible and significant level of community concern about the management of the Barwon-Darling cannot be left unaddressed.

Land use planning and water resources

As discussed in Chapter 1, agricultural development, particularly irrigated agriculture, expanded substantially during the latter half of the 20th Century. With that expansion has come concerns regarding its effect on the water resources of the Basin.

The Commission has received a number of submissions which have expressed concern regarding the expansion of cotton crops, particularly in the Northern Basin. Along with rice, cotton is often perceived by members of the Australian public as a ‘thirsty’ crop that is unsuitable for the Basin’s arid, water scarce, environment. Concern was also expressed regarding the expansion of irrigated permanent plantings around the Sunraysia region in Victoria, particularly almond crops. The Mildura Rural City Council (**Mildura**

Council) noted that 4500 hectares of permanent crops were planted in winter 2017, and a further 15 500 hectares were planned to be planted over the next five years.¹⁹⁵

Cotton Australia provided a detailed submission which addressed what was described as a misconception that cotton is a thirsty crop.¹⁹⁶ First, Cotton Australia, and its Chief Executive, Mr Adam Kay, argued that the increase in cotton plantations was an ordinary feature of the market informing what was the most profitable crop for farmers to produce. If cotton crops were not using water designated for irrigation use, other crops, which use a similar amount of water, would be.¹⁹⁷ Second, Cotton Australia argued that the Australian cotton industry is, in any event, highly water efficient and a world leader in water usage, referring in particular to a 40% improvement in water efficiency in the decade up to 2012.¹⁹⁸ Finally, as Mr Kay elucidated in evidence, as an annual crop, cotton is therefore able to adapt to changing availability of water, and is thereby arguably suited to the inherent variability of the Basin's water resources.¹⁹⁹ The Ricegrowers' Association of Australia also submitted to the Commission that the Australian rice industry was similarly a world leader in water usage.²⁰⁰

In any event, the mischief that the Water Act and the Basin Plan are designed to address is the reduction of the levels of extraction of the Basin's water resources that have been overallocated or overused. Save with respect to the provision of critical human water needs, neither the Water Act nor the Basin Plan purport to prescribe the consumptive uses to which the Basin's water resources should be applied, and nor should they. To do so would be to unduly affect the functioning of a viable market which would otherwise determine the best available use of those resources.

However, the appropriate regulation of the Basin's water resources necessarily requires appropriate regulation of land use in the form of local planning laws. Land use activities such as clearing vegetation and the planting of crops necessarily have an impact upon the use of water resources. As one necessarily affects the other, it is vital for the provisions of the instruments of water planning — such as the Water Act, Basin Plan, WRPs and Environmental Watering Plans — to be drafted and implemented in a consistent and coordinated manner with local planning laws, insofar as they regulate such activities, and vice versa. The maintenance of this connexion becomes especially crucial in circumstances where the development and promulgation of these fields of regulation are the responsibility of different entities and across different jurisdictions. The drafting and implementation of either cannot occur in a vacuum.

However, it is apparent that this connexion does not appear to have been either fully realized or implemented. Notwithstanding its significant work in developing horticulture planning within its jurisdiction, the Mildura Council has been effectively sidelined from the process of developing the relevant WRP.²⁰¹ The submission from the Murray Darling Association would suggest that this experience is not unique.²⁰² Without that connexion, there is a real risk that the achievement of the objects and purposes of the Water Act will be seriously undermined.

Conclusion

What is plain is that the issue of floodplain diversions raises real and complex issues. There has, however, been a clear failure to grapple with those complexities in a meaningful way for too long. A continued failure by the MDBA, and the New South Wales and Queensland Governments, to take action will prevent the achievement of the objects and purposes of the Water Act.

Whilst the issues thrown up by the WSP and the connexion between land use planning and water resources are more discrete, they too have the potential to impact on the achievement of the objects and purposes of the Water Act, particularly in the context of the Basin's broader, connected river system.

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15 Groundwater

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Introduction

Much of this report, and the materials and evidence upon which it is based, concerns the use and management of surface water in the Murray-Darling Basin (**Basin**). Whilst this emphasis is not surprising — surface water extractions considerably exceed groundwater extractions — it should not be taken as an indication that the use and management of groundwater is not problematic. On the contrary, it is universally accepted that the management of groundwater in the Basin is hydrologically and administratively complex, has been affected by poor or limited environmental management, and is attended by significant knowledge gaps in the relevant science. As a result, groundwater resources are at significant risk of depletion and contamination.

Many of the publications discussing groundwater by the Murray-Darling Basin Authority (**MDBA**) accept this fundamental starting point. However, on the materials before this Commission, in the absence of further explanation and clarification from the MDBA, there remain serious concerns about the efficacy of the MDBA's approach to groundwater management, and whether it is consistent with the objects and purposes of the *Water Act 2007* (Cth) (**Water Act**).

Background

Unlike surface water, there has been no historic cap on groundwater diversions. As a consequence, the *Basin Plan 2012* (Cth) (**Basin Plan**) will be the first legislative restriction on groundwater usage since the first bores were drilled in western New South Wales in 1879.¹ This regulatory apathy has had significant consequences. The absence of any interaction between the cap on surface water diversions (**Cap**) and groundwater extractions was noted in the early stages of the Cap, where water users were supplementing their restricted access to surface water by increasing groundwater extractions.² By 1999, the Murray-Darling Basin Commission (**MDBC**) noted:

*environmental mismanagement in the Basin over the past one hundred and fifty years has moved groundwater systems into a period of instability. Without adequate management the groundwater is also at risk of contamination. Rising groundwater is mobilising salt in many areas. Elsewhere, where the resource is being overused, rapid falls are being experienced. It will take many decades to adjust to a new equilibrium.*³

Recognizing the growing reliance on groundwater, the MDBC conducted a comprehensive overview of groundwater use and management in the Basin in 2000. It concluded that aquifer levels had decreased significantly in the period between 1990 and 2000, as a result of a lower rainfall recharge and increased use.⁴ It recommended the development of a 'rigorous and scientifically defensible approach' to sustainable take from aquifers, development of integrated management plans that recognized the connexion

between surface water and groundwater, and greater monitoring and measurement of aquifers and groundwater take.⁵

The National Water Initiative (NWI) in 2004 envisaged a management system of surface and groundwater resources that recognized the ‘connectivity between surface and groundwater resources and connected systems managed as a single resource’.⁶ It required contracting governments to identify connected groundwater and surface water resources by the end of 2005, and implement systems for the integrated accounting of groundwater and surface water use by the end of 2008.⁷ In 2007, in its first assessment under subsec 7(2) of the *National Water Commission Act 2004 (Cth)*, the National Water Commission (NWC) noted that ‘[u]rgent national effort’ was needed to ‘build the knowledge and capacity needed to jointly manage surface water and groundwater’.⁸ In 2009, the NWC made the following recommendation:

*that unless otherwise established, it should be assumed that all surface and groundwater systems are connected and that the eventual impact of groundwater pumping on surface water flow may be as high as 100%. This is the reverse of current practice.*⁹

In 2008, as part of the Sustainable Yields Project, the CSIRO produced a number of reports that outlined the current scientific knowledge of groundwater systems, projected its use in the coming decades, and the management challenges that would be faced. The purpose of this work was to better inform the establishment of sustainable diversion limits (SDL) on groundwater under the Basin Plan.

An important aspect of the CSIRO’s analysis concerned the connectivity of groundwater and surface water systems. The concept of connectivity between such systems was previously thought to be well understood. River streams can be classified as ‘gaining’, where groundwater seeps into the streams, or ‘losing’, where surface water moves into groundwater systems. Conceptually, rivers tend to be ‘gaining’ streams in highland areas, before converting to variable ‘gaining’ and ‘losing’ streams depending on the hydrogeological conditions downstream.¹⁰ However, because of the historical separation between groundwater and surface water management, the precise application in the Basin of the concept of connectivity was not well understood.¹¹ In its analysis, the CSIRO was able to improve that knowledge, and identified a trend of increased ‘losing river reaches’, and concluded:

*The extent of losing reaches may further increase in the future as the broad alluvial plain areas continue to adjust to changed climatic conditions, time lags from groundwater development are realised, and groundwater extraction increases in some areas. Careful management will be needed to limit exacerbation of this trend.*¹²

In its review of what modelling was available for groundwater resources in the Basin, the CSIRO found 10 of the 20 groundwater management area models where the most extraction occurred significantly lacking due to a number of issues, including:

*(i) poor model conceptualisation; (ii) poor quality groundwater data with poor spatial and temporal distribution that lead to poor calibration; (iii) unreliable extraction data especially in areas where surface water is highly connected to groundwater; and (iv) application of models outside the time scales of their predictive capacity. The general issue of data quality and availability seem to be the most crucial.*¹³

Critically, the CSIRO found that none of the groundwater models assessed were ‘fully integrated surface-groundwater models’, and there were ‘no instances of joint calibration of the groundwater and river models’.¹⁴ The CSIRO made a number of recommendations to improve groundwater modelling and management, including by prioritizing significant areas, improving models’ long-term predictive abilities, and improving calibration and connectivity with surface water models.¹⁵

Notwithstanding these identified gaps in scientific knowledge, the CSIRO estimated extraction as at 2004–05 as 1832 GL per year, excluding extraction from combined aquifers that were part of both the Basin and the Great Artesian Basin. The CSIRO considered in 2008 that those levels of extraction, in seven of the 20 major groundwater management units, was unsustainable, and estimated would result in a reduction of streamflow across the Basin by 447 GL per year.¹⁶

Whilst the CSIRO predicted that climate change would have only a limited impact on rainfall recharge and water levels on groundwater resources, an approximate doubling of groundwater extractions was predicted, to 3956 GL per year by 2030, based on then current groundwater plans. The CSIRO considered that this would increase the impact on stream flow by an additional 393 GL per year, to a total impact of 840 GL per year, and would, in particular, ‘significantly affect baseflow in small tributaries, turning some into ephemeral streams’.¹⁷

In 2010, the Productivity Commission noted the conclusions reached in the Sustainable Yields Project in 2008, and the recommendation made by the NWC in 2009, but made no additional recommendations specifically regarding groundwater management.¹⁸

In 2011, noting that substantive improvements had been made to improve knowledge of groundwater systems, the NWC nonetheless explained that ‘continued investment in groundwater science and knowledge’ remained a priority.¹⁹ The NWC further noted that whilst policies had been developed for managing connected surface and groundwater systems, ‘the implementation of effective conjunctive management remains limited and the understanding of connectivity in individual systems is still inadequate in many areas’.²⁰ In its 2013 ‘Report Card’, the NWC noted the risk to groundwater resources from rights to water for extractive industries, which occurred outside of water planning processes.²¹

In 2014, the NWC published a paper on integrated management of surface and groundwater resources. It recommended groundwater and surface water be used and

managed together, regardless of direct hydraulic connectivity.²² In particular, it noted that the categorization of catchments as ‘highly connected’ or ‘moderately connected’ should not be used exclusively to determine how a resource is managed, but rather that ‘[d]ifferent treatment of different systems should come from considering the situation and the opportunities, benefits and costs of integration, as well as from the level of connectivity — but not from the level of connectivity alone’.²³

By 2018, the Productivity Commission noted that the ‘number of water plans that fully integrate groundwater and surface water resource management remains small’. It nonetheless added, in optimistic terms, that the number of water plans that recognise connectivity between groundwater and surface water had ‘increased substantially since 2004’.²⁴ Despite this apparently low number of properly integrated plans, the Productivity Commission’s assessment of this aspect of the NWI was ‘largely achieved’.²⁵

Proposed sustainable diversion limits

The Guide to the proposed Basin Plan

As outlined in Chapter 4, in the Guide to the proposed Basin Plan (**Guide**), the MDBA estimated Basin-wide groundwater diversions as 1786 GL per year.²⁶ The MDBA determined that a SDL reflecting an environmentally sustainable level of take (**ESLT**) would require a reduction between 99 GL and 227 GL, and ultimately proposed one scenario involving a recovery target of 185 GL, corresponding to a Basin-wide SDL of 1601 GL.²⁷ This assessment incorporated the principle that no SDLs would be set higher than current use other than in groundwater management areas where there were no current limits, and where it could be demonstrated that increases would not compromise the ESLT nor negatively affect surface water availability in a 50-year timeframe.²⁸

Draft Basin Plan

As has been noted elsewhere in this report, publications from the MDBA that post-date the Guide are often vague, unhelpful and, at times, contradictory. The MDBA’s publications on groundwater during the drafting of the Basin Plan are no exception. Following the release of the draft Basin Plan in November 2011, the MDBA released a supporting report in early 2012 (**Groundwater Methods Report**) that outlined, in a very concise manner, the approach taken with respect to setting the baseline diversion limits (**BDL**) and the SDL for groundwater.²⁹

That report provides an estimate of groundwater use of ‘approximately’ 1795 GL.³⁰ The discrepancy between this figure and that quoted in the Guide is unexplained. To add to the confusion, in an ‘addendum’ report published in July 2012 (**Groundwater Addendum Report**), the MDBA states that the most up to date groundwater use information was for

the period 2003–04 to 2007–08, and then uses a third, different, figure of 1745 GL.³¹ Again, this discrepancy is not explained.

In the Groundwater Methods Report, the BDL is stated as 2352 GL.³² In the Groundwater Addendum Report, the BDL is revised to 2373 GL.³³ By way of purported explanation for these figures, the Groundwater Addendum Report states the BDL has been determined on the following basis:

1. *where a water management plan or proposed plan exists, the BDL is the plan limit unless the plan limit is greater than the level of entitlement, in which case the BDL is the entitlement;*
2. *where there is no plan, the BDL is the entitlement along with the effect of any rules managing extraction; and*
3. *where there is a cross-border agreement for groundwater management, the extraction limit under the agreement is the BDL.*

*All BDLs also include an estimate of stock and domestic take.*³⁴

The Groundwater Addendum Report explains that this approach was designed to most accurately reflect limits on groundwater extractions imposed by the then current planning arrangements. It notes that the effect of this approach is, ‘in many cases’ the setting of a BDL above that of actual use. In those circumstances, the Groundwater Addendum Report explains the MDBA has estimated the potential impact of increased groundwater use within the BDL ‘should it occur’ on surface water resources to be 56 GL per year using ‘connectivity ratios’ or ‘connectivity factors’ discussed below.³⁵

The Groundwater Methods Report states the proposed Basin-wide SDL for groundwater resources was 4340 GL. This represents an increase of between 2545–95 GL or between 141–148% from actual use, depending on which figure is used. The change from a reduction in use of between 99–227 GL in the Guide to this increase is explained in the Groundwater Methods Report as arising from ‘new and updated information’, including ‘new groundwater models, recharge estimates, and the updated assessment of connectivity between surface water and groundwater in a number of areas’.³⁶

The Groundwater Addendum Report provides a revised Basin-wide SDL of 3184 GL, representing an increase of between 1389–1439 GL or between 78–82% from actual use, depending on which figure is used, explaining this reduced figure arose in response to concerns in submissions received and a ‘subsequent review of the groundwater methods and assessments’.³⁷ That review process apparently included a workshop held on 17 May 2012 with seven attendees, the outcome of which is recorded in an appendix to the Groundwater Addendum Report.³⁸

During the consultation on the draft Basin Plan, the MDBA, in accordance with subsec 43A(6) of the Water Act, published a report outlining the MDBA’s views on

the matters raised by the Ministerial Council (**MinCo**). That report records the MinCo supporting the ‘precautionary principle for all aquifers’, but noting the ‘potential to adjust groundwater SDLs in future years’, and refers to a further ‘series of bilateral workshops’ on 20 July 2012, which were attended by those who attended the earlier workshop in May 2012.³⁹ No detail is provided as to what was discussed or agreed upon at those workshops — however, the MDBA’s response states:

The Authority has heard submissions from each Basin jurisdiction with respect to groundwater SDLs, and after consideration of advice from the groundwater expert panel has made a number of minor changes to the proposed Basin Plan. [sic] that have increase the overall groundwater SDL from 3184 GL/y to 3324 GL/y.⁴⁰

In this report, the MDBA sets out how this increase of what is described as an additional 139 GL would be apportioned across New South Wales, Victoria and Queensland SDL resource units, including the addition of a new SDL resource unit in Queensland comprising 100 GL alone. The discrepancy between the 139 GL and the apparent difference between 3184 GL and 3324 GL is likely a result of rounding, but this is left to the reader to surmise — it is not explained. Nor is there any further explanation other than the brief, two-page summary in this report for this 139 GL or 4% increase in the Basin-wide groundwater SDL.

Review of groundwater SDLs

During the consultation on the draft Basin Plan, the New South Wales Government submitted that the MDBA did not use the information, modelling and scientific expertise held amongst hydrogeologists employed by the New South Wales Government, and requested that the MDBA increase the SDL for selected SDL resource units by a total of approximately 689 GL. In one area, the Lachlan Fold Belt, the New South Wales Government proposed an increase of more than double the SDL in the Basin Plan — from 259 GL to 608 GL.⁴¹ In response, the MDBA was not prepared to revise the groundwater SDLs as requested, however proposed the potential incorporation of a ‘groundwater SDL adjustment mechanism’, similar to the surface water SDL adjustment mechanism.⁴²

Mr David Harriss, formerly a water official of the New South Wales Government, explained in particular with reference to two aquifers, that the proposed SDLs represented ‘effectively what was being taken at the time’, and that New South Wales officials ‘thought that was ridiculous, there was no science involved’.⁴³ Mr Harriss explained that unless these SDLs were reviewed having regard to the scientific understanding within the relevant State agencies, New South Wales would not have agreed to the implementation of the Basin Plan.⁴⁴

Ultimately, no adjustment mechanism equivalent to Chapter 7 of the Basin Plan was incorporated, however secs 6.06(6) and 6.06(7) required a review of three groundwater SDL resource units within two years of the commencement of the Basin Plan. Four years

later, the MDBA published the results of its review under these sections, proposing an increase to the Basin-wide groundwater SDL of 159.9 GL to a new total of 3494 GL, to be apportioned across nine SDL resource units, together with amendments and refinements made to various groundwater resource unit areas and locations.⁴⁵

Scientific critique and response

In a joint submission with Professor Quentin Grafton, after characterizing the process adopted for setting the surface water SDLs as ‘baffling’, Professor John Williams described the groundwater SDLs as ‘appear[ing] to defy scientific logic’.⁴⁶ In particular, Professor Williams referred to the work done by the CSIRO as part of the Sustainable Yields Project, describing it as ‘gold hydrology’, which recommended that, given the importance of groundwater-surface water interactions, groundwater extractions should be reduced rather than increased.⁴⁷

Connectivity was one of the four issues that had been identified by the Wentworth Group of Concerned Scientists (**Wentworth Group**) as neglected or based on indefensible assumptions, in its analysis of the Groundwater Methods Report.⁴⁸ In particular, the Wentworth Group noted that a key assumption adopted, that losing rivers can be treated as unconnected systems, was fundamentally incorrect as a matter of hydrological science, explaining:

Basically, there is no free lunch—aquifers that receive recharge must discharge their water somewhere to maintain the water balance. Allowing additional extractions from these aquifers must reduce the amount of water that discharges into rivers.⁴⁹

The Wentworth Group further raised the issue of connectivity in its broader submission on the draft Basin Plan, noting that the ‘vast majority’ of groundwater and surface water in the Basin is hydraulically linked. In light of the NWC’s recommendation that a connexion should be assumed unless shown beyond doubt otherwise, the Wentworth Group submitted that ‘[n]o scientific reasons’ were given for the increases in the draft Basin Plan.⁵⁰

The Wentworth Group also raised concerns regarding the appropriateness of the ‘recharge risk assessment method’ for setting SDLs, the increases to the BDLs and the failure to identify impacts on groundwater dependent ecosystems, concluding that:

the setting of Sustainable Diversion Limits for groundwater should be approached very cautiously. We have much poorer knowledge of groundwater than we do of surface water. There is a good chance that, as our understanding grows, we will find that we have underestimated the extent to which increased groundwater use will affect ecosystems, downstream surface water users and existing groundwater users. Given this, the draft Basin Plan should adopt a conservative approach and not

*establish such over-generous Sustainable Diversion Limits which will be difficult and costly to modify later.*⁵¹

Whilst the Groundwater Addendum Report was published after this critique, and otherwise notes ‘concerns raised in the submissions on groundwater’ in respect of the setting of the groundwater SDL, it fails to adequately engage with these criticisms. It blandly states that the MDBA ‘undertook a review of the methods and assessments’, with no detail. In the discussion on connectivity, the Groundwater Addendum Report merely states that the MDBA ‘further investigated this issue’ which resulted in impacts on stream flow that ‘differed significantly’ from the analysis conducted by the CSIRO in the Sustainable Yields Project.⁵²

When Professor Williams expressed concern and bewilderment in 2012 regarding the groundwater figures, he explained that the MDBA’s response was ‘we had a two-day workshop’, with no explanation, and no further documentation.⁵³

Senate inquiries

In 2013, the Senate Standing Committee on Rural and Regional Affairs and Transport accepted the concerns raised by the Wentworth Group before it, which reflect those discussed above. It supported the Wentworth Group’s criticism that the Basin Plan failed to adequately assess the impact of groundwater extraction on surface water, and that this undermined the ability of the Basin Plan to achieve the Water Act’s objects and purposes.⁵⁴ In particular, the Wentworth Group referred to the NWC’s recommendation about assuming connectivity in the absence of knowledge.⁵⁵ In response, the MDBA mischaracterized the Wentworth Group’s argument and, by extension, the NWC recommendation, saying that it treated all groundwater as directly linked to surface water. It called this straw man argument ‘simplistic and wrong’.⁵⁶

The Committee recommended that a ‘thorough review’ be undertaken of the groundwater aspects of the Basin Plan, and that in conducting that review, the MDBA should:

*consult with a range of scientific experts. To ensure reliability, the final review findings should be peer reviewed by the CSIRO. To ensure transparency, the results of the review should be published by the MDBA.*⁵⁷

In response to an interim recommendation that the MDBA further articulate the reasoning for the changes in groundwater SDLs, the Commonwealth Government provided a typically bland, vague and unhelpful summary of the MDBA’s methodology, and simply referred to the reports discussed above.⁵⁸ Five years later, in March 2018, the Commonwealth Government provided its response to the Committee’s final report of March 2013. It purportedly agrees with this recommendation, but merely points to the limited review of three groundwater areas discussed above, and involvement of the

CSIRO in those reviews. This plainly falls far short of the ‘thorough review’ of Basin-wide groundwater SDLs envisaged by the Committee’s recommendation.⁵⁹

Review of potential impacts of groundwater SDLs

It has only been very recently, in October 2018, that a review has been conducted by scientists of the University of Melbourne into the potential impacts of groundwater SDLs in the Basin on river flow (**Groundwater Review Report**).⁶⁰ After repeated calls for greater scientific analysis and understanding over the course of several decades, it is bad enough that it has taken such a lengthy time for a review of any kind to be made into groundwater SDLs. However, in a media release, Mr Colin Mues of the MDBA is quoted as explaining that the review was commissioned ‘after some stakeholders expressed concerns’.⁶¹ This is a mischievous understatement, insofar as it tends to suggest that these are relatively isolated concerns that have only recently been made. The Groundwater Review Report itself, on the other hand, is more revealing as to its genesis. It expressly mentions it was conducted in response to the concerns raised in, amongst two other publications, the submission to this Commission by Professors Grafton and Williams.⁶²

Due to its recent publication, it is somewhat premature for this Commission to purport to offer a full critique of the Groundwater Review Report without the benefit of its consideration and analysis by the scientific community, including Professor Williams, or without the benefit of examination of the authors of the report themselves. However, a number of points can be made by way of preliminary analysis.

