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Commissioner for the River Murray in South Australia

Mr Richard Beasley SC

Annual Report
2022-23

An Initiative of
Government of
South Australia

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Letter to the Deputy Premier

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Commissioner for the River Murray in South Australia

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The Hon Dr Susan Close
Deputy Premier of South Australia
Minister for Climate, Environment and Water
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Dear Deputy Premier

Commissioner for the River Murray in South Australia - Annual Report 2022-23

I am pleased to provide you with my annual report for 2022-23, reporting on the health of the River Murray in South Australia, my key activities in the past year, and priorities for the 2023-24 year. While my report was originally due in November 2023, I asked you for an extension so that I could report on the progress of legislation that was then before Federal Parliament crucial to the river system and to the South Australian environment.

I am pleased to say that significant progress has been made this year towards securing enduring arrangements for full delivery of the Basin Plan. This culminated with the passing by Federal Parliament of the Water Amendment (Restoring our Rivers) Bill 2023 (Restoring our Rivers Bill), which made vital amendments to the *Water Act 2007* (Cth), and the Basin Plan. In terms of providing the additional 450GL of environmental water for the Southern Murray, much of which is for the benefit of South Australia's environmental assets such as the Lower Lakes and the Coorong, the passage of this Bill represents the most important environmental step forward for the river system in over ten years. The key components of the Bill are outlined in more detail in my report, but the most important from the perspective of the environment of the Southern Murray are:

1. Repeal of the 1500GL "cap" on the Commonwealth's ability to voluntarily purchase water from entitlement holders for the purposes of the Basin Plan; and
2. Enabling funds from the Water for the Environment Special Account to be used to make purchases of water for the recovery of 450GL of environmental water by 31 December 2027. This water is aimed at achieving positive environmental outcomes for key South Australian environmental assets. It has taken over ten years to recover about 25GL of the 450GL. The Commonwealth Government can now buy water towards the 450GL in voluntary transactions with entitlement holders.

I was very pleased that the South Australian Government supported the Restoring our Rivers Bill, and made submissions for its enactment subject to some sensible suggested amendments. The South Australian Government's advocacy for the Bill (in an amended form) was important to it passing. I was also greatly impressed by the evidence given in the Senate Inquiry by Ben Bruce (Acting Chief Executive, Department for Environment and Water) and Dan Jordan (Director, Water Security, Policy and Planning), who were the senior South Australian public servants with responsibility for it.

I was also pleased to be given the opportunity to give evidence at the Senate Inquiry that was Chaired by Senator Grogan, along with conservation groups and scientists who have long advocated for more water for the environment, and the fulfilment of the Basin Plan. Many Conservation Groups (including Conservation SA), the Wentworth Group of Concerned Scientists, Environment Victoria, the Australia Institute and others played an important role in advocating both for the Bill, and also for the environment of the Murray Darling.

I also congratulate those crossbench Senators that supported this reform, led by Senator Hanson-Young, who worked with Minister Plibersek to improve the Bill. The passing of the Restoring our Rivers Bill is an important legislative step by the Commonwealth Government taken towards honouring a commitment made by it when in opposition immediately before the last federal election. The recovery of the environmental water must now follow, and be completed by the end of 2027.

I have enjoyed the opportunity of acting as a conduit for the South Australian Government, connecting the complex worlds of law, science, and politics. I hope that my continued work on behalf of the South Australian Government will assist with the ongoing advocacy to advance South Australia's interests in the River Murray system, and will distil these complexities.

I would like to take this opportunity to express my gratitude to the individuals and organisations that have taken the time to engage with me this past year (all of whom I hope are mentioned in this report) about the Murray-Darling Basin, but offer particular thanks to the great assistance provided by officers of your Department for Environment and Water (in particular Mr Bruce, Mr Jordan, and Ms Emma Finnie), and to the MDBA and its Chief Executive Andrew McConville, who facilitated early meetings for me with his staff (and Board) prior to my focus shifting to the Restoring our Rivers Bill.

Yours sincerely

Richard Beasley SC
COMMISSIONER FOR THE RIVER MURRAY IN SOUTH AUSTRALIA

23 / 01 / 2024

Executive Summary

The River Murray is not just a flowing body of water. It encompasses numerous communities, ecosystems and industries of the Murray-Darling Basin. Its health has profound repercussions for our natural environment and our economy, with potential irreversible consequences if left un-checked.

My role as Commissioner for the River Murray is an opportunity for me to traverse difficult relationships, and dispel myths and misinformation concerning the *Water Act 2007* (the Act) and the Murray Darling Basin Plan 2012 (Basin Plan). I am pleased to have the opportunity to continue to act as a conduit for the South Australian Government, connecting the complex worlds of law, science, and politics.

This report aims to continue my efforts to offer clarity on the intricate journey of implementing the Basin Plan for the South Australian Government and, by extension, the people of South Australia.

The Department for Environment and Water (South Australia) (the Department) has provided me with a comprehensive analysis of the past year's developments concerning the river system. Encouragingly, certain stretches of the river display promising signs of recuperation, attributed to restoration projects and the recent influx of flood waters. Conversely, areas persistently face challenges from factors such as climate change, over-extraction, and habitat fragmentation. There are concerns regarding ongoing fluctuations in water quality, especially salinity and blue-green algae blooms in some regions.

Throughout the past year, I have been deeply engaged with key stakeholders in dialogues surrounding the full implementation of the Basin Plan. This extensive engagement encompasses public forums with experts, industry and community meetings, interactions with regulatory bodies, media, and politicians, as well as providing counsel to governmental agencies.

The nuanced interplay of bureaucracy and law remains central to this mission. This highlights the crucial importance of fighting for transparency and accountability between all jurisdictions and agencies, such as the Murray-Darling Basin Authority. Such transparency is pivotal in rebuilding the trust of communities which have had to deal with the real-world impacts of mismanagement and the resulting degradation of the River Murray for decades.

In June 2023, the Murray-Darling Basin Authority advised that the current legislative deadlines under the Act and Basin Plan would be impossible to achieve. In response, the Federal, New South Wales, South Australian, Queensland and Australian Capital Territory Governments agreed to extend timeframes for Basin Plan implementation. This was ultimately addressed with the passing of the *Water Amendment (Restoring our Rivers) Bill 2023* (Restoring our Rivers Bill) by the Commonwealth Parliament on 30 November 2023. This Bill made significant reforms to the Water Act and Basin Plan, and should enable a vital part of the Basin Plan to be achieved: the recovery of an additional 450 GL of environmental water aimed at achieving positive ecological responses in the southern Murray, and for South Australia's key environmental assets such as the Ramsar Convention listed Lower Lakes and the Coorong. Key components of the Restoring our Rivers Bill now reflected in the Act and Basin Plan include:

- Repeal of the 1500 GL "cap" on the Commonwealth's ability to voluntarily purchase water from entitlement holders for the purposes of the Basin Plan.
- Enabling funds from the Water for the Environment Special Account to be used to make purchases of water for the recovery of 450 GL of environmental water by 31 December 2027. The recovery of this water is aimed at achieving positive environmental outcomes for key South Australian environmental assets. This has been legislated for in the Act, but has been the subject of minimal recovery for over ten years. This environmental water can now be recovered by the Commonwealth buying water in voluntary transactions with water entitlement holders.
- Increased accountability and transparency about the recovery of the 450 GL.
- Improvements to how the Basin Plan addresses First Nations water needs.
- Giving the Commonwealth Government power to withdraw State Government infrastructure projects that are deemed unviable.

As a result of the passing of the Restoring our Rivers Bill, I am optimistic for the upcoming year. The Review of the Basin Plan in 2026, and the Basin Plan Evaluation 2025, promise to provide valuable opportunities for me to continue my work in advocating on the key issues concerning the Basin Plan.

As we transition into 2024 and beyond, I foresee that escalating water demands and mounting ecological strains exacerbated by climate change will intensify existing concerns, such as:

- The importance of recovering the final 450 GL of water for the environment, and if necessary (and I strongly believe it is), through the voluntary purchase of water entitlements, something that is now available to the Commonwealth Government following the passage of the Restoring our Rivers Bill. We simply cannot afford to continue down the pathway of investing (wasting) taxpayer funds into any unproductive (for the purposes of recovering environmental water) projects.
- Opposition to voluntary water purchase, and the misinformation regarding their economic impacts which only serve to hamper genuine efforts to reach a workable solution. This misinformation should be distinguished from any proven negative impacts of voluntary purchases of water. On this point, the relevant communities should not only be reassured that any negative economic impacts will be mitigated through appropriate systems of support by the Commonwealth Government, but this should also actually happen.
- The ongoing and unacceptable lack of progress on key projects notified under the Basin Plan's Sustainable Diversion Limit Adjustment Mechanism (SDLAM), and the need to implement measures to ensure accountability for such projects going forward. A view I have long held, in part because of Commissioner Walker's findings in his Murray Darling Basin Royal Commission Report, is that the SDL 605 GL adjustment Chapter of the Basin Plan, and its various "supply measure" projects, should be the subject of a rigorous, independent scientific review.
- Securing the integrity of the science behind the water recovery targets devised under the Basin Plan, including the proper incorporation of climate change projections into those targets.

Health of the River Murray in South Australia

This section of this report represents my understanding of the health of the River Murray in South Australia for 2022-23. It is based on the information provided to me by the Department and other experts during the year.

The ecological impacts of the flooding in 2022-23 are to some degree still being assessed. Flood events can bring environmental benefits from the additional water received in the main channel, floodplain, and Coorong, Lower Lakes and Murray Mouth. Further benefits and impacts will take more time to be well understood as monitoring programs continue.

As is obvious however, floods of the magnitude recently experienced (in South Australia, and elsewhere) have terrible impacts on people, their property, and businesses. Further, catastrophic floods are rarely entirely beneficial to the environment. The Basin Plan is designed to provide sufficient water and flows at times for beneficial over-bank events at the right time of year at the right places, as well as to provide much needed environmental flows when conditions are dry. Massive flood events are often devastating for people, and are not always or uniformly good for all ecosystems. They are certainly not alternatives for a science-based Basin Plan.

Department for Environment and Water Advice for 2022-23

During 2022, the Murray–Darling Basin experienced high rainfall due to the La Niña conditions across Australia. This rainfall, in conjunction with full or near full capacity storages in Basin catchments, led to high river flows and flooding in much of the system, including in South Australia, particularly the period between November 2022 and February 2023. This period has been a particularly notable juncture in the River Murray in South Australia's recent history, witnessing the most overwhelming inundation since 1956.

A flow rate of 186 gigalitres (GL) per day was recorded at the border of South Australia and Victoria on 22 December 2022. The recent high flows in South Australia enabled the river, floodplain and estuarine environments to be fully reconnected. This supported the flow of water, movement of fish and export of salt and nutrients from the system.

A range of monitoring and research activities were undertaken in 2022-23, including continued long-term monitoring programs that provide information on ecological responses at key managed floodplain sites (Chowilla, Pike and Katarapko), weir pool sites along the River Murray channel and the Lower Lakes and Coorong. These activities provide valuable input into how the environment responds to significant water flows, and supports future environmental planning and response activities.

Significant immediate environmental benefits from the floods have already been observed along the length of the River Murray in South Australia, including:

- improved condition of long-lived floodplain vegetation including river red gums and black box and flourishing flood dependent understorey vegetation, including a range of threatened species
- breeding and improved condition of Murray cod and golden perch
- increased organic matter production to boost the riverine food web
- improved water quality in the Lower Lakes and Coorong, including salinity conditions and reductions in nutrient levels in the Coorong South Lagoon
- scouring of the Murray Mouth, pausing the need to dredge
- increased abundance and distribution of fish species in the Coorong, along with wide-spread growth of aquatic plants and increased diversity of macroinvertebrates providing habitat and food for key species
- breeding of birds, frogs and other flood dependent species
- flushing of salt from floodplain soils.

While there were significant environmental benefits there were also some short-term negative ecological consequences of the flood, including:

- inundated floodplain habitat led to a massive breeding event of carp
- very high water levels in the Coorong significantly reduced mudflat feeding habitat for shorebirds, which were present in lower numbers
- high water levels also inundated Fairy Tern nesting sites in the Coorong (leading to a failed breeding event).

The recent flooding underscores the interconnected nature of the Murray-Darling Basin system, the importance of maintaining a flow regime with regular high flows, and the need for diligent flow management to ensure sustained ecological prosperity.

River Murray and its floodplain

The South Australian River Murray and its floodplain encompasses two Ramsar-listed Wetlands of International Importance (the Riverland Ramsar site and Banrock Station Wetland Complex), as well as two of The Living Murray Icon Sites – the River Murray Channel Icon Site and the Chowilla Floodplain Icon Site (also part of the Riverland Ramsar site).

The recent flooding reached parts of the floodplain that are beyond the current influence of management actions that can deliver environmental water.

Current health of the River Murray and its floodplain ecosystems

Thousands of hectares of floodplain vegetation were inundated for the first time in decades, with some areas not flooded for almost 70 years. The condition of key floodplain tree species such as River red gum, black box and cooba markedly improved in response to the flood event,[1,2,3] and germination of new tree seedlings occurred across the floodplain. Follow-up watering will be required to support the survival of these seedlings in order to sustain floodplain woodlands into the future, and to recover from the loss of trees incurred during the Millennium Drought. Some tree death was recorded post-flood, likely the result of prolonged inundation of stressed trees and potentially exacerbated by exposure to saline groundwater in the root zone.

