

# Submission to the South Australian Murray–Darling Basin Royal Commission

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### Acknowledgement of the Traditional Owners of the Murray–Darling Basin

The Murray–Darling Basin Authority pays respect to the Traditional Owners and their Nations of the Murray–Darling Basin. We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

The guidance and support received from the Murray Lower Darling Rivers Indigenous Nations, the Northern Basin Aboriginal Nations and our many Traditional Owner friends and colleagues is very much valued and appreciated.

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# Introduction

1. The Murray–Darling Basin Plan and associated investment in improved irrigation efficiency is a substantial reform intended to achieve the long term sustainable use of the Basin’s water resources in the national interest.
2. The *Basin Plan 2012* (the Basin Plan or the Plan) requires an understanding of the physical environment (ecology and hydrology, including the nature of existing river regulation settings) and the consequences of different management scenarios for both surface and groundwater systems. It also requires an understanding of the social and economic consequences of those scenarios.
3. The Murray–Darling Basin is large and complex. The water resources and the communities that depend on them are diverse. There is no single objective method for working out the optimum water management prescription for the Basin. The science is not perfect. Expert views are often contested. The views of water users and local communities are many and varied and often cannot be reconciled.
4. It is also clear that what might be considered to be the most suitable management arrangements today, will need to be revised in the future, in light of improving knowledge, technology and experience.
5. However, the absence of absolute certainty does not mean that the journey towards a more sustainable Basin should not commence.
6. The framework provided by the *Water Act 2007* (the Act) and the Basin Plan:
  - a. set water management objectives for the whole Basin;
  - b. reflect the importance of consulting widely and appropriately;
  - c. support well-informed, expert judgements now about key management settings from a whole of Basin perspective; and
  - d. put in place arrangements for monitoring, review and adaptation of those settings in future.
7. This framework is vastly better than the consensus arrangements that preceded it.
8. This submission does not extensively revisit the content of the Basin Plan adopted in 2012, nor the content of this year’s amendments in response to the MDBA’s assessment of measures under the SDL adjustment mechanism, nor in relation to the Northern Basin Review. This is because:
  - a. **the MDBA is confident that the 2012 Plan and the two amendments referred to were made consistent with the requirements of the Act.** Our published reports, including those on this [summary page](#) or referred to elsewhere in this submission, provide a comprehensive basis for understanding the Basin Plan and the amendments.<sup>1</sup> We also support the content included in the letter from the Minister for Agriculture and Water Resources [to the South Australian Government](#) on 2 July 2018 in relation to some of these issues.<sup>2</sup>
  - b. **the Basin Plan as made in 2012 and the two amendments referred to above have bilateral support at the federal level and unanimous agreement of Basin State governments.** We note that the submission from the South Australian government to the Royal Commission confirms such support.

- c. **we consider it more useful to focus on the full implementation of the current arrangements.** There are opportunities to refine and adapt implementation as we proceed. There are also significant challenges ahead that will demand the cooperation of all Basin governments and the community if the full benefits of the Plan are to be realised.
- 9. This submission focuses on the here and now – and some of the challenges ahead if the Basin Plan is to be implemented in full and on time:
  - a. compliance with water laws across the Basin;
  - b. completion and accreditation of state water resources plans (WRPs);
  - c. progress with the SDL adjustment mechanism; and
  - d. progress with the ‘toolkit measures’ in the northern Basin.
- 10. Finally, the submission responds to some of the themes repeated in material that has been presented to the Commission about the integrity of work done by the MDBA.
- 11. Throughout the submission we have included references to specific documents, most of which are on our website. Our intention is that these documents be considered as part of the material in this submission.