First, perhaps unsurprisingly given the short space of time between its apparent commissioning in response to materials published earlier in 2018, the Groundwater Review Report expressly did not use any new modelling or data collection. Rather, it used ‘existing methodologies, literature and datasets’.⁶³ Its utility in purportedly improving the ‘evidence base’⁶⁴ is therefore very limited.

Second, the Groundwater Review Report calculates impact from groundwater extraction on river flow through the use of ‘connectivity factors’, used in previous studies including the Sustainable Yields Project. However, it is expressly noted that there is a ‘high degree of uncertainty’ with connectivity factors, principally from ‘the spatial and temporal distribution of future extraction, along with uncertainty of hydrogeological parameters’.⁶⁵ It would be surprising if the very empirical work that was not done in modelling and data collection would not have assisted in addressing these uncertainties.

Third, the Groundwater Review Report selects three future extraction scenarios for a period of 40 years of no growth in extractions, 2% growth in extractions and 4% growth in extractions. These scenarios generate Basin-wide total groundwater extractions by 2057 of 1335 GL, 1980 GL and 2198 GL respectively.⁶⁶ It is explained that these scenarios ‘may not represent reality, but plausible scenarios from which we can learn’.⁶⁷ No other explanation or analysis is provided as to why these scenarios were selected.

No explanation is given as to why the 'no growth scenario' is 410 GL less than even the lowest figure used by the MDBA as representing current extractions.⁶⁸ Nor is there any explanation as to why these scenarios vastly differ from the prediction of the CSIRO in 2008 for a 200% growth in extractions to a Basin-wide total of 3956 GL by 2030.⁶⁹

Fourth, the Groundwater Review Report concludes that the effect of groundwater extractions on river flow over the next 40 years ranges between 0 GL and 360 GL per year, with 170 GL per year as 'the most likely'.⁷⁰ This incongruously large range is explained as arising from the uncertainties relating to the growth in extractions and the connectivity factors used. That these figures are lower than those reached by 'other commentators' is explained as being calculated on the selected future extraction scenarios and the application of different connectivity factors.⁷¹ However, no further explanation or analysis is provided as to why these figures are substantially less than the assessment by the CSIRO of a reduction in streamflow of 447 GL per year based on the then current extractions of 1832 GL per year.

On a preliminary analysis, therefore, it is difficult to conclude that the Groundwater Review Report provides much in the way of assistance in the complex area of groundwater use and management. It manifestly does not ensure that 'Basin Plan science [is] strengthened', as touted by the MDBA in its media release.

Groundwater recovery and its lack of progress

It is perhaps characteristic of the haphazard manner in which the groundwater SDLs were apparently developed, that the required recovery amount arising from the setting of the SDL cannot be readily ascertained from a single documentary source. That a certain level of forensic analysis is required to ascertain how the Basin-wide groundwater recovery target has been set is another example of the manifestly inadequate documentation and explanation provided by the MDBA in its administration of the Water Act.

The Groundwater Addendum Report contains a table from which it can be ascertained that the setting of a Basin-wide groundwater SDL of 3184 GL in the draft Basin Plan in May 2012 required recovery of 4 GL from the Goulburn-Murray Sedimentary Plain SDL resource area, 35.4 GL from the Upper Condamine Alluvium (Central Condamine Alluvium) SDL resource area, and 5 GL from the Upper Condamine Alluvium (Tributaries), for a total Basin-wide recovery of 44.4 GL.⁷² However, the increased Basin-wide groundwater SDL of 3324 GL in August 2012 incorporated an increase of 4.1 GL to the SDL for the Goulburn-Murray Sedimentary Plain SDL resource area, thereby negating the need for the 4 GL recovery in that SDL resource area.⁷³ The remaining two SDL resource areas which had previously required recovery amounts were not affected by this amendment, nor the subsequent amendment which increased the Basin-wide groundwater SDL to 3494 GL.

Consequently, the Basin-wide recovery amount for groundwater was ultimately set at 40.4 GL, comprising 35.4 GL for the Upper Condamine Alluvium (Central Condamine Alluvium) SDL resource area, and 5 GL from the Upper Condamine Alluvium (Tributaries).

It would be a considerable understatement to describe the progress on this water recovery amount as ‘slow’. Virtually non-existent would appear to be a more appropriate term. As at February 2017, 2.7 GL had been recovered against a target of 40.4 GL.⁷⁴ By the time the Wentworth Group published its ‘Review of Water Reform in the Murray-Darling Basin’ in November 2017, 2.7 GL had been recovered.⁷⁵ As at 30 September 2018, 2.7 GL had been recovered.⁷⁶

Notwithstanding that this recovery remains at only 7% of the target, the Productivity Commission nonetheless describes the overall progress of water recovery, including groundwater, as ‘broadly on track’.⁷⁷ It appears the Productivity Commission bases this optimism, at least in part, on a media release issued by the Department of Agriculture and Water Resources (**DAWR**) on 18 July 2018, which the Productivity Commission describes as explaining that the DAWR had accepted tenders providing 21.8 GL.⁷⁸ Somewhat confusingly, however, that media release states that 5.8 GL had been recovered in the second tranche of tenders, leading to a total of 24.5 GL recovered towards the 40.4 GL target. This somewhat loose language in a media release may reflect that these amounts may more properly relate to water recovery that has been contracted, but not yet delivered. This may explain why these figures bear no resemblance to the recovery amounts published and referred to above. However, again, it is left to surmise — no explanation by either the DAWR or the MDBA is forthcoming.

Conclusion

As the discussion in Chapter 1 demonstrates, substantive regulatory reform to address the environmental mismanagement of the Basin’s water resources has historically occurred only when severe ecological decline has made it clear that such reform is urgently required. Whilst this is well illustrated with respect to the Basin’s surface water resources, it is also apparent with respect to the Basin’s groundwater resources. Regulatory complacency over a resource that is difficult to measure, combined with a lack of investment in scientific research, has placed the Basin’s groundwater resources at considerable risk that may manifest over many decades.

That complacency and lack of investment appears to have continued in the development and implementation of the Basin Plan. In the face of the materials before this Commission, it is difficult to conclude otherwise. Since the publication of the Guide, the volumes said to represent actual extractions and extractions permissible under existing management plans — the latter representing the BDL — have substantially varied. No reasoned, coherent, explanation is apparent from the materials published by the MDBA that explains these variations. To the contrary, the MDBA has unhelpfully asserted its method for determining the BDL has not changed.

The MDBA's determination of a SDL that reflects an ESLT has varied from 1601 GL in the Guide in 2010, to 4340 GL in early 2012, 3184 GL in July 2012, 3324 GL in August 2012 to finally 3494 GL in November 2016. Nebulous explanations have occasionally been proffered in the materials for each of these changes. These explanations instil little confidence that a reasoned, well-resourced and scientifically driven decision-making process has been followed, as Professor Williams' submission and evidence demonstrate.

Finally, in the face of considerable scientific uncertainty, there appears to be insufficient effort given to better understanding the complex hydrogeology of the Basin's groundwater resources, in the face of decades of repeated and increasingly urgent calls for such investment. As the Wentworth Group concluded in its statement on the draft Basin Plan:

In the absence of this critical information on the impact of groundwater extractions on river health and how such dramatic changes in baselines can be justified, it is impossible for the community, science or Parliament to understand its implications or have confidence it has any prospect of delivering a healthy working river.⁷⁹

That lack of confidence exists today as it did in 2011.

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16 Compliance & Enforcement

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Chapter summary

On 24 July 2017, ABC TV broadcast a Four Corners program, entitled ‘Pumped: Who’s Benefitting from the Billions Spent on the Murray-Darling?’ (**Pumped**). Pumped raised concerns in relation to matters of compliance with the *Basin Plan 2012* (Cth) (**Basin Plan**) in the Northern Basin. The allegations included misappropriation, maladministration and misconduct in the New South Wales Government, including collusion between senior officials from the Department of Primary Industries (**DPI**) and irrigation lobbyists, interference with investigations relating to non-compliance in the Barwon-Darling and the improper spending of public funds to develop water infrastructure for private use.¹ The subject of compliance and enforcement has been in the public gaze since then.

Pumped was not the first time concerns regarding compliance and enforcement of Murray-Darling Basin (**Basin**) water resources has been raised, but it exacerbated long-standing resentment felt by communities, environmental organizations and businesses in New South Wales and Queensland, as well as across Victoria and South Australia, about the relative lack of metering and monitoring of water take in the Northern Basin.

The allegations exposed on Pumped resulted in a number of inquiries by the Commonwealth, New South Wales and Queensland Governments² as well as prosecution proceedings in New South Wales and Queensland. The focus of Pumped, and the investigations that have followed, have largely concerned the administration of laws regarding metering, monitoring and the willingness of regulatory authorities to take enforcement action. The resulting inquiries, investigations, and public discourse has made it clear that it is dysfunctional and demoralizing for a national system, in its intent, to have an unjustifiable discrepancy in the accountability of individual farming enterprises for their use of a public resource.

During the course of this inquiry, care has been taken not to interfere with any other inquiries or investigations, as to do so would in many cases amount to wasteful duplication and possibly eventually a contempt of court. This report will not discuss, in detail, ongoing prosecutions in order to avoid any possible prejudice to those proceedings. In addition, although the Commissioner is aware of several important reports that have been published, and of certain reforms that have been made, it is not intended that the work of those other agencies or inquiries be repeated in any detail. The evidence heard by the Commissioner in relation to matters concerning floodplain diversions, planning law and broad governance issues have been addressed in other chapters.

The purpose of this chapter is to explore the extent to which issues of compliance and enforcement have given rise to questions of systemic weakness in the legislative approach, having regard to the nature of shared responsibility of Basin water resources. The analysis is predicated upon the expectation that amongst and between Basin States, tolerably similar laws, policies and compliance cultures should preferably exist so as best to achieve the objectives of the *Water Act 2007* (Cth) (**Water Act**) and Basin Plan.

Compliance framework

The Water Act was enacted in response to a national imperative to return water resources of the Basin to a sustainable level. The Basin Plan is the blueprint for achieving this. Basin States must implement the Basin Plan through water resource plans (**WRPs**). WRPs will effectively be administered by Basin States through their respective legislative regimes. Accordingly, the achievement of the aims and objectives of the Water Act and Basin Plan necessarily occurs in the context of shared responsibility in relation to Basin water resources. It is within this context that the compliance and enforcement framework must be considered.

The Water Act

The obligations under the Water Act are largely directed to Basin State governments. The most significant obligation in this regard is the development and accreditation of WRPs. To that end, the Water Act and Basin Plan contain multiple obligations to be met by Basin States. These matters have been addressed in detail in Chapter 12. Importantly, WRPs may be (and are expected to be) prepared by the Basin States and accredited by the Minister in accordance with sec 63 of the Water Act. If that does not happen, the Murray-Darling Basin Authority (**MDBA**) may exercise the ‘step-in’ powers in sec 68 to develop the WRPs for adoption by the Minister. Basin States have ongoing reporting obligations under sec 71 of the Water Act, which will be relevant to the MDBA’s ability to assess their compliance with the Water Act and Basin Plan, including compliance with the sustainable diversion limits (**SDLs**) for water resource areas.

Pursuant to sec 137 of the Water Act, the MDBA is the ‘appropriate enforcement agency’ for contraventions relating to Part 2 of the Water Act as well as the information gathering provisions of Part 10 of the Water Act. Part 2 of the Water Act relates to the ‘Management of Basin Resources’ and encompasses obligations such as the coordination of environmental water. These obligations are implemented under the Basin Plan through WRPs. The MDBA’s Part 10 powers include to acquire information relevant to implementing the Basin Plan. The Water Act does not create criminal offences for a contravention of the obligations under the Basin Plan or WRPs. The remedies available to the MDBA to ensure compliance by Basin States are administrative in nature and include court-ordered injunctions and declarations.

It is also noted that the MDBA has power to obtain enforceable undertakings, issue infringement or enforcement notices, and commence civil enforcement proceedings against individuals whose conduct infringes upon the implementation of the Basin Plan or the achievement of its objectives. For instance, an infringement notice may be issued if there are reasonable grounds to believe a person has contravened water market rules.³ Enforceable undertakings may be voluntarily entered into between a person and the MDBA in circumstances where a person has contravened the Water Act.⁴ A court may direct a person to comply with the undertaking, compensate another person, or

make payments to the MDBA in certain circumstances. An enforcement notice may be issued to direct a person to take specific action if the MDBA is satisfied the person has contravened, is contravening or is likely to contravene the Basin Plan or WRP, or is otherwise engaged in conduct inconsistent with or prejudicial to the implementation of the Basin Plan or WRPs.⁵ A body corporate is vicariously liable for the conduct of its director(s), employee(s), or agent(s).⁶

Basin Plan

For the purpose of determining compliance with the long-term annual diversion limit for a water resource unit, the Basin Plan creates a register of take (**Register**).⁷ The Register will commence on the first water accounting period for each SDL resource unit after 30 June 2019.⁸ The register must include information about how much water was permitted to be taken during a water year and how much water was actually taken.⁹ If the volume of water actually taken is greater than the amount permitted, the difference must be recorded as a debit on the register.¹⁰ Non-compliance is determined to have occurred when there is a debit equal to or greater than 20% of the long-term diversion limit for the SDL resource unit and the Basin State does not have a reasonable excuse.¹¹ A claim for reasonable excuse must be accompanied by a report setting out the reasons for the excuse and the steps to be taken to reduce the cumulative balance to zero.¹² For the purpose of compliance, some water resource units are treated collectively. The Victorian Murray, Kiewa, and Ovens SDL resource units may be treated as a single SDL resource unit as will the Goulburn, Broken, Campaspe and Loddon SDL resource units.¹³

Basin States

In contrast to the high-level obligations imposed by the Water Act, the focus of State legislative regimes is directed to ensuring compliance by individuals. Although WRPs have not yet taken effect, it is through the regulation of individual conduct that the States will ensure compliance with WRPs and thus meet their obligations under the Water Act and Basin Plan.

The coordination of, and responsibility for, the management of Basin water resources varies significantly between Basin States. This includes differences in the number of entities involved in water regulation as well as the interplay between various State Acts.

Notwithstanding these structural differences, in all Basin States water is formally vested in the Crown.¹⁴ Authorization is required for the purpose of taking water.¹⁵ Although statutes differ to varying degrees, it is ultimately an offence (in all Basin States) to take water unless authorized to do so,¹⁶ including taking water otherwise than in accordance with water allocations,¹⁷ or in breach of licence conditions.¹⁸ There are also offences relating to metering and conduct such as meter tampering.¹⁹ The approach to penalty varies, sometimes significantly, between Basin States. In the case of unauthorized take, the maximum penalty in:

- Queensland is \$217 365.75 with no distinction between natural person or corporate offenders²⁰
- New South Wales is \$1.1 million for a natural person or two years' imprisonment or both or \$4.95 million for a corporation²¹
- Australian Capital Territory is \$8000 or six months' imprisonment or both for a natural person or \$40 500 for a corporate body²²
- Victoria is \$9671.40 or six months' imprisonment for a first offence or \$19 342.80 or 12 months imprisonment for a subsequent offence,²³ and
- South Australia is \$35 000 for a natural person or \$70 000 for a body corporate (or greater in some circumstances).²⁴

In addition to differences in offences and penalty regimes, statutory time limitations within which to prosecute offences range from 12 months in Victoria,²⁵ three years in New South Wales,²⁶ and five years in South Australia.²⁷ In some jurisdictions, upon a finding of guilt, a court may be directed to specific penalty considerations and may impose a range of orders with respect to restoration, prevention, costs and compensation.²⁸ The vast differences in penalty regimes and the scarcity of previous successful prosecutions across Basin States, particularly in the period before Pumped aired, make it difficult for the Commissioner to assess any interstate differences in how courts have responded to conduct such as water theft.

A range of alternatives to prosecution proceedings to ensure compliance and conserve water may also be available. This may include administrative orders regarding water use, including to prohibit or restrict the taking of water from specified water resources where it is in the public interest to do so,²⁹ or there is a water shortage,³⁰ as well as orders for the installation of metering equipment,³¹ and the demolition, removal, modification or dismantling of unlawful water management works.³² It may be an offence to fail to comply with an administrative order.³³

A review of State legislative regimes reveals that State laws generally appear to be sufficiently robust and equipped to deal with unlawful behaviour, having regard to the circumstances of each case, including the seriousness of the offending conduct. Concern in relation to compliance and enforcement has not, in any event, focussed heavily on the legislative framework, but on the operational capacity of States to monitor, and cultural willingness to pursue, enforcement outcomes. This is so, even though a range of national agreements has attempted to promote consistent national standards. For example, the 'National Framework for Non-Urban Water Metering' was established in 2010 to provide a nationally consistent basis for water metering. It required all non-urban meters to comply with the national standards by 1 July 2020.³⁴ New South Wales, for example, received approximately \$31.5 million of Commonwealth funding to implement the National Metering Framework. Concerns about operational capacity of the States has been reflected in the many inquiries since Pumped. A summary of selected inquiries is provided below.

Summary of inquiries following Pumped

Ombudsman New South Wales

At the time Pumped aired, the Ombudsman was part way through a fourth investigation into compliance with water laws in New South Wales.³⁵ In November 2017, the Ombudsman published a report entitled ‘Investigation into Water Compliance and Enforcement 2007–17’ (**Progress Report**).³⁶ The Progress Report summarized the progress and findings of earlier investigations and identified long-standing issues of ‘chronic and severe under-resourcing, issues with staff training and core capabilities, lack of adequate legal support and organisational culture issues’.³⁷ An example of the embedded cultural issues in the New South Wales Government was, despite assurances to the contrary, the provision of highly inaccurate statistical information to the Ombudsman in relation to enforcement action undertaken by WaterNSW.³⁸

On 17 August 2018, the Ombudsman published a further report entitled ‘Water: Compliance and Enforcement’. The Ombudsman ‘found that aspects of the conduct of both DPI Water and WaterNSW in performing their water compliance functions had been unreasonable, based on irrelevant considerations or otherwise wrong within the meaning of s 26 of the *Ombudsman Act 1974*’.³⁹ The evidence showed that the agencies failed to adequately resource compliance functions, clearly communicate structural changes to staff, take appropriate and timely action on instances of clear breaches of the law, or meet acceptable standards of public administration in the conduct of their compliance functions.⁴⁰ Investigation methods were shown on numerous occasions to be below standard.⁴¹ Significant concern was expressed about metering such as the failure to comply with the National Metering Framework,⁴² which had not been rolled out more than two decades after work had commenced.⁴³

A total of 35 recommendations were made.⁴⁴ Importantly, the Ombudsman recommended that the DPI and WaterNSW review their communication, record-keeping and delegation policies and practices, and whether the objectives of the ‘no meter no pump’ policy could be achieved sooner given the extraordinary delay in this area.⁴⁵

Ken Matthews Investigation

On 2 August 2017, Mr Ken Matthews AO was commissioned to conduct an independent investigation into New South Wales water management and compliance.⁴⁶ On 8 September 2017, Mr Matthews published his interim report and concluded that water-related compliance and enforcement arrangements in New South Wales had been ineffectual and required significant and urgent improvement.⁴⁷ Mr Matthews recommended that a ‘Water Management Compliance Improvement Package’ (**Package**) be implemented urgently for the purpose of ensuring the transparency, independence and effectiveness of the compliance and enforcement system in New South Wales.⁴⁸ The Package recommended

the creation of a new compliance and enforcement body, the Natural Resources Access Regulator (NRAR).⁴⁹ Specific recommendations were also made regarding improved transparency and the protection of environmental water, including under the Water Sharing Plan (WSP) for the Barwon-Darling. Recommendations regarding improved transparency included enabling the public to readily access from a single source, details of entitlements, such as name, licence number, licence conditions, water entitlement, water allocation, meter readings, real-time water account balance, trading activities and identification of specific pumps.⁵⁰ In relation to protecting environmental water, Mr Matthews recommended interim solutions such as the implementation of individual daily extraction limits, greater use of event-based mechanisms, more flexible ‘commence-to-pump’ rules during periods of low-flow, manipulation of flows from tributaries where hydrological regulation provides the opportunity, publication of simple explanatory materials to assist the public’s understanding of any interim processes, and specific event-by-event public communications.⁵¹

On 24 November 2017, Mr Matthews published his final report in which he identified risks to the implementation of compliance recommendations. Concerns were raised regarding delays to elements of the reform package, unwarranted ‘watering down’ of reform measures, confusion as to inter-agency boundaries and organizational restructurings that may lead to an unsatisfactory or unworkable operational environment for compliance staff, inadequate commitment to proper funding and resourcing, and delays in decision-making about whether to prosecute the conduct alleged on Pumped.⁵² Further recommendations were made regarding the implementation of changes to the compliance framework.