Lignum, another keystone floodplain species and a highly productive component of the floodplain habitat, provides critical structural habitat for a range of birds, frogs and other fauna. Autumn surveys of lignum condition at the managed Chowilla, Pike and Katarapko floodplains yielded mixed results.[4,5,6] Some very localised poorer condition outcomes were driven by prolonged and deep inundation in lower-lying stands of lignum, though improvement in condition has been observed in those locations in the period since the monitoring surveys. In contrast, some higher elevation stands of lignum have been stressed by lack of watering for many years, and for those stands of lignum the water received from the flood has not been sufficient for their full recovery and they will require follow-up watering to reach good condition.

[1] Wallace, T.A. (2023) Chowilla Floodplain Icon Site Tree Condition survey data; May 2008 to May 2023. Report produced by Riverwater Life Pty Ltd for the Department of Environment, Water and Natural Resources, South Australian Government (Final version, released 24th October 2023)
[2] Wallace, T.A. (2023) Pike floodplain tree condition survey data March 2009-May 2023. Report produced by Riverwater Life Pty Ltd for the Department for Water and Environment, South Australian Government (Final report released 28th July 2023)
[3] Wallace, T.A. (2023) Eckerts-Katarapko floodplain Tree condition survey data April 2015-May 2023. Report produced by Riverwater Life Pty Ltd for the Department for Water and Environment, South Australian Government (Final report released 28th July 2023)
[4] Walsh, R (2023, draft). Eckerts-Katarapko floodplain lignum condition: 2023 survey results and reporting against ecological targets. Government of South Australia, Department for Environment and Water, Adelaide.
[5] Walters, S (2023, draft). Pike floodplain lignum condition: 2023 survey results and reporting against ecological targets. Government of South Australia, Department for Environment and Water, Adelaide.
[6] Hodder GV (2023). Chowilla Floodplain Icon Site Lignum (Duma florulenta) Condition Monitoring, DEW Technical report 2022/23, Water Infrastructure and Operations, Government of South Australia, Department for Environment and Water, Berri.

Resilient floodplains undergo major changes in understorey vegetation species composition in response to flooding and drying: their capacity to respond with diverse and dense cover in both dry and wet phases is a measure of floodplain condition. The shedding floodplain (i.e. ephemeral habitats defined by their lack of ability to retain water after inundation) was completely transformed by the 2022-23 flood with widespread regeneration of flood-responding grasses, herbs and shrubs and substantial increases in native plant species diversity at the Pike and Katarapko and Chowilla floodplains.[7]

Multiple instances of regeneration of spiny lignum were recorded, a rare lignum of conservation significance that is generally distributed at higher elevation on the floodplain.

Unfortunately, the flood equally benefitted pest plants that are adapted to the same watering regime as native floodplain plant species, requiring a substantial effort in weed management.[8]

Due to abundant insect life and plant growth, the diversity of woodland bird species using the floodplain habitat at Pike and Katarapko increased in 2022-23 compared with the previous year.[9] The flood event vastly altered the available habitat for wetland birds providing increased available feeding habitats. As water receded, a mosaic of shallow and deep-water habitats that are key to supporting a diverse assemblage of wetland bird species became available.

Fifty-four different wetland bird species were recorded utilising the floodplain, including: an array of wetland bird guilds including migratory waders (such as red-necked stint, sharp-tailed sandpipers, and curlew sandpipers), small sedentary waders (such as black-fronted dotterel and red-capped plover), large sedentary waders (such as Australian white ibis and masked lapwing), seasonally dispersive or nomadic waders (such as yellow-billed spoonbill and white-headed stilt), local residential duck (such as musk duck and Australian shelduck), nomadic and locally migratory duck (such as pink-eared duck and chestnut teal), and dispersive, cryptic species (such as spotted crake).[10]

Extensive waterbird breeding activity occurred during and after the flood. Many waterbird species that are adapted to breed opportunistically and serially in response to flood were able to take advantage of the resources and habitat available, with rookeries of waterbird species, such as cormorants, ibis, spoonbills and darters. Widespread connected flow of extended duration is required to trigger breeding and to ensure success of large waterbird breeding events (that is, survival of chicks to adult populations). Such high flow events are critical to waterbird population resilience with long-term trends showing major declines in their abundance.[11]

Fish surveys following the flood event (in autumn 2023) showed that Murray cod numbers were generally stable and were detected in increased numbers in some anabranches. Some recruitment of both Murray cod and golden perch occurred and young fish from previous good years continued to grow and be recruited into the adult population in 2023.[12,13,14] Silver perch and freshwater catfish were found in lower abundances following the 2022-23 flood.

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[7] Nicol, J.M., Frahn, K.A., Fredberg, J., Gehrig, S.L., Marsland, K.B. and Weedon, J.T. (in prep). Chowilla Icon Site – Floodplain Vegetation Monitoring 2023 Interim Report. South Australian Research and Development Institute (Aquatic and Livestock Sciences), Adelaide.

[8] Annual Highlights of the Murraylands and Riverland Landscape Board 2022-2023. https://cdn.environment.sa.gov.au/landscape/docs/mr/2022-23-highlights-summary-FIN.pdf

[9] Kieskamp, H. (2023) Pike and Katarapko Floodplain Bird Monitoring 2022-2023 Final Report. Unpublished report prepared for Department for Environment and Water.

[10] Hodder GV and Vial LD (2023, draft). Chowilla Floodplain Icon Site Intervention Monitoring at Inundated Wetlands, DEW technical report 2022/23, Water Infrastructure and Operations, Government of South Australia, Department for Environment and Water, Berri.

[11] Bino G; Brandis K; Kingsford RT; Porter J, 2021, 'Shifting Goalposts: Setting Restoration Targets for Waterbirds in the Murray-Darling Basin Under Climate Change', Frontiers in Environmental Science, 9, http://dx.doi.org/10.3389/fenvs.2021.785903

[12] Fredberg, J. and Bice, C.M. (2023). Katarapko Fish Assemblage Condition Monitoring 2023. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2021/000517-2. SARDI Research Report Series No. 1150. 45pp.

[13] Fredberg, J. and Bice, C.M. (2023). Pike Fish Assemblage Condition Monitoring 2023. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2021/000433-2. SARDI Research Report Series No. 1151. 46pp.

[14] Fredberg, J.*, Bice, C.M.* and Zampatti, B. P. # (2023). Chowilla Icon Site Fish Assemblage Condition Monitoring 2023. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2021/000000-1. SARDI Research Report Series DRAFT *SARDI Aquatic Sciences, South Australia Department for Primary Industries and Regions #CSIRO Land and Water.

The full nature of fish assemblage response to the flood may be underestimated and may become apparent after sampling next autumn. Non-native common carp made up a large portion of the catch in fish monitoring undertaken in floodplain anabranches and the main River Murray channel. Other non-natives such as goldfish, redfin perch and eastern gambusia also increased in abundance.

The flood may have served as a redistribution event for some declining fauna species of conservation significance, with the possibility that they may re-establish more spatially extensive populations. Vulnerable (*EPBC Act 1999*) southern bell frogs, for example, were recorded from locations where they have been undetected for several years.[15]

The effect of the flood on floodplain and wetland health has been overwhelmingly positive and the event has provided an effective reset for many parts of the River Murray floodplain. However, many of the benefits will be short-lived without follow up watering and regular inundation. Ongoing monitoring and active management will also be required to sustain the benefits.

Coorong, Lower Lakes and Murray Mouth

The Coorong, Lower Lakes and Murray Mouth is arguably Australia's most important wetland area due to its high abundance and diversity of wetland fauna, particularly waterbirds. Its importance is also recognised for the purpose of national biodiversity protection legislation, and international migratory bird agreements.[16]

The Coorong estuary act as a sentinel for the Murray-Darling Basin. Its location at the terminus of the Murray-Darling River systems, which drains more than 1 million square kilometres across 22 major catchments, means that any change to climate, water extraction or land use in the upstream states will have repercussions for the Coorong. It therefore acts as an indicator of the health of the Murray-Darling Basin and the effectiveness of the Murray-Darling Basin Plan in protecting this ecosystem.[17]

The recent flood supported increased freshwater flows to the Coorong, Lower Lakes and Murray Mouth enabling critical connectivity, flushing of salt and nutrients, in turn reducing salinities and supporting many positive ecological responses in the Coorong, Lower Lakes and Murray Mouth during 2022-23.

Current health of the Coorong, Lower Lakes and Murray Mouth

In 2022-23, approximately 16,600 GL flowed through the barrages to the Coorong and the ocean via the Murray Mouth. The floodwaters peaked at around 120 GL per day (120,000 ML/d) at the barrages in February 2023. The high flows supported the widening, deepening and scouring (i.e. removal of sand) of the Murray Mouth, with bathymetric surveys detecting a maximum depth of 11.5 metres (m) compared to a pre-flood depth of 2-4 m. There has been no dredging at the Murray Mouth since November 2022. The decision on when to resume dredging will be informed by continued bathymetric surveys and monitoring tidal movement inside and outside of the Mouth. Indications are that dredging may resume shortly (and might have done so by the time of publication of this report).

Water levels in the Lower Lakes increased by only 0.3 m above normal full supply level in mid-summer as the flood peaked. Conditions in the Lower Lakes remain fresh, with the floodwaters having facilitated greater water movement between Lakes Alexandrina and Albert. Lake Albert salinities lowered to below 1000 EC, the lowest average reading since salinity records began in 1968.

[15] DEW, 2023, Collated spring 2022 frog call data, Katarapko floodplain. Unpublished spreadsheet, E-Water Toolset.

[16] The Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals), Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA), Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA), and also for species listed under Australia's *Environment Protection and Biodiversity Conservation Act 1999*.

[17] Brookes, J.D., Busch, B., Cassey, P., Chilton, D., Dittmann, S., Dornan, T., Giatas, G., Gillanders, B.M., Hipsey, M. and Huang, P. 2023. How well is the basin plan meeting its objectives? From the perspective of the Coorong, a sentinel of change in the Murray-Darling Basin. Australasian Journal of Water Resources, 1-18.

The flushing and dilution effects of the flood also resulted in significant reductions in salinity in the Coorong and export of excess nutrients from the system. The North Lagoon sustained unusually fresh conditions throughout summer, averaging 5-10 ppt from December 2022 to February 2023. Salinities in the Coorong South Lagoon halved from winter 2022 – autumn 2023 compared to typical summer/values, and problematic nutrient levels (total nitrogen and total phosphorus), and microalgal densities reduced in the South Lagoon. Both the North and South Coorong lagoons were still classed as eutrophic (i.e. contain excessive nutrients), reflecting the need for ongoing flushing and export of nutrients from the Coorong, which high flows can help provide. Filamentous green algae remained abundant in parts of the Coorong, but did not form extensive surface mats during the flood.[18]

Numerous ecological benefits of the flood are still evident across the site, and particularly in the southern Coorong. Recent widespread growth of diverse aquatic vegetation such as *Ruppia tuberosa*, *R. megacarpa, Althenia cylindricarpa* and the stonewort *Lamprothamnium* sp. was observed in July 2023,[19] providing habitat and food for invertebrates, fish and waterbirds throughout the Coorong.

A substantial increase in the southward's distribution and abundance of native fish including congolli, black bream, greenback flounder and yelloweye mullet has been recorded in responses to lowered salinity conditions and higher food resources throughout the Coorong. Fish species numbers doubled in the South Lagoon following the reduction of salinity to <60 ppt. The increase in fish biomass benefited many piscivorous (fish-eating) birds and fishes. Local commercial fishermen have also reported increased catch of species such as flounder and mullet, and evidence of fast-growing fish driven by the extra productivity. Both fish and waterbird populations benefitted from abundant invertebrate food resources such as worms, bivalves and tiny crustaceans, which also moved further southwards in the Coorong in response to decreasing salinity.[20]

While conditions are shaping up to be excellent for wading birds in the Coorong this coming summer, the high water level conditions in the Coorong in summer 2022-23 were not favourable for many waterbirds, including migratory waders. These high water levels flooded Coorong mudflats, limiting the amount of feeding habitat for migratory waders. In fact, 70,000 less waterbirds were recorded across the entire Lower Lakes and Coorong in January compared to the previous year.[21] High Coorong water levels also inundated the nesting sites of the fairy tern (a nationally vulnerable listed species), leading to a failed breeding event.[22]

Anticipated longer-term environmental benefits from the 2022-23 River Murray flood event

The recent River Murray flood event increased flow connectivity and have provided a much-needed short term boost to the River Murray, its floodplain and Coorong, Lower Lakes and Murray Mouth in South Australia. These improvements must be sustained into the future through sufficient environmental flows, including the delivery of the Murray-Darling Basin Plan and further investigation of management options to improve the site's resilience to future environmental and climatic conditions.

While certain immediate benefits have been noted, the longer-term effects of this historic flooding will not be known for several years and are dependent on improved hydrological conditions and unconstrained environmental water delivery in the future.

Despite the progress made, a sobering truth is that considerable parts of the system still languish in deterioration. This is largely attributable to an entrenched legacy of suboptimal stewardship that has haunted the Murray-Darling Basin.

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[18] Waycott, M., Urgl, C., O'Loughlin, E., van Dijk, K., Nicol, J., Imgraben, S. and Mosley, L. 2023 Coorong nutrients, aquatic plants and algae investigations 2022-2023. Results of monthly and widespread survey field work (May 2023). University of Adelaide, Adelaide, South Australia

[19] Paton, D.C. and Paton, F.L. 2023a Annual winter monitoring of Ruppia tuberosa in the Coorong region of South Australia, July 2023, Adelaide, South Australia.