## About the MDBA

- 12. The Murray–Darling Basin Authority (MDBA) is a statutory authority of the Australian Government comprising a part-time Chair, full time Chief Executive, and four part-time members. The functions of the Authority are supported by an office currently of around 285 full time equivalent staff based at several locations around the Basin, and led by the Chief Executive.
- 13. The MDBA’s functions are prescribed by the Act. Key functions include the development of a plan for the sustainable use of water resources across the Basin, and the provision of river operation, asset management and related services to the joint venture arrangements set out in the Murray–Darling Basin Agreement.
- 14. For Basin Plan matters, the MDBA is accountable to the Australian Government Minister for Agriculture and Water Resources. The Minister may direct the MDBA about the performance of its functions in certain respects and has an important role in key processes, including the making or amendment of the Basin Plan and in accrediting WRPs.
- 15. For matters under the MDB Agreement, the MDBA is accountable to the Murray–Darling Basin Ministerial Council (Ministerial Council). The Ministerial Council is comprised of a Minister from each of the Basin State<sup>1</sup> governments and is chaired by the Commonwealth Minister. The Ministerial Council has the power to set objectives and outcomes for the MDBA in relation to certain matters and there are a number of MDBA functions that require the approval of the Ministerial Council.
- 16. Other Australian Government agencies involved in implementing the Basin water reforms are the Department of Agriculture and Water Resources (DAWR), which chairs the Basin Officials Committee (BOC) and is responsible for the water recovery programs, and the Commonwealth

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<sup>1</sup> Basin States refers to the following jurisdictions: New South Wales, Queensland, Victoria, South Australia and the Australian Capital Territory.

Environmental Water Holder (CEWH), who is responsible for managing the growing portfolio of Australian Government environmental water holdings.

# Compliance with water laws across the Basin

*(Terms of reference 7, 8, 9, 10)*

17. The MDBA is the enforcement agency for Part 2 of the Act, the Basin Plan and matters relating to acts inconsistent with WRPs.
18. When the Act was drafted, the working assumption was that, reflecting historic practice, states would continue to ensure that individual water users would comply with relevant state laws governing water use. This reflected the Act's explicit recognition of State water management laws.
19. In light of concerns raised by the community about lack of compliance in parts of New South Wales (NSW), the MDBA has further considered its compliance approach.
20. On 5 September 2017 the Prime Minister commissioned the MDBA and an independent expert panel to conduct a Basin-wide review of water compliance (the Review). [The Review](#) is in two parts and includes recommendations developed by the MDBA and by the independent expert panel.<sup>3</sup>
21. The Review found serious problems with compliance and enforcement arrangements across the Basin and recommended that Basin States:
  - a. improve water measurement, particularly metering of take and measurement of floodplain harvesting;
  - b. improve the culture of compliance, including resourcing and transparency;
  - c. review penalties for non-compliance, and in some jurisdictions adopt a broader range of penalties with stronger deterrents; and
  - d. finalise the accreditation of state WRPs by 30 June 2019, and ensure they adequately protect environmental water.
22. The Review also 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 strengthened enforcement powers.
23. On 27 November 2017 the Prime Minister confirmed his [support for the recommendations](#) contained in the Review and commended the findings to Basin States.<sup>4</sup>
24. The MDBA has agreed to implement **all of the actions** from the Review within its purview. To date, the MDBA has:
  - a. established an Office of Compliance , including qualified auditors and investigators;
  - b. established an [Independent Assurance Committee](#) (IAC) to advise the Authority on the effectiveness of our compliance arrangements including both their design and the MDBA's progress with implementation.<sup>5</sup> Members of the IAC have deep regulatory and natural resource management expertise and include: Mr Allan Holmes (Chair), Ms Lisa Corbyn, Mr Garry Smith and Mr Martin Dolan. Advice from the IAC to the Authority is published;