Queensland Independent Review into Water Metering

In August 2017, the Queensland Government appointed an Independent Expert Panel to audit non-urban water measurement and compliance (**Queensland Audit**).⁵³ The Queensland Audit was published on 23 March 2018. The Queensland Audit found that improvements were needed to most governance and compliance arrangements in Queensland, including that measurement, monitoring and compliance of non-urban water use in Queensland lacks robustness, completeness and transparency.⁵⁴ Additional expenditure on metering and compliance was recommended as necessary,⁵⁵ as was the need to develop a stronger compliance culture.⁵⁶ The Queensland Audit observed that most compliance cases were not pursued in a timely manner,⁵⁷ were managed inconsistently across the State and too often resulted in no action.⁵⁸ Deficient record-keeping was also noted.⁵⁹

Murray-Darling Basin Authority Review

In November 2017, the MDBA published a review of water compliance in the Basin (**MDBA Review**).⁶⁰ For the purpose of the MDBA Review, the MDBA assessed the

compliance and enforcement framework and practices of the Basin States and the MDBA, as well as ‘the appropriateness of water management rules for protecting environmental water’.⁶¹ The MDBA Review found significant variations between the Basin States in relation to their respective cultures of compliance, level of resourcing, transparency, and clarity of their policy frameworks.⁶² An important observation in this regard was the metering rate of 96% in South Australia compared to between 25% and 51% in the Northern Basin.⁶³ Given the metering rate for surface water in the Northern Basin, it is hardly surprising that such large-scale water theft is alleged to have occurred.

The MDBA acknowledged that the community had ‘expressed considerable frustration that the MDBA did not respond adequately to allegations of serious breaches’,⁶⁴ and it had not given sufficient attention to, nor adequately dealt with, such allegations.⁶⁵ Importantly, the MDBA Review ‘found that the MDBA had not been taking adequate steps to ensure community confidence in compliance across the Basin, and recommended a number of actions to improve its performance, including strengthening enforcement powers’.⁶⁶ The MDBA Review raised concerns that the process of developing WRPs had been slow, compromising the prospects that compliance with the Basin Plan will be achieved by 30 June 2019.⁶⁷ The MDBA Review found that there was a need to protect low-flows for downstream communities and suggested this could be achieved on an event-by-event basis.⁶⁸ The MDBA found that the current New South Wales Barwon-Darling WSP failed ‘to provide adequate protection for environmental water’.⁶⁹

The MDBA also commissioned an Independent Panel that confirmed there had been insufficient progress on the accreditation of WRPs, and protection of environmental water.⁷⁰ It endorsed the recommendations and actions of the MDBA Review. Further recommendations were provided, including ‘COAG to endorse an amendment of the Water Act to provide a more comprehensive suite of sanctions and powers’.⁷¹

Productivity Commission

On 30 August 2018, the Productivity Commission released its ‘Murray-Darling Basin Plan: Five-year assessment: Draft Report’ (**2018 Draft Report**). The Productivity Commission observed that prior to late 2017, the MDBA had only a limited focus on preparing for its full compliance role after the accreditation of WRPs on 1 July 2019.⁷² The Productivity Commission recognized that the accuracy of metering and measurement was of great importance to the community. Particular concerns were noted regarding the lack of metering in the Northern Basin and reference was made to the significant disparities in measuring surface water between the Basin States.⁷³ The Productivity Commission made several recommendations on the subject of metering. It also recommended that the MDBA clarify its compliance function and utilize ‘system-wide enforcement levers such as SDL accounting compliance mechanisms to enforce limits on water take’.⁷⁴ The Productivity Commission recommended that the MDBA undertake structural reform in order to manage its conflicting roles and maintain credibility.⁷⁵ Significantly, and as also discussed in Chapter 17, the Productivity Commission recommended that by 2021 the

MDBA separate into the Murray-Darling Basin Corporation, and the Basin Plan Regulator (**BPR**). The Productivity Commission proposed that the BPR undertake the compliance, evaluation and review functions and be governed by a Board with requisite compliance and evaluation skill.⁷⁶ The MDBA and Commonwealth Government have rejected this recommendation.⁷⁷

Senate Rural and Regional Affairs and Transport References Committee

On 29 November 2018, the Senate Rural and Regional Affairs and Transport References Committee (**RRAT Committee**) released its report on the integrity of the water market in the Murray-Darling Basin. The RRAT Committee was concerned about ‘the independence and regulatory strength’ of the MDBA⁷⁸ and the development of WRPs in New South Wales.⁷⁹ It also raised concerns about the operation and oversight of the Water for the Environment Special Account⁸⁰ and the changing ‘goalposts’ in relation to metering that ‘has been on the national agenda for a considerable period’.⁸¹

The RRAT Committee supported the draft recommendation of the Productivity Commission to separate the MDBA into two entities.⁸² The RRAT Committee recommended that the Australian Government ensure ‘sufficient funding and resources’ to the new BPR⁸³ and that the MDBA ‘allocate sufficient resources to complete its assessment and evaluation of Water Resource Plans’.⁸⁴ The RRAT Committee also recommended that the Commonwealth Department of Agriculture and Water Resources (**DAWR**) ‘present detailed annual reporting on the allocation of funds from the Water for the Environment Special Account’.⁸⁵ Finally, it was recommended that ‘a uniform schedule of evidentiary requirements, penalties and sanctions be developed to apply to breaches of water legislation in Murray-Darling Basin jurisdictions,’ having regard to matters such as the evidentiary burden for water breaches, use of technology, the suitability of strict liability offences, and the simplification of offences.⁸⁶

Evidence before the Commissioner

The Commissioner has received over 140 submissions. More than 50 expressly raised concerns about compliance. The public concern on this subject, as expressed before the Commissioner, reinforces the fundamental importance of an effective compliance and enforcement regime to ensure community confidence.⁸⁷ Some of the concerns raised included:

- lack of confidence in the MDBA’s independence⁸⁸ and possible government corruption⁸⁹
- government restructures resulting in loss of local staff and knowledge⁹⁰
- lack of standardized metering requirements.⁹¹

A number of submissions recommended improvements including:

- more compliance officers⁹²
- better metering and improved technology⁹³ (such as remote sensing technology),⁹⁴ and
- more severe penalties.⁹⁵

Research conducted (by way of survey) between the University of New South Wales and the University of Canberra into compliance, enforcement, metering and monitoring in New South Wales revealed that less than half of the respondents were confident that water users complied with licence conditions, around three quarters of respondents did not believe that compliance checks were sufficiently regular, and only a third of respondents had confidence that people taking water unlawfully would be caught.⁹⁶ The research also revealed that more than a third of water meters were ‘misreading by more than 20%’. If these findings were consistent across New South Wales up to an additional ‘140 000 ML’ of water, in excess of what is assumed, could be currently subject to extraction amounting to ‘\$21m per year on the water market’.⁹⁷

Witnesses before the Commissioner

Witnesses gave evidence of the shortcomings of regulatory authorities in taking enforcement action or meaningfully engaging with compliance concerns. This includes the failure to respond, follow up, or make appropriate referrals in relation to potentially unlawful conduct or to permit public access to information that would, at a minimum, enable individuals or organizations to take appropriate action where necessary.

Ms Maryanne Slattery of the Australia Institute informed the Commissioner of her involvement with an experimental project referred to as ‘Data Cube’. Data Cube relied on satellite imagery to track environmental flows. The project revealed decreases in river flows attributable to over extraction. Ms Slattery cross-referenced her findings through multiple independent avenues. Ms Slattery recalled that this occurred around the time the MDBA was receiving community feedback about allegations of water theft. Although the findings of Data Cube were known at an executive level at the MDBA, they were not initially included in the MDBA’s Data Cube Report.⁹⁸ Further, as discussed in Chapter 14, Mr Chris Lamey provided an extensive and detailed chronology of unsatisfying attempts he made with local, State and Commonwealth agencies in relation to the development of floodplain infrastructure on a neighbouring property which had significant implications for the operation of his family business.⁹⁹

Dr Emma Carmody from the New South Wales Environmental Defenders Office gave evidence of the difficulties in accessing information in both New South Wales and Queensland.¹⁰⁰ Dr Carmody noted that in New South Wales some information is available through title searches, but the process involved is time consuming and costly.¹⁰¹ In support of this evidence, Dr Carmody provided two case studies regarding applications made under

freedom of information laws to obtain information in relation to floodplain harvesting.¹⁰² Months after having made the applications, and following multiple conversations with departmental officers, including repeated attempts to refine the scope of the applications, Dr Carmody was no closer to obtaining the information sought. Dr Carmody also commented that obtaining water allocation information in Queensland is difficult, even for a lawyer specializing in water law, due to the lack of publicly available information.¹⁰³

Commitment to compliance and enforcement by governments

In submissions to the Commission, all Basin States affirmed their commitment to compliance. South Australia, Victoria and the Australian Capital Territory did not direct the Commissioner to any current reforms relating to compliance or enforcement. The submissions from these States emphasized their long-standing commitment to compliance, accountability and decision-making responsibilities,¹⁰⁴ as well as the already high levels of metering, compliance and enforcement.¹⁰⁵

The Queensland Government directed the Commissioner to the Queensland Audit,¹⁰⁶ which was being considered in conjunction with the MDBA's Review findings.¹⁰⁷ The Queensland Government acknowledged that other Basin States have received substantial funding to implement metering and measurement and noted that it was time for similar investment in Queensland. The Queensland Government informed the Commissioner that it would be making a submission for assistance on that basis.¹⁰⁸

The New South Wales Government directed the Commissioner to the current Water Reform Action Plan (**WRAP**).¹⁰⁹ The New South Wales Government also referred to the establishment of the NRAR and to its collaboration with the Commonwealth Environmental Water Holder, local communities and irrigator groups to deliver the Northern Connectivity Event, as demonstrations of its commitment to reform.¹¹⁰ The submission referred to a package of amendments to the *Water Management Act 2000* (NSW) that will deliver on the WRAP.

In its submission to the Commissioner, the MDBA acknowledged serious problems with compliance and enforcement arrangements. The MDBA stated its compliance role as 'regulating the regulators'.¹¹¹ The MDBA affirmed its commitment to improving measuring and metering of floodplain harvesting, developing a compliance culture, and ensuring WRPs are accredited.¹¹² In its effort to improve compliance outcomes, the MDBA referred to the establishment of an Office of Compliance and Independent Assurance Committee, the Basin Compliance Compact and the Compliance and Enforcement Policy 2018–2021, as well as to the Memorandum of Understanding with the NRAR and work with the DAWR to increase its compliance and enforcement powers. Other matters addressed by the MDBA included the development of reports relating to the progress of WRPs, methods to protect environmental water, and the creation of a register for allegations of non-compliance.¹¹³

The DAWR submission to the Commissioner noted it had provided \$9.1 million in funding to the MDBA for the purposes of strengthening compliance functions and that the MDBA had already implemented various recommendations from the MDBA Review.¹¹⁴ In addition, the Commonwealth Government has committed \$20 million in funding ‘to support the development of remote sensing and other technologies to enhance monitoring, measurement and compliance in all Basin jurisdictions and improved hydrometric networks in the Northern Basin’.¹¹⁵ The DAWR also made reference to the appointment of the Northern Basin Commissioner¹¹⁶ and that all ‘Commonwealth agencies have fully engaged in the development of a Basin-wide Compliance Compact ...’¹¹⁷

The Commonwealth Government’s commitment to fund remote sensing and metering technology received strong support from the Murray-Darling Basin Ministerial Council (**MinCo**) at its meeting held on 14 December 2018. The MDBA’s communique of that meeting stated that funding proposals for improved metering are due to the Commonwealth by 31 January 2019. The Commonwealth may consider additional funding for hydrometric networks and remote sensing subject to ‘...the value for money of the proposals received, advice from the Northern Basin Commissioner and the extent of any additional contributions provided by jurisdictions and project partners’.¹¹⁸

There cannot be any objection to the expenditure of public funds being on a value for money basis. But it should be to the forefront of decision-making about spending on metering improvements that without very substantial work the real value of irrigation water and its environmental implications will remain at obvious peril. Measurement is crucial to the system’s integrity.

Reforms and prosecutions

Commonwealth

At its meeting on 14 December 2018, the MinCo ‘noted the Commonwealth’s commitment to draft legislative amendments to the Water Act to strengthen the [MDBA’s] compliance and enforcement powers’, including the addition of criminal offence provisions for conduct such as water theft.¹¹⁹ The details of any proposed amendment(s) had not been prepared or were not made publicly available at the time of this report.

MDBA

MOU between the MDBA and the NRAR

On 20 February 2018, the MDBA and the NRAR signed a Memorandum of Understanding (**MOU**). The purpose of the MOU is ‘to improve public confidence in water management arrangements through a strong and co-operative approach to compliance with, and enforcement of, water management rules in the NSW Murray-Darling Basin’.¹²⁰

The MOU defines responsibilities of the NRAR (for example, water theft) and the MDBA (for example, a breach of trade rules). Where responsibilities are shared, the parties will consult and co-operate. The MOU establishes a protocol for handling allegations. The MDBA and the NRAR are to actively share information as well as experience and opportunities that could assist compliance and enforcement capacity, such as new technology, training and development.¹²¹ The MDBA's Chief Compliance Officer and the NRAR's Chief Regulatory Officer are to meet regularly to facilitate this. A program of activities to progress the purpose of the MOU will be established annually and the outcomes reported.¹²² The MOU is to be reviewed every two years.¹²³

Independent Assurance Committee and the Office of Compliance

In December 2017, Mr Russell James, Executive Director Policy and Planning, MDBA stated that the Office of Compliance had been established.¹²⁴ Further, in February 2018, the MDBA established a four member Independent Assurance Committee (IAC).¹²⁵

The IAC is designed to hold the MDBA accountable in the discharge of its compliance roles and responsibilities under the Basin Plan.¹²⁶ The IAC met for the first time on 16 March 2018, following which a brief report was released.¹²⁷ IAC reports are to be provided following each meeting.¹²⁸ The first report briefly discussed foundational elements of the MDBA's compliance work such as the Compliance Compact. The report stated that verbal briefings were provided on the protection of environmental water and on WRP progress, but no specific details were provided. At its second meeting on 18 April 2018, the IAC discussed foundational elements for the Office of Compliance.¹²⁹ A presentation was made outlining a revised work program for the Office of Compliance that was cross-referenced against the MDBA Review.¹³⁰ The Commissioner understands that the elements of the Office of Compliance's 'work plan and program for review' were on the agenda for IAC's November 2018 meeting.¹³¹ The Commissioner has not been able to identify details of the work plan or review program.

Water compliance reporting

The MDBA has developed a publicly available register for allegations of non-compliance (**non-compliance register**). The non-compliance register is current as at October 2018.¹³² The non-compliance register provides an MDBA case number, area of non-compliance, location/WRP area, date the allegation was received, status of the matter, and the agency the allegation has been referred to (eg NRAR). There are currently 18 matters listed on the non-compliance register with the earliest dating back to January 2016. A register of closed cases has also been developed to record matters that have been finalized. There is currently only one matter listed on the closed register.

The MDBA has detailed on its website a process for handling allegations of non-compliance.¹³³ This will involve conducting a preliminary assessment of the merits of the allegation and referring the matter to the appropriate agency.¹³⁴ The MDBA proposes

to follow up the progress made with relevant agencies, including escalating matters to the MinCo or anti-corruption bodies if progress has not been adequate.¹³⁵ The MDBA may investigate the matter without referral or after referral if it considers that direct investigation by the MDBA is the most appropriate response.¹³⁶ The progress of matters will be recorded on the non-compliance register, as discussed above.¹³⁷

The MDBA has also developed ‘reporting guidelines’ for Basin States and the MDBA to publicly report on their water compliance activities.¹³⁸ The reporting guidelines comprise a series of questions in relation to compliance and enforcement activity (for example, numbers of meters read, alleged compliance breaches reported, investigations commenced), including the number of prosecutions commenced in the reporting year, the status of prosecutions currently in progress and the outcome of any finalized matters.¹³⁹

In addition, the MDBA has commenced annual publication of reporting in relation to allegations of non-compliance. The MDBA’s Compliance Activity Report 2017–18 is the first such publication.¹⁴⁰ That report stated that between 30 June 2017 and 30 June 2018, the MDBA did not commence or finalize any investigations nor had it issued any advisory letters, formal warnings or statutory notices. However, 20 allegations of non-compliance were apparently reported to the MDBA. In 12 cases no breach was found, and eight cases were under review. Six matters had been referred to a State agency. It is not clear how the MDBA determined that 12 out of 20 reported allegations of non-compliance involved no breach in circumstances where the MDBA did not undertake any investigation. It is also unclear why seemingly only six out of eight cases under review had been referred to a State agency.

Compliance compact

On 8 June 2018, the Basin States and the MDBA agreed to a Draft Compliance Compact,¹⁴¹ which was endorsed, without amendment, by the Council of Australian Governments on 12 December 2018.¹⁴² The Compliance Compact (**Compact**)¹⁴³ sets out the following expectations and timeframes for improvements to governance arrangements:

- Basin States and the MDBA to review internal governance arrangements by 31 December 2018¹⁴⁴
- Basin States to publish a reporting framework for management decisions involving discretion by 30 September 2018¹⁴⁵
- Australian Government and Basin States to review joint governance arrangements by 31 December 2018¹⁴⁶
- Basin States and the MDBA to publish a revised compliance framework by 31 December 2018¹⁴⁷
- MDBA and Basin States to develop protocols in relation to Basin Plan compliance and enforcement actions by 31 December 2018¹⁴⁸

- Basin States to publish a metering policy and implementation plan by 31 December 2018 with all new meters complying with AS 4747 by no later than June 2025¹⁴⁹
- all take to be covered by meters by June 2025¹⁵⁰
- Basin States to implement a program to progressively automate reporting of take by no later than 2025¹⁵¹
- Basin States to report annually on installation of metering commencing 30 September 2019¹⁵²
- New South Wales and Queensland to publish program for improved floodplain harvesting measurement by 30 June 2019¹⁵³
- Basin States to implement pre-requisite policy measures to protect environmental water by 30 June 2019,¹⁵⁴ and
- New South Wales and Queensland to revise WRPs and trial interim and enduring solutions for the better protection of environmental water by 30 June 2019.¹⁵⁵

In December 2018, the MDBA released the Murray-Darling Basin Compliance Compact Interim Assurance Report 2018.¹⁵⁶ Broadly speaking, that report concluded that Basin governments and the MDBA have achieved or are likely to achieve their self-imposed expectations as set out in the Compact. Concerns were, however, identified with respect to matters including progress on public access to information, implementing pre-requisite policy measures, floodplain diversions and progressing the backlog of allegations of non-compliance. The report concluded that New South Wales will not finalize WRPs in full or on time.¹⁵⁷

Compliance and Enforcement Policy 2018–2021

In June 2018, the MDBA released its Compliance and Enforcement Policy 2018–2021 (**Enforcement Policy**).¹⁵⁸ The Enforcement Policy covers WRPs, SDLs, monitoring and auditing of Basin States' enforcement frameworks, improving metering and measurement of take, protecting environmental water, trading rules, and water quality and salinity targets.¹⁵⁹ The overriding principles of the Enforcement Policy are to ensure transparency and accountability, risk management, proportionality, fairness, co-operation, and avoidance of duplication.¹⁶⁰

The Enforcement Policy refers to the creation of the Office of Compliance, as well as the IAC to provide expert advice on compliance to the MDBA.¹⁶¹ Various compliance tools are identified, namely information and education, capacity building, setting guidelines, audits, and use of technology and remote sensing, reporting and publishing.¹⁶² The enforcement tools range from negotiations, undertakings, injunctions, declarations, and civil penalty proceedings.¹⁶³

The Enforcement Policy establishes an escalation pathway for the purpose of determining the appropriate enforcement response.¹⁶⁴ The most severe enforcement

action proposed against Basin States, for example, relating to non-compliance with SDLs are court ordered declarations or injunctions.¹⁶⁵ In relation to illegal take, the Enforcement Policy refers to a range of enforcement action against individuals including issuing infringement notices, and enforceable undertakings.¹⁶⁶

The Enforcement Policy states that the MDBA's compliance program is shaped by its annual compliance priorities. A statement of those priorities is published on the MDBA's website.¹⁶⁷ The annual enforcement policies for 2018–2019, include compliance and enforcement of unauthorized take in the Northern Basin, protection of environmental water, WRP assessment, and accurate measurement of water take.¹⁶⁸ In relation to these matters the MDBA proposes to audit Basin States enforcement framework, work with New South Wales to ensure the Barwon-Darling WSP includes rules to protect environmental water and adopt a streamlined accreditation framework for WRPs.¹⁶⁹

Sustainable Diversion Limit Reporting and Compliance Framework

In November 2018, the MDBA released its Sustainable Diversion Limit Reporting and Compliance Framework (**SDL Framework**) which will come into effect on 1 July 2019.¹⁷⁰ Central to the SDL Framework is the establishment of the Register.

In accordance with the SDL Framework, compliance with individual licence conditions remains the responsibility of State governments.¹⁷¹ The MDBA will work with Basin States to ensure that potential breaches are investigated and action taken if water use grows over time.¹⁷² The MDBA may intervene if it is concerned that a Basin State is not appropriately dealing with individual non-compliance. No guidance is provided as to the circumstances in which the MDBA will intervene in individual cases of non-compliance or how the MDBA will do so. Reference in this regard is made to the Enforcement Policy.¹⁷³

The MDBA considers its primary role is to ensure that Basin States are compliant with SDLs. To that end, the SDL Framework identifies the MDBA's responsibilities as:

- establishing a register of take
- reviewing data provided by Basin States pursuant to sec 71 of the Water Act
- determining non-compliance with SDLs
- taking action if actual take exceeds the long-term average, and
- undertaking regular audits and assurance reviews.¹⁷⁴

The MDBA considers that monitoring and assessing SDL compliance will take time and that the earliest time action could be taken will be two or three years after the water year in which the potential exceedance was identified.¹⁷⁵ One factor identified in this regard is to ensure adverse impacts upon entitlement holders are minimised.¹⁷⁶ The MDBA's functions are evidently contingent upon the performance of the Basin States meeting their obligations. The SDL Framework identifies such obligations as:

- preparing WRPs and ensuring water management performed consistently with the WRPs¹⁷⁷
- reporting and self-assessment of SDL compliance, and
- identifying steps to be taken where non-compliance is likely¹⁷⁸.

The SDL Framework does not identify what steps the MDBA will take if SDL compliance is not achieved or when any steps to compel compliance will be taken. Under the SDL Framework the MDBA will prioritize ‘up to two’ SDL water resource unit audits a year, which may be potentially interspersed with ‘progressive assurance audits’ relating to improvements of methods to measure take, growth on use by unmetered forms of take, and reporting of held environmental water.¹⁷⁹ Reference is made to the MDBA’s Audit Policy and Procedures Manual 2018.¹⁸⁰ The Commission was unable to locate this document after an extensive search of the MDBA’s materials.