[20] Dittmann, S., Kent, J., Ahmed, D. and Newbery, A. 2023 Benthic macroinvertebrate survey 2022-2023 report. Coorong, Lower Lakes and Murray Mouth Icon Site. , Flinders University, Adelaide, South Australia (in prep).

[21] Paton, D.C., Paton, F.L., Whittaker, D.A. and Markos, D.G. 2023 Condition monitoring of the Lower Lakes, Murray Mouth and Coorong Icon Site: Waterbirds in the Coorong and Lower Lakes 2023, University of Adelaide, Adelaide, South Australia.

[22] Paton, F.L. and Paton, D.C. 2023b Waterbirds breeding in the Coorong and Lower Lakes during summer 2022-23, Adelaide, South Australia.

Other prescribed water areas

All of the other prescribed areas in the South Australian River Murray have showed variable condition over the last decade with some areas responding well hydrologically to the recent wetter years, however, despite the recent wetter years, water dependent ecosystems are generally declining across the region.[23]

The Eastern Mount Lofty Ranges (ELMR) prescribed area showed good recovery from the 2018 – 2019 dry period with both surface water and ground water being classed as mostly average.[24] Groundwater showed a stronger recovery with 80% of monitoring wells showing average or higher levels. Surface water was average for three of the four monitoring locations assessed, and below average one. The condition of water dependent ecosystems across the EMLR is variable with most locations showing either stable or declining conditions since the end of the Millennium Drought. In particular, the overall fish community condition declined to its lowest level since 2014 in 2023 (rated poor condition).[25] Very few sites have showed any recovery in macroinvertebrate community condition from the drought.[26] The Flows for the Future Program currently underway is installing to help improve the flows for ecological outcomes, however, the current water use is significantly above sustainable limits given the incomplete implementation of the Flows for the Future Program.

The Marne Saunders Prescribed area showed declines in both surface water and ground water levels. 56% of the monitoring wells showed the lowest levels on record and 92% of the monitoring wells showed a declining trend. The surface water flow is the lowest on record with an extended cease to flow period from late 2017 through to 2021. The water dependent ecosystems in the Marne Saunders prescribed water area declined with several native fish species either locally extinct or at extreme risk of local extinction. Overall fish condition in the Marne and Saunders catchments was rated as poor in 2023. The Flows for the Future program is also operating in the Marne Saunders, however, as with the EMLR, surface water use is significantly beyond sustainable limits based on the incomplete implementation of the program.[27]

The Mallee and Peake, Roby, Sherlock prescribed wells areas have shown general declines in water level with over half the wells showing below average or lowest on record levels and 72% of wells showing a declining trend between 2016 and 2020.[28] Despite the declining levels, water use is within the limits permitted under the Water Allocation Plans for these areas. There are no groundwater dependent ecosystems in these areas.

[23] Whiterod, N., Lutz, M. and Zukowski, S. (2023). Assessment of the status of fish communities across the Eastern Mount Lofty Ranges, 2014 to 2023. A report for the South Australian Department for Environment and Water. Nature Glenelg Trust, Victor Harbor.
[24] DEW (in prep). Hills and Fleurieu Landscape Region PWRA ecological condition assessment 2022, DEW Technical report 2023/65, Government of South Australia, Department for Environment and Water, Adelaide. Whiterod, N., Lutz, M. and Zukowski, S. (2023). Assessment of the status of fish communities across the Eastern Mount Lofty Ranges, 2014 to 2023. A report for the South Australian Department for Environment and Water. Nature Glenelg Trust, Victor Harbor.
[25] Whiterod, N., Lutz, M. and Zukowski, S. (2023). Assessment of the status of fish communities across the Eastern Mount Lofty Ranges, 2014 to 2023. A report for the South Australian Department for Environment and Water. Nature Glenelg Trust, Victor Harbor.
[26] DEW (in prep). Hills and Fleurieu Landscape Region PWRA ecological condition assessment 2022, DEW Technical report 2023/65, Government of South Australia, Department for Environment and Water, Adelaide.
[27] DEW (in prep). Hills and Fleurieu Landscape Region PWRA ecological condition assessment 2022, DEW Technical report 2023/65, Government of South Australia, Department for Environment and Water, Adelaide; Whiterod, N., Lutz, M. and Zukowski, S. (2023). Assessment of the status of fish communities across the Eastern Mount Lofty Ranges, 2014 to 2023. A report for the South Australian Department for Environment and Water. Nature Glenelg Trust, Victor Harbor.
[28] Department for Environment and Water, Mallee and Peake-Roby-Sherlock Prescribed Wells Areas 2019-20 water resources assessment Technical Note, December 2021.

The River Murray in a changing climate

The 2022-23 period found itself under the distinct thumbprint of La Nina, ushering in rainfalls generously above what we would call the norm for most of South Australia. Consequently, our Murray-Darling Basin experienced perhaps its most saturated spring to date, with the River Murray shouldering the brunt of consequential flooding. However, by September 2023, the pendulum swung the other way with the onset of El Nino, hinting at potential drier times ahead for the Basin, at least in the longer term, if not summer 23-24.[29]

Looking into the Bureau of Meteorology's proverbial crystal ball for the Murray-Darling Basin, predictions largely gravitate towards an escalation in temperatures, reduced rainfall, and more frequent extreme weather events.[30] Such hotter and drier conditions will likely amplify evapotranspiration,[31] inevitably decreasing the volume of catchment run-off throughout the Basin. Rising sea levels present an added challenge, with the potential to alter the hydrodynamics at the Coorong and Murray Mouth, further inviting seawater into our Lower Lakes. As previously explained, increasing salinity levels can wield considerable effects on water health.

Moreover, other societal dynamics, like burgeoning populations and the expansion of both agricultural and industrial endeavours, are expected to heighten the strain on South Australia's water resources.[32]

For the enduring prosperity of the River Murray in South Australia, and more specifically, for the fragile Southern Coorong, a delicate balance of conditions is needed. This encompasses restricting periods of diminished connectivity and hyper-salinity, whilst ensuring nutrient levels remain conducive for diverse invertebrates and facilitate a healthy nutrient cycle. Getting to that stage necessitates fortifying inflows and connectivity to effectively purge excessive salt and nutrients, bolstering the habitats for our precious waterbirds and fish. Such efforts are vital for supporting our native fish populations and putting a leash on invasive occupants like the Carp.

While the recent floods did provide a semblance of relief to the river, it is imperative to remember that genuine restoration isn't a mere short-term endeavour. It's a marathon, not a sprint. Without real intervention, our ecosystem faces a labyrinth of challenges, which include:

- diminished resilience to environmental extremes
- eroding the very traits that have earned its international acclaim
- ongoing struggles with low connectivity and flows, further exacerbated by the unyielding spectre of climate change
- restricted connectivity and movement of aquatic species
- a relentless build-up of nutrients and salt, disrupting aquatic life and courting potential collapse in the food chain
- increasing potential for algal blooms, interfering with primary production, food source provision, and leading to detrimental nutrient cycling
- the concerning continued eutrophication (high nutrient state) and pre-eminence of monosulfidic black oozes in the Southern Coorong due to a lack of flushing and connectivity to export excess nutrients and algae.

[29] South Australia, Annual Water Security Update 2023; Bureau of Meteorology, Climate Driver Update History, 20 June 2023.
[30] Murray-Darling Basin Authority, *Basin in Brief – June 2023*, 15 June 2023; Bureau of Meteorology, *Climate outlook for July to October*, 29 June 2023; Murray-Darling Basin Authority, *Climate change*, 29 June 2023.
[31] Evapotranspiration is the combined processes which move water from the Earth's surface into the atmosphere. It covers both water evaporation and transpiration.
[32] See South Australia's Annual Water Security Update 2023 for a snapshot of the current trends for our region's prescribed water resources. See in particular Tables 3 and 4.

Achievements and key activities from 2022-23

Being Commissioner

As this is my inaugural annual report, I have reflected on what it means to be the Commissioner for the River Murray in South Australia.

There are those who believe (or inaccurately assert) that I have been granted the responsibility for managing the River Murray in South Australia in its entirety. The truth (much to my relief, and no doubt others) is much less dramatic.[33] Even if merely a political barb, the suggestion misrepresents the actual essence of my role and undermines the work of those who deliver physical water and environmental management, including all those personnel, volunteers and agencies that were a part of the flood response efforts.

According to my Services Agreement with the South Australian Government, my role is to:

1. Stand up for the health of the River Murray, including the Lower Lakes, Murray Mouth and the Coorong. This may include engaging with the media, key stakeholders, jurisdictional ministers and the Murray-Darling Basin Authority Board
2. Help in the endeavour to secure the delivery of the final 450 GL of water recovery required to deliver 94 per cent of environmental flow indicators required to achieve an Environmentally Sustainable Level of Take as proposed by the Act and the Basin Plan
3. Assist the South Australian Government to further improve the transparency of information provided about the management of the River Murray and the communication of River Murray-related outcomes, directions and issues
4. Prepare an annual report and
5. Any other functions as agreed

In my view, my primary responsibility is to provide informed, independent recommendations (whether that be to the South Australian Government, or to any other relevant River Murray stakeholder) based on my expertise, experience, and the evidence presented to me. That expertise has been acquired through my role as Senior Counsel Assisting the Murray Darling Basin Royal Commission in 2018-19, and in the years since being guided by various other experts including scientists from many different disciplines.

I have attempted to fulfil each of functions 1, 3, 4 and 5 to the best of my ability. Function 2 has now to a significant part (at least as to enabling legislation) been achieved through the passing of the Restoring our Rivers Bill. I hope my advocacy helped, but do not take any credit for this matter. Instead, credit belongs to:

- The large number of scientists from many disciplines, economists, and environmental groups who have long advocated for this sort of reform.
- The Commonwealth Government for putting the Bill up, and the Federal Parliament for passing it.
- The South Australian government for playing its role in supporting the Bill, subject to sound suggested amendments.
- The Australian Greens and the crossbenchers who supported the Bill subject to amendment.
- The First Nations people who have advocated for additional environmental water.
- All the many members of the community and community groups who have supported such reform.

(If I have left anyone or any group of significance out, I apologise. It is unintentional).

One of the great benefits of this role is the transparency it entails. Every recommendation I offer is documented in the public domain, keeping me, and the recipients of my advice, accountable. My role affords me the ability to engage with people across the Basin unencumbered by being a politician or a public servant. This broad exposure continually enhances my understanding, allowing me to hear and appreciate the myriad of available perspectives. This is particularly important when it comes to advocating for the future of the River Murray, given the long-standing history of political interference and lack of independent voice.

[33] Parliament of South Australia, Hansard of Grievance Debate, 9 February 2023.

Key activities

In November 2022, I delivered to the Deputy Premier my interim report which details my activities and findings from my appointment in August 2022 to November 2022. I will not repeat the contents in that letter, it is at Annexure A. It contains a list of the meetings and other activities I was engaged in as Commissioner up until November 2022. Since then, I have been actively involved in approximately 40 meetings or events related to my role. These including meetings with the Department, various scientists and scientific and conservation groups, members of the public, and with decision makers and legislators. While I hesitate to single any meeting or public event out as more important than any other, the submission I made to the Senate Inquiry into the Restoring our Rivers Bill, the evidence I gave at the Senate Inquiry, and the meetings I had with advisors and legislators concerning it, were of particular importance.

Importance of recovering the 450 GL

In May 2023, I presented the Minister with another report, highlighting what I consider to be both compelling and frankly irrefutable arguments in favour of the Basin Plan's final 450 GL of water for the environment, especially in the southern Basin. Much of this piece was based on the findings of Commissioner Walker in his Royal Commission Report, and on various pieces of scientific literature published before and after that Report. This report, located at Annexure B, underscores the significance of recovering the 450 GL in order to ensure an Environmentally Sustainable Level of Take (ESLT), and our obligations under international law. I also took the liberty of debunking some common misconceptions regarding this water recovery target. These issues collated by me in this report (which reflect Commissioner Walker's Royal Commission findings which are themselves based on a synthesis of his legal analysis and consideration of the science which informed the Basin Plan) are why I was so pleased that the Restoring our Rivers Bill was passed by the Commonwealth Parliament in November last year.

Life or Death of the Murray-Darling

In June and July 2023,[34] the Conservation Council and Murray Darling Conservation Alliance brought together panellists to discuss the future of the Murray-Darling Basin in a trio of forums in Adelaide, Sydney and Melbourne: *Life or Death of the Murray-Darling*. There, I was joined by fellow panellists:

- In Adelaide: Kate McBride (a farmer, Parliamentary Liaison Officer and prominent advocate for the protection of the Murray-Darling); Grant Rigney (a Ngarrindjeri man and prominent figure in Aboriginal governance); and Professor Jeff Connor (Professor in Water Economics at the University of South Australia).
- In Sydney: Kate McBride; Brendan Kennedy (a Tati Tati and Wadi Wadi Traditional Owner, Deputy Chair of Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and Chair of the Victorian Aboriginal Water Officer Network, among other accolades); and Dr Celine Steinfeld (a geographer specialising in natural resource management policy and the Director of the Wentworth Group of Concerned Scientists, overseeing the 5-year strategy for water reform and landscape conservation in a changing climate)
- In Melbourne: Kate McBride; Brendan Kennedy and Michael Vanderzee (a water policy analyst for the Wentworth Group of Concerned Scientists. Michael has had an extensive career as a senior government policy adviser which, including 15 years' experience in national and state water policy reform)

[34] Adelaide (30 June 2023), Sydney (2 July 2023), and Melbourne (7 July 2023).