- c. led the negotiation of a [Basin Compliance Compact](#) with Basin governments.<sup>6</sup> The Compact was agreed by the Ministerial Council in June 2018 and will be put to the Council of Australian Governments for endorsement at the next opportunity. The report was bolstered with [independent advice from Dr Wendy Craik OAM](#).<sup>7</sup> The Compact sets out a number of commitments from all Basin governments to improve compliance, and an annual reporting arrangement to track progress;
  - d. released a new [Compliance and Enforcement Policy](#), commenced an audit program, developed an [MOU](#) with the new NSW Natural Resources Access Regulator, and commenced work to ensure improved adoption of the relevant Australian metering standard;<sup>8, 9</sup>
  - e. commenced work with DAWR on the scope of legislative amendments to enhance our compliance and enforcement powers; and
  - f. developed reports on progress with [State WRPs](#), measures to protect environmental water, and a [register](#) of allegations of non-compliance referred to the MDBA.<sup>10, 11</sup>
25. As outlined in the Review and the Compliance Compact, the MDBA's role in compliance is best described as one of 'regulating the regulators'. State government agencies continue to have primary responsibility for ensuring that individual water users comply with State water management laws. To the extent that States do not do this, the MDBA may escalate the issue and take direct action if appropriate.
  26. More generally, the MDBA's compliance approach focuses on auditing and reporting of particular State compliance activities, helping to develop the 'regulatory craft' among practitioners for example by establishing a community of practice, and working with States to develop guidelines on good practice for compliance activities such as measurement.
  27. Attention is also drawn to the compliance reviews conducted in NSW and Queensland and the responses of those respective governments. Many of the actions from these reviews are reflected in the Compliance Compact.
  28. More recently, the Minister for Agriculture and Water Resources has announced the appointment of Mr Mick Keelty as the Northern Basin Commissioner. Mr Keelty brings a vast amount of experience in law enforcement, and will play a valuable role in scrutinising the arrangements that the Commonwealth (including MDBA), NSW and Queensland have in place for compliance, and reporting on areas for improvement.

## Completion of state water resources plans

*(Terms of reference 1, 2, 3)*

29. Delivering the Sustainable Diversion Limit (SDL) is central to the effective implementation of the Basin Plan. The SDLs are intended to be implemented through WRPs. The Basin Plan envisaged 7 years – to 30 June 2019 – for States to submit their WRPs to the MDBA for assessment and for the Australian Government Minister for Water to accredit WRPs.
30. Queensland is currently the only Basin State with an accredited WRP (the Warrego-Paroo-Nebine). Another three have been submitted for accreditation, with the remaining 29 under preparation.
31. The MDBA's assessment is that WRPs for South Australia, Queensland and the Australian Capital Territory (ACT) will likely meet the timeline for accreditation. However, the prospects

of this are less certain for Victoria and NSW. Victoria submitted two WRPs in June 2018 and the remaining three are still under development. NSW has a substantial task with 20 WRPs to submit.

32. Responsibility for the delays lies with both 'sides' - the MDBA and the Basin States. Queensland, South Australia and the ACT commenced the development of the WRPs early in the process, whereas, Victoria and NSW were slower. Victoria is now strongly engaged and some good progress has been made in resolving long standing policy differences. Over the past 12 months, NSW has substantially improved its level of engagement and commitment to the development of suitable WRPs.
33. 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.
34. There is a significant risk that not all WRPs will be accredited by 30 June 2019. Success depends on Basin States submitting their WRPs in a timely way and the MDBA reviewing them efficiently. That said, the primary focus of the MDBA is to make certain that WRPs meet the requirements contemplated by the Act and the Basin Plan.
35. Acknowledging this risk, the MDBA will work with relevant governments on contingency arrangements that seek to protect key elements of the reform- such as SDL accounting and protection of environmental water- if there is a short overrun of time.

## Progress with the SDL adjustment mechanism

*(Terms of reference 3, 5, 6)*

36. When developing the Basin Plan SDLs, it was assumed that river infrastructure and operating arrangements (e.g. operating rules, water accounting arrangements, flood easements) were static. This meant that the assessment of environmental outcomes associated with those SDLs was based on an assumption of no improvement in these arrangements.
37. The responsibility for river infrastructure and operating arrangements rest with State governments, or in the case of the River Murray System – the joint governments.
38. In this context, the [Ministerial Council requested](#) the inclusion of an SDL adjustment mechanism in the Basin Plan during the final round of consultation for the Plan.<sup>12</sup> Negotiation of the mechanism was undertaken on behalf of Ministers by senior officials from all Basin governments. These meetings were chaired by the then Australian Government Department of Sustainability, Environment, Water, Population and Communities and supported by senior MDBA officials. The Act was amended by the [Water Amendment \(Long-term Average Sustainable Diversion Limit Adjustment\) Act 2012](#) to facilitate the adjustment.<sup>13</sup>
39. An important purpose of the SDL adjustment mechanism is to harness the potential of improved management settings to deliver both improved socio-economic and environmental outcomes compared to initial Basin Plan settings. For example, by negotiating flood easements with impacted landholders, it should be possible to increase routine inundation levels in key parts of the system. Known as Constraints Management, this work builds on a scheme that was successfully introduced with landholders below Hume Dam in the 2000s.
40. The SDL adjustment mechanism provides for changes to the SDLs to reflect:



- a. the implementation of measures that operate to increase the quantity of water available to be taken for consumptive use (known as supply measures);
  - b. the implementation of measures that operate to increase the quantity of water available to the environment (known as efficiency measures); and
  - c. implementation of a program to remove constraints to more environmentally-friendly flow patterns within the river system.
- 41. Critically, the SDL adjustment mechanism did not affect the requirement that the SDLs must reflect an environmentally sustainable level of take. The mechanism operates within bounds that restrict the limit of change (through a 5% limit on the net effect of adjustments under s7.19 of the Basin Plan), and ensures there is a review of contributions achieved through the measures (through a reconciliation process at the end of 2024 under s7.11 of the Basin Plan).
- 42. In practical terms, the 5% limit operates to ensure that the net effect of change cannot exceed 543 GL/ year. Hence, in order to access the full 605GL referable to the total contribution from supply measures, 62GL of efficiency measures must first be registered.
- 43. The ongoing addition of efficiency measures (to 450GL) through to 2024 is intended to achieve the environmental outcomes associated with recovery of up to 3200GL under static river operating arrangements.
- 44. The [SDL adjustment projects](#) and further details on the [project assessment process](#) and the [determination process](#) are set out on the MDBA website.<sup>14, 15, 16</sup>

## Efficiency measures

- 45. The efficiency measures program is implemented by DAWR. As is normal practice with water recovery programs, the Australian Government will require participants – both on and off-farm – to provide water entitlements in return for program funding. These entitlements will be managed by the CEWH. This approach ensures that – in concert with implementing other aspects of the Basin Plan – the enhanced environmental outcomes sought through the program can be achieved.
- 46. A key element of the mechanism agreed by the Ministerial Council and included in the Basin Plan in 2012 was that the efficiency measures should have neutral or improved socio-economic outcomes. The main test included in the Plan to establish whether efficiency measures meet this requirement is that water users participate in the funding program (s7.17 of the Plan). That is, individuals are best placed to assess whether or not they will be better off through participating in the efficiency measures program. There is no obligation on them to do so.
- 47. More recently, some stakeholders have questioned the appropriateness of this test, and expressed concern about possible negative socio-economic impacts of further water recovery through efficiency measures at the community, rather than individual level. To assist in clarifying these concerns, the Ministerial Council commissioned Ernst and Young to conduct a review. The [Ernst and Young report](#) suggested that between 209 GL and 690 GL in efficiency measures could be achieved in a way that is socio-economically neutral or positive, consistent with the Basin Plan requirements.<sup>17</sup>
- 48. At the Ministerial Council meeting in June 2018, Basin water ministers agreed that Basin governments develop agreed additional program criteria to ensure neutral or beneficial socio-economic outcomes for potential on-farm infrastructure efficiency measures. Ministers also decided to develop an agreed pathway for the recovery of 450 GL in efficiency measures. This work will come to the Ministerial Council meeting for agreement by the end of 2018.

# Supply and constraints measures

49. The [package of supply measures](#) was assessed by the MDBA based on a robust methodology that was developed by the CSIRO and agreed by all Basin governments. Implementing the full suite of projects within the timeframe will be challenging.<sup>18</sup> It is an ambitious package and risks include:
- a. some of the projects are highly complex and to date have had limited consultation with local communities; and
  - b. the governance and funding arrangements required at the implementation phase have yet to be settled by governments.
50. In terms of addressing constraints, five constraints projects have been proposed as part of the SDL adjustment supply measure package:
- a. Hume to Yarrawonga
  - b. Yarrawonga to Wakool Junction
  - c. Murrumbidgee
  - d. Lower Darling
  - e. Lower Murray (in South Australia).
51. A further constraints project was proposed by the Victorian Government for the Goulburn valley, although not as a supply measure. It is currently designed to deliver flow rates that are lower than those previously articulated as deliverable by Victoria (at the time the Basin Plan was settled).