Assessment of compliance will largely rely upon hydrological modelling accredited under WRPs.¹⁸¹ It is acknowledged that these models are not designed for this purpose but are considered to be the ‘best available tool’.¹⁸²

Queensland

Queensland has accepted, at least in principle, the majority of recommendations from the Queensland Audit. Many of the timeframes identified for the implementation of reforms prevent the Commissioner from offering any comment as to its progress. The Queensland Government rejected two recommendations from the Queensland Audit, namely:

- prohibiting water users from drawing forward on water accounts that are already overdrawn on the basis that Queensland’s water planning framework accommodates a ‘boom-bust cycle’,¹⁸³ and
- establishing a scientific and technical committee to research and advise on water measurements standards, policies and technologies on the basis that the Department of Natural Resources, Mining and the Environment has extensive processes in place to engage in best practice water science and policy.¹⁸⁴

The Commissioner is also aware of current prosecutions in Queensland relating to allegations exposed in Pumped. The prosecutions involve allegations against two people for multiple counts of fraud relating to the use of funds from the Healthy Headwaters Water Use Efficiency Project over a period of seven years. The defendants have not yet entered pleas. These matters have been adjourned for return on 4 February 2019.

New South Wales

New South Wales has set out an ambitious reform agenda reflected in the WRAP. The stated goals of the WRAP are to introduce best practice for water management, ensure transparency in how water is shared, allocated and managed, and build a compliance and enforcement capacity. The measures identified in the WRAP include the establishment of the NRAR, increasing compliance and resourcing by \$9.5 million per year, developing a metering and water policy, piloting technology to be used for water monitoring and compliance activities, creating a public register containing information about water entitlements, and establishing an interagency working group to develop solutions to better manage environmental water.¹⁸⁵

Natural Resource Access Regulator

The NRAR has already overseen prosecutions for breaches of water laws. As at 19 September 2018, the NRAR reported that it had taken ‘... over 100 actions against land owners in its first 100 days of operation’,¹⁸⁶ including four prosecutions, five penalty infringement notices, eight remediation notices directing landholders to take action, 81 advisory letters notifying landholders of alleged breaches, and 11 warning letters advising of suspected minor breaches.¹⁸⁷

Of significant public interest are the matters for which prosecution proceedings have been initiated. The material made publicly available indicates that NRAR is currently pursuing several individuals and a corporate body for allegations of water theft offences, including taking water from a river while metering equipment was not working, using a channel to convey water without approval, undertaking works along the river bank without a controlled activity approval, and providing false and misleading information to water investigators.¹⁸⁸ The defendants have pleaded not guilty to the allegations. These matters have been listed for trial. Further, on 26 November 2018, Mr Anthony Barlow pleaded guilty to ‘... one offence of pumping during an embargo on pumping, and two offences of pumping while metering equipment was not working’.¹⁸⁹ That matter has been adjourned for sentence.

Transparency

In March 2018, the New South Wales Government released a consultation paper for community input.¹⁹⁰ The paper referred to amendments made to the *Water Management Act 2000* (NSW) to authorize the disclosure of personal information through the creation of a single public register.¹⁹¹ It was intended that information, in addition to information that is already publicly available, will be added once it becomes available, for example, through better metering.¹⁹² The consultation paper also considered how to deal with commercially sensitive information. The basis for treating information as commercially sensitive was not explained, but it was suggested that ‘... account balances and meter reading information could be provided on the public register at an aggregated level or at a

time when the information was no longer commercially sensitive'.¹⁹³ The Commissioner has not been directed to any further progress made in this regard. The names of licence holders, meter readings and real-time water account balances have not yet been made publicly available.¹⁹⁴

Protection of environmental water

In June 2018, an interagency working group comprising representatives from State and Commonwealth agencies was established to present the New South Wales Government with interim solutions for the better management of environmental water.¹⁹⁵ Interim solutions included temporary water restrictions by prohibiting take¹⁹⁶ for the purpose of trialling a form of active management.¹⁹⁷ In this regard, the Commissioner is aware of the Northern Connectivity Event trialled in mid-April 2018.¹⁹⁸ The Commissioner is not aware of any subsequent trial to actively manage environmental flows in the Barwon-Darling. It was also suggested that event protocols be established to balance the protection of held environmental water 'and extractive use when the flows in the unregulated systems are above the commence-to-pump levels'.¹⁹⁹ No event protocols have been identified. A review of the WSP for the Barwon-Darling reveals that total and daily extraction limits have not been included nor have any specific rules for the active management of environmental flows.

Metering

In November 2018, the New South Wales Government released its 'Non-Urban Water Metering Policy'²⁰⁰ (**Metering Policy**). The Metering Policy set out the non-urban water metering requirements, as prescribed under the *Water Management Act 2000* (NSW) and the *Water Management (General) Regulation 2018* (NSW). It commenced on 1 December 2018 and applies to all forms of take unless taken under basic landholder rights, where surface water works are marked as inactive, or are otherwise exempt.²⁰¹

The Metering Policy is based on various thresholds, including infrastructure size, pump capacity thresholds, and identified at risk groundwater sources.²⁰² The implementation of new metering requirements will occur in stages, namely:

- Stage 1: Surface water users with pumps of 500 mm or larger must comply by 1 December 2019
- Stage 2: Remaining users in northern inland regions must comply by 1 December 2020
- Stage 3: Remaining users in southern inland regions must comply by 1 December 2021, and
- Stage 4: Remaining users in the coastal regions must comply by 1 December 2023.²⁰³

All new and replacement meters must, from 1 April 2019, be ‘pattern-approved and installed and validated by a duly qualified person in accordance with the requirements of Australian Standard 4747’.²⁰⁴ This includes, where required, the installation of tamper evidence seals and telemetry, except for certain surface water pumps authorized to be less than 200 mm.²⁰⁵ It also includes a requirement to comply with maintenance specifications, which must be validated by a duly qualified person within the prescribed timeframes.²⁰⁶

Discussion

The importance of an effective compliance and enforcement regime is universally accepted. It has been emphasized time and time again. Adopting the words of Mr Matthews:

*Despite the frequent discord about many water management issues, there is one thing that all parties agree on — non-compliant or illegal extraction of water should not be tolerated and should be dealt with firmly. Environmental groups want assurance that the environment is not being short-changed. State governments want to be confident that other states are observing the rules. Irrigators want assurance that their peers are behaving honestly.*²⁰⁷

The compliance and enforcement framework under the Water Act, properly implemented, is suitable to achieve the aims and objects of the Water Act and Basin Plan. The MDBA’s ability to compel compliance by the Basin States through the use of administrative remedies is appropriate having regard to the nature of intergovernmental agreements and obligations between governments. Further, the capacity for the MDBA to take action against individuals engaged in conduct that undermines the implementation of the Basin Plan or WRPs, in addition to the compliance action available to States, appears sufficient. Further law reform to the Water Act will not necessarily achieve greater compliance and enforcement outcomes. A review of the MDBA’s current and proposed practices, however, raises serious concerns about its commitment to holding Basin States or individuals accountable.

On its face, the inclusion of a formal mechanism, namely the Register in the Basin Plan to monitor SDL compliance, is welcome. However, the policy rationale for permitting Basin States to exceed SDLs by up to 20% or by more than 20% with a ‘reasonable excuse’ is dubious. The 20% threshold appears too high, even having regard to the Basin’s inherent climatic variability. There also appears to be no good reason why some water resource areas will be treated as a single SDL resource unit for the purpose of assessing SDL compliance. Doing so ignores the premise of having a separate SDL for each water resource unit — the premise being that each water resource area must achieve its own environmental objectives. That one water resource area may be below its SDL is irrelevant to the question of compliance with the SDL and achievement of environmental outcomes in another water resource area.

The MDBA's reliance upon modelling to monitor compliance simply on the basis that it has been used in the past is unsatisfactory. That no improvement has been made in the last 20 years to assess compliance such that the same practices, not designed for that purpose, are still being used is unlikely to assist the MDBA remould itself as a trusted organization. Compounding the objections to the way in which compliance will be measured is the MDBA's proposal to audit no more than two water resource areas per year. The Basin has 22 water resource areas. On this basis it would take the MDBA at least 11 years to audit each water resource area at least once. In theory, a water resource area could be in excess of its SDL by up to 20% for up to 11 years without being subject to audit and still be treated as being compliant. The MDBA has not detailed how it will make any decision about which water resource areas to audit. For instance, will auditing be done on the basis of a risk assessment, namely that high risk areas, perhaps with a history of non-compliance and a greater prospect of increased future use be audited more regularly than other areas? Will areas with less robust metering processes be subject to more frequent auditing? The MDBA has also committed to taking more direct action against individuals, where necessary. The circumstances in which it proposes to do so have not been adequately explained.

In light of the foregoing, there appears to be merit in the draft recommendation of the Productivity Commission to separate the current compliance and enforcement functions of the MDBA. Although the MDBA and Commonwealth Government have rejected this recommendation, there appears to have been little progress by the MDBA in relation to the role of the IAC or Office of Compliance, raising doubts about its concrete commitment to operational reform.

At a State level, the various legislative regimes, if properly implemented, appear sufficiently robust to ensure compliance with WRPs when they come into effect on 1 July 2019. A range of enforcement options is available to allow appropriate decisions to be made depending on the facts and circumstances of each case and the application of important policy considerations such as relevant prosecutorial guidelines. Nevertheless, there remains scope for improvement. This may include giving consideration to increasing statutory time limitations or penalties where appropriate, and to the question whether the range of penalty options adequately reflect community disapproval of such offending. The high degree of inconsistency between Basin States invites reflection as to the possibilities for greater uniformity between them. This is particularly given the national intent of the management of Basin water resources. The discrepancies in State legislative regimes makes it difficult for sentencing courts to have regard to the treatment of comparable conduct across Basin States.

The inconsistencies between Basin States do not explain the apparent lack of enforcement action. It is noted that a lack of prosecutions does not in itself indicate that the various State regimes are ineffective. Not every offence needs to be prosecuted. It has, however, contributed to public perception that Basin States are unwilling to respond to, and properly investigate, allegations of water theft. The many inquiries and investigations

undertaken since Pumped have demonstrated significant shortcomings with the operational capacity of regulatory authorities to properly respond to allegations of unlawful conduct. Issues relevant in this regard include the suitability of metering, access to information, and the development of a culture which supports effective compliance, including appropriate levels of resourcing. The lack of proper metering and monitoring, for example, makes it difficult for authorities to determine if breaches have occurred, and if so, to what extent. This complicates decision-making and compromises the ability to take any enforcement action. The lack of enforcement action has very obviously created a sense of mistrust in the law and has produced considerable community resentment — between neighbours, and amongst Basin States.

The focus on operational reforms has largely centred on Queensland and New South Wales. Those States are to be commended for the reviews undertaken and commitments made to reform. Understandably, significant reforms are likely to take some time to fully implement. By reference to the enforcement action already undertaken, some improvements have already been made. In particular the action by NRAR and its public openness to reporting on its enforcement activities. That justice is being seen to be done is a necessary ingredient to restore public confidence. However, other areas of improvement seem to have stalled. Measures to improve metering, monitoring, transparency and the protection of environmental water have not yet been adequately demonstrated.

It seems that in New South Wales and Queensland, the public still has no access to real time measuring of take or the comprehensive suite of information regarding licence details recommended by Mr Matthews. Interim and enduring measures to protect environmental water do not appear to have been finalized. Other than the Northern Connectivity Event, there is no evidence of additional attempts to actively manage environmental flows. Most significantly perhaps are the lengthy timeframes for the roll out of proper, consistent and modern metering. Metering has been on the national agenda for more than 20 years and millions of dollars have supposedly been invested into it, and yet the Northern Basin has a metering rate of no more than 51%. Some of those meters may be wildly inaccurate, resulting in higher volumes of water extraction than what is being recorded.

It is of real concern that Basin States have now had significant time to address operational shortcomings in advance of the WRPs being finalized. Although the recent MDBA and IAC assessment indicates that Basin States and the MDBA are progressing commitments under the Compact, the timeframes to fully implement operational improvements either extend beyond the time that WRPs are due to take effect or may not leave sufficient opportunity to make necessary adjustments. Many of the matters dealt with under the Compact could have and should have been dealt with already. There is a sound basis for public suspicion that the commitments under the Compact will not be properly delivered given the demonstrated history of governments failing to do so in accordance with previous intergovernmental agreements, such as the commitments made under the National Metering Framework.

Failure to make sufficient practical and operational progress in terms of monitoring, compliance and enforcement before the WRPs come into effect will serve only to further undermine the public's confidence in the achievement of environmental, economic, and social objects of the Water Act and Basin Plan and the capability of the MDBA and State regulatory authorities.

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Introduction

There have been many examples of defects and dysfunction in the actions and decisions of the Murray-Darling Basin Authority (**MDBA**), documented throughout this report. They will not be repeated here. They reflect, however, failures in good and proper governance by the MDBA, in its drafting and implementation of the *Basin Plan 2012* (Cth) (**Basin Plan**).

What follows is an analysis of the governance arrangements established under the Murray-Darling Basin Agreement 2008 (**MDB Agreement**), the *Water Act 2007* (Cth) (**Water Act**) and the Basin Plan, for the purpose of discussing three specific areas in which reform is urgently needed, in order to ensure that the objects and purposes of the Water Act can be achieved.

The first arises further to observations made elsewhere in this report, that the requirement for decisions to be made based on the best available science is rare in a legislative context, and to be treasured. This aspect makes the Basin's legislative scheme all the more ground-breaking and important. The fact that matters of fact and science are removed, in the legislative framework, from the scope of Ministerial direction, reiterates the importance of the MDBA's independence in those areas. The legislation mandates that the MDBA must make its own decision on such matters. However, as discussed in Chapter 18, the MDBA has failed to disclose its science publicly, and in a manner that permits scrutiny, testing and replication by the scientific community. This chapter opines that the Water Act would benefit from an amendment that makes it clear that any decisions of the MDBA on matters of fact and science must not be a cloistered exercise.

The second builds on the discussion in Chapter 11, and the fact that the manner in which Aboriginal people are engaged in all aspects of the Murray-Darling Basin (**Basin**) is wanting. Reform in this area must be driven by legislative amendment, in order to mandate the role of Aboriginal people in the governance of all aspects of the Water Act and Basin Plan.

Finally, the Commissioner notes and echoes concerns reflected in the 2018 draft Productivity Commission report (**2018 Draft Report**) regarding the inappropriateness of the MDBA marking its own work.¹ Noting the Productivity Commission's recommendations regarding structural reform within the MDBA, the Commissioner prefers the National Water Commission (**NWC**) model, on the basis it provided a necessary and appropriately expert and independent oversight of the implementation of the Basin Plan. The NWC played an important role in the governance of the Murray-Darling Basin which worked well, and was abolished without justification. It warrants renewed consideration in the context of achieving the best and most effective governance arrangements.

Murray-Darling Basin Agreement 2008

On 15 December 2008, and in conjunction with the passing of the Water Act, the MDB Agreement took effect, and was inserted into the Water Act as Sched 1. The MDB Agreement was executed on behalf of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory (**Basin States**) and the Commonwealth (**Contracting Governments**).

From a governance perspective, the MDB Agreement provided:

- that the functions of the former Murray-Darling Basin Ministerial Council were conferred, in the most part, on a newly formed Murray-Darling Basin Ministerial Council (**MinCo**),² and
- for the establishment of the Basin Officials Committee (**BOC**), comprised of representatives of all Basin States, for the purpose of advising the MinCo.³

That governance structure is discussed further below.

Legislative context

The decisions under the Water Act and Basin Plan are all ultimately made by the MDBA or the Commonwealth Minister. To that end, the MinCo and the BOC have solely consultative or advisory functions.

MDBA

The MDBA is established by sec 171 of the Water Act. Pursuant to secs 176–77, the MDBA is a body corporate comprising six members, including the Chief Executive, Chair and four other members. Staff of the MDBA are public servants.⁴

References throughout the Water Act to the ‘Authority’ are references to the MDBA Board, comprised of the members referred to above.⁵ Throughout this chapter, the acronym ‘MDBA’ has been used in place of ‘the Authority’.

Members are appointed by the Governor, and must have high-level expertise in one or more of the following at the time of their appointment:

- water resource management
- hydrology
- freshwater ecology
- resource economics
- irrigated agriculture

- public sector governance
- financial management
- ‘Indigenous matters’ relevant to Basin water resources.⁶

Powers and functions

The functions and powers of the MDBA are prescribed both in the Water Act and the MDB Agreement.

Section 172 of the Water Act sets out core functions associated with the management of the Basin’s water resources via the Basin Plan. In summary, those functions relate to:

- measuring, monitoring and recording
- consultation
- research and investigation
- advice, and
- collection and dissemination of information.

In addition, the MDBA has functions set out in Part 2 of the Water Act in relation to the establishment, amendment and review of the Basin Plan.

Clause 29 of the MDB Agreement prescribes that the MDBA is to: give effect to any decision of the MinCo, give effect to any high-level decision of the BOC on river operations, and to provide advice to the MinCo and the BOC.

The MDBA has broad powers pursuant to sec 173 of the Water Act to do that which is necessary or convenient in the performance of its functions, including to acquire, hold and dispose of property and enter contracts. Part 10 sets out various special powers, including to enter land and gather information. Those powers may be delegated to a Board or staff member (or others), except in respect of preparing, amending and reviewing the Basin Plan, which powers and functions may not be delegated.⁷

Murray-Darling Basin Ministerial Council

The MinCo’s key functions are described in cl 9 of the MDB Agreement:

- (a) *to consider and determine outcomes and objectives on major policy issues of common interest to the Contracting Governments ... in so far as those issues are not provided for in the Basin Plan*

...

- (c) *to approve the annual corporate plan, the annual work plan, and the asset management plan, prepared by the Authority for the purposes of this Agreement...*

Whilst the MinCo has a role to play in the context of the Water Act and Basin Plan, insofar as it is required, or permitted, to do something, it must do so in accordance with any requirements specified in the MDB Agreement.⁸

Basin Officials Committee

The BOC comprises a Chair and a representative from each of the Basin States.⁹ Clause 26 of the MDB Agreement sets out its functions and powers, namely:

- (a) *to advise the [MinCo] in relation to outcomes and objectives on major policy issues of common interest to the Contracting Governments ... in so far as those issues are not provided for in the Basin Plan;*
- (b) *to give effect to any policy or decision of the [MinCo]...*
- (c) *to exercise responsibility for high level decision making in relation to river operations...*

Pursuant to cl 25 of the MDB Agreement, the Chief Executive and Chair of the MDBA may attend and participate in BOC meetings, but are not entitled to vote.

In addition to the matters set out above, sec 201 of the Water Act gives the BOC the following, advisory functions:

- (a) *to advise the Authority about the performance of the Authority's functions, including advising about:*
 - (i) *engaging the Basin States in the preparation of the proposed Basin Plan and proposed amendments of the Basin Plan; and*
 - (ii) *matters referred to the Committee by the Authority;*
- (b) *to facilitate cooperation and coordination between the Commonwealth, the Authority and the Basin States in managing the Basin water resources.*

Ministerial power & matters of a 'factual or scientific nature'

The Commonwealth Minister is responsible for key decision-making under the Water Act and Basin Plan, including regarding drafting and amending the Basin Plan, and regarding water resource plans (WRP).¹⁰

Pursuant to subsecs 175(1) and (3) of the Water Act, the Minister may give directions to the MDBA about the performance of its functions, which must be consistent with the objects of the Act (that is, the Minister can't direct the MDBA to do something unlawful)

and must be complied with. There are also a number of provisions scattered throughout the Water Act that provide for Ministerial direction in specific contexts, some examples of which are discussed further below.

As stated in subsec 175(2), however, the Minister may not give directions concerning:

- (a) *a determination by the Authority under paragraph 83(2)(b);*
- (b) *its powers under Division 3 (information gathering) of Part 10;*
- (c) *the monitoring of compliance with, or the investigation of possible contraventions of, a provision of:*
 - (i) *Part 2 or regulations made for the purposes of Part 2; or*
 - (ii) *Division 3 of Part 10;*
- (d) *its powers under Part 8 (enforcement);*
- (e) *the performance of a function that is conferred under Part 1A or 2A.¹¹*

The matters identified in subsec 175(2) above are, in essence and with respect, sensible carve outs in the context of the regulator-type functions of the MDBA.

Beyond those specific exclusions, the provisions of the Water Act governing the making of the Basin Plan powerfully and specifically exclude Ministerial direction in the context of matters of a factual or scientific nature, discussed further below.

Making the Basin Plan

The procedure for making the Basin Plan is set out in secs 41–44 of the Water Act. Those provisions provide that:

- In preparing the Basin Plan, the MDBA must consult with the Basin States, the BOC and the Basin Community Committee, and may undertake such other consultation and publication of information it considers appropriate.¹²
- Once a proposed Basin Plan is prepared, the MDBA must invite submissions from the Basin States and members of the public, and prepare and publish the proposed Basin Plan, a summary of it, submissions received and the MDBA responses to those submissions.¹³
- The MDBA must then provide the proposed Basin Plan, together with advice on socio-economic implications, to each member of the MinCo and consider any comments from the MinCo, including engaging in further consultation and publication, if appropriate.¹⁴
- The MinCo must advise the Minister in writing of any view it wishes to express.¹⁵
- The MDBA must provide a Basin Plan to the Minister.¹⁶

- The Minister must consider the Basin Plan and either adopt it, or return it to the MDBA with suggestions for consideration. The MDBA must consider and, if desired, further consult and publish, reverting to the Minister with either an unaltered, or amended, Basin Plan, and a written explanation.¹⁷
- The Minister must then consider and either adopt the Basin Plan, or direct the MDBA to make modifications, and to provide the Basin Plan for adoption. Any such direction must be complied with by the MDBA and the resulting Basin Plan adopted by the Minister.¹⁸

As discussed in Chapter 5, that detailed process was followed in the course of making the Basin Plan.

In exercising the power of direction, sec 44(5) specifically provides that:

The Minister must not give a direction under subparagraph (3)(b)(ii) in relation to:

- (a) any aspect of the Basin Plan that is of a factual or scientific nature; or*
- (b) without limiting paragraph (a), any of the matters referred to in:*
 - (i) items 1, 2, 3 or 8 of the table in subsection 22(1); or*
 - (ii) subsection 75(1); or*
 - (iii) subsection 81(2) or (3).*

Paragraph 44(5)(a) is necessarily broad in its scope, and its terms are not otherwise defined in the Water Act.