The highlights of our conversations included:

- There is a dire need for scientific rigour to form the basis of the Basin Plan's water recovery targets, as opposed to the current situation where numbers based on science have been watered-down due to political compromise. Tying into this, the need for an independent review of the 605 GL to ensure in the future, these numbers are based on verifiable science.
- Propaganda sprouting misinformation about buybacks is rampant throughout the Basin.
- Ongoing concerns for historic (and current) overallocation of water away from the environment, and how this ties in with the various industries that support communities along the Basin, whether they suffer detriment from buybacks, and thinking about the future. The increase in almond production is one such industry of concern. Planted almonds increased from 3,500 hectares in the year 2000 to around 45,000 hectares in 2018, resulting in an overall increase in demand for water in the southern Basin.[35]
- That buybacks, if they are implemented to recover the remaining 450 GL of water, need to be pursued in a strategic manner, accompanied by a government-powered structural adjustment program to support communities.
- Efficiency projects are not necessarily without merit. It could very well be that the way forward involves a strategic combination of efficiency projects with voluntary water purchases. However, any efficiency projects must be realistic. We cannot risk continued investment in projects that either do not have tangible benefits, or are not realistically going to be completed within the given timeframes.
- The question of why Australians who own water entitlements are allowed to sell those entitlements everywhere in the market, *except* for back to the Commonwealth government for the purpose of directing towards environmental water.
- How we define successful water management in the Murray-Darling Basin, which ultimately boils down to compromise.
- A timely reminder of the importance of safeguarding the health of ecosystems into the future. Communities and economies rely on the sustainable existence of a healthy Murray-Darling Basin. The scary thing is that once those ecological processes fall apart, they can't be recovered.

Water Amendment (Restoring our Rivers) Bill 2023

On 22 August 2023 the Australian Government and governments of New South Wales, South Australia, Queensland and the Australian Capital Territory announced an agreement to amend the Act and the Basin Plan.[36] In line with the agreement, on 6 September 2023 the Australian Government introduced the Water Amendment (Restoring Our Rivers) Bill 2023 into the Australian Parliament.[37]

I made a submission to the Senate Environment and Communications Legislation Committee on the Bill in September 2023 (located at Annexure D), and appeared to give evidence on 31 October 2023. The Committee's inquiry report was published on 9 November 2023, recommending (by majority) that the Bill be passed with some amendments.[38] As indicated above, the Bill was passed on 30 November 2023, and commenced operation on 7 December 2023. It represents a major step forward for the legality of the Basin Plan, as well as for the environment of the Southern Murray, including all of South Australia's key environmental assets.

[35] Murray-Darling Basin Authority, Irrigation trends – choosing what to grow | Murray–Darling Basin Authority, accessed on 30 June 2023.
[36] Agreement of Murray-Darling Basin Ministers to Deliver the Basin Plan in Full, accessed on 20 December 2023.
[37] Parliament of Australia, *Water Amendment (Restoring Our Rivers) Bill 2023*, accessed on 20 December 2023.
[38] Parliament of Australia, Inquiry into the Water Amendment (Restoring our Rivers) Bill 2023, accessed on 13 November 2023.

Response to the Murray-Darling Basin Royal Commission Report: September 2023

In mid-September 2023 the South Australian Government published its Response to the Murray-Darling Basin Royal Commission Report.[39] This response clearly states the South Australian Government's requirements to deliver the Basin Plan in full, including how it will implement all of the Royal Commission's recommendations. I was pleased to contribute to this publication, which was long overdue. Until this response from the Malinauskas government, there had been no meaningful or remotely adequate response by South Australia to the Commissioner's Report, despite it being roundly welcomed by environmental groups and the relevant scientific community, and being frequently cited in academic papers. While people have expressed disagreement with the Commissioner's findings, no dissenting opinion has been published that I am aware of that offers any rational challenge to the legal opinions expressed by the Commissioner, nor his other opinions that were based on the vast amount of scientific and economic evidence he considered.

Productivity Commission's Murray-Darling Basin Plan: Implementation Review 2023

In July 2023, I provided the Productivity Commission with a submission (located at Annexure C) in response to its key questions as part of its second 5-yearly inquiry into the effectiveness of the implementation of the Basin Plan and Water Resource Plans.[40] The Productivity Commission released its Interim Report on 30 October 2023. I note that the Commission's findings and recommendations concerning "bridging the [environmental water] gap" for the Basin Plan are consistent with relevant provisions of the Restoring our Rivers Bill and the amendments it made to the Act and Basin Plan.

[39] South Australia, *Response to the Murray-Darling Basin Royal Commission Report*, September 2023.

[40] Further information can be found on the Productivity Commission's website: *Murray-Darling Basin Plan: Implementation review 2023*

Meetings and Engagement

In carrying out my functions as Commissioner for the River Murray in South Australia in the 2022-23 financial year (and up to the time of the publication of this annual report), I have engaged with the following stakeholders listed below (usually on multiple occasions) to discuss key issues in relation to securing the full delivery of the Murray-Darling Basin Plan.

As may be noticed from the list of Members of Parliament below, there is no reference to any member of the South Australian Parliament who is a member of the South Australian branch of the Liberal Party. While I think this is unfortunate, it's fair to say that those members of the South Australian opposition who have discussed my role, are possibly not in favour of it, and certainly not in favour of my appointment. They are absolutely entitled to any view as to whether there should be a Commissioner for the River Murray, and they are of course entitled to the view that I am in any event not the right person for it.

However, some members of Parliament have said some inaccurate nonsense about the extent of my functions. The extent of my functions is set out expressly in my Services Agreement, and are set out earlier in this report. Further, in large part those Liberal members who have discussed my role have seen fit to hurl insults, almost all behind the cover of Parliamentary Privilege. I have been called variously "inarticulate", "foul mouthed", "disgraceful", and a "Labor mate" (whatever that means).

My memory now fails me as to whether any of these insults (assuming "Labor mate" was intended as an insult) appeared in some of my school reports. They might have. Whether they make a useful addition to the debate concerning the Basin Plan, and the opportunities it provides for the South Australian environment, is another matter others can judge. Only for the record, I am not a member of a political party. I have never worked for a political party, or for a member of parliament. I have very close friends who probably could be described as "Labor mates", and equally close friends who are undoubtedly "Liberal mates", and "Green mates". I have other close friends who are disillusioned by politics. It's fair to say I probably don't have a friendship with anyone who could be described as a "One Nation mate", but maybe my life would be richer if I did? The 'Labor mate' accusation is however no more than a repeat of a feeble response to Mr Walker SC's Murray Darling Basin Royal Commission Report by one member of the South Australian parliament, who suggested (without evidence) that the Commission team was analogous (or actually) some kind of ALP sub-branch. If it was, it was the most well-informed sub-branch about Federal water policy and the environment in history. Of course, it was not remotely a sub-branch of any kind. It was simply a Commission of people who worked hard and with integrity to identify some serious matters of unlawfulness and inadequacy concerning the Basin Plan. The "maladministration" exposed by Commissioner Walker (to the detriment of South Australia and its environment) should be what is of interest to politicians, not who someone might vote for.

In any event, I am sure what is of most interest to South Australians is the ecological health of the Coorong, and the River Murray as a whole. This coincides with my main interests: the lawfulness and the scientific integrity of the Basin Plan.

Further for the record, if any member of the South Australian Parliament from any political party wishes to discuss my functions as Commissioner for the River Murray with them, or any aspect of the Basin Plan or the Commonwealth Water Act (and the Basin Plan and the River Murray should be a first order priority for any representative of the people of South Australia) I would be happy to oblige them.

Members of Parliament	
Minister for the Environment and Water, Australia	The Hon Tanya Plibersek MP
Deputy Premier and Minister for Climate, Environment and Water, South Australia	Dr Susan Close MP
Senator Sarah Hanson-Young (and her advisors)	
Senator David Pocock (and his advisor)	
The office of Senator Lidia Thorpe	
Minister for Water, New South Wales	The Hon Rose Jackson MP (and her water advisor)
Government	
Department for Environment and Water, South Australia	Various representatives from the Water and River Murray Division
Department of Climate Change, Energy the Environment and Water, Australia	Representatives from the Water Reform Taskforce: Ms Rachel Connell and Ms Emma Solomon
Other stakeholders	
Murray-Darling Basin Authority	Meetings with Air Chief Marshal Sir Angus Houston AK, AFC (Ret'd) (Chair), and Mr Andrew McConville (Chief Executive). Meetings with MDBA River Operators and attendance at MDBA Board meetings.
Inaugural Chief Scientist and Engineer, New South Wales	Professor Mary O'Kane
Australia Institute	Mr Rod Campbell (Research Director), and Ms Kate McBride (Researcher)
South Australian Water Ambassador	Ms Karlene Maywald
First Nations representatives in the Coorong	Mr Grant Rigney and Mr Trevor Kennedy
Conservation Council South Australia Environment Victoria	Mr Craig Wilkins; Ms Charlotte Nitschke Mr Jono La Nauze
Lifeblood Alliance	
Wentworth Group of Concerned Scientists	Dr Celine Steinfeld (Director); Professor Jamie Pittock, Mr Michael Vanderzeee
Ramsar Secretariat	Dr Emma Carmody
Conservation Alliance	Mr Sean Halse (Consultant)
Southern Riverina Irrigators	Mr Tim Horne (Lawyer)

Publications and Media

As author	
Climate change and the Basin Plan: where unlawful meets unethical	[2022] NSWBarAssocNews 144; (2022 Winter) Bar News: Journal of the NSW Bar Association 42
The Basin Plan relegated climate science to the status of 'hoax'	The Advertiser, 25 July 2023
Our river's robbed, and it stinks like rotten fish	The Advertiser, 26 July 2023
Comment	
Radio interview with ABC Radio Adelaide	23 August 2022
"Renegade state risks millions as SA backs River Murray buybacks"	23 August 2023, InDaily
"'Politics dressed up as science': SA report lashes Murray-Darling Plan"	15 September 2023, InDaily
"Fear mongering 'unforgivable' amid Murray basin drought warning"	27 April 2023, InDaily
Podcast Interview with WaterWatch Radio 2DryFM, "A total fraud on our environment: Richard Beasley SC"	3 August 2023
Radio Interviews with ABC Radio Adelaide and FiveAA	23 August 2023
Radio Interview with ABC North and West Port Pirie	15 September 2023
Radio Interview with ABC Adelaide	1 November 2023
Press Conferences	
Release of the Response to the Murray-Darling Basin Royal Commission Report with Deputy Premier of South Australia	15 September 2023

Expenditure

I have made my distaste for the impact of political processes on the Murray-Darling Basin known for a long time and commend any pursuit to uphold government transparency.[41]

In the spirit of openness and transparency, I report on this year's financial movements. To those with a deep interest in this matter, my Services Agreement provides that I am to be paid $100,000 per annum, inclusive of GST. This is somewhat less than the $2 million fee one member of the South Australian Parliament suggested I was being paid. While this is clearly a serious error, I am grateful to them for impliedly considering my services are worth this higher amount. At the time of renewal of my Services Agreement I did not seek to take up with the Deputy Premier this notion that my remuneration should be increased.

In respect of the 2022-23 financial year, I billed the Department for the following expenses in accordance with the Agreement (airfares were almost entirely economy class. I did not charge a per diem for food. There was one occasion when I flew in a private aircraft (not mine), but I believe the cost of this was covered by the Commonwealth Government (refreshments were not served):

DESCRIPTION	AMOUNT	PAID
Consultancy fees for period 23/08/2022-22/09/2022	$8,333.33	10/11/22
Consultancy fees for period 23/09/2022-22/10/2022	$8,333.33	1/12/22
Travel and accommodation costs for trips to Canberra and Adelaide (from Sydney)	$3,313.59	1/12/22
Consultancy fees for the period 23/10/2022-22/11/2022	$8,333.33	15/12/22
Consultancy fees for the period 23/11/2022-22/12/2022	$8,333.33	9/2/23
Consultancy fees for the period 23/12/2022-22/01/2023	$8,333.33	9/2/23
Consultancy fees for the period 23/01/2023-22/02/2023	$8,333.33	20/4/23
Consultancy fees for the period 23/02/2023-22/03/2023	$8,333.33	2/5/23
Travel and accommodation costs for trip to Adelaide (from Sydney)	$2,407.41	2/5/23
Consultancy fees for the period 23/03/2023-22/04/2023	$8,333.33	28/9/23
Consultancy fees for the period 23/04/23-22/05/23	$8,333.33	27/6/23
Consultancy fees for the period 23/05/23-22/06/23	$8,333.33	20/7/23
Consultancy fees for the period 23/06/23-22/07/23	$8,333.33	10/8/23
Travel and accommodation costs for trip to Adelaide (from Sydney)	$3,054.52	10/8/23
TOTAL	**$100,442.15**	

[41] Richard Beasley SC, *Dead in the Water*, 2 February 2021 (Allen & Unwin); Parliament of South Australia, Hansard of Grievance Debate, 9 February 2023.