## Reconciliation

52. All supply, efficiency and constraints measures are to be in place by 30 June 2024. Should there be a shortfall in the contributions delivered by supply or efficiency measures, the Basin Plan includes a reconciliation process. Reconciliation will enable the Authority to consider actual against anticipated contributions and adjust relevant SDLs accordingly. If this occurs, governments would need to make up any shortfall through additional water recovery.
53. It is expected that a number of the supply measure projects will evolve as they move from design to implementation, through concept trials, community engagement, and interactions between other projects. The MDBA will need to monitor implementation of the measures closely to ensure they deliver intended outcomes.
54. As part of its approach to reconciliation, the MDBA is planning to provide regular public reports on progress with implementation of the SDL adjustment mechanism including supply, efficiency and constraints measures. The MDBA has also committed to facilitating yearly technical workshops with stakeholders to review implementation progress.

# Progress with the ‘toolkit’ measures in the northern Basin

(Terms of Reference 12, 13)

55. At the time the Plan was made, it was recognised that the information base in the northern Basin was less robust than it was in the southern Basin. For this reason, the MDBA committed to conduct a review of settings in the northern Basin.
56. The Northern Basin Review (the NBR) drew together hydrological, social, cultural, economic and environmental investigations over four years. At its centre was a consultative body, the Northern Basin Advisory Committee (NBAC). The work also required collaboration with the NSW and Queensland governments.
57. The technical work involved in the NBR is published on the [MDBA’s website](#).<sup>19</sup>
58. One of the key learnings from this work was that in highly variable river systems such as the northern Basin, long term average SDLs are of less utility in achieving improved environmental outcomes than is the case in the southern Basin. In the north, it is just as important – or more important - to consider the management of individual flow events.
59. The responsibility for river operating arrangements rests with State governments, and the MDBA sought commitments from NSW and Queensland governments to implement a range of such measures as part of the NBR.
60. These measures are referred to as the ‘toolkit’, which was the name devised by NBAC whose original concept of the toolkit was:

*It is vital for all governments and policy makers to acknowledge the necessity for a Toolkit of measures to achieve the Water Act’s objective “to promote the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes.” It is now broadly understood that the Basin Plan’s singular focus on increases to environmental flows (‘just add water’) is only one aspect of long term environmental sustainability that can by itself be, at best, partially successful and result in poor ‘value for money’ outcomes. An approach that includes the other factors that influence environmental outcomes is required...<sup>20</sup>*

61. The relationship between the toolkit and the subsequent amendment of the Plan is outlined in the [explanatory material](#) which accompanied the *Basin Plan Amendment Instrument (No. 1) 2018*.<sup>21</sup>
62. Toolkit measures are the responsibility of NSW and Queensland to implement, with funding assistance from the Australian Government. While the three governments have agreed in – principle to implement the toolkit, now that the relevant Basin Plan amendment has passed into law the intention is that commitment be reflected in a published intergovernmental agreement. Such an agreement is currently under negotiation.
63. Notwithstanding this, the work has already begun on a number of the toolkit measures:
  - a. Queensland has developed options to shepherd existing environmental water through Beardmore Dam;

- b. NSW passed legislation in June 2018 to amend the Barwon–Darling, Macquarie–Bogan and Gwydir Unregulated Water Sharing Plans to allow for active management of shared flows between the environment and other users;
  - c. the NSW Government publically released its ‘Better Management of Environmental Water: Interim solutions package’ in June 2018. This sets out a range of interim and proposed enduring solutions for the protection of environmental water; and
  - d. the NSW Government placed temporary water restrictions on extraction by consumptive users during the ‘Northern Connectivity Event’ that occurred between April to June 2018, enabling successful environmental water delivery across the northern Basin.
64. A Northern Basin Project Group involving Queensland, NSW, the MDBA, CEWO and DAWR has been established to progress implementation of toolkit measures, including the protection of environmental flows.