Discussion

Given the introductory words in para 44(5)(b), that provision is clearly not intended to have the effect of reading down the scope of para 44(5)(a). Notably, the matters specifically excluded in para 44(5)(b) relate to mandatory content of the Basin Plan (a description of the Basin water resources;¹⁹ identification of the WRP areas and water accounting periods;²⁰ risks to the condition of the Basin water resource;²¹ methods to determine if the long-term average sustainable diversion limit (**SDL**) has been complied with,²² and allocating responsibility for changes in the reliability of water allocations²³). Plainly those matters are technical, and specifically factual or scientific.

It is somewhat curious that subpara 44(5)(b)(i) selects only some of the matters set out in the table in subsec 22(1) for specific exclusion from Ministerial direction. Consideration of the remaining items is somewhat instructive in interpreting the meaning of para 44(5)(b). Those remaining matters relate to the mandatory content of the Basin Plan and include: that the Basin Plan must achieve management objects and outcomes;²⁴ strategies to manage risks;²⁵ setting SDLs for the Basin water resource as a whole and for each WRP area (on the basis that they reflect an environmentally sustainable level of

take (ESLT));²⁶ temporary SDLs;²⁷ environmental watering plan;²⁸ a water quality and salinity plan;²⁹ requirements for WRP accreditation;³⁰ rules for the trade and transfer of water rights,³¹ and a program for the monitoring and evaluation of the effectiveness of the Basin Plan.³²

On their face, those additional matters set out in subsec 22(1) are also a mixture of fact and science. The setting of the SDL on the basis that it reflects an ESLT is a specific example of a truly scientific exercise. The definition of ESLT in sec 4 of the Water Act makes that plain. Further to the discussion in Chapters 3 and 5 of this report, it is clear that the MDBA has adopted a triple bottom line approach to the Basin-wide ESLT and SDL determinations. Accordingly, the question arises as to whether item 6 is specifically left out of the list in subpara 44(5)(b)(i), in order to permit Ministerial direction on matters that consider the triple bottom line. Some may argue in advancing that proposition that the ESLT determination is not a matter of science, on the basis that it's a topic upon which reasonable minds will differ.

That reasoning is rejected. First, on grounds as set out in Chapters 3 and 5 — namely, that a triple bottom line approach is not lawful in the context of the ESLT and SDL determinations. Second, science is not characteristically, let alone always, the subject of universal agreement. Finally, reading the paragraph as a whole, arguably para 44(5)(b) is intended to particularize by way of example, rather than in order to limit, the matters excluded from Ministerial direction on the basis they concern factual or scientific matters.

Amending the Basin Plan

The mechanism for amending the Basin Plan is set out in subdiv F of Div 1 of Part 2 of the Water Act, in secs 45–48. The process is akin to that described above for making the Basin Plan, namely it requires extensive consultation, public submissions and publication, input from the MinCo and scope for the Minister to adopt the amendment or give suggestions to the MDBA (para 48(1)(b)), and to subsequently adopt or direct the MDBA to make modifications to the amendment (para 48(3)(b)). As in the case of making the Basin Plan, subsec 48(5) contains an exclusion from Ministerial direction of matters of fact and science, in terms that mirror subsec 44(5) (with the exception that subsecs 81(2) and (3) are not expressly referred to).

As discussed in Chapter 7 of this report, secs 23A and 23B of the Water Act provide a separate process to that prescribed in subdiv F, for the MDBA to propose adjustments to the SDL. Expressly, these provisions enable an adjustment without requiring an amendment to the Basin Plan under subdiv F.³³ Accordingly, these provisions impose much less onerous requirements on the MDBA. Ultimately, the MDBA must prepare a notice reflecting the effect of the proposed adjustments, and an amendment to the Basin Plan reflective of the information contained in the notice, and provide those to the Minister.³⁴

Subsection 23B(6) states:

As soon as practicable after receiving the amendment, the Minister must:

- (a) consider the amendment; and*
- (b) either:*
 - (i) adopt, in writing, the amendment; or*
 - (ii) give the Authority notice, in writing, that the Minister has decided not to adopt the amendment.*

Discussion

Notably, the provisions concerning the making of the Basin Plan are drafted in similar terms to those relating to amendments, albeit to achieve separate purposes. They are distinguishable, however, insofar as the making of the Basin Plan is mandatory — as evidenced by sec 41, whereas the preparation of an amendment to the Basin Plan is discretionary — see sec 45.

In the context of the scope for Ministerial direction in the case of an amendment to the Basin Plan, there is apparently no power for the Minister to refuse to make an amendment. To that end, the carve-out of matters of fact and science from the scope of Ministerial direction secures a desirable level of independence for the MDBA in this decision-making.

There is a clear disparity, however, in the power vested in the Minister, as between subsec 23B(6) and sec 48. In the former, the Minister has no power to direct the content of the amendment (in contrast to para 48(3)(b)). However, the Minister does have the power in subsec 23B(6) to determine not to adopt an amendment proposed by the MDBA, including in circumstances where that amendment is based on matters of fact and science.

Ultimately, in terms of governance, these legislative provisions highlight the relationship between the MDBA and the Minister, and emphasize that factual and scientific matters are not subject to Ministerial direction, except in the case of the SDL adjustment.

Compliance

The aspects of the legislative framework established by the Water Act that govern compliance are addressed in some depth in Chapter 16 and as such, require nothing more than a terse reference here. In short, responsibility for compliance sits primarily with the Basin States, including in the context of WRPs, which have force in law at both the Commonwealth and State level. As such, matters of compliance raise complex, multi-jurisdictional issues.

In the context of the future implementation of the Basin Plan, Chapter 16 discusses plans to review governance arrangements, proposed in the context of the Draft Compliance Compact and endorsed without amendment by the Council of Australian Governments (COAG) on 12 December 2018.³⁵

Noting that some level of review is currently underway, and in an effort to re-build trust in the administration, transparency, real-time reporting of consumptive take, and accurate metering and measuring techniques are key. Likewise, taking proactive steps to enforce compliance breaches is essential and may be assisted by giving consideration to the severity of penalties for such breaches, including whether they are sufficiently onerous so as to have a deterrent effect.

Areas for reform

Throughout the work of this Commission, the scope for legislative reform across three key areas, specifically relevant to the governance context, has emerged as necessary in order to ensure the objects and purposes of the Water Act can be achieved. They arise in the areas of:

- disclosure and the role of science
- Aboriginal engagement, and
- the need for independent oversight of the MDBA's work.

Disclosure and the role of science

Based on the discussion above, the Water Act provisions governing making and amending the Basin Plan appear to be based on a model of good governance, insofar as they require broad consultation, and establish a blend between maintaining the independence of the MDBA on matters of fact and science, whilst ultimately leaving the decision to make the Basin Plan to the Minister.

The MDBA is required to consult widely, but is then responsible for preparing the Basin Plan for the Minister's consideration. By carving out matters of fact and science from the scope of Ministerial direction, the Water Act builds an appropriate degree of independence into the MDBA's decision-making concerning factual and scientific matters (except in the case of adjustments to the SDL).

The MDBA's function is thus independent, but must not be isolated.

Based on the evidence presented to this Commission, which is discussed in detail elsewhere (see Chapters 5, 7, 8, 9, 10 and 18), the provisions in Part 2 Div 1 of the Water Act, governing both the making of the Basin Plan and its amendment, appear to have been insufficient, in practice, to mandate the necessary level of public disclosure of the

MDBA's science in order to ensure that the MDBA's scientific methods, reasoning and decisions are exposed, robust, tested and replicable.

The governance structure is flawed insofar as it has permitted what is, in effect, a small group of MDBA Board members, staff and others, to engage in a secretive exercise in respect of scientifically-based decisions. That defect is readily remediable through the full public disclosure of all of the science, including the modelling, during the various consultation phases mandated in Part 2 Div 1 of the Water Act. Only after the full science has been disclosed and debated, should the MDBA be exercising its statutory functions and powers in respect of matters of science.

Further in terms of reform, and noting that secs 23A and 23B were incorporated into the Water Act late, and as part of the political compromise at the time of making the Basin Plan, the content of sec 23B detracts from the primacy and independence of the MDBA on matters of fact and science, and would appear to amount to what is, at least in theory, an alarming contradiction within the Water Act. That contradiction gives rise to the risk of a possible and future abuse of those provisions, in the absence of a legislative amendment to remedy that inconsistency. Such an amendment should be considered in the interests of good governance.

Aboriginal engagement

The Commissioner was much assisted during the course of the Commission by detailed contributions from Aboriginal people across the Basin, through private consultations, written submissions and oral evidence.

Specifically in the context of governance, an overarching conclusion drawn from those thoughtful contributions is that much more should be done to ensure that the depth of insight, knowledge and experience of Aboriginal people is embraced, and Aboriginal interests acknowledged and progressed, in the pursuit of the objects and purposes of the Water Act. Without question, all inhabitants of, and stakeholders in, the Basin will share the benefit if that is the case. Most importantly, Aboriginal people themselves are entitled to that as of moral right, but also consider it their responsibility.³⁶

An obvious opportunity exists to address this issue in a decisive manner in the context of sec 178 of the Water Act, which addresses the constitution of the MDBA Board. As stated in Chapter 11, positioning Aboriginal people with a central decision-making role on all matters concerning the Basin is essential.

Based on a brief review of the historical constitution of the MDBA Board, it would appear that, as at the time of writing, current and past Board members have not, at least expressly, held expertise in 'Indigenous matters relevant to Basin water resources' (para 178(3)(h)).

That outcome is entirely unsatisfactory. Accordingly, Aboriginal representation on the MDBA Board must be mandated, in order to ensure Aboriginal voices can be heard on this important council of the nation. As demonstrated by the Aboriginal representatives that provided assistance to the Commission, the perspectives and interests of Aboriginal people are necessarily diverse. As such, a single voice is likely to be insufficient and unrepresentative. Accordingly, and at the very least, two Aboriginal representatives should be required.

Naturally, awaiting a legislative amendment is not necessary in order to progress this issue. Further, and consistent with the observations in Chapter 11 regarding the need for urgent and genuine engagement with Aboriginal people, the obvious place to start is in the context of the process for determining those Board representatives. The Commissioner considers that the Chairpersons of Murray Lower Darling Rivers Indigenous Nations and Northern Basin Aboriginal Nations are obvious choices for Board representation, but ultimately those are matters to be determined elsewhere.³⁷

Independent oversight

Consistently throughout the course of this Commission, individuals, organizations, scientists and former high-level members of government spoke of the merits of the former National Water Commission (NWC), likewise lamenting its repeal in 2014.

The NWC was established under the *National Water Commission Act 2004* (Cth) (NWC Act) to implement the National Water Initiative (NWI) and reform the broader national water agenda. It was an independent statutory authority within the Department of Sustainability, Environment, Water, Population and Communities portfolio that provided independent, evidence-based advice to the COAG and the Commonwealth Government on national water issues.³⁸

A key function of the NWC was to advise the Prime Minister on expenditure of the Commonwealth Government Water Fund between 2004 and 2010. This included three programs. In the case of the Raising National Water Standards Program, the NWC managed more than 170 projects and facilitated investment in Australia's ability to measure, monitor and manage its water resources.³⁹

The NWC was also responsible for assessing and reporting on progress on the NWI.⁴⁰

The NWC Act was amended in June 2012 following an independent COAG Review of the NWC. Under the amended Act, the NWC had three core ongoing functions: monitoring, audit, and assessment. The NWC was also empowered to undertake broader activities promoting national water reform objectives and was given additional functions under other Commonwealth Acts and Regulations.⁴¹

In particular, the Water Act assigned an ongoing function to the NWC to audit the effectiveness of the implementation of the Basin Plan and associated WRPs. Ms Karlene Maywald, former Chair of the NWC, gave evidence that the NWC's functions: 'included responsibility for auditing the work of the MDBA, how the States were progressing in terms of meeting their targets to achieve the sustainable diversion limit, and whether States were on target to meet their 2019 deadlines regarding Water Resource Plans'.⁴²

The NWC was required to conduct its first audit by March 2013 and subsequently no later than five years from the conduct of the first audit.⁴³ Ms Maywald explained that the 2013 audit date was set on the basis that it would have been five years into the implementation of the Basin Plan. However, due to the time taken to pass the Basin Plan, the NWC had less than 12 months to audit and as such, determined to conduct an assessment of risks and priorities for the Commonwealth and States instead. The NWC had intended to undertake its first full audit in 2015 but, due to input from the States and Commonwealth, it was put off until 2017.⁴⁴

The NWC was abolished by the Abbott Government by means of the *Australian Government's National Water Commission (Abolition) Act 2015 (Cth) (Abolition Act)* in October 2014. The reason given was that, due to 'the substantial progress already made in water reform and the current fiscal environment, there is no longer adequate justification for a stand-alone agency to monitor Australia's progress on water reform'.⁴⁵ In the Second Reading Speech debating the Abolition Act, the additional justification was offered that:

our government is also aware of the need to find appropriate savings measures and of returning the budget to surplus and as such have determined it is no longer necessary to retain a separate body to undertake the auditing and monitoring functions of the [NWC].⁴⁶

Upon its abolition, the various functions of the NWC were divided between the Productivity Commission (including specifically assessments of progress towards achieving NWI objectives and outcomes and the independent audit of the implementation of the Basin Plan), the Department of the Environment (Cth), ABARES, the Bureau of Meteorology and the MDBA.

At the time of debating the Abolition Act, complaint was made in the Parliament that abolition of the NWC would see the loss of a specialist, independent and expert body with particular skills in audit, evaluation and governance but also hydrology and ecology in the context of the process of water reform, with concerns that the Productivity Commission was ill-equipped to take up the auditing function of the Basin Plan.⁴⁷

In very recent times, it appears that similar concerns have been expressed to the Senate's Rural and Regional Affairs and Transport References Committee Inquiry concerning the integrity of the water market in the Basin. Those concerns were reflected in its report of November 2018.⁴⁸

Similarly, those concerns were echoed in submissions and evidence to this Commission. Parties told the Commissioner how the abolition of the NWC has contributed to the erosion of the national oversight of water reform and the delivery of the Basin Plan,⁴⁹ and some shared calls for its reinstatement.⁵⁰ Ms Maywald told the Commissioner that the advantage of the NWC was that it had ‘the buy-in’ of the States. She echoed concerns about the inability of the Productivity Commission to influence the implementation of the Basin Plan.⁵¹ One submission to the Commission discussed the merits of the NWC thus:

there are a number of shortfalls in the NWI’s monitoring and continuous improvement systems. While monitoring of water plan outcomes is still impoverished, perhaps the biggest shortfall relates to oversight of the NWI system itself. As a tool for improving and progressing the NWI, the NWC assessments were arguably its most important product, helping to facilitate benchmarking of performance. The assessments also shed light on gaps in the agenda, and publicly ‘prodded’ governments when they were dragging the chain on water reform. This success is worth noting given that, subsequent to the National Competition Reforms and their incentive arrangements, there has been little funding to encourage State commitment to implementation ...

Despite the success of the NWC, it was abolished in 2015. ... With the government left to self-assess progress (albeit alongside Productivity Commission or ad hoc senate and independent inquiries), the disciplinary drivers that arose from the NWC’s public transparency and comparisons have largely fallen away. As the NWC itself noted before being disbanded, there is ‘little assurance against backsliding on previous gains’. This is particularly worrying given the substantial amount of work still to be completed regarding the Basin Plan.

At a minimum, improving the commitment to monitoring and improvement goals requires increasing monitoring budgets (e.g. for water plans) and reembracing an oversight and transparent benchmarking role for the MDBA (or some other new body).⁵²

Ms Maywald gave evidence to the Commission regarding the merits of the NWC, and her disappointment regarding its abolition. She stated that she did not agree with shutting down the NWC in 2015:

due to the amount of unfinished business with the NWI. Also, I was concerned that under the new arrangements, without formal reporting back into [COAG]... there was a high risk of backsliding against the NWI agenda and the concerns underpinning the Basin Plan.⁵³

The evidence persuasively shows that the NWC provided a necessary check and balance, and oversight, that is now lacking in the implementation of the Basin Plan. To some extent, the MDBA has been left to check its own work, which is entirely unsatisfactory, and in other cases bodies such as the Productivity Commission fail to provide the expert, independent and appropriately funded oversight that is needed in the

complex and specialized Basin context. There was no good reason for the abolition of the NWC in 2015, as is rather implied in the uninspired assertion that it was necessary as a savings measure. More likely, that decision was reflective of a waning commitment by the Commonwealth Government in 2015 to meaningful and long-term investment in restoring the health of the Basin. Had the NWC remained in place, some of the issues of lack of openness and disclosure addressed in Chapter 18 may have been avoided. Insofar as it represented a small, elite, scientifically fierce, policy-based body, a return to the NWC-type model likely presents an important improvement in the future implementation of the Basin Plan.

Draft Productivity Commission Report

Pursuant to sec 87 of the Water Act, the Productivity Commission has conducted its first five-yearly assessment of ‘the effectiveness of the implementation of the Basin Plan and water resource plans’. Its 2018 Draft Report was published on 30 August 2018 and contains 35 recommendations, which are described as mostly ‘essential but incremental improvements to the current arrangements’.⁵⁴ At the time of writing, the final report had been produced to the Government, but not yet published.

In the context of governance, the 2018 Draft Report states that ‘there are major shortcomings in the current institutional arrangements and these pose a significant risk to the next phase of implementation of the Basin Plan’.⁵⁵ Contrary to the comments above concerning audit of the Basin Plan implementation generally, the Commissioner acknowledges the skill and expertise of the Productivity Commission in conducting a governance review, and notes, with respect, the astute observations made in the 2018 Draft Report in that regard, including the following:

- It is not clear who is now responsible for leading implementation of the Basin Plan: the MDBA or Basin governments. This uncertainty has resulted in blame-shifting, ineffective arrangements for intergovernmental collaboration, a lack of accountability and the absence of strategic guidance. Basin governments have managed implementation through last-minute negotiations as crises emerge or deadlines loom.⁵⁶
- There has been a lack of transparency in Basin governments’ and the MDBA’s decision-making, particularly in regards to supply measures and water purchases, resulting in low confidence and trust in governments.⁵⁷
- The MDBA lacks a policy to guide its decisions about when, how and in what form peer-reviews of its work and science are commissioned.⁵⁸
- There is an inherent conflict in the MDBA’s roles of providing independent advice to the government concerning making and amending the Basin Plan; its regulator function ensuring compliance with the Basin Plan, and its role as agent of Basin State governments in providing services under the MDB Agreement. In effect, the

MDBA is assessing its own performance: ‘In its current form, the MDBA cannot be a trusted adviser to Basin governments and be a credible regulator’. These conflicting functions have the potential to undermine accountability, bias judgement and decision-making, erode trust in compliance regimes, and tarnish the MDBA’s public image.⁵⁹

- The MDBA should be separated into two entities: the Basin Plan Regulator (responsible for compliance and evaluation, and funded by and accountable to the Commonwealth Government) and the Murray-Darling Basin Corporation (the agent of governments providing MDB Agreement services and supporting governments to implement the Plan).⁶⁰
- Basin governments should be responsible and held accountable for the Basin Plan’s implementation. The BOC should take a more central role in driving intergovernmental collaboration. It should be led by an independent chair (as opposed to the Commonwealth).⁶¹
- Without structural reform, the credibility of the MDBA will be extremely compromised, and the likelihood of successful Basin Plan implementation significantly diminished.⁶²

Commonwealth & MDBA response

In its submission in response to the 2018 Draft Report,⁶³ the Department of Agriculture and Water Resources (**DAWR**) notably advised as follows:

- The MDBA has well-established internal processes to manage any risk of real or perceived conflict of interest arising from its operational and regulatory roles.⁶⁴
- The Department disagrees with the recommendation that an institutional separation of the MDBA is required in order to manage possible conflicts of interest.⁶⁵
- In September 2018 Basin States commissioned Mr Greg Claydon to undertake a review of the effectiveness of current joint governance arrangements for implementing the Basin Plan. That review will focus on the role of the existing inter-jurisdictional committees and Mr Claydon is due to report in early 2019. Whilst that review will not consider the structure of the MDBA,⁶⁶ its aim is to:

*ensure streamlined decision making; improve clarity of the roles and responsibilities of the various committees; improve the efficiency and cost effectiveness of joint governance arrangements; and to increase transparency and community confidence.*⁶⁷

- The 2024 Independent Review of the Water Act will provide a timely opportunity to revisit the role of the MDBA, its regulatory functions and the knowledge and skills mix of its members.⁶⁸

The MDBA likewise provided a submission in response to the 2018 Draft Report, and rejected the need for structural change to the MDBA on the basis it is ‘a blunt and premature solution, which has the potential to undermine the successful implementation of the Basin Plan’.⁶⁹ It pointed to the existence of Mr Claydon’s review as ‘best placed to examine in detail, and provide recommendations on, how to improve joint governance’.⁷⁰ The basis for that assertion is not apparent. The MDBA pointed to its recent work on completing the Northern Basin Review and 605 GL SDL adjustment as evidence of its key role as an independent statutory agency in assisting to resolve tensions. It acknowledged that its role as ‘an independent, expertise based advisor, is to provide leadership, assurance and transparency’.⁷¹ Those responses do not, however, appear to directly engage with the criticisms made by the Productivity Commission on the MDBA’s failings in respect of good governance. Further, as noted in Chapters 5 and 7 of this report, the MDBA’s work in relation to the SDL adjustment, the Northern Basin Review, and the determination of the ESLT, is not something it should be proud of.

Discussion

As is evidenced by the discussion above concerning the merits of the NWC, the findings of the Productivity Commission concerning the failings of the MDBA, including in the context of lack of transparency, very much accord with evidence heard in this Commission. These matters are discussed further in Chapter 18. Likewise, the observations that the MDBA cannot mark its own work, and there must be an independent auditing function conducted outside of the MDBA, which is currently wanting, are compelling in their merit and utility.

In its recent report, the Rural and Regional Affairs and Transport References Committee recommended that the Australian Government support the Productivity Commission’s draft recommendation to separate the MDBA into two entities, and that sufficient resources be provided to the regulator.⁷²

Merely separating functions so as to remove these institutional conflicts will not guarantee improvement in the present shortcomings in the MDBA’s capacity to critique its performance, internally and continuously, as a genuinely scientifically guided entity should. The current and mulish non-disclosure inculcated in the leadership cadre of the MDBA is, after all, calculated to impede a truly outside auditor. The national need is therefore a separate audit function by empowered and resourced experts — and also the maintenance and reinforcement of a frequent, regular and published self-report by the MDBA, with named senior individuals taking responsibility for the merits of those reports.

It is concerning, albeit no longer surprising, that neither the DAWR nor the MDBA appear to have heard or heeded the messages, received loud and clear during this Commission, of discontent and lack of trust in the MDBA. Perhaps the advent of the

Claydon Review, about which further information was limited as at the date of writing, may presage some meaningful impact on the issues of MDBA governance.