Priorities for 2023-24

Key issues

During the 2022-23 period, my focus has been on the issues hindering the full implementation of the Basin Plan. At the heart of the Basin Plan lies the primary objective to strike a balance between water consumption, while preserving the vitality of the Basin's ecosystems. It's not just about a legal mandate; it's a moral one.

The following outlines what I see as being the key issues in need of attention for the 2023-24 period. I have also addressed these issues in my other reports at Annexure A, B, C and D.

For the 2023-24 year, my priorities will be to advocate for:

- The urgent need to ensure recovery of the final 450 GL of water for the environment (with an emphasis on the speed of recovery), and (unless supported by sound science) from the southern Basin).
- The necessity to correct prevalent myths and misinformation about buybacks, while also respecting any evidenced based and reliable claims of impacts from water recovery.
- The need for the Commonwealth Government to do away with the socio-economic criteria formulated in the 2018 Ministerial Council meeting, which currently only serve as further impeding the delivery of the 450 GL.
- The glaring lapses in executing the obligations of the Basin Plan, particularly the lack of progress on key SDLAM projects.
- The importance of a thorough, independent assessment of the 605 GL SDL adjustment under Chapter 7 of the Basin Plan, grounded in the principle of 'best available scientific knowledge', as the legislation mandates, and encompassing the implications of climate change. As I have previously reported, the 605 GL SDL adjustment stands on shaky scientific foundation. I have read many reports and spoken to many experts about the method used by the Murray-Darling Basin Authority to calculate the SDL adjustment. Terms like "novel and untried", "without precedent", and "significant uncertainty or risk" have been employed to describe this method. These critiques reflect the precariousness of this approach. As such, I will continue to advocate for a comprehensive, independent review of this part of the Basin Plan. As we approach the 2026 review of the Basin Plan, this examination isn't just vital; it is indispensable.

More information

- Website: South Australia's Commissioner for the River Murray
- Contact: DEW.RiverMurrayCommissioner@sa.gov.au

www.environment.sa.gov.au

Abbreviations

Term	Definition
GL	Gigalitres
MDBA	Murray-Darling Basin Authority
ML	Megalitre
Water Act	*Water Act 2007* (Cth)
Basin Plan	Basin Plan 2012
Department	Department for Environment and Water (SA)
SDL	Sustainable Diversion Limit
SDLAM	Sustainable Diversion Limit Adjustment Mechanism
ESLT	Environmentally Sustainable Level of Take: the amount of water that must be recovered from consumptive uses and returned to the environment to prevent long term degradation

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List of Annexures

Annexure	Description
Annexure A	Richard Beasley SC, *Interim report,* November 2022
Annexure B	Richard Beasley SC, *The unrecovered 450GL of water for the environment under the Basin Plan*, May 2023
Annexure C	Richard Beasley SC, *Submission to the Productivity Commission's Murray-Darling Basin Plan: Implementation Review 2023*
Annexure D	Richard Beasley SC, *Submission to the Senate Environment and Communications Legislation Committee*

Annexure A

RICHARD BEASLEY SC

30 November 2022

The Hon Dr Susan Close
Deputy Premier of South Australia
and Minister for Environment and Water
GPO Box 11071
Adelaide SA 5001

Dear Deputy Premier,

Re: Commissioner for River Murray (SA)

Introduction

1. Although my Consultancy Agreement with the South Australian Government does not require me to produce a report until 30 June 2023, I thought it timely to provide you with an update now as to various meetings and briefings I have had on key issues prior to the next Basin Ministers' meeting next year. I have assumed that you do not mind that my preference for reporting to you is by written correspondence, rather than by text message[1].

Meetings and Briefings

2. Set out below is a list of the meetings I have had since 22 August 2022 (some of which are raised in more detail on other sections of this report):

   (i) 23 August 2022 – Meetings in Adelaide with departmental officers of the Department for Environment and Water (including Ben Bruce, Dan Jordan, and Emma Finnie).

   (ii) 2 September 2022 – Meeting with Kate McBride and Rob Campbell from the Australian Institute.

[1] Cf: The former Australian "Drought Envoy".

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(iii) 5 September 2022 – Conference with Chief Executive (Andrew McConville) and Chair (Air Chief Marshall Sir Angus Houston AK, AFC (Ret'd)) of the Murray-Darling Basin Authority (**MDBA**). Mr McConville has kindly facilitated a number of briefings concerning ongoing work of the MDBA, and with relevant people in other government agencies.

(iv) 9 September 2022 - Zoom conference with Alliance of Conservation Councils CEOs and Members.

(v) 5 October 2022 – Briefing by MDBA concerning climate change and the Basin Plan.

(vi) 6 October 2022 – Meeting with SA Department Officials; conference with Federal Minister the Hon Tanya Plibersek; meeting with Ngarrindjeri representatives; attend Stakeholders' meeting with various representatives from environmental and irrigation groups.

(vii) 14 October 2022 – Zoom conference with Karlene Maywald, SA Water Ambassador.

(viii) 20 October 2022 – Briefing (in Canberra, accompanied by Dan Jordan) with MDBA on SDL adjustments and accounting.

(ix) 20 October 2022 – Briefing with MDBA River Operators, principally on "constraints".

(x) 21 October 2022 – Attend MDBA Board meeting with Mr Jordan.

(xi) 4 November 2022 – Meeting in Sydney with Rachel Connell and Emma Solomon from the "Water Reform Taskforce" of the Department of Climate Change Energy, the Environment and Water (Cwth) (**DCCEEW**).

(xii) 21 November 2022 – Meeting in Sydney with Professor Mary O'Kane, who is currently conducting a "water science" review into aspects of the Murray Darling for DCCEEW.

(xiii) 29 November 2022 – Telephone conference with Dr Celine Steinfeld, Director, Secretariat of the Wentworth Group of Concerned Scientists.

The 450 Gigalitres

Introduction

3. Although some of what follows is very well known to you, it is convenient first to set out a summary of a part of the Plan that has become both unnecessarily controversial, as well as a near total failure – that is, the adjustment of the Basin Plan to recover an additional 450GL of water on an average annual basis for the environment.

Why have a Basin Plan?

4. Any discussion of the 450GL should begin with at least a briefly stated outline of why the Basin Plan was enacted. It was because by 2006 (and probably well before) the relevant Basin state governments, and the Commonwealth government, recognised that there had been a significant overallocation of the Basin's water resources for consumptive uses, to the considerable detriment of the environment. A clue could have perhaps been taken since 1982, when the Murray Mouth was first dredged. The treatment of our frequently hydrologically challenged rivers as though they could sustain the endless expansion of the growth of food and fibre not only risked the environment, but also risked Australia falling into breach of various international treaty obligations. I can resist providing you as footnotes to this letter references to a multitude of scientific reports supporting these facts. To make the points good I need only refer to s.21(2) of the *Water Act 2007* (Cwth) in which the Commonwealth Parliament took the unusual step of legislating as a fact that overextraction had caused environmental damage, and that "special measures" were needed to address this. The special measure became the Basin Plan.

Core of the Basin Plan – an Environmentally Sustainable Level of Take

5. The core of the Basin Plan is the determination of an Environmentally Sustainable Level of Take (**ESLT**)[2] for the Basin, which itself forms the basis for the long-term average Basin wide Sustainable Diversion Limit (**SDL**) – the amount of water that can sustainably be taken from the Water Resource Plan Areas, and then the Basin as a whole. The ESLT is best thought of as the amount of water that must be recovered from consumptive uses and returned to the environment to prevent long term degradation. This involves complex science. It required the work of experts from many disciplines, with judgments being made as to what are the "key environmental assets" of the Basin, what flow rates they need, in what years, and in what volumes. I will not attempt to set it all out here. For better or worse, this amount was determined on a yearly average. Also for better or worse, it had to be determined by the MDBA "taking into account" Ecologically Sustainable Development (ESD) (which includes the precautionary principle): see s.21(4)(a) of the *Water Act*. Further, the ESLT must be based on the "best available scientific knowledge": s.21(4)(b). I say for better or worse as it is almost a philosophical issue (as well as a political one) as to whether it would have been better or preferable for the *Water Act* to require the Basin Plan to have been made through being "informed" by best science, not solely based on it. This might have given more scope for lawful input by policy makers, and by those who are usually referred to as "stakeholders". I do not think this would have been preferable, or better. I'm not sure it would have been worse, either. It could have been different. It wasn't.

An unlawful Plan – but this is no longer the central issue

6. In his Royal Commission Report into the Murray-Darling Basin Plan, Commissioner Walker SC found the Basin Plan to be unlawfully made, and at least in part invalid. One of a number of reasons for this was that he found the determination of the ESLT – how much water the environment needs returned to it – was made by political compromise, not "best available science". It is unarguable this is what happened, but it is not a matter I intend to dwell on in this letter, or explore further in my role. It is relevant, but no longer the main game. There is compelling evidence the current partly invalid and

[2] The ESLT is defined in s.4 of the *Water Act*, by purely environmental criteria

unlawfully made Basin Plan provides real benefits for the environment. It is an adaptive Plan, that is regularly to be reviewed[3]. It can be made better, which is where I consider the main focus should be. That said, in 2010 the MDBA's position was (presumably at least then based on "best available science") that 4000GL to 7000GL on a yearly average needed to be returned to the environment for the Basin wide SDL to represent an ESLT[4]. Less than a year later the volume was said to be represented by this equation: 2750GL, plus 450GL, less 605GL. This change, and the subsequently agreed equation, makes good Walker's finding that the determination of the ESLT was more politics than science. While not wishing to get back into those details, that reduction in the range of the ESLT does emphasise the importance of two things: **first**, the return to the environment of the extra 450GL is crucial; **secondly**, the need for real scientific credibility concerning the non-recovery of the 605GL.

SDL adjustments

7. The agreement reached between the Basin States and the Commonwealth for an environmental water recovery target of 2750GL per year on average was, as should be clear from the above, conditional. It required insertion into the Basin Plan of what became Chapter 7. This Chapter of the Plan allows for the adjustment of the Basin Wide SDL. The aspect of the SDL adjustment mechanism relating to NOT having to recover approximately 605GL as a result of what are defined as "supply measures" in the Basin Plan is discussed in the next section of this letter. A further adjustment is for the recovery of the additional 450GL of water for the environment on average each year.

450GL and Efficiency measures

8. The 450GL of extra environmental water (for some reason referred to occasionally as "up-water") is provided for in s.86AA of the *Water Act*, and Chapter 7 (especially s.7.09, 7.16 and 7.17) and Schedule 5 of the Basin Plan. The legislated object of the extra 450GL is to be to achieve certain environmental targets for the Southern Murray, and for the Coorong, Lower Lakes, and Murray Mouth. As currently enacted, the water

[3] In 2026

[4] And for the objects of the *Water Act* to be met, and for Australia to fulfil its international treaty obligations, upon which the constitutional validity of the *Water Act* depends. This was the volumetric figure published in "The Guide to the Basin Plan", (MDBA, 2010).

is to be recovered through what are defined in the Basin Plan as "efficiency measures", through a fund called the "Water for the Environment Special Account". An example of an "on-farm" efficiency measure is "replacement of less efficient irrigation methods with drip irrigation". An on or off farm efficiency measure might be the lining of water channels to also reduce evaporation or losses of water to groundwater. Such measures – which have controversy attached to them concerning both cost and the reliability of how much water is actually recovered for the environment – were the means chosen to recover the 450GL in lieu of the Commonwealth purchasing water entitlements (sometimes called "buybacks"). Efficiency measures are to *"achieve neutral or improved socio-economic outcomes"*, a term defined in s.7.17(2)(b) of the Basin Plan. An attempt was made to alter these socio-economic criteria at a meeting of Basin Water Ministers in December 2018. What was agreed was in my view (and I am not alone) not just absurd, but invalid (see below).

Recovery of 450GL set to take 1,125 years

9. Claims were made at Senate Estimates on 11 November 2022 that approximately 4GL of the 450GL of environmental water has been recovered under the Basin Plan. This recovery is over a 10-year period. This represents a rate of recovery of 0.4GL per year. This would mean that at the current rate it will take approximately another 1,125 years to recover this water.

Floods, drought, climate change and the 450GL

10. I appreciate it might seem odd to some to discuss recovering water for the environment at a time when many areas of the Murray-Darling Basin are experiencing horrendous flood events. Some of these floods are at and beyond record levels, and have caused great hardship to a large number of people. Talking about recovering water for the environment in times of shortage or drought raises similar sensitivities, because drought causes different but often equally severe impacts on people and businesses. There are people who have insisted the topic of climate change not be mentioned at the time of fires[5]. The Basin Plan, of course, does not cause drought or flood or climate change.

[5] Although never by people actually affected by fires

Further, historical climate data as well as projections for the future reliably inform us that it is unlikely to take long for the Basin to shift from a flood year to drought.

11. Climate projections now indicate, at a level of near certainty, that the future for the Murray-Darling Basin is for a hotter climate. It will almost certainly be hotter and drier in the Southern Basin, with the potential for significantly less run-off into its rivers and watercourses. The future for the Northern Basin is almost certainly hotter too, although there are scenarios involving it both being hotter and slightly drier, or slightly wetter. If slightly wetter, that will likely be through torrential downpours. None of this is assertion, or new science – it represents a probably inadequately short summary of the work of the CSIRO from the "sustainable yields" project and beyond, as well as that of other credible research including reports of the IPCC. Other than amongst lunatics, the debate is no longer about whether the climate will get hotter on a daily average basis – it is only a question of how much hotter, and hence how much less run-off or water availability that might mean for the Basin. The current scenarios indicate a decrease in rainfall of about 10%, and a decrease in runoff of 30% by 2050.