## Transparency and best available information

65. It is noted that in material that has been provided to the Commission several witnesses (including former MDBA staff members) have both named and made allegations about actions undertaken by current and former individual MDBA employees. Inferences have been made that these named staff have inappropriately influenced decisions made by the Authority.
66. Such inferences are rejected. Key decisions of the MDBA are taken by the six member Authority. The Authority members take advice from MDBA staff and external sources, and together with their own knowledge, weigh up and sift these advices. It is the Authority who, as a group, exercise collective judgement and make key decisions. This process can result in advice from particular members of staff not being taken or that perspective not being construed as determinative. This does not mean that the advice has been ignored or is not valued.
67. The six members of the Authority value highly the support provided to it by staff, who it regards as acting with a high level of professionalism, commitment and integrity.

## Transparency and consultation

68. The MDBA is a transparent and accountable organisation. This does not mean that others will always agree with every detail of its work. Nevertheless, the MDBA makes a substantial investment in understanding issues and concerns of stakeholders, and setting out the reasons for its decisions. For example:
- a. in preparing the Northern Basin Review we took part in more than 300 stakeholder meetings and briefings over a period of three years;
  - b. we have a growing investment in regional engagement with staff based in offices in Goondiwindi, Toowoomba, Albury-Wodonga, Adelaide and Canberra. A permanent network of eight Regional Engagement Officers has been established to provide better communication between the MDBA and communities. The 16 member [Basin Community Committee](#) also plays an important role in providing community perspectives on a wide range of water resource, environmental, cultural and socioeconomic matters; and <sup>22</sup>

- c. we consult with the Northern Basin Aboriginal Nations (NBAN) and the Murray Lower Darling Rivers Indigenous Nations (MLDRIN). They are the two peak Traditional Owner-based organisations in the Basin with a primary focus on water management. They are independent, self-determining organisations and together comprise delegates from 46 member Nations.
- d. we have provided the following reports or been subjected to scrutiny via the following reviews:
  - i. we provide an [annual report on Basin Plan implementation](#) in addition to our ordinary [annual report](#); <sup>23, 24</sup>
  - ii. since the Plan was enacted in 2012 there have been four parliamentary inquiries into the Plan or the management of the Basin (two are currently underway), and we have appeared at senate estimates 17 times;
  - iii. [National Water Commission assessment](#) (2014); <sup>25</sup>
  - iv. [the statutory review of the Water Act](#) (2015); <sup>26</sup>
  - v. Report by the Murray–Darling Basin Ministerial Council to the COAG on [Implementing the Basin Plan](#) (2017); <sup>27</sup>
  - vi. Basin-wide [review of Compliance](#) (2017); <sup>28</sup>
  - vii. [2017 Basin Plan Evaluation](#) (2017); and <sup>29</sup>
  - viii. [Productivity Commission inquiry](#) (2018) and the [MDBA’s submission](#). <sup>30, 31</sup>

## Best available information

- 69. Good science is critical to the Basin Plan. Attention is drawn to an [article](#) by the recently retired head of the Bureau of Meteorology, Dr Rob Vertessy, on this topic.<sup>32</sup>
- 70. The MDBA is required to ‘act on the basis of the best available scientific knowledge and socio-economic analysis’ (Water Act s 21(4)(b)). This requirement feeds through a number of aspects of the MDBA role under the Act and Basin Plan, and is one of the principles which underpins monitoring, evaluation and review of the Basin Plan.
- 71. The MDBA routinely seeks advice and critical review from the independent scientists appointed to its multi-disciplinary Advisory Committee on Social, Economic and Environmental Sciences ([ACSEES](#)).<sup>33</sup> This Committee was established to provide strategic advice on science and knowledge to underpin the implementation of an adaptive Basin Plan.

## Peer review

- 72. The MDBA exposes its work to peer review as a matter of standard practice. Reviews are carried out by external subject-matter experts, such as an expert panel, academic, or other technical experts within a government agency such as Geosciences Australia or CSIRO. The reviews are undertaken by an independent party and are published. As is common practice for government agencies, the MDBA in some cases pays the reviewers for their time.
- 73. Examples of such reviews are:
  - a. [The SDL adjustment assessment framework for supply measures](#).<sup>34</sup> The framework includes the use of an independently-developed (by the CSIRO), scientifically-robust scoring method for testing for environmental equivalence of measures relative to

benchmark conditions. The Independent Review Panel found the framework and test to be fit-for-purpose.