Conclusion

The pursuit of the objects and purposes of the Water Act, primarily through the implementation of the Basin Plan, has been and will continue to be a complex process. The sheer complexity of the inter-connectedness and operations of the Basin and its water resources necessarily demands that it be so. Given that, a sound legislative framework is an essential starting point to ensure good governance.

The Water Act provides a unique and sound framework within which to pursue the implementation of the Basin Plan, but, as with any complex process, must be the subject of continuous review and, where necessary, reform.

With some readily achievable adjustments to the current governance arrangements, driven largely through legislative amendment, and provided the political will exists, necessary improvements will be achievable in the ongoing implementation of the Basin Plan. Those steps are likely to be essential to the task of rebuilding trust among Basin communities and stakeholders which have arisen, in part at least, due to failures by the MDBA to exercise good governance.

References

- 1 Productivity Commission, ‘Murray-Darling Basin Plan: Five-Year Assessment’ (Draft Report, August 2018) (RCE 539) 294.
- 2 *Water Act 2007* (Cth) sched 1 cl 7.
- 3 *Ibid* sched 1 cl 17–18.
- 4 *Ibid* sec 206. Pursuant to the transitional provisions set out in Part 10A of the *Water Act 2007* (Cth), the former Murray-Darling Basin Commission’s assets and liabilities were vested in the MDBA.
- 5 *Ibid* secs 18A, 171.
- 6 *Ibid* 178.
- 7 *Ibid* secs 199–200, pt 2 div 1 subdivs E–G.
- 8 *Ibid* sec 12A.
- 9 *Ibid* sched 1 cl 18.
- 10 *Ibid* pt 2, divs 1–2.
- 11 *Ibid* subsec 175(2).
- 12 *Ibid* subsecs 42(1), (3).
- 13 *Ibid* subsecs 43(1)–(9).
- 14 *Ibid* subsecs 43A(1)–(6).
- 15 *Ibid* subsecs 43A(7)–(8).
- 16 *Ibid* sec 41.
- 17 *Ibid* subsecs 44(1)–(2).
- 18 *Ibid* subsecs 44(3), (6).
- 19 *Ibid* subsec 22(1) item 1.
- 20 *Ibid* subsec 22(1) item 2.
- 21 *Ibid* subsec 22(1) item 3.
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- 23 Ibid subsecs 75(1), 81(2)–(3).
- 24 Ibid subsec 22(1) item 4.
- 25 Ibid subsec 22(1) item 5.
- 26 Ibid subsec 22(1) item 6, sec 23.
- 27 Ibid subsec 22(1) item 7.
- 28 Ibid subsec 22(1) item 9.
- 29 Ibid subsec 22(1) item 10.
- 30 Ibid subsec 22(1) item 11.
- 31 Ibid subsec 22(1) item 12.
- 32 Ibid subsec 22(1) item 13.
- 33 Ibid subsec 23A(3).
- 34 Ibid sec 23B.
- 35 Murray-Darling Basin Ministerial Council, ‘Murray-Darling Basin Compliance Compact’ (June 2018) (RCE 1095) 9; Murray-Darling Basin Authority, ‘Murray-Darling Basin Ministers Meet in Melbourne’ (Communique, 14 December 2018) (RCE 1107).
- 36 Transcript of Murray-Darling Basin Royal Commission Public Hearings (18 July 2018, F Hooper) 1005, 1009; Transcript of Murray-Darling Basin Royal Commission Public Hearings (19 July 2018, W Mooney) 1207–8.
- 37 As discussed in Chapter 11, notably, at the MinCo meeting on 14 December 2018, Ministers agreed that there should be a standing Aboriginal member appointed to the MDBA Board, and to that end, the Commonwealth Minister agreed to seek an amendment to the Water Act. Whilst this development is an important step forward, the Commissioner defers to the comments within this chapter regarding a single voice being likely insufficient, and the importance of engaging with Aboriginal people on these matters.
- 38 National Water Commission, ‘National Water Commission: Annual Report 2014–15’ (8 September 2015) (RCE 269) 8; National Water Commission, *Roles and Functions* <<http://webarchive.nla.gov.au/gov/20160615060857/http://www.nwc.gov.au/organisation/role>>.

- 39 National Water Commission, ‘Annual Report 2009-10’ (2010) <<http://webarchive.nla.gov.au/gov/20160615075458/http://archive.nwc.gov.au/library/annual-reports/annual-report-2009-10/section-1>> (RCE 1080).
- 40 *National Water Commission Act 2004* (Cth) sec 7.
- 41 Ibid.
- 42 Witness Statement of Karlene Maywald, 28 August 2018 (RCE 261), [25].
- 43 *Water Act 2007* (Cth) sec 87–8, as repealed by *National Water Commission (Abolition) Act 2015* (Cth) sec 4.
- 44 Witness Statement of Karlene Maywald, 28 August 2018 (RCE261), [26]–[27].
- 45 Commonwealth, *Parliamentary Debates*, Senate, 25 September 2014, 7110 (Mitchell Fifield).
- 46 Commonwealth, *Parliamentary Debates*, House of Representatives, 26 May 2015, 4491 (Robert Baldwin).
- 47 See, eg, Commonwealth, *Parliamentary Debates*, House of Representatives, 26 May 2015, 4494 (Mark Butler); Commonwealth, *Parliamentary Debates*, House of Representatives, 26 May 2015, 4502 (Sharon Claydon); Commonwealth, *Parliamentary Debates*, House of Representatives, 26 May 2015, 4510 (Lisa Chesters).
- 48 Senate Rural and Regional Affairs and Transport References Committee, Parliament of Australia, *Integrity of the Water Market in the Murray-Darling Basin* (2018) (RCE 1081) 45–6.
- 49 See, eg, Wilderness Society, Submission to Murray-Darling Basin Royal Commission, April 2018 (RCE 651) 2; Wentworth Group of Concerned Scientists, Submission to Murray-Darling Basin Royal Commission, 21 May 2018 (RCE 73) 25; Cameron Holley et al, Submission to Murray-Darling Basin Royal Commission, 27 April 2018 (RCE 662) 6.
- 50 See, eg, Anne Jensen, Healthy Rivers Ambassador, Submission to Murray-Darling Basin Royal Commission, 29 April 2018 (RCE 274) 7; Mike Young, Submission to Murray-Darling Basin Royal Commission, 2018 (RCE 406) 10–11; Transcript of Murray-Darling Basin Royal Commission Public Hearings (24 August 2018, T Korn) 2246–7; Transcript of Murray-Darling Basin Royal Commission Public Hearings (5 September 2018, D Papps) 2755.
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- 53 Witness Statement of Karlene Maywald, 28 August 2018 (RCE 261), [29]. See also Transcript of Murray-Darling Basin Royal Commission Public Hearings (29 August 2018, K Maywald) 2504–8.
- 54 Productivity Commission, above n 1, v, 24.
- 55 Ibid 285.
- 56 Ibid 292–3.
- 57 Ibid 296.
- 58 Ibid 297.
- 59 Ibid 293–5; 300.
- 60 Ibid 302–3.
- 61 Ibid 301–2.
- 62 Ibid 305.
- 63 Department of Agriculture and Water Resources (Cth), Submission No DR103 to the Productivity Commission, *Murray-Darling Basin Plan: Five Year Assessment* (2018) (RCE 611).
- 64 Ibid 17.
- 65 Ibid 18.
- 66 Ibid 2, 22–3.
- 67 Ibid 17.
- 68 Ibid 16–19.
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- 70 Ibid 5.
- 71 Ibid 6.
- 72 Senate Rural and Regional Affairs and Transport References Committee, above n 48, 104.

18 Public Disclosure

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Introduction

The Murray-Darling Basin Authority (MDBA) frequently asserts that it is a transparent and accountable organization. This claim was repeated in its submission to the Commission.¹ In the same submission, it purported to ‘reject’ sworn evidence given at the Commission hearings, some of which was from former MDBA employees.²

Notably, no specific reference was made to what particular aspects of the evidence the MDBA sought to reject. It appears to be an attempt at a global rejection, lest anything be missed. This attempt was neither supported by any documentary evidence, any reasoned or detailed argument, nor — indicative of the gossamer-like substance of the attempted rejection — any sworn evidence.

For the reasons that follow, the MDBA’s claimed transparency can be answered by a paraphrase of Queen Gertrude in Shakespeare’s *Hamlet*: ‘The [MDBA] doth protest too much, methinks’.

‘Transparency’ has become somewhat of a weasel word in both the realm of politics, and the corporate world. Claims of openness are frequently made; important information remains secret. Those that claim they are transparent often mean something less than full disclosure of information.

For the reasons that follow, the MDBA has succeeded in giving the word transparency an Orwellian twist when they use it. The Commissioner does not mean this as a compliment. The MDBA is a publicly funded authority that has been given environmental and scientific responsibilities to be implemented in the national interest. And yet it keeps classified its modelling and other processes that should be publicly disclosed. It has no basis to claim it is the open and accountable organization it should be.

Before outlining examples of the MDBA’s approach to disclosure — relevant to each Term of Reference as to whether the *Basin Plan 2012* (Cth) (**Basin Plan**) will achieve its objects and purposes and those of the *Water Act 2007* (Cth) (**Water Act**) — it is important to briefly consider two fundamental matters:

1. What statutory provisions impose obligations of disclosure and accountability on the MDBA, and
2. What are the policy reasons, if any, that require such disclosure and accountability?

Statutory provisions

Pursuant to the provisions of the Water Act and Basin Plan, the MDBA is required to undertake the following reviews:

- annual analysis of the Basin Plan’s effectiveness³

- report to the Murray-Darling Basin Ministerial Council (**MinCo**) on the impacts of the Basin Plan, by the end of 2020⁴
- review of the environmental watering plan every five years⁵
- review the Basin-wide environmental watering strategy every five years or at any time⁶
- review of water quality and salinity targets in the water quality and salinity management plan, every five years⁷
- review of the monitoring, evaluation and reporting capabilities, no later than five years after the Basin Plan commences⁸
- review of the Water for the Environment Special Account, in 2019 and 2021⁹
- review of water trading rules by 2020¹⁰
- review of the operation of the Water Act and the extent to which the objects of the Act have been achieved, by the end of 2024¹¹
- review of the Basin Plan every 10 years,¹² and
- review of the Basin Plan if the Minister or all of the Basin States request the MDBA to do so.¹³

Other provisions provide that the MDBA may conduct certain reviews. For example:

- the MDBA may conduct research and investigations into aspects of the Basin Plan, including into sustainable diversion limits (**SDL**). A review may be undertaken at the request of the MinCo¹⁴
- the MDBA may conduct or arrange audits to assess the extent of compliance with the Basin Plan,¹⁵ and
- the MDBA may periodically undertake assessments of the Murray-Darling Basin's (**Basin**) condition.¹⁶

Additionally, the MDBA must evaluate the effectiveness of the Basin Plan against the objectives and outcomes set out in Chapters 5, 8 and 9 of the Plan, and by reference to the matters listed in Sched 12, for the purposes of annual reports into the effectiveness of the Basin Plan, advising the MinCo on the impacts of the Basin Plan, 10-yearly reviews of the Basin Plan, and other reviews.¹⁷

The MDBA must also publish the following:

- information (including data) obtained in monitoring the effectiveness of the Basin Plan¹⁸
- findings and recommendations arising from evaluations of the effectiveness of the Basin Plan¹⁹
- findings and recommendations arising from reviews²⁰

- reports of audits,²¹ and
- findings of assessments.²²

Finally, every five years the Productivity Commission must inquire into and prepare a report into the effectiveness of the implementation of the Basin Plan and the water resource plans.²³ This imposes some form of accountability on the MDBA. However, it can be noted from its August 2018 draft report (**2018 Draft Report**) that the Productivity Commission has called for the MDBA, in aspects of its work, to exercise greater transparency.²⁴

Other statutory indicia for public disclosure

The imperative for full disclosure by the MDBA in matters of science is also informed by the following statutory requirements of the Water Act.

The first is the requirement that a determination be made of a SDL that reflects an environmentally sustainable level of take (**ESLT**). That is, a level of take:

- a) beyond which the key environmental assets, key ecosystem functions, productive base and key environmental outcomes of the Basin would be compromised,²⁵ and
- b) that sees Australia fulfil its obligations under various international agreements such as the Ramsar Convention, the Biodiversity Convention, the Climate Change Convention and Australia's various agreements concerning migratory birds.²⁶

The setting of the Basin-wide SDL, which must reflect an ESLT, is to be based on the 'best available scientific knowledge'.²⁷ It is to be determined by science, not politics.

The driving force behind the need for a SDL is the actual and statutory facts that the Basin has historically been an overallocated system, which has contributed to environmental degradation, and that special measures (like the setting of a SDL and the provision of an environmental watering plan) are needed to both restore and protect that degraded environment.²⁸

A number of disclosure obligations emerge from these statutory provisions. The Water Act is an environmental law. Its objects are to protect and restore the environment of the Basin and have Australia fulfil its international agreement obligations. It creates the MDBA as the organization to prepare the Basin Plan, which is to fulfil these tasks, and undertake the necessary science-based research and decision-making that will achieve those objects. It is a vital reform, funded by huge amounts of public money. Public disclosure of all aspects of science-based environmental restoration and protection seems both fitting and desirable as a matter of obviousness. Nothing about it suggests either a need for, or public benefit from, secrecy. Whether Australia is meeting its international obligations under environmental treaties is not a 'cloak and dagger' matter.

All the functions to be performed by the MDBA under the Water Act are ones that properly lend themselves to public scrutiny. For example, the word ‘available’ in the context of science immediately suggests ‘available to the scientific community’ and hence also the public. It clearly implies that the science is either already available to the public, or that it is to be made available by the MDBA. Further, ‘scientific knowledge’ relates to the pursuit, research into or implementation of science. As many witnesses who gave evidence at the Commission hearings stated, the process of ‘science’ involves something — a theory, a model, a conclusion, a finding, a discovery — that is capable of being tested, and proved wrong. This self-evidently implies the sharing of all information in order for that scientific knowledge to be properly checked. Knowledge that cannot be scrutinized because of a lack of information is not science. Equally, scientific knowledge not publicly disclosed obviously cannot be checked.²⁹

Hand in hand with the implications for disclosure and accountability by the MDBA that derive from the Water Act, are those that necessarily arise from our system of government. Australia is a representative democracy. Our politicians, and the bureaucrats that advise them, act in the service of the people. This has important implications for a statutory authority like the MDBA, as it does for the Department of Agriculture and Water Resources (**DAWR**), the Minister for Water, and other relevant members of the elected governing body. They apply equally to State politicians and bureaucrats whose responsibilities include matters pertaining to the Basin Plan.

It is imperative in a system of government involving democratically elected representatives that the servants of the people — relevantly here, the MDBA, water bureaucrats and relevant ministers — release to the public and the scientific community all of the important information and material necessary so that the scientific work done pursuant to the Water Act and Basin Plan by those servants can be checked, queried, tested and — possibly most importantly of all — improved. Full disclosure also ensures that there can be public, scientific and legal oversight as to whether the MDBA is actually complying with the law by basing the Basin Plan on ‘the best available scientific knowledge’.

The MDBA is not ASIO. Its scientific inquiries and work should never remain private. Regrettably and inappropriately, since the time when the Guide was published in 2010 and the ESLT determination was made in 2011, through to its attitude towards this Commission, the MDBA has preferred to avoid making itself accountable to the public and to the wider scientific community.

Legal advices and construction of the Water Act

For reasons outlined in Chapter 3 of this report, the MDBA’s construction of the Water Act has been in error, particularly relating to the definition of ESLT. This is one cause for the unlawfulness of that determination and the setting of the Basin-wide SDL. One advice from the Australian Government Solicitor has been relied upon (**AGS**

Opinion).³⁰ As also discussed in Chapters 3 and 5, that advice is flawed, and an outlier. It is almost certainly inconsistent with prior advice given to the MDBA,³¹ and is inconsistent with the views of many highly qualified and regarded lawyers.³² It is contrary to the Commissioner's view (see Chapter 3).

In 2011, noting that it was in the public interest, especially when it appeared that conflicting positions were taken amongst Commonwealth government agencies, the Senate Standing Committee on Legal and Constitutional Affairs recommended that all advice on the Water Act be released 'as a matter of urgency'.³³

The Commonwealth Government declined to do so, claiming legal professional privilege, purportedly with respect to potential future litigation and 'matters which may have implications for other schemes supported by the external affairs and other powers'.³⁴

During the course of this Commission, all legal advices provided to the MDBA and the DAWR on the construction of the Water Act were sought by the Commissioner. That request was not complied with. When it was not, those advices were sought through summonses issued by the Commissioner. Those summonses were resisted.

There are no doubt times when it is appropriate for government to resist the disclosure of the legal advice it has obtained. One obvious example would be where it is involved in litigation. However, reliance on privilege, or other means of resisting disclosure such as ancient practice, seems at best odd in relation to advice concerning the construction of the Water Act, and the definition of an ESLT. That determination — because it must be reflected in the SDL — is the most important task undertaken by the MDBA, at least in terms of the original making of the Basin Plan. The MDBA's understanding of how to lawfully determine the ESLT falls well short of what might be considered a State secret or matter of national security. Rather, it involves a view on the meaning of certain text which will influence how an important matter of science is undertaken. There seems no good reason why the legal advice on this matter should be restricted to the relevant Minister and his public servants. It could not be argued that they are in some better position to understand that advice than the academic community, lawyers in private practice, or the public at large. Publication of such advice could not cause any material harm to the MDBA or the nation. The question must be asked, what is the proper rationale or public utility in keeping such advice secret? Nothing springs readily to mind. Further, given that the AGS Opinion was disclosed, what possible proper basis is there for not releasing all advices obtained on the same subject matter?

Exposure of such advice brings real advantages. The identification of error is one such advantage. The lawful determination of the ESLT — the core matter for an environmental reform involving \$13 billion in public funds — is a matter of critical importance. Reliance on one advice from the AGS in this regard seems rash, particularly when it is placed against the opinions of many others who uniformly disagree. Worse still, as indicated in Chapters 3 and 5, the AGS Opinion is demonstrably wrong. The government has chosen not to heed the voices of the lawyers who have pointed this out.

This has caused the MDBA to act unlawfully, to the detriment of both the public and the environment.

The release of one AGS advice, but the resistance to publicly releasing all advices the MDBA or Commonwealth Government have obtained on the construction of the Water Act, and the lawfulness of the determinations and actions of the MDBA, raises grave concerns about proper administration. It looks very much like one advice was chosen that suited a political end, but misinterpreted the Water Act. That is heading dangerously close to that kind of maladministration which consists of a slanted approach to the facts and law. This is particularly so if the Commonwealth Government or MDBA has failed to disclose advices it holds — as the Commissioner considers is almost certain — which are contrary to the AGS Opinion.

The recent adjustment to the SDL based on supply measures is also likely to be unlawful (see Chapter 7). There would again appear to be no proper basis for the government not to release what advice it must surely have received concerning its lawfulness or otherwise.

There is no good reason for the MDBA or the DAWR to withhold from the public the legal advice it has received on the construction of the Water Act, particularly pertaining to the determination of the ESLT, and the setting and adjustment to the SDL. There are still advantages to be had from the public release of those advices.

Guide/ESLT

The MDBA has still not made available to the general public and scientific community its modelling that was used to:

- determine the range of the ESLT in the Guide to the proposed Basin Plan (**the Guide**) (3000 GL per year to 7600 GL per year)
- determine the 2750 GL per year recovery in its 2011 ESLT Report (**ESLT Report**).

The South Australian Government was given access to some of the modelling for the Guide, but not for the ESLT Report.

To the extent that ‘social and economic outcomes’ influenced the decision to model scenarios of 3000 GL, 3500 GL and 4000 GL in the Guide, or the determination of 2750 GL in the ESLT Report, no details have ever been provided. The public, and the scientific community, is left to guess. The extent of disclosure is barely more than the diagrammatic representation on page 17 of the ESLT Report,³⁵ and the comment that the framework created by the MDBA for determining the ESLT allows it to ‘iterate if required to meet environmental, and socio-economic objectives’.³⁶

Did such iteration occur?

How?

Can such iteration be done between economic, social and environmental outcomes at once? How?

What volume of water represents the economic and social iteration?

None of these questions are answered by the MDBA in its reports. Inconsistently with the submissions made by the DAWR to the Commission, on page 66 of the ESLT Report the MDBA states that:

In modelling the ESLT options, MDBA had to take account of social and economic implications in the following ways:

- *setting the ESLT within the constraints and operative rules of the current system which has been designed for irrigation and other water use;*
- *avoiding third party impacts, by protecting the reliability of entitlements;*
- *managing the held environmental water portfolio according to existing rules, in order to retain the productive capacity of the water dependent enterprises; and*
- *assessing the additional water recovery needed, assuming the efficient use of environmental water, effectively optimising water use so as to reduce the scale of change required.³⁷*

How, precisely, did the modelling incorporate the matters in the bullet points? This also remains a mystery.

It is true that the MDBA commissioned the CSIRO to undertake a review of the estimation of the ESLT, and the report was released in November 2011 (**CSIRO Review**). Amongst other concerns, the authors of this CSIRO Review noted that:

other reduction scenarios have been modelled, but the panel has not seen modelling results for these other scenarios, and thus it is not clear how the 2800 GL/yr reduction proposal was arrived at. The panel assumes this proposal was arrived at as a result of socio-economic considerations by MDBA ... but a consideration of socio-economic analyses is beyond the terms of reference for this review.³⁸

In other words, like the rest of Australia's scientific community, the CSIRO was left to evaluate the MDBA's modelling and other work in setting the ESLT wearing a blindfold. This is an unjustifiable approach for a Commonwealth-funded statutory authority charged with the protection and restoration of many of the country's key environmental assets.

Not only has the MDBA kept its modelling from the public and the scientific community, it has refused to make it available to even the Basin States, or at least to

South Australia. Why is unclear, as this excerpt from the evidence of Mr Bruce and Dr Heneker demonstrates:

MR BEASLEY: Shouldn't that have been given to the government by the MDBA? I know have you (sic) done your own, but what's the reason the Authority doesn't provide the modelling to South Australia? I asked that in particular given that we all know the enhanced environmental outcomes are almost all in relation to South Australian assets. Take your time.

MR BRUCE: We are just clarifying the question.

DR HENEKER: So just to clarify the question. So you are asking why we didn't get the models themselves?