The 450GL does not require the building of an Ark

12. I will resist the urge to respond in detail to the notion, that I have seen suggested by some people recently, that an extra 450GL of water recovered for the environment under the Basin Plan would likely lead to the sort of flooding we are now witnessing. It is better for a scientist rather than a lawyer to dispose of that nonsense. I cannot help though to say that such suggestions are wrong at a level that makes them arguably offensive. The short point is that despite the huge volume of water in the system at the moment, the 450GL is still vitally important for the environmental health of the Southern Connected Basin, as well as the Coorong, Lower Lakes and Murray Mouth. That is not an assertion, or something made up by a lawyer – it's another very short distillation from a plethora of scientific reports. Not that it matters to everyone, but the 450GL recovery is also part of the law.

Albanese Labor Government commitment

13. The new Commonwealth Government made five election commitments regarding the Murray-Darling Basin. The first was expressed as follows:

"Working with Basin governments and stakeholders to deliver on water commitments, including the 450GL for the environment."

14. Whatever view is taken of this commitment, the intent behind it can only sensibly be construed as one involving delivery of the 450GL in the near future, and not at the rate that would see it fulfilled in over a thousand years. The current policy (and perhaps legislative provisions) to "deliver" this water has failed. There have been reports in the media that the new Commonwealth Government might be considering purchasing water to recover some of the 450GL. Those reports, regrettably, may not be accurate. From what I heard at Senate Estimates, and from material published by DCCEEW, strategic water purchases might be implemented to bridge what is described as the current "gap" in water recovery (49GL), but not (at least currently) for the 450GL. My views about this are set out in the paragraphs that follow.

Much of the 450GL should be purchased by the Government

15. First, it should not be forgotten that there would be no Murray Darling Basin Plan without the 450GL of environmental water provided for in Part 2AA of the *Water Act* and Chapter 7/Schedule 5 of the Basin Plan. The then South Australian government was clear – based on scientific reports at the time – that the Plan needed to recover a minimum of 3200GL on average per year to fulfil the ecological targets set for the Plan.

16. As mentioned above, as currently legislated, the *Water Act* and Basin Plan provide for the 450GL to be recovered through "efficiency measures" paid for by money in the Water for the Environment Special Account. A recovery of 4 of 450GL in 10 years demonstrates that this means for recovering the extra 450GL has failed.

17. There are numerous peer reviewed scientific papers (as well as a report by the UN Food and Agriculture Organisation) that question the reliability of the recovery of water from efficiency measures, or at least cast real doubt about the amounts claimed to have been recovered[6]. It has also been established by various water economists in peer reviewed

[6] Perry and Sedato, "Does Improved Irrigation Technology Save Water?", Discussion Paper, Food and Agriculture Organisation of the United Nations, 2017. See also Wang et al, "Groundwater and Return Flows Impact Report" (short title), Melbourne School of Engineering, Water, Agriculture and Environment, October 2018.

papers that recovering water through efficiency measures is far more expensive to taxpayers than recovering water through the voluntary purchase of water entitlements. The facts and opinions about "return flows", and the reliability of efficiency measures as a means of recovering water, are best resolved by relevantly qualified scientists rather than me. The unarguable point is that 450GL does not appear likely to be recovered through efficiency schemes (which in and of themselves might otherwise be worthwhile investments) within any reasonable timeframe. A sizeable proportion of the 450GL will have to be bought.

Misinformation about buybacks

18. Should the Commonwealth Government decide to purchase water entitlements to recover some or all of the 450GL (which might require legislative amendments to be made at some time), it will be criticised for doing so. It is likely much of that criticism will be by way of assertions in media releases rather than being evidence-based. The impacts of water purchases by the Government have been either overstated or, on occasions, invented. What is likely to be said about the government making voluntary purchases of water for the environment are that they:

    (i) "..are a water grab, which …devastates Basin communities and industries"[7]; and
    (ii) "will rip the heart out of communities" and "erode the economic base of town" and are "economic vandalism"[8]; and
    (iii) cost jobs; and
    (iv) create stranded irrigation assets, and increase water delivery costs; and
    (v) damage the social fabric of towns, and reduce population.

19. What is unlikely to be said about the purchase of water are the following matters:

    (i) There is no proportional relationship between a reduction in the use of water for consumptive use, and farm production.

[7] NSW Irrigators Council Press Release, 26/10/22
[8] Sam Birrell MP, Federal Member for Nicholls, quoted (I assume accurately) by the "Shepparton News", 4/11/22

(ii) Most irrigators/farmers who historically sold water to the government sold a partial and not an entire entitlement. They stayed in irrigated agriculture/farming.

(iii) Money obtained from the sale of entitlements was spent locally

(iv) Job losses and economic contraction in rural and regional communities has many causes – mechanisation; increased urbanisation; climate change; fluctuation in commodity prices etc. The Basin Plan, on peer reviewed evidence, is not a similar level cause of economic loss.

(v) It is much cheaper to buy water than to attempt to recover it through efficiency measures.

(vi) Any credible economic analysis must include the economic benefits of recovering water for the environment, not just any alleged negative impacts.

Impacts should be mitigated

20. A further point should be made here. There have been examples of heavily water dependant towns that suffered impacts as a result of what could be argued to be non-strategic buying of water by the government, that largely occurred before the Plan was even enacted. My experience is that this created genuine fear and distress in some parts of the Basin. That distress, and any negative impacts water purchases had, should not be ignored or trivialised. As a matter of obviousness, any third-party impacts from the purchase of water entitlements should be sought to be avoided, or minimised and compensated as far as possible. However, the matters outlined in [19] above represent the work of far too great a portfolio of peer reviewed economic literature for me to footnote in this letter. Amongst the authors of this work however are Professor Sarah Wheeler, Professor Quentin Grafton, Dr A Lock, Dr D Adamson, many others – and, relevant in a different context to this work, the independent report of Ernst & Young referred to below. Unfortunately, at least to date I have not seen a great deal of appetite by any government to deal in facts and data concerning buybacks. Hyperbole seems to be preferred. Of course, no Australian politician from any side of politics would engage in "fear mongering" in relation to water buybacks, but if they did it would be not just unforgivable, but contrary to the National (and local) interest.

Why has the 450GL not been recovered?

21. There have been a few key reasons why only 4 of the 450GL has been recovered over the last 10 years. They are as follows:

    (a) A plan to purchase the water should have been implemented years ago, when it was obvious it would not be recovered though efficiency measures alone.

    (b) The socio-economic criteria "agreed" to at Min-Co in December 2018. Those criteria make for difficult reading. They are written in a manner that is beyond my level of literacy. More importantly, they appear designed to stymie the recovery of the 450GL rather than to ensure it happens. Although you would no doubt be inclined to obtain more detailed advice concerning this, the socio-economic criteria agreed to at Min-Co in December 2018 are also in my opinion almost certainly invalid. I have a reasonable degree of confidence that I am not the only lawyer that would hold this view. They are not consistent with s.7.17(2)(b) of the Basin Plan. A sensible response from all of the Basin State Ministers and the Commonwealth Water Minister would be to now put aside these criteria as a mistake. Expressed another way, it is long past the time for Recommendation 11 made by Commissioner Walker SC to have been taken up – that is, the socio-economic criteria agreed to at the Min-Co meeting of 14 December 2018 *"should be abandoned"*[9]. While on this topic, it should not be forgotten (although it appears to have been by some Basin states) that the most comprehensive and independent study of efficiency measures in the Basin (conducted by Ernst & Young in 2017-18) concluded that off farm efficiency measures generally have positive socio-economic impacts. The authors also found on-farm efficiency measures almost always have positive impacts for the irrigators/farmers involved. While concerns were raised that participants in efficiency schemes might have an advantage over those that did not participate, no evidence was found of such negative socio-

[9] Royal Commission Report page 73

economic impacts.[10] I have not read any critique of this report that suggests the authors were wrong. Rather, the report has been ignored as its findings did not seem to suit the NSW and Victorian governments, or the then Federal government. Again, I am confident that no Australian politician would ever ignore an independent economic or science-based report simply because the findings did not align with ideology or political gain, but if that ever were to happen, it would be gross negligence, and perhaps worse.

(c) Lack of progress on constraints. Nearly 10 years after a constraints policy was developed by the MDBA, little progress has been made in relation to constraints. That is not a criticism of the MDBA – it is not empowered to fix this problem. I have been advised that, in particular, New South Wales and Victoria have made no real attempts to make progress in relation to constraints, and there is also resistance by some landowners to constraint measures such as the construction of culverts or the building of bridges for land access. Lack of progress in relation to constraints seems to have been used as an excuse for a lack of action in relation to the recovery of the 450GL. Priorities should be reversed. The 450GL should be recovered. Constraints progress will have to follow. Further, and crucially, given the non-recovery of the 605GL as part of the SDL supply measure adjustment, the constraints issue should be manageable on the modelled outcomes I have seen even if all of the extra 450GL was recovered. Even with the extra 450GL, it would be a mistake to think of the Plan as one involving a return of a volume of 3200GL. It would be an (approximately) 2100GL Plan, plus 450GL, plus an alleged equivalency of 605GL. That alleged equivalency is not "real" water.

Is it ethical to prevent people from selling water to the government for environmental purpose?

22. I have been advised in the course of my meetings that since the May 2022 Federal Election a number of water entitlement holders have contacted the Federal Government expressing interest in selling some or all of their water entitlements. There exists an "unsolicited water entitlements register". There is no environmental, social or economic reason why relevant

[10] Ernst & Young, "Analysis of Efficiency Measures in the Murray-Darling Basin: opportunities to recover 450GL in additional Environmental Water by 2024 through Efficiency Measures by 2024 with Neutral or Positive Socio-Economic Impacts – Independent Report to the Murray-Darling Basin Ministerial Council" (January 2018).

changes should not be made such that water is now purchased by the Commonwealth Government in a strategic way to make real progress with the recovery of the 450GL.

23. It seems remarkable (and not in a good way) that in Australia a holder of a water entitlement can sell that entitlement to anyone, including a large corporate entity, but is prevented from selling their water to our federal government to aid the environment. I have no desire to delve into what could be thought to be a form of "legal moralism", but in what way is this considered to be ethical by those who are decision makers? Why should people be prevented from selling their water voluntarily for an environmental purpose? If this were a debating question, I know which side I would like to argue.

24. Finally, it is difficult to see how the Commonwealth Government will meet its key election commitment in relation to the Basin Plan without acquiring a significant proportion of the 450GL through strategic water buybacks. It should do this. At every meeting I have had I have impressed upon the participants all of the matters referred to above. I am yet to hear a convincing reason[11] why voluntary water buybacks should not be used (even if in conjunction with efficiency measures), to recover a large proportion of the 450GL. In conclusion, I have not heard any reason of substance why Recommendation 8 from Commissioner Walker SC's Royal Commission Report should not be adopted by the Commonwealth Government – that is:

> *"Future water recovery for the environment, including the 450GL, should be purchased through buyback. This requires repeal of the 1500GL cap on buybacks and s.85C of the Water Act."*[12]

The 605 Gigalitres

What is this adjustment?

25. Section 23A of the *Water Act* provides for adjustments to be made to the long-term average SDL for the Basin. Through Chapter 7 of the Basin Plan (and schedules 6 and 6A), and the implementation of "supply measures", 605GL[13] of water does not need to be recovered for the environment, as these supply measures, as a result of

[11] By reason I mean fact-based opinion. Something supported by credibly economics and science.
[12] Royal Commission Report p.72
[13] Technically 543GL

"environmental equivalency", will represent this volume of water. Examples of supply measures given in the Basin Plan include *"reconfiguring suitable lakes and storage systems to reduce evaporation"*, *"changing the methods of environmental watering"* and *"reducing the quantity of water required to deliver water at a particular place"*: see s.7.03 of the Basin Plan.

26. In practice, there were 36 supply measure projects proposed for the supply measure SDL adjustment. I will not provide a list of them for the purposes of this short report. Some were beyond problematic – for example, the Menindee Lakes supply measure (said to represent 106GL of the 605GL) would, if proceeded with, perhaps have devastated up to 28,000 ha of native fish habitat[14]. While it is open for policy makers to prefer humans to fish, this is a lot of habitat. Leaving this aside, it is now clear that many supply measures proposed will not have been built or implemented by 30 June 2024. At the National Press Club on 22 November 2022, MDBA Chief Executive Andrew McConville said the range might now be between 290GL to 415GL in lieu of 605GL. This is consistent with other briefings I have had. My concern however is that any "supply measures" that will be operational by 2024 cannot properly be said to represent even a range of 290GL to 415GL of water.

27. This SDL adjustment therefore makes what is sometimes referred to as a "3200GL plan" – that is, a plan that recovers 3200GL for the environment – in truth this: *2750GL minus 70GL (Northern Basin Review) plus 450GL (of which 4GL has been recovered) minus 605GL.* While a person being introduced to the Basin Plan may consider this equation somewhat perplexing, the fact that the Basin Plan has an adjustment mechanism should be seen as a good thing – there should be the capacity for the Plan to be adaptive. The supply measure adjustment mechanism however is extremely troubling for the reasons I set out below.