- b. [Independent review of SDL limits of change](#).<sup>35</sup> This review was conducted midway through the development of the package of SDL adjustment measures to provide assurance that the developing package, and MDBA's assessment, were appropriate.
- c. [Independent expert panel Murray–Darling Basin Plan SDL limits of change review](#).<sup>36</sup> Prior to the SDL adjustment determination, early MDBA modelling indicated the potential for a number of limits of change rules to be breached. The expert review panel undertook an independent ecological analysis and found no material or significant breaches in terms of their likely impact on ecological responses.
- d. [Independent review of social and economic modelling for the Northern Basin Review](#).<sup>37</sup> This review by the University of New England examined the adequacy of the socio-economic modelling of Basin Plan impacts in the northern Basin, and noted that '...MDBA's modelling and supporting information are together critical to making decisions over water withdrawals'.
- e. [Independent expert panel review of the hydrological modelling framework for the SDL adjustment mechanism and the Northern Basin Review](#).<sup>38</sup> This review '... has not identified any key weaknesses in the modelling frameworks or approaches that would prevent them from being used for the two projects in a manner which is consistent with the requirements of the Basin Plan. Accordingly the review endorses the use of the modelling frameworks to support each project.'

## Hydrological Indicator Site Method

- 74. The Guide to the proposed Basin Plan published in October 2010 proposed a high and low uncertainty range for reduced diversions to meet environmental water requirements. While this report referred to a range of information, the figures were largely based on a relatively simple 'end of system' flow analysis.
- 75. This work was superseded by the later work published by the MDBA which centred on a more robust analysis: the so-called Hydrological Indicator Site Method. The 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. The key report, [The proposed 'environmentally sustainable level of take' for surface water of the Murray–Darling Basin: Method and outcomes](#), outlines the use of the Hydrological Indicator Site Method and the derivation of the environmentally sustainable level of take.<sup>39</sup>

# Modelling

76. Hydrologic modelling is an important planning tool for water management. Combined with judgement and a range of other types of information, it provides a critical tool for examining different management settings and predicting the outcomes associated with them.
77. Sometimes it is suggested that the model outcomes and hydrological flow targets used to inform Authority judgments about key settings, such as the Environmentally Sustainable Level of Take, should be an explicit requirement of the Basin Plan. This is not the case. To have written such explicit requirements into the Basin Plan would have been to extinguish any ability for innovation and adaption short of a formal amendment to the Plan. Further, a comprehensive framework for environmental watering was established by the Basin Plan and this allows for ongoing improvements to environmental watering to occur.
78. The models used by the MDBA for the Basin Plan are the best available. They have been developed since the early 1970s by the MDBA (and its predecessors, the Murray–Darling Basin Commission and River Murray Commission) and state water agencies. The models are used routinely by Basin States to underpin key water allocation decisions, and there is an extensive community of professional modellers who are dedicated to model improvement and practice.
79. The Australian Government has contributed significant funds to lift the performance of models by underwriting the development of a new modelling platform known as Source. Within the Basin, the MDBA is leading the roll-out of this new platform within the River Murray System.
80. Modelling is best used in combination with other lines of evidence. This approach recognises that modelling, while an important tool, cannot capture all of the complexities associated with a wide-ranging policy reform such as the Basin Plan. The NBR adopted this ‘multiple lines of evidence’ approach.
81. The modelling conducted for the NBR explored the river flow changes expected to occur under different Basin Plan options. This work was then supplemented with other scientific research to examine the expected social, economic and environmental outcomes. It was further supplemented with local knowledge, cultural values, and expert input to ensure that the review captured people’s lived experience with the river.
82. The modelling program completed for the NBR was far larger and more comprehensive than that completed as part of Basin Plan development prior to 2012. More than 30 scenarios were completed, compared to the six scenarios completed prior to 2012, providing the Authority with a far greater information base to underlie their review of SDLs.
83. The modelling explored different SDL options at a detailed resolution, but it also explored the benefits of supplementary activities such as improved environmental water use and targeted water recovery. The modelling was therefore able to support the analysis of options on the benefits of toolkit measures to enhance the social, economic and environmental outcomes of the Basin Plan through improved water management practices, but with less water recovered for the environment.
84. The MDBA’s modelling for the NBR was subject to considerable community consultation and was peer reviewed. The independent peer reviewer, Drew Bewsher, [concluded](#) that the work was appropriate and contained no major weaknesses.<sup>40</sup>