MR BEASLEY: Yes. Has not had access to the modelling to be able to confirm or refute. My question is, why haven't you been given access to the modelling so you can confirm or refute?

THE COMMISSIONER: I guess the first question is have you ever asked for it?

DR HENEKER: Yes.

THE COMMISSIONER: And it has been refused, has it?

DR HENEKER: We have always asked for everything ... asked for everything.

THE COMMISSIONER: It has been refused?

DR HENEKER: The model — sometimes yes, it hasn't been — it hasn't been provided. What has often been provided is the modelling outputs. So time series information. So we analyse the outcome.

MR BEASLEY: Sorry, just pausing there, though. Why is that — should the modelling be treated as though it is something to do with the Manhattan Project? Why is this so secret that a state government can't be given —

THE COMMISSIONER: Why is it secret at all?

DR HENEKER: I can't answer that question. That's a question for them. That's a question for the MDBA.³⁹

Lamentably, even that question is one the MDBA refuses to answer.

Equally indefensible was the approach of the MDBA to the CSIRO's 'Multiple Benefits' Report.⁴⁰ Leaving aside the allegations of censorship and misleading rewriting of parts of this report made by Dr Matthew Colloff (corroborated by documents such as the draft report⁴¹ and his contemporaneous diary notes⁴²), the manner in which the MDBA

treated Dr Colloff's request for information about how they had dealt with the issue of constraints is telling about its reliance on, and addiction to, secrecy. As discussed in Chapter 5, Dr Colloff led a CSIRO team commissioned by the MDBA, in part, to produce a report on the ecological benefits of a return of 2800 GL per year to the environment. He posed questions to the MDBA about the treatment of constraints as a means of attempting to understand its modelling results. He and the CSIRO were rebuffed.⁴³ As Dr Colloff said in evidence in an exchange with the Commissioner:

THE COMMISSIONER: Doing the best you can, can you describe what position or positions were presented by the MDBA representatives concerning the treatment of constraints as either fixed matters that could not be examined or matters that required to be considered for possible removal?

*DR COLLOFF: Yes. My assessment of that situation was that they — they treated all constraints as not up for discussion. That they were — as far as they were concerned, that was knowledge that they had, it was their business, and that we shouldn't question their judgement on that. That was the overriding impression I got from discussions about that.*⁴⁴

The Commissioner assumes this is part of the evidence — along with Dr Colloff's evidence of misleading censorship — that the MDBA (and the CSIRO) purports to 'reject' in its submission to the Commission. As mentioned, Dr Colloff produced to the Commission a prior version of the Multiple Benefits Report. The final version contained many changes of significance. Clearly Dr Colloff was genuinely upset by the changes. He made contemporaneous notes of the process. A mediator was engaged to deal with the damage done to staff morale. There is no motive for him to not tell the truth, or to exaggerate. The alterations to the draft report speak for themselves. If the MDBA or CSIRO wanted his evidence to be rejected, they could have:

- sent a lawyer to the Commission to seek to challenge Dr Colloff's evidence, on professionally proper grounds, or
- produced a witness to give sworn contrary evidence.

Neither course was adopted. A bald rejection, in the manner of the MDBA, is nearly as good as an admission. And that non-engagement, and the evidence of Dr Colloff, highlights a deeply unsatisfactory approach by the MDBA: it seeks a review to be conducted by the CSIRO, yet then fails to provide the disclosure of matters of science the CSIRO seeks.

Northern Basin Review

As with the Guide and the ESLT determination, the MDBA has refused to disclose its modelling to justify the 70 GL per year reduction in recovery of water for the Northern Basin. As the Commission heard in evidence at the hearings, this was to the considerable

frustration of several members of the Northern Basin Advisory Committee such as Mr John Clements, Mr Mal Peters and Mr Geoff Wise.⁴⁵ It is manifestly self-defeating, and some may fairly describe as cynical, for the MDBA to set up an ‘Advisory Committee’ only to deny that Committee access to the information it seeks in order to give the supposedly sought advice. The most credible inference is that the MDBA wanted a ‘tick’ from the Advisory Committee on the Northern Basin Review (**NBR**), but with no questions asked.

In its ‘Environmental outcomes of the Northern Basin Review’ Report (**NBR Report**) of October 2016, the MDBA stated that:

The decision on whether or not to amend the current legislated sustainable diversion limit for the northern basin is based on finding a balance between social, cultural and economic impacts using a triple bottom line assessment.

...

We recognise that hydrologic models provide important planning insights, but are necessarily an approximation of the true complexity of the system ... Models also do not tell us how to manage the system on an event by event real time basis. Thus, although model results are an important tool that the Authority uses in coming to a decision on recommending Sustainable Diversion Limits, they are not the only line of evidence. ... In addition to the environmental assessment, the outcomes of economic and social studies and community views are also included, with equal importance, in the Authority’s decision making process.⁴⁶

As mentioned in Chapter 3, the Water Act does not provide for a triple bottom line approach when determining the SDL. Public relations ‘spin’ or slogans are no substitute for carefully reading legislative text. Not only has the MDBA not provided its modelling for scrutiny in relation to the NBR, it has not disclosed how ‘outcomes of economic and social studies and community views’ are included in the ultimate determination to reduce the amount of water available to the environment in the Northern Basin by 70 GL per year. On face value, the MDBA seems to be equating a ‘community view’ at the same level as the ‘best available scientific knowledge’, which is the mandate of the Water Act.

The exposition of environmental outcomes in the NBR Report is sadly consistent with the MDBA’s overall approach to disclosure and, thus, to genuine accountability. The public and the scientific community are merely told, in bland terms, without specifics or detail, what has been done. They are never told the details of how. A wearisome slogan — triple bottom line — is trotted out, despite the actual wording and meaning of the Water Act. That is, despite the law.

SDL adjustment

The SDL adjustment has been made with a wholly inflated air of secrecy. Only limited and generic information about each supply measure was published at the time the MDBA

announced and consulted the public on the 605 GL adjustment to the SDL. Business cases became publicly available only after the resort to compulsive processes of the Senate. The suggestion has been made by South Australian Government representatives that these business cases were never intended to be public documents. That may be a revelation of a defeatist mindset. What possibly could be the private nature of a government produced document said to make a case for the building of infrastructure or for some other project — with public funds — designed to have a science-based organisation agree that less water need now be recovered for the environment? There is not a single aspect of that process that properly lends itself to secrecy. Even estimates of cost do not fall within that category (although a tendered bid might). The subject matter is not locating stolen plutonium or a terrorist cell. The subject matter is water for the environment, at public expense, and for broad community purposes.

Further, the MDBA created ‘analysis’ documents of these business cases which raised a number of alarming environmental concerns and risks. These documents were also not disclosed to the public and the scientific community until the MDBA was forced to produce them in the Senate. It is difficult to understand what utility is served by that. These analyses were not even made available to Federal parliamentarians before the Senate voted on a motion to disallow the amendment to the Basin Plan based on the supply measures. That is not in the national interest. It reflects very badly on the processes of the MDBA and the DAWR that important legislative processes (including amendment) are proceeded with despite the majority of those voting being kept in a position of ignorance, and the wider Australian scientific community being deprived of the ability to comment in an informed way. The ultimate loser in that process is the public.

It is no wonder then that in its 2018 Draft Report, the Productivity Commission noted a ‘degree of dissatisfaction and mistrust in parts of the community, including traditional owners, arising from a lack of transparency and consultation’ in relation to supply measures.⁴⁷

Efficiency measures

The DAWR has not been upfront as to why it has prioritized efficiency measures over buybacks, and has done little to publicly justify the additional expense of this policy preference. As discussed in Chapter 9, it has not explained with any specificity what it considers the purported ‘significant social and economic consequences’ of buybacks to be, and has not been willing to respond to the serious and widely-published criticisms of efficiency measures.⁴⁸ It continues to offer only vague explanations as to the supposed benefits of efficiency measures, while perpetuating a discourse of myth and exaggeration in relation to the impacts of buybacks. The public deserves a far higher standard of intellectual honesty, engagement and disclosure from a Commonwealth Department attempting to defend such a contentious policy.

Further, the DAWR has published only limited information about the irrigation efficiency upgrades it has funded to date. This has diminished public confidence in the effectiveness and environmental value of those investments. The DAWR has recently announced that it will publish online a range of details about projects funded under its new Murray-Darling Basin Water Infrastructure Program.⁴⁹ This is a welcome development, but the practice should have been adopted long ago.

Given the huge cost of the efficiency measure programs, full disclosure is fundamental. The public deserves to know how its extra tax dollars are being spent, and for what benefit. This view was also shared, in draft, by the Productivity Commission.⁵⁰ The issue cries out for the ministrations of the Auditor-General.⁵¹

Scrutiny

The MDBA chose to commence proceedings against the State of South Australia and the Commissioner rather than have its employees or members of its Board summonsed to give evidence. The same applies to employees of the CSIRO, as another example. This is despite the fact that witnesses raised serious questions not just about the MDBA's engagement and use of science, but about the integrity of aspects of its processes — see, for example, the evidence of Mr David Bell, Mr Peter Cosier and Dr Colloff.⁵² The public would benefit from hearing relevant persons from the MDBA and the CSIRO under oath on these matters. This Commission was one such opportunity. The position in relation to the determination of the ESLT, the setting of the long-term average SDL, the NBR, and recommendations regarding supply and efficiency measures are in the same category.

The MDBA no doubt employs skilled and diligent scientists, but it is far from the only entity in Australia that does so. Many eminent scientists gave evidence at the Commission hearings and lodged submissions. Those submissions, and the transcript of their evidence, record that all of them have deep concerns about the failure of the MDBA to make available important matters of science. In short, they say it is a non-transparent (or opaque) organization.⁵³

The MDBA claims otherwise.⁵⁴ The record renders that claim insupportable.

The objects and purposes of the Water Act and Basin Plan identified in many of the Commissioner's Terms of Reference are unlikely to be achieved for quite a few reasons, not the least of which is the MDBA's aversion to proper disclosure and its reluctance to foster scientific scrutiny — such as its conduct to restrict the extent of such scrutiny, or the result of it. That is an unacceptable way for a publicly-funded Commonwealth science-based authority to act.

References

- 1 Murray-Darling Basin Authority, Submission to Murray-Darling Basin Royal Commission, September 2018 (RCE 775), [68].
- 2 Ibid [65]–[66].
- 3 *Water Act 2007* (Cth) sec 52A.
- 4 Ibid sec 49A.
- 5 Ibid subsec 22(1) item 13; *Basin Plan 2012* (Cth) sec 13.09.
- 6 *Basin Plan 2012* (Cth) sec 8.17.
- 7 *Water Act 2007* (Cth) subsec 22(1) item 13; Ibid sec 13.08.
- 8 *Basin Plan 2012* (Cth) sec 13.23.
- 9 *Water Act 2007* (Cth) sec 86AJ.
- 10 *Basin Plan 2012* (Cth) sec 12.02(5)–(6).
- 11 *Water Act 2007* (Cth) sec 253.
- 12 Ibid subsec 50(1).
- 13 Ibid subsec 50(2).
- 14 *Basin Plan 2012* (Cth) sec 6.06.
- 15 Ibid sec 13.10.
- 16 Ibid sec 13.11.
- 17 Ibid sec 13.05.
- 18 Ibid sec 13.17.
- 19 Ibid sec 13.18.
- 20 *Water Act 2007* (Cth) subsec 50(5); Ibid sec 13.19.
- 21 *Basin Plan 2012* (Cth) sec 13.20.
- 22 Ibid sec 13.21.
- 23 *Water Act 2007* (Cth) sec 87.

- 24 Productivity Commission, ‘Murray-Darling Basin Plan: Five-Year Assessment’ (Draft Report, August 2018) (RCE 539).
- 25 *Water Act 2007* (Cth) sec 4.
- 26 Ibid para 3(b), subsec 21(1).
- 27 Ibid para 21(4)(b).
- 28 Ibid subsec 21(2).
- 29 See generally Transcript of Murray-Darling Basin Public Hearings (27 June 2018, M Colloff) 101; Transcript of Murray-Darling Basin Public Hearings (28 June 2018, R Kingsford) 334–5; Transcript of Murray-Darling Basin Public Hearings (11 July 2018, B Thom/J Pittock/P Cosier), 653–55, 689–90; Transcript of Murray-Darling Basin Public Hearings (25 July 2018, M Mallen-Cooper) 1506–7; Transcript of Murray-Darling Basin Public Hearings (26 July 2018, R Grafton) 1525–6, 1547; Transcript of Murray-Darling Basin Public Hearings (30 August 2018, A Jensen) 2615.
- 30 Robert Orr and Helen Neville, ‘The Role of Social and Economic Factors in the Basin Plan’ (Australian Government Solicitor, 25 October 2010) (RCE 370).
- 31 Murray-Darling Basin Authority, ‘Plan for the Murray-Darling Basin — Role of Authority Chair’ (Media Release, 7 December 2010) <<https://www.mdba.gov.au/media/mr/plan-murray-darling-basin-role-authority-chair>> (RCE 7).
- 32 See, eg, Paul Kildea and George Williams, Submission to Senate Legal and Constitutional Committee, *A Balancing Act: Provisions of the Water Act 2007*, 16 March 2011 (RCE 11); Anita Foerster and Alex Gardner, Submission to Murray-Darling Basin Royal Commission, 2018 (RCE 12); Transcript of Murray-Darling Basin Royal Commission Public Hearings (20 September 2018, E Carmody) 2969–73.
- 33 Senate Legal and Constitutional Affairs References Committee, Parliament of Australia, *A Balancing Act: Provisions of the Water Act 2007* (2011) (RCE 488) 64–5.
- 34 Commonwealth, Parliamentary Debates, Senate, 10 May 2012, Documents, Tabling, Procedural Text, ‘Australian Government Response to the Senate Legal and Constitutional Affairs References Committee Report: A Balancing Act: Provisions of the Water Act 2007’ (RCE 989) 3237.

- 35 Murray-Darling Basin Authority, ‘The Proposed ‘Environmentally Sustainable Level of Take’ for Surface Water of the Murray-Darling Basin: Method and Outcomes’ (MDBA Publication No 226/11, November 2011) (RCE 6) 17.
- 36 Ibid.
- 37 Ibid 66.
- 38 W J Young et al, ‘Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray-Darling Basin’ (Final Report to the Murray-Darling Basin Authority, November 2011) (RCE 9) 30.
- 39 Transcript of Murray-Darling Basin Royal Commission Public Hearings (29 September 2018, B Bruce/T Heneker) 3356.
- 40 CSIRO, ‘Assessment of the Ecological and Economic Benefits of Environmental Water in the Murray-Darling Basin — The Final Report to the Murray-Darling Basin Authority from the CSIRO Multiple Benefits of the Basin Plan Project’ (CSIRO Water for a Healthy Country National Research Flagship, 28 March 2012) (RCE 16).
- 41 CSIRO, ‘Chapter 3: Ecological Benefits — Assessment of the Ecological and Economic Benefits of Environmental Water in the Murray-Darling Basin’ (Draft Chapter, Murray-Darling Basin Authority — Multiple Benefits Project, 6 December 2011) (RCE 17).
- 42 Matthew Colloff, Summary of Handwritten Notes, (14 June 2018) (RCE 19).
- 43 Transcript of Murray-Darling Basin Royal Commission Public Hearings (27 June 2018, M Colloff) 113–4.
- 44 Ibid 117.
- 45 Witness Statement of John Clements, 23 July 2018 (RCE 132), [25]–[37]; Witness Statement of Mal Peters, 16 August 2018 (RCE 226), [13]–[19]; Witness Statement of Geoff Wise, 21 August 2018 (RCE 228), [23]–[26], [36], [40].
- 46 Murray-Darling Basin Authority, ‘Environmental Outcomes of the Northern Basin Review’ (October 2016) (RCE 50) 9–10.
- 47 Productivity Commission, above n 24, 10.
- 48 See Chapter 9 for a discussion of the concerns relating to efficiency measures.

- 49 Department of Agriculture and Water Resources (Cth), *Murray-Darling Basin Water Infrastructure Program* (29 November 2018) <<http://www.agriculture.gov.au/water/mdb/programs/basin-wide/mdbwi-program>> (RCE 1015).
- 50 Productivity Commission, above n 24, 97.
- 51 See further the discussion in Chapter 9 regarding the criteria apparently agreed upon by the MinCo in December 2018, and the report published by Sefton and Associates in December 2018, which reflect the need for better provision of information and community engagement in this area. Whilst clearly a better approach to disclosure in this area is urgently required, Chapter 9 discusses broader issues associated with those Agreed Criteria.
- 52 Witness Statement of David Bell, 16 June 2018 (RCE 14); Witness Statement of Peter Cosier, 24 June 2018 (RCE 20); Witness Statement of Matthew Colloff, 21 June 2018 (RCE 15).
- 53 See, eg, John Williams and R Quentin Grafton, Submission to Murray-Darling Basin Royal Commission, 19 April 2019 (RCE 27), 1–3; Wentworth Group of Concerned Scientists, Submission to Murray-Darling Basin Royal Commission, 21 May 2018 (RCE 73), 10; David Paton, Submission to Murray-Darling Basin Royal Commission, 30 April 2018 (RCE 325), 5–6; Anne Jensen, Submission to Murray-Darling Basin Royal Commission, 29 April 2018 (RCE 274), 2–3; Richard Kingsford, Submission to Murray-Darling Basin Royal Commission, 2018 (RCE 39), 5–6, 16, 23–5.
- 54 Murray-Darling Basin Authority, above n 1, 9–13.

Appendix 1: Abbreviations

ABARE(S)	Australian Bureau of Agricultural and Resource Economics (and Science)
AGS	Australian Government Solicitor
ALRC	Australian Law Reform Commission
ASIO	Australian Security Intelligence Organisation
BDL	Baseline Diversion Limit
BEWS	Basin-wide Environmental Watering Strategy
BOC	Basin Officials Committee
BPR	Basin Plan Regulator
CAP	Community Advisory Panel
CEWH	Commonwealth Environmental Water Holder
CEWO	Commonwealth Environmental Water Office
CLLMM	Coorong, Lower Lakes and Murray Mouth
CMS	Constraints Management Strategy
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cth	Commonwealth
DAWR	Department of Agriculture and Water Resources (Cth)
DEW	Department for Environment and Water (SA)
DPI	Department of Primary Industries (NSW)
EIS	Environmental Impact Statement
ELMA	Environmental Land Management Allocations
EPA	Environment Protection Authority

ESD	Ecologically Sustainable Development
ESLT	Environmentally Sustainable Level of Take
EWR	Environmental Water Requirements
GDP	Gross Domestic Product
GL	Gigalitre
IAC	Independent Assurance Committee
IAG	Independent Audit Group
IDELs	Individual Daily Extraction Limits
IGA	Intergovernmental Agreement
IPCC	Intergovernmental Panel on Climate Change
IQQM	Integrated Water Quantity and Quality Simulation Model
LCARC	Legal and Constitutional Affairs References Committee
LMRIA	Lower Murray Reclaimed Irrigation Areas
LTIM	Long-term Intervention Monitoring
LTWP	Long-term Watering Plans
MDBA	Murray-Darling Basin Authority
MDBC	Murray-Darling Basin Commission
MDBWI	Murray-Darling Basin Water Infrastructure Program
MinCo	Murray-Darling Basin Ministerial Council
ML	Megalitre
MLDRIN	Murray Lower Darling Rivers Indigenous Nations
MMELA	Macquarie Marshes Environmental Landholders Association
MOU	Memorandum of Understanding
NBAC	Northern Basin Advisory Committee
NBAN	Northern Basin Aboriginal Nations

NBR	Northern Basin Review
NIC	National Irrigators' Council
NRA	Ngarrindjeri Regional Authority
NRAR	Natural Resources Access Regulator
NWC	National Water Commission
NWI	National Water Initiative
OEH	Office of Environment and Heritage (NSW)
PPMs	Pre-requisite Policy Measures
RCP	Representative Concentration Pathway
ROP	Resource Operation Plan
SAP	Stakeholder Advisory Panel
SARMS	South Australian River Murray Sustainability Program
SDL	Sustainable Diversion Limit
SDLAAC	Sustainable Diversion Limit Adjustment Assessment Committee
SDLAM	Sustainable Diversion Limit Adjustment Mechanism
SEACI	South Eastern Australian Climate Initiative
SEFRP	South East Flows Restoration Project
SRA	Sustainable Rivers Audit
SRWUIP	Sustainable Rural Water Use and Infrastructure Program
TLM	The Living Murray
WAP	Water Allocation Plan
WESA	Water for the Environment Special Account
WRAP	Water Reform Action Plan
WRP	Water Resource Plan
WSP	Water Sharing Plan

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Establishment

The Murray-Darling Basin Royal Commission was established by His Excellency, the Honourable Hieu Van Le AC, Governor of South Australia on 23 January 2018. The Governor appointed Bret Walker SC as Royal Commissioner, and requested that the Commissioner inquire and report into the matters set out in the Terms of Reference by 1 February 2019.

The Terms of Reference, and their various responses, are set out at the commencement of this report.

A website was established containing information about the work of the Commission, its Terms of Reference, Commission Protocols, Frequently Asked Questions, Scholarly Articles and Published Reports referenced by the Commission. The website contained information about all phases of the Commission to assist in informing Murray-Darling Basin (**Basin**) communities and stakeholders.

Commission Staff

The Commission was supported by a team of 24 staff, including legal staff, research officers, para-legal officers, administrative, communications and support staff, not all of whom remained with the Commission for the entire year. The staff members and their respective positions are outlined below:

- Richard Beasley SC, Senior Counsel Assisting
- Carolyn Lee, Director
- Joanne Masters, Senior Instructing Solicitor
- Sarah Avey, Senior Advising Solicitor
- Sean O’Flaherty, Junior Counsel Assisting
- Michael Opacic, Senior Solicitor
- Chris Kwong, Senior Solicitor
- Bianca Geppa, Solicitor
- Matthew Traeger, Research Officer
- Jessica Bajger, Research Officer
- Aste Corbridge, Research Officer
- Lindy Ang, Research Officer
- Danielle Russell, Research Officer
- Caitlyn Georgeson, Research Officer

- Catherine Hockley, Communications Adviser
- Yvette Latty, Business Manager
- Eleni Roumeliotis, Site Visit/Consultation Engagement Officer
- Jane Caperna, Senior Administration and Witness Liaison Officer
- Julianne Manaois, Paralegal
- Carol Neal, Paralegal
- Jessica Freund, Paralegal
- Guglielmo Plain, Paralegal
- Greg Norris, Driver/Hearing support
- Sally Harding, Communications Officer

Phases of the Commission

The initial phase of the Commission focussed on analysis of existing information sources, including expert studies, reports and other materials relevant to the inquiry. Details of materials under consideration by the Commission were listed on the Commission's website. Commission staff were briefed on the Basin river system, its management and issues of specific interest through a series of sessions with key staff from the South Australian Department for Environment and Water and the Department of Primary Industries and Regions SA.

Community consultations

The Commission held nine community consultations across the Basin over a seven-week period from March to May 2018. Public consultations were held at the following sites:

- Albury, New South Wales
- Bourke, New South Wales
- Broken Hill, New South Wales
- Mildura, Victoria
- Moree, New South Wales
- Murray Bridge, South Australia
- Renmark, South Australia
- Shepparton, Victoria
- St George, Queensland

Communities across the Basin were informed of the sessions through advertisements in newspapers and social media. A press release was provided to local media in these communities, and Mr Beasley spoke to various media outlets to explain the consultation process and invite interested people to participate.

Community consultation sessions began on 29 March 2018 in Murray Bridge, South Australia, and continued across Queensland, New South Wales and Victoria until the final session held in Renmark, South Australia on 30 May 2018.

The approach to community consultations was relatively informal, with the format beginning with a brief summary of the inquiry and the Terms of Reference, and the audience then invited to address the session.

Community participation in consultation sessions varied across the areas visited by the Commission, with a number of people commenting that they felt ‘consultation fatigue’ due to the numerous inquiries conducted throughout the Basin and regarding the *Basin Plan 2012 (Cth) (Basin Plan)* over recent years.

The Broken Hill community consultation was well attended by many local people, as well as farmers and irrigators from further afield, eager to raise key issues affecting their community, including the Wentworth to Broken Hill Pipeline, concerns of local Aboriginal people and low-flow in the Darling River.

Similarly, in Mildura, there was a large attendance with concerns raised about an expansion in permanent plantings, the Wentworth to Broken Hill Pipeline, and the proposed Menindee Lakes Water Saving Project. In Albury, concerns were raised about the impacts of water recovery and associated water buybacks on local communities, over-bank flooding from environmental flows, and the lack of consultation with Aboriginal communities.

The impact of water buybacks was again raised during the consultation in Shepparton, where the local community expressed concerns about the social and economic impacts of water recovery in the region. There were also questions about the sustainable diversion limit adjustment mechanism and whether the proposed supply measure projects will be effective.

In Bourke, the Commission heard from a small audience, where irrigators stressed that their water consumption was compliant and raised concerns about being the subject of criticism, following the high profile Four Corners report concerning illegal take of water in the Basin.

St George attracted a small group of local attendees who spoke informally with the Commission about the social impact of water buybacks in their community.

In Moree, the community also focussed on irrigator compliance with metering, impacts of low-flows, whether the Basin Plan complies with the *Water Act 2007* (Cth) (**Water Act**), and the sustainability of groundwater extraction.

The South Australian sessions in Murray Bridge and Renmark heard local communities' concerns about whether the 450 GL would be recovered, the need for an upgrade of the barrages, low-flow in the Darling River and its downstream impacts, and concerns about an apparent expansion of permanent plantings upstream.

Site visits

During the period of the community consultations, the Commission also participated in 20 local site visits to key locations across the Basin, to learn more about the river system and its vast natural features, and to better understand management and coordination of the system. The site visits began at the Murray Mouth in South Australia on 28 March 2018, with special thanks to Major Sumner who conducted a Welcome to Country. Site visits continued across the Basin at the locations listed below:

- Barmah National Park, Victoria
- Chowilla Creek Environmental Regulator, South Australia
- Coorong and Lower Lakes, South Australia
- Deniliquin Rice Mill, New South Wales
- Dunns Lagoon, South Australia
- Ebner Property, Victoria
- Golder Dairy Farm, South Australia
- Goolwa Barrages, South Australia
- Goulburn-Murray Water Tatura offices, Victoria
- Hattah Lakes, Victoria
- Kangarra Farm, South Australia
- Lamey Farm, Toobeah, Queensland
- Lower Murray Water, Victoria
- Menindee Lakes, New South Wales
- Murray Mouth, South Australia
- Oro Rice Farm, New South Wales
- Red Cliffs River Pump Station, Victoria
- RNR Farms, South Australia
- Stahmann Farms, New South Wales
- The Creeks Pipeline Company Ltd, South Australia

Private consultations

The Commissioner also conducted individual consultations across the Basin with interested parties and stakeholders, in order to hear their views and perspectives on matters concerning the Terms of Reference. Lists of persons and organizations consulted, together with persons who assisted with arranging consultations and site visits, are set out below. The Commission is very much indebted to all of those people who took the time to engage with it, and provide assistance.

- Albury City Council, Mayor Kevin Mack, Ray Stubbs, Brad Ferris
- Alexandrina Council, Mayor Keith Parkes, Councillor Barry Featherston
- Australian Floodplain Association, Justin and Julie McClure, Stuart Le Lievre
- Balonne Shire Council, Mayor Richard Marsh, Councillors Ian Todd, Samantha O'Toole, Robyn Fuhrmeister
- Barkandji Nation, William 'Badger' Bates, Kevin Knight, Gerald Quayle, Maureen O'Donnell
- Berri Barmera Council, Mayor Peter Hunt
- Bourke Shire Council, Mayor Barry Hollman
- Brewarrina Shire Council, Mayor Phillip O'Connor, Jeff Sowiak
- Broken Hill and Darling River Action Group, Mark Hutton, Darryn Clifton, Robert & Katharine McBride
- Broken Hill City Council, Mayor Darriea Turley
- Chris Lamey, Toobeah
- City of Wodonga, Mayor Anna Speedie, Councillor Ron Mildren, Patience Harrington
- David Harriss
- Deniliquin Rice Mill, Sharon Bloomfield
- District Council of Loxton Waikerie, Councillor Trevor Norton
- Edward River Council, Mayor Norm Brennan, Adam McSwain
- Flinders University, Associate Professor Steve Hemming
- Goondiwindi Regional Council, Mayor Graeme Scheu, Carl Manton
- Goulburn Broken Catchment Management Authority, Simon Casanella, Mark Turner
- Goulburn-Murray Water, Scott Barber, Paul Cox
- Greater Shepparton City Council, Mayor Kim O'Keeffe, Geraldine Christou, Colin Kalms

- Lower Darling Horticulture Group, Alan Whyte, Rachel Strachan
- Macquarie Marshes Environmental Landholders Association, Dugald Bucknell, Garry Hall
- Mildura Rural City Council, Mayor Mark Eckel, Councillor Anthony Cirillo, Councillor Jason Modica, Gerard Jose, Martin Hawson
- Moree Plains Shire Council, Mayor Katrina Humphries, Lester Rodgers
- Murray Lower Darling Rivers Indigenous Nations, Kingsley Abdullah
- Ngarrindjeri Elder, Major ‘Moogy’ Sumner AM
- Ngarrindjeri Regional Authority Inc, Grant Rigney, Ken Sumner, Eunice Aston
- Northern Basin Aboriginal Nations, Fred Hooper, Maureen McKellar, Margaret Seckold, Tony Munro, Feli McHughes, Cyril Logan, Peter Harris, Owen Murphy
- Oro Rice Farm, Michael Hughes
- Renmark Paringa Council, Mayor Neil Martinson, Tony Siviour
- Ricegrowers’ Association of Australia, Jeremy Morton, Graeme Kruger, Neil Bull
- Richard Feld
- Southern Riverina Irrigators, Gabrielle Coupland, Perin Davey
- Speak Up Campaign, Shelley Scoullar
- SunRice, Laurie Arthur, John Bradford
- Suzanna Sheed, Member for Shepparton
- Yorta Yorta Nation Aboriginal Corporation, Monica Morgan, Ruben Baksh, Lance James

The following people assisted with community consultations and site visits:

- Amy Wallace, Albury Entertainment Centre
- Andrew Kremor, Lower Murray Water
- Andrew Beal, Department for Environment and Water (SA)
- Ben Bruce, Department for Environment and Water (SA)
- Benita Cox, Kingfisher Cruises
- Brett Kennedy, Primary Industries and Regions SA
- Bruce Greenop, Department of Environment, Land, Water and Planning (Vic)
- Christopher Longbottom, South Lakes Golf Club
- Chris Morony, Department for Environment and Water (SA)
- David Reibel, Stahmann Farms

- David Sheehan, Department of Environment, Land, Water and Planning (Vic)
- Garry Fyfe, SA Water
- Howard Lowndes, Albury Taxis
- Jan Whittle, Department for Environment and Water (SA)
- Jenny Collins, Mallee Catchment Management Authority
- Julia Reed, Department of Environment, Land, Water and Planning (Vic)
- Kahli Boyce, Balonne Shire Council
- Mayor Katrina Humphries, Moree Plains Shire Council
- Kellie Morgan, Quality Hotel Mildura Grand
- Kym Walton, Primary Industries and Regions SA
- Lawrie Golder, Golder Farm South Australia
- Leith Williams, Broken Hill Musicians Club
- Major ‘Moogy’ Sumner AM
- Mark Connelly, Moree Plains Shire Council
- Mike Reynolds, The Creeks Pipeline Company
- Nick Sheehan, Mallee Catchment Management Authority
- Dr Nick Whiterod, Nature Glenelg Trust
- Peter Ebner, Lower Murray Water
- Richie Roberts, RNR Farms
- Steve Burdett, Vitalharvest
- Stuart Johnson, Back O Bourke Car Hire
- Tarsha McGregor, Primary Industries and Regions SA
- Tim Goodes, Primary Industries and Regions SA
- Tim Kruger, SA Water
- Toby Osmond, Yaama Ganu Gallery
- Tony Herbert, Department for Environment and Water (SA)
- Tracey Lehmann, Murray Bridge and District Community Club

Submissions

Call for submissions re Terms of Reference and Issues Paper 1

On 19 February 2018, the Commission issued a public invitation for submissions relating to the Terms of Reference, with a deadline of 30 April 2018. A public notice calling for submissions was placed in major metropolitan and regional newspapers across the Basin and in capital cities. A press release was distributed to media outlets to promote awareness of the Commission and encourage communities to participate through the submission process. Letters were sent to around 400 individuals and groups, alerting them to the inquiry and the fact of the invitation. The Commission's social media accounts, Twitter and Facebook, were used to alert Basin communities and encourage their participation through targeted posts.

The Commission released Issues Paper 1 on 4 April 2018, highlighting matters of particular interest to the Commission arising under the Terms of Reference.

Submissions were uploaded to the Commission's website, emailed or posted to the Commission's office. A total of 144 submissions were received regarding Issues Paper 1. Details of the organizations and persons who provided those submissions are set out below. Links to submissions were also available on the Commission's website.

Call for submissions re Issues Paper 2 and Explanatory Memorandum

Issues Paper 2 was released on 30 April 2018 to outline key issues concerning the construction of the Water Act under consideration by the Commission, and to invite further comment and submissions specifically on those matters. A total of 21 responses were received on Issues Paper 2. Details of the organizations and persons who provided those submissions are also set out below, and links to submissions were available on the website.

The Commissioner issued an Explanatory Memorandum on 14 May 2018 to clarify the extraterritorial powers of the Commission.

Public hearings

The Commission commenced its public hearings on 18 June 2018 in the David Spence Room at the Adelaide Town Hall, and they concluded on 30 October 2018. Hearings were mostly held at the Adelaide Town Hall, with some evidence taken by Skype at the Commission's hearing room in Grenfell Street, Adelaide.

All hearings were open to the public, and a live audio stream was available through the Commission's website to provide the Basin community and a broader audience immediate access to evidence given. Transcripts were available the same day and posted on the Commission's website.

A total of 68 witnesses gave evidence at the hearings, and the Commission is very grateful for their valuable contributions to the inquiry.

Notices of Intention

The opportunity was given for people to appear before the Commission to make submissions and/or call evidence and/or question a witness, pursuant to the Notice of Intention process detailed in the Commission's protocols. That process required lodgement of a Notice with the Commission, and the grant of leave to appear by the Commissioner.

Three people were granted leave to appear before the Commission pursuant to this process, and are indicated in the list of witnesses below.

Exhibits

More than 1100 exhibits were tendered to the Commissioner. A full list of the exhibits, together with links to the related documents, were available on the Commission website.

The Issues Papers, public submissions, witness statements, hearing transcripts and exhibits form part of the official records of the Commission and will be archived in accordance with the *State Records Act 1997* (SA).

Submissions received — Issues Paper 1

Commonwealth

Organizations

Department of Agriculture and
Water Resources

Commonwealth Environmental
Water Holder

CSIRO

Murray-Darling Basin Authority

Australian Capital Territory

Organization

Australian Capital Territory
Government

Individuals

Maryanne Slattery, The Australia
Institute

Quentin Grafton and John Williams

New South Wales

Organizations

Antia Brademann, Upper
Murrumbidgee Demonstration
Reach

Andrew Kelly, West Corurgan
Private Irrigation District

Barwon-Darling Water

Bernard Griffin, West Wallsend
Branch of the Australian Labor
Party

Broken Hill City Council

David Arnold, Bindara on the
Darling

Dugald Bucknell, Quambone
Pastoral Co Pty Ltd

Environmental Defenders Offices
of Australia

Gabrielle Coupland, Southern
Riverina Irrigators

Garry Hall, Macquarie Marshes
Environmental Landholders
Association

Inland Rivers Network

Jane Redden, Narromine Shire
Council

Justine Keech, Deniliquin Business
Chamber

Katrina Humphries; Lester
Rodgers, Moree Plains Shire
Council

Mark Hegarty, Blue Zone Group

Mark McKenzie, NSW Irrigators'
Council

Mark Hutton, Broken Hill and
Darling River Action Group

Michael Murray, Cotton Australia

Murray Valley Private Diverters

Narwie Partners

Norm Brennan, Edward River
Council

Northern Basin Aboriginal Nations

NSW Farmers Association

New South Wales Government

Paul Porter; Matt Ireson, Wah Wah
Alternative Supply Group

Phillip O'Connor, Brewarrina Shire
Council

Rachel Strachan, Lower Darling
Horticulture Group

Ricegrowers' Association of
Australia

Richard Sargood, Murray River
Action Group

Simon McArthur, Australian
Regional Tourism Ltd

Speak Up Campaign

Steve Whan, National Irrigators'
Council

Terry Korn PSM, Australian
Floodplain Association

Wentworth Group of Concerned
Scientists

Wilderness Society Australia

Gordon Crisp

Helen Dalton

Jack Bennett

Keith Peasley

Louise Burge

Marie Wecker

Mark Smith

Martin Mallen-Cooper

Murray McClure

Pauline Carr

Paul Cohrs

Paul Connellan

Paul Newell

Richard Kingsford

Rob Foster

Robert and Katharine McBride

Robert Vincin

Ross Howse

Ruby Davies

Stuart Heffer

Thomas Dineen

Thomas Wild

Warren Duncan

William (Badger) Bates

William Johnson

Yvonne and Don Stewart

Individuals

Austin Evans

Barbara Webster

Barrie MacMillan

Bernard Griffin

Brian Bycroft

Cameron Holley; Darren Sinclair
(Australian Capital Territory);
Tariro Mutongwizo; and Amelia
Brown

Carol Jacobson

Chris Edwards

Christopher Priestley

Christopher Rawlins

David Papps

Donald J Macleod

Edward Fessey

Geoff Wise

Queensland

Organizations

Queensland Government
Richard Marsh, Balonne Shire
Council
Travis Tobin, Queensland Farmers'
Federation

Individuals

Kylie Kilroy

South Australia

Organizations

Anne Jensen, Healthy Rivers
Ambassador
Barry Featherston, Murray Darling
Association Region 6
Bill Bagley, Angas Partners
David Burgess, Murraylands and
Riverland Local Government
Association
David Shetliffe, Murray Darling
Association Region 7
District Council of Loxton
Waikerie
Elizabeth Tregenza, River Lakes
and Coorong Action Group
John Hunt, South Australian
Dairyfarmers' Association
Kane Aldridge, Goyder Institute for
Water Research
Kathy Whitta, Conservation
Council of South Australia
Ngarrindjeri Regional Authority Inc
Peter Wadewitz, Australian
Organics Recycling Association
Rob Kerin, Primary Producers
South Australia

Roch Cheroux, SA Water
Russell Peate, Mid Murray Council
Ruth Trigg, Centre for Culture,
Land and Sea
Sharon Starick, South Australian
Murray-Darling Basin Natural
Resources Management Board
South Australian Government
South Australian Wine Industry
Association
Tony Siviour, Renmark Paringa
Council

Individuals

Alan Herath
Alastair Wood
Andrew Sniedze
Chris Bagley
David Paton AM
Ken Jury
Margaret Gambling
Mike Young
Murray Jacobs
Nick Harvey
Rosa Hillam
Samuel Dodd
Sarah Wheeler; Jeff Connor;
Quentin Grafton (Australian
Capital Territory); Lin Crase;
John Quiggin (Queensland)
Tom Loffler
Tom Martin

Victoria

Organizations

Adrian Kidd, Water Advisory
Committee, Liberal Party of
Australia (Mildura Branch)

Birdlife Mildura

Emma Bradbury, Murray Darling
Association

Howard Pascoe, Howard Pascoe
Consulting

Jason Modica, Healthy Rivers,
Healthy Communities

John Pettigrew, Goulburn Valley
Environment Group

Juliet Le Feuvre, Environment
Victoria

Mark Eckel; Jason Modica;
Anthony Cirillo; Gerard Jose;
Martin Hawson, Mildura Rural City
Council

Victorian Government

Individuals

Alistair Watson

Barry Croke

Bill McClumpha

Brenton Rittberger

Carina Dick

Jan Beer

James Wilton

John Brian

Keith Greenham AM

Lindsay Leake

Ron Perry

Warren Gould

Other

Brian Chatterton, Italy

Deni

Submissions received — Issues Paper 2

Australian Capital Territory

National Farmers' Federation

New South Wales

Barbara Webster

David Bell

David Pearce and Elizabeth
Russell-Pearce

Doug Humphreys OAM, The Law
Society of New South Wales

Gabrielle Coupland, Southern
Riverina Irrigators

Mary Ewing, Lachlan Valley Water

Michael Murray, Cotton Australia

Ray Stubbs, Riverina and Murray
Regional Organisation of Council

Queensland

Paul Stevens

Travis Tobin, Queensland Farmers'
Federation

South Australia

Anna Hooper, Australian Vignerons

Anne Jensen, Healthy Rivers
Ambassadors

Hugo Hopton, Nature Foundation
SA

John Hunt, South Australian
Dairyfarmers' Association

Julia Peacock, Nature Conservation
Society of South Australia

Tom Rooney, Waterfind Australia

Victoria

Ken Pattison

Murray Lower Darling Rivers
Indigenous Nations

Other

Anita Foerster and Alex Gardner,
Victoria/Western Australia

Saideepa Kumar and Paul
Humphries, Tasmania/New South
Wales

Public hearings & witnesses

18 June 2018	Mr David Bell Notice of Intent: Mr John Elferink, South Australian Dairyfarmers' Association
27 June 2018	Dr Matthew Colloff Mr Peter Cosier, Wentworth Group
28 June 2018	Professor Richard Kingsford Professor John Williams
3 July 2018	Professor Sarah Wheeler
5 July 2018	Associate Professor Rebecca Lester
10–11 July 2018	Wentworth Group of Concerned Scientists: A/Professor Jamie Pittock, Mr Peter Cosier, Professor Bruce Thom AM, Dr Celine Steinfeld
12 July 2018	Messrs Michael Murray and Adam Kay, Cotton Australia Ms Maryanne Slattery, The Australia Institute
17 July 2018	Ms Rachel Strachan, Lower Darling Horticulture Group Mr Alan Whyte, Lower Darling Horticulture Group Professor Justin Brookes
18 July 2018	Mr Fred Hooper, Northern Basin Aboriginal Nations Ms Monica Morgan, Yorta Yorta Nation Aboriginal Corporation Mr Steve Whan, National Irrigators' Council
19 July 2018	Mr Steve Whan, National Irrigators' Council Mr David Harriss Messrs Rene Woods and Will Mooney, Murray Lower Darling Rivers Indigenous Nations
24 July 2018	Ms Emma Bradbury, Murray Darling Association Mr John Clements
25 July 2018	Mr Bill Johnson Dr Martin Mallen-Cooper
26 July 2018	Professor Quentin Grafton Messrs Ian Cole and Tony Thompson, Barwon-Darling Water
30 July 2018	Dr David Adamson, Dr Adam Loch Notice of Intent: Mr Rob Rendell, RMCG

31 July 2018	Ms Maryanne Slattery, The Australia Institute
2 August 2018	Mr Grant Rigney, Ngarrindjeri Regional Authority
16 August 2018	Mr Robert and Mrs Katharine McBride, Tolarno Station Ms Louise Burge, Murray Valley Private Diverters
23 August 2018	Mr Mal Peters OAM Mr Geoff Wise Mr Chris Bagley
24 August 2018	Messrs Justin McClure, Stuart Le Lievre and Terry Korn, Australian Floodplain Association Mr Mark McKenzie, NSW Irrigators' Council
28 August 2018	Mr William 'Badger' Bates, Barkandji Nation Ms Juliet Le Feuvre, Environment Victoria Ms Jan Beer
29 August 2018	Messrs Garry Hall and Dugald Bucknell, Macquarie Marshes Environmental Landholders Association Ms Karlene Maywald
30 August 2018	Mr Hugo Hopton and Ms Natalie Stalenberg, Nature Foundation SA Dr Anne Jensen, Healthy Rivers Ambassador
4 September 2018	Professor Justin Brookes Dr Chris Perry
5 September 2018	Mr David Papps A/Professor David Paton AM
6 September 2018	Mr Andy Close Messrs Jason Modica and Mark Jenkins, Mildura Rural City Council
20 September 2018	Notice of Intent: Dr Emma Carmody, NSW Environmental Defenders Office
21 September 2018	Mr Chris Lamey Professor Andy Pitman
25 September 2018	Mr Jason Alexandra Professor Mike Young

26 September 2018	Mr Ben Bruce, Dr Theresa Heneker and Ms Chris Morony, Department for Environment and Water (SA)
27 September 2018	Notice of Intent: Dr Emma Carmody, NSW Environmental Defenders Office
23 October 2018	Professor Petra Tschakert Professor Mark Howden
30 October 2018	Richard Beasley SC, Final Submissions



**MURRAY-
DARLING BASIN
ROYAL COMMISSION**