The 605GL adjustment risks being an environmental fraud

28. The supply measure SDL adjustment involved the creation of an "Ecological Elements [scoring] Method", which measures (scores) the environmental impacts and benefits of

[14] A risk identified by the MDBA

supply measures against four species of waterbirds, six species of vegetation, and two species of fish. I am mindful I am not a scientist. Since first reading about this part of the Basin Plan I have attempted to temper my initial reaction to the Ecological Elements Method as being something closer to a pea-and-thimble trick than science. I have so far failed in this attempt, but remain persuadable. Given my failure, as I have made clear to relevant people at the MDBA, I remain deeply concerned about the reliability and credibility of the science behind the non-recovery of 605GL of the Basin Plan environmental water recovery amount as part of the "supply measures" scheme. Commissioner Walker SC found Ch 7 and Schedules 6 and 6A of the Basin Plan to be *"an attempt to put into legislative form a complex, and distinctly imperfect, scientific procedure"*.[15] He found that the ecological element scoring method in Schedule 6 of the Basin Plan had *"alarming shortcomings"*. He found the supply measure contribution (the 605GL, or more accurately at present 543GL) to be *"the result of a highly uncertain experiment with the environment to the Basin … that is not consistent with the requirements of the Water Act"*.[16]

29. While having noted I am not a scientist, I have closely read the various expert reports and expert reviews about the science behind the supply measure adjustment. These scientific reviews have described the SDL adjustment Ecological Elements Method as *"novel and untried"*, *"without precedent"* and that *"no one should assume that the adoption of the* [method] *is without significant uncertainty or risk"*.[17] An independent panel made an observation that there was a *"substantial error space"* inherent in the model and method used. Other criticisms could be made, but I simply refer you generally to Chapter 7 of Commissioner Walker's Royal Commission Report. I would add this: it is one thing to ignore Walker, as has been done. The reports and science reviews he relied on for his views should not be ignored.

30. I have not been able to find anything that provides me with any confidence that this part of the Basin Plan is reliable or that it represents "the best available scientific

[15] Key Finding 7.1, page 56
[16] Key Finding 7.6, page 57
[17] Royal Commission Report p.303

knowledge".[18] One description of the supply measure SDL adjustment under the Basin Plan is that it is a gamble with the environment. An environmental gamble is not authorised by the *Water Act*. Another description – based on reading the expert reports on this part of the Plan that are available to be read – is that it at least runs a risk of being a fraud on both the environment, and the objects and purposes of the *Water Act*. That is also not authorised by the *Water Act*, and something no government should want to be a party or bystander to.

31. The use of the words "gamble" and "fraud" are not used flippantly. The Basin Plan is a scheme that anticipates that it will change, be reviewed, and evolve. Like no doubt other long-term plans that are to be science based, there should be recognition that science can itself evolve, advance, or at least be better understood. No rational person in my view that has read the published expert opinions concerning the SDL supply measure adjustment could be left with any other view than there is tremendous uncertainty about the science behind it, particularly the Ecological Elements Method. How it all amounts to a volume of water – be it 543GL, or 605GL, or even 10GL – is a mystery to me. That would not be such a problem if it were not also a mystery to people with relevant scientific qualifications and experience. It does not look like an adjustment to the Basin Wide SDL (of a huge volume of water) that is sufficiently science based to be lawful. It arguably more than flirts with falling foul of s.21(4)(b) of the *Water Act* ("based on best available scientific knowledge"), and it is difficult (at least for me) to see how it sits properly with the concept of "ecologically sustainable development", and in particular the "precautionary principle"[19]: see s. 21(4)(a) of the *Water Act.*

32. I have indicated to the MDBA (who I don't doubt are working in good faith to implement the supply measures scheme) that I would like some further and better explanation provided to me as to why anyone should hold confidence concerning this part of the Basin Plan. I will follow this up with Andrew McConville. Of course, as a non-scientist I am happy to be informed through reliable means that we all should have complete confidence in this part of the Basin Plan which absolves the States from

[18] *Water Act* s.21(4)(b).
[19] A good definition of ESD and the precautionary principle can be found in *Telstra Corporation Limited v Hornsby Shire Council* [2006] NSWLEC 133; (2006) 67 NSWLR 256 at [108]-[115] Per Preston CJ

recovering nearly 605 GL of water that might otherwise go to the environment as part of the 2,750GL.

There should be an independent review of the 605GL adjustment

33. Beyond a brief to me, I believe there should be a full and comprehensive independent review by relevant experts of this part of the Basin Plan. There is sufficient uncertainty here that in my view a responsible government would ensure that there is a fully independent scientific inquiry into the supply measures aspect of the Basin Plan. I appreciate how difficult that will be, given that we have been travelling down this road for 10 years now. However, the findings of Commissioner Walker SC about the supply measures SDL adjustment, and the concerns he had about it, were not lightly made. They were only made after close analysis of the available reviews of the "science" associated with this part of the Plan.

34. With this in mind, I note that Professor Mary O'Kane (former Chief Scientist of NSW, and current Chair of the NSW Independent Planning Commission) has been engaged by DCCEEW to conduct a "water science" review of Murray Darling Basin[20], but not of the Basin Plan itself. I think we all should welcome this. In my view, we would be well served if the extent of Professor O'Kane's review was extended to examine the science behind the supply measure SDL adjustment, which is a view I expressed when I met with her on 21 November.

BDL/SDL Adjustment

35. As you would be aware, New South Wales has still not provided to the MDBA the majority of its Water Resource Plans to be accredited under the Basin Plan. The original deadline for this was 30 June 2019. Since then, the NSW Government has passed legislation concerning floodplain harvesting and the licensing of it. As I understand it, in some of the water resource plan areas, there will be an increase in the baseline diversion limits (**BDL**). BDL is defined in the Basin Plan, but in terms too broad to set out here. A simplistic (but not complete) understanding is to think of it as the volume of water taken from each water resource plan area in the basin as of 30 June 2009

[20] See O'Kane Review "Fact Sheet"

(before the Basin Plan was made and enacted). The MDBA's position is that an increase in the BDL for each water resource plan area will lead to an equal increase in the SDL for those water resource plan areas. As I understand it, the MDBA's position is that this can be done without an amendment to the Basin Plan.

36. It is of concern to me that there will be increases in the SDL for various valleys in northern NSW as a result of its floodplain harvesting licensing regime. The increases for the SDL for NSW in total appear likely to amount to about 324GL[21]. This was the subject of one of the briefings I had with the MDBA in October. I am aware (as are they) that submissions were made during the course of the NSW Parliament's Inquiry into Floodplain Harvesting that the approach that the MDBA appears likely to take (increasing SDLs without an amendment to the Basin Plan) has been said to be unlawful. Part of a legal opinion was tendered to the NSW Government Inquiry concerning this. Briefly, it seems that the argument being raised is that the *Water Act* contains provisions/schemes within it for the exercise of power to make an adjustment to the SDLs such that they are the provisions that must be followed to lawfully adjust/increase the basin-wide SDL. It is not part of my role to provide legal advice to the MDBA. I raise this matter simply so that you are aware of it (and I know that your departmental officers are) and note that there has been at least some indication that there may be a legal challenge to the approach that the MDBA intends to take.

Climate Change

37. The ESLT for the Basin Plan, and hence the Basin Wide SDL, was determined by modelling climate data from 1895 to 2009. Despite indications from the CSIRO that not including climate change projections into the modelling was "indefensible", the ESLT was determined by the MDBA without the use of such projections. This has been found this to be "maladministration" and "gross negligence"[22].

38. Based on the briefings I have received from the MDBA, it is now my understanding that climate change projections are likely to be incorporated into the Basin Plan

[21] "SDL Accounting Overview", MDBA, 20 October 2022, p 15
[22] Royal Commission Report at, for example, page 55, 247.

modelling, and at least for the review of the Basin Plan in 2026. This work is being undertaken by the CSIRO with the MDBA.

39. Since the CSIRO undertook its sustainable yields research back in 2008-2010, there has been no significant change to the likely climate scenarios for the Murray Darling Basin (except for a higher degree of confidence in relation to those projections). As discussed above, scientists now consider that it is a matter of certainty that it will be hotter in the Murray-Darling Basin by 2030 and 2050. How much hotter is likely to depend upon the reductions of greenhouse gas emissions globally. The Basin is already 1.1° to 1.4C hotter than it was on a daily average from pre-industrial times. On average, for every 1°C it gets hotter in the Basin, and in particular the Southern Basin, there will be 15% less water runoff. A 2°C increase could be catastrophic. It may also be hotter and drier on the Northern Basin, although a realistic scenario is hotter and wetter. Unfortunately, that is not wetter in a good way – that is, wetter through increased torrential downpours. As set out at [11], by 2050 there is a real risk of a reduction of runoff of 30%.

40. Controlling global emissions and daily temperature rises is outside of the terms of reference for my Consultancy Agreement. So is advising about what difficult decisions and structural adjustments will need to be made if the Basin suffers a 30% reduction in water. I can say that incorporating climate change projections in the Basin Plan for its review in 2026 may reveal that an increase in water for the environment is needed for the purposes of ensuring the Basin-wide SDL represents an ESLT as that term is defined in the *Water Act*. It should result in a more science-based plan.

41. As an aside, there is currently before the NSW Land and Environment Court a case involving a challenge to the lawfulness of one of NSW's Water Sharing Plans (the Border Rivers Plan). That challenge centres on an allegation that this Plan was not made with any regard to climate change projections (I think a matter that is not in dispute). This case will turn on the proper construction of the *Water Management Act* 2001 (NSW), and not the *Water Act* 2007 (Cwth), but it is not impossible that the case could have some implications for the Basin Plan.

Conclusion

42. At the end of the stakeholders' meetings in Adelaide on 6 October 2022 Minister Plibersek and I briefly discussed a further meeting, which I would certainly welcome. I also intend to meet again before Min-Co with relevant Commonwealth bureaucrats. This would be to further reinforce some of the matters raised above and also to raise some additional matters that have emerged since then. At a fundamental level, however, it is difficult to see how the Commonwealth Government will meet its election commitments concerning the Basin Plan (particularly in relation to the 450GL) without a strategic purchase of water entitlements – perhaps in conjunction with a properly operating efficiency measures scheme based on the socio-economic criteria described in s.7.17(2) of the Basin Plan (and not the invalid mishmash of criteria that emerged from the December 2018 Min-Co) (see generally [15] to [24] above).

43. While it looks highly unlikely that all supply measures will be in place by 30 June 2024 in any event, for the reasons outlined above, there remains such uncertainty from a scientific perspective about this adjustment that it should not be ignored. The Commonwealth should stand up an independent scientific review of the supply measure adjustment (see generally [28] to [34] above).

44. As a final matter, I want to let you know that I have had excellent support from senior people within your department (Ben Bruce, Dan Jordan, Emma Finnie), as well as fruitful and informative discussions with them. As stated above, Andrew McConville has provided me with great assistance in facilitating engagement with relevant people at the MDBA which I have appreciated, and I have no doubt will continue.

45. I would of course welcome the opportunity to discuss any of the matters raised above with you or any of the senior people of your department that I have been speaking to in the recent months.

Yours sincerely,

Richard Beasley SC
Commissioner for the River Murray in South Australia

Liability limited by a scheme under the Professional Standards legislation

Annexure B

The unrecovered 450GL of water for the environment under the Basin Plan

Executive Summary

1. The revenue generated by agriculture in the Murray Darling Basin is substantial. When criticism of the Basin Plan is made however, rarely is there focus on the benefits (economic and otherwise) of water recovered for the environment. Some of those benefits, particularly in relation to tourism revenue, are mentioned later in this paper. Tourism revenue, which all Basin States share, amounts to about $11 billion annually[1]. Depressed ecologists aside, it is anticipated less people not more would visit permanently degraded rivers and wetlands.

2. The Basin Plan is a child of the commonwealth *Water Act* 2007. That Act, which was drafted to facilitate a compromise between agriculture and healthy ecosystems, has recovered too little water for the environment, not too much. The Basin Wide water recovery target of 2750GL – 605GL – 70GL + 4.5GL/450GL: (see this "equation" in its fully inglorious form at [11] below) does not reflect an *"Environmentally Sustainable Level of Take"* as it must under the *Water Act*. Nor is it a volume determined on *"the basis of the best available scientific knowledge,"* as the law also requires[2]. While the water recovery target for the Basin Plan should have been determined lawfully and in accordance with the requirements of the relevant legislative provisions, the point of this document is not to make out the obvious case for that. It is to highlight that in circumstances where insufficient water for the environment has been recovered under the Basin Plan (environmentally and legally), it is imperative that the Federal Government fulfil its election promise to recover the 450GL now.

3. The assertions put forward in opposition to the recovery of the 450GL for "enhanced environmental outcomes" are just that: in general they amount to no more than claims that lack a proper evidentiary foundation. They are not based on either the best available scientific or economic knowledge. Recovery of the 450GL is mandatory. The object of

[1]MDBA, "The Murray Darling Basin and why it is important", (mdba.gov.au)

[2] These are not mere assertions. They represent findings made by Bret Walker SC in his "Murray Darling Basin Royal Commission Report" (**RC Report**), and are based on thousands of pages of oral evidence, dozens of expert reports, and hundreds of submissions.

s.86AA of the *Water Act* "is to be achieved"[3]. Further, failure to recover this water threatens not just the environmental integrity but also the constitutional validity of the Basin Plan, as outlined in Section 2 below.

4. The proposed 605GL SDL Adjustment from "supply measures" is also not based on best available science[4]. There is no independent report, or peer reviewed article that supports this precise volume, as described in Section 3. Again, the purpose of this document is not to advocate for the abandonment of the SDL Adjustment (although an independent science review is needed). Rather, it is to call attention to the enormous environmental risk associated with not recovering this water, which also make it imperative that the Federal Government now recover the 450GL.

5. The combination of the matters summarised in [1] – [3] above, and outlined in more detail below[5], are why the additional 450GL for the environment must be recovered from the Southern Basin immediately.

[3] S.86AA(3)
[4] A further finding of Walker SC in the RC Report.
[5] No proper understanding of the complexities of the Basin Plan can be gleaned from merely reading this Executive Summary.

Section 1

Environmentally sustainable level of take

6. No discussion of the 450GL of water that must be recovered for the environment under s.86AA of the *Water Act* can meaningfully take place unless that discussion is had in proper context. That begins with the fact that even if all of the 450GL had by now been recovered as "real" water, the Basin-wide recovery amount would still be so low that it fails to meet the objectives of the *Water Act*, and threatens the validity (including constitutional validity) of the Basin Plan. While that is unacceptable, even the current inadequate water recovery under the Basin Plan has been of some environmental benefit, especially at times of low flows. While it is currently at legal risk, "blowing up" the Basin Plan through legal challenge might be counterproductive. The alternative approach advocated here is to immediately improve it, and the environmental benefit it provides.

7. The water recovery target for the Basin Plan must be based (but currently isn't) on an *Environmentally Sustainable Level of Take* [6]. For the Basin (or any of its individual water resource areas) this means a level of take which, if exceeded, would compromise (i.e., damage):

   (a) key environmental assets; or

   (b) key ecosystem functions; or

   (c) the productive base[7]; or

   (d) key environmental outcomes

   of the Basin.

8. These are solely environmental criteria, and are entirely within the judgment of appropriately qualified scientists, not policy or law makers. That is the law Federal Parliament enacted. Unsurprisingly then, the Basin Plan, and the *Environmentally Sustainable Level of Take*, "must" be prepared and determined *"on the basis of the best available scientific knowledge"*: s.21(4)(b) of the *Water Act.* If Parliament wanted the *Environmentally Sustainable Level of Take* to be merely "informed" by science, or

[6] S.4 Water Act

[7] "ecologically" productive base

partly based on science but equally based on certain defined economic considerations, or on the phases of the moon, or on the whims and desires of lobby or industry groups[8], it could have enacted such a law. It didn't. It instead passed what is undeniably an "environment first" law.

9. The Basin Plan is a legislative instrument of the Federal Parliament. To be legally valid, it must *"faithfully implement"* international environmental conventions upon which the *Water Act* is based. It has to *"give primacy to the environment"* before social or economic effects are considered. If the Basin Plan is *"incompatible with the environmental conventions, then it will be unconstitutional because it is those conventions that were "relied upon to get the constitutional power for the Water Act."*[9]

10. Not every policy or law maker has found the "environment first" nature of the *Water Act* to be convenient, or appealing. Returning water to the environment has consequences. It means that there is less water available for consumptive use such as the growing of food and fibre. Of course, the provisions of the *Water Act* do not require a restoration of the Murray Darling system to what it was pre-1788, or before the introduction of widespread irrigated agriculture. It requires a compromise to be made. It assumes consumptive uses like irrigated agriculture will continue. It legislates though for science to determine when the level of water take from those uses has reached a limit where the environment will be damaged. It is likely that most rational people, which include environmentalists but also that group of Australians who would simply prefer the environment not to be wrecked, consider this legislative compromise to be both reasonable and sensible. They no doubt include those Australians who, while not (necessarily) part of the radical left[10], believe that this country is unlikely to fall into ruin should it fulfil its international environmental treaty obligations, as the *Water Act* requires. Even that group who "prefers people to fish"[11] in general would consider it non-controversial that we should not degrade the environment through the overuse of water, and should base our efforts to restore and sustain it based on science, not press releases.

[8] God forbid.
[9] Quote of Professor George Williams: see RC Report, Page 194
[10] A small group in Australia, unrepresented by anyone in the media
[11] A philosophy or creed that perhaps requires extensive context to be fully understood.

11. Regrettably, the inconvenience of the *Water Act* resulted in the Basin Plan not being prepared on the basis of the best available scientific knowledge. That is not to say science did not play a role, but that role became secondary to the political compromise[12] that resulted in the ultimate determination of the *Environmentally Sustainable Level of Take*. Science, and no less "best available science," involves rigour, transparency, testing, and replication. Eminent scientists have said repeatedly (both under oath, and in peer reviewed scientific literature) that the manner in which the 2750GL annual recovery figure was determined is opaque[13], and as such incapable of being replicated[14]. It either does not reflect an *Environmentally Sustainable Level of Take*, or there is no proper evidence that it does[15]. Our scientific community, and hence the public, has not been informed in any meaningful way as to how the volume of 2750GL (or the 605GL SDL Adjustment) was determined, and how so called "social and economic" considerations were used to reduce the original volumetric range for Basin-wide recovery (approximately 4000GL to 7000GL[16]) to 2750GL. That was an unacceptable state of affairs in 2012, and remains so today. It means scientists do not have the data and information necessary to interrogate the volumes determined by the MDBA. That is the inverse of good governance[17]. In any event, that the *Environmentally Sustainable Level of Take* recovery target "had to commence with a 2" was well known at the MDBA in 2011-12[18]. Sworn evidence has been given to this effect, which was unchallenged. Further, at the time the Basin Plan was being finalised, it is beyond argument that the final water recovery target was a "political outcome" not a "best available science outcome"[19]. In short, science was hijacked by politics, and resulted in this equation for the water recovery target in the Basin Plan:

Water Recovery average yearly volume for an Environmentally Sustainable Level of Take:

[12] Not authorised by the Water Act
[13] A polite term for it having a woeful level of transparency.
[14] Combined evidence of, amongst others, Professor Jason Brookes; Professor Richard Kingsford, Professor John Williams, Dr Matthew Colloff, Mr Peter Cosier, Dr Theresa Heneker, Professor Jamie Pittock, Dr Celine Steinfeld, etc, etc
[15] Ibid
[16] See "The Guide" to the proposed Basin Plan, 2010
[17] The OECD has long identified poor water governance as a major risk to the environment/water resources.
[18] Sworn evidence of David Bell at Royal Commission, plus multiple other sources
[19] For example, evidence of Karlene Maywald at Royal Commission

= 3856GL (representing a "high level of uncertainty" of meeting the watering requirements for the Basin's key environmental assets) to **6983GL** ("low level of uncertainty")
becomes (after non-disclosed change to computer modelling):
2750GL (on an average yearly basis)
minus 605GL (SDL Adjustment)
plus 4.5GL (should be 450GL**)**
minus 70GL (Northern Basin Review)
not including any consideration of climate change projections
= (approximately) **2079GL.**

An insufficient number of people seem embarrassed by this equation.

That is so even without also considering the further matters below.

12. There are numerous scientific reports which evidence that the Basin-wide water recovery target (for simplicity, 2750GL on an average yearly basis) does not represent an *Environmentally Sustainable Level of Take*. There are no published scientific reports or peer review reports which evidence a contrary opinion. There are non-scientific assertions to this effect, but they amount to no more than a *Humpty Dumpty-like* claim of "2,750GL is a lawful plan because we say it is".[20] For example, in 2011 the CSIRO (at the invitation of the MDBA) performed a review of the water recovery target which resulted in a report titled "Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray-Darling Basin"[21]. Of the many criticisms of the MDBA's then 2800GL target for water recovery, the authors of this report stated:

(a) Modelling data for climate change impacts to 2030 was available, <u>but not used</u>.
(b) A level of take *"represented by the 2800GL/yr. is <u>not consistent with the hydrologic and ecological targets"</u>.*

[20] Apologies to Lewis Carroll for dragging him into the politics of the Basin Plan
[21] Young et al, CSIRO, November 2011

(c) A 2800GL scenario does *"not achieve the majority of the hydrological targets"* and meets only *"55% of the achievable targets at either "high risk" or "low risk" frequency."*

(d) *"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."*

13. Each of the matters opined above at (a) to (d) by the CSIRO have been confirmed and reinforced by sworn oral evidence, and in substance by other expert reports.[22] There is apparently no published or peer reviewed work that challenges the opinions expressed in these reports, which amount to an admission that the recovery target of 2750GL is NOT reflective of an *Environmentally Sustainable Level of Take*.

14. The second part of context relates to the tired assertion that it is pointless to recover an extra 450GL for the environment until such time as all "constraints (relaxation) measures" are in place. Modelling shows that a Basin Plan that returns 3200GL of water on average per year will hit 17 out of 18 key environmental flow indicator markers in circumstances where constraints are addressed.[23] This can be compared to a 2800GL Plan which only hits 11 out of 18 markers. It is sometimes contended that until constraints are addressed, a 3200GL plan would cause flooding and damage, and hence there is no point in recovering the extra 450GL until all issues relating to constraints are addressed. This is a fallacious argument, advanced only by those who fail to comprehend the reality of the current Basin Plan and water recovery pursuant to it.

15. The Basin Plan is not a 3200GL water recover plan. Nor is it a 2800GL Plan, or a 2750GL, or 2670GL plan. It is a 2079 GL plan. Adding 450GL to that does not make it a 3200GL plan in relation to which constraints might (or might not) cause a delivery issue for planned environmental water flows. Even accepting against all the evidence

[22] 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," 28/3/12. Chrissie Bloss et al, "Hydro-ecological Analysis of the Proposed Basin Plan – South Australian Floodplain," March 2012; Heneker and Higham, "Review of the Basin Plan Water Recovery Scenarios for the Lower Lakes, South Australia: Hydrological and Ecological Consequences", March 2012.

[23] MDBA, "Hydrologic Modelling of the Relaxation of Operational Constraints in the Southern Connected System: Methods and Results," October 2012.

that supply measures work perfectly and account for an equivalency of 605GL, that water is not added to the environment. It simply does not have to be recovered. Even with an extra 450GL of environmental water, the Basin Plan would be one in which about 2500GL of real water has been recovered for the environment. There is no evidence that constraints become an issue for any plan less than 2800GL (properly managed environmental flows would not cause flooding at this level of recovery, or likely beyond). As such, there is no basis for any claim that the 450GL of water for enhanced environmental outcomes should not be recovered until constraints are fully addressed. The tired argument that there should be no recovery of this extra environmental water until there is progress on or achievement of constraints measures should be finally rejected now.

16. The third part of the context for the 450GL is the SDL Adjustment involving the thirty-six supply measures said to make up an equivalency of 605GL of water on an average annual basis. These measures and the adjustment do not represent "best available scientific knowledge." They represent a gamble with the environment for which there is no statutory warrant[24]. This matter is addressed in more detail in Section 3 below.

17. The overuse of Basin water resources (a statutory fact pursuant to s.21(2) of the *Water Act*), combined with an inadequate water recovery target that does not reflect an *Environmentally Sustainable Level of Take*, are reason alone for the urgent recovery of the 450GL of water referred to in s.86AA(3)(b) of the *Water Act* and Schedule 5 of the Basin Plan.

[24] RC Report, page 334

Section 2

450GL

18. There is some misconception that the 450GL of extra water for enhanced environmental outcomes is optional rather than mandatory. The targeted for "aims" of s.86AA(2)) are of course not mandatory. They relate to environmental outcomes which are to be aimed for, but cannot be mandated. For example, you cannot mandate that two million tonnes of salt will be discharged from the Murray Darling Basin as a long-term average, any more than you can mandate that the health of forests or the habitats of fish will be improved. The overall object of s.86AA of enhancing environmental outcomes by an increase in the volume of water available for the Basin by 450GL is however mandatory. It "is to be achieved.": s.86AA(3).

19. Leaving aside the text of 86AA, the 450GL is mandatory for another reason. This extra water for the environment is essential for the Basin Plan to be considered a law that seeks to "faithfully implement"[25] the international treaty obligations that underpin the constitutional validity of the *Water Act*. Any person that says that either the 450GL is either not mandatory or not essential is saying this (wittingly or not):

    The Basin Plan is constitutionally invalid, but I don't care.

    It should not have to be stated[26], but policy and law makers, and governments, should care about this.

20. Delivery of the 450GL of extra environmental water was an election commitment by the Albanese Labor Government. At its core, it is an overdue commitment to act in a manner heading towards lawfulness. In the great tradition of cooperative Federalism, all of the Basin States made this pledge back in 2012. This commitment clearly cannot be construed as one of going down the same path (aimlessly, and not very far) that we have been over the last decade. That would see the 450GL recovered in about a

[25] This is constitutionally required, given the reliance on s.51.xxix of the Constitution for the validity of the Basin Plan

[26] But does, based on conduct over the last ten years.

thousand years[27]. Neither on-farm or off-farm efficiency measures are going to achieve anything like the recovery of 450GL being returned to the environment. That is obvious, as found by the authors of the *"Second Review of the Water for the Special Account,"* (December 2021). In any event, the previous Federal government abandoned on-farm efficiency measures, and the same review found that the 450GL could not be recovered by off-farm efficiency measures.

21. There should be no need now to refute the view that the 450GL should largely be recovered for the environment by the voluntary purchase of water entitlements. This must take place in the Southern Basin. Not only has the modelling