# Climate change

85. As mentioned previously, the Basin Plan is an adaptive instrument – it can be revised in light of further information and analysis. Climate change is a good example of an issue impacting on



water availability about which knowledge is improving all the time. The MDBA released a [paper](#) in 2015 summarising how it took account of climate change in the Basin Plan, and the need to monitor and review the Plan in future in light of improved knowledge.<sup>41</sup>

## Return Flows

86. A return flow occurs when water extracted for irrigation is not used by crops and instead drains and returns to the river further downstream, or seeps into groundwater (and often, after some time, back to the river).
87. Some in the academic community argue that levels of water recovery are being overestimated as the impact of return flows has not been taken into account. The MDBA accepts that return flows are an issue to be managed and accounted for, but consider the impacts claimed by some to be greatly overstated.
88. The MDBA and state water management agencies have studied and considered the risk posed by reductions in irrigation return flows for nearly 20 years. As a result of this work there is a collective view among agencies that the risk is small.
89. The majority of surface water return flows are captured through existing accounting arrangements, including the Cap diversion register. In this case, reductions in surface return flows must correspond with a reduction in diversions.
90. In respect of groundwater, the impacts are less well understood and very challenging to measure. However, irrigators have been adopting more efficient irrigation practices (and subsequently reducing groundwater return flows) for more than 20 years to reduce water costs and mitigate water logging, soil salinity and the discharge of highly saline groundwater to the river. Balancing salinization, water logging, river water quality and river flows is an ongoing challenge and needs to be considered in any policy response to the impact of efficiency measures on return flows.
91. The MDBA acknowledges that some scientists have different views about return flows. We have therefore commissioned an independent study led by the University of Melbourne to assess whether changes in return flows may reduce the effectiveness of environmental water recovery efforts.
92. As part of this work, ACSEES recently hosted a workshop where experts in the field were invited to critique the methods and analysis being used by the independent reviewers and to test preliminary findings. There was consensus from the workshop that the approach and methodology used for the review was sound. With regards to the preliminary results, there was agreement that there is no prima facie case that the impacts of reduced return flows on stream flows has substantially undermined the Basin Plan. The findings of this work will be published in October 2018.

## Conclusion

93. The Basin Plan is a substantial national reform. It is important that it is completed as agreed.
94. The Plan is based on best information available, and provides substantial opportunities at different levels to adapt as the information base, management experience and technological change allow for finer judgements to be made. For example, there are significant opportunities to make better use of remote sensing and telemetry to improve compliance, and to improve the protection of environmental flows by adopting more innovative river operating rules.



95. There is a lot at stake. The livelihoods of many Basin communities, our precious landscape, and cultural heritage are at risk. Balancing the many diverse and competing interests – both upstream and downstream – will always be controversial, and will always be in the realm of judgement rather than scientific prescription.
96. The MDBA believes that the best approach is to make the best possible decisions today, within the agreed framework, and to adapt and improve in future. We also believe that a collaborative approach in the national interest, rather than confrontation, will continue to lead to better outcomes for all. That is the approach we have taken in developing and implementing the Basin Plan. While the Plan will never be perfect, and there are challenges ahead, there is no Plan B.

## Endnotes


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- <sup>15</sup> <https://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/sustainable-diversion-limit-adjustment-mechanism-0>
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- <sup>17</sup> <https://www.mdba.gov.au/sites/default/files/Analysis-of-Efficiency-Measures-Final-Report-v2.pdf>
- <sup>18</sup> <https://www.premier.vic.gov.au/wp-content/uploads/2018/08/180809-Backing-Irrigators-And-Communities-In-Northern-Victoria-1.pdf>
- <sup>19</sup> <https://www.premier.vic.gov.au/wp-content/uploads/2018/08/180809-Backing-Irrigators-And-Communities-In-Northern-Victoria-1.pdf>
- <sup>20</sup> <https://www.mdba.gov.au/publications/mdba-reports/NBAC-report> at page 16.
- <sup>21</sup> <https://www.legislation.gov.au/Details/F2018L00982/Explanatory%20Statement/Text>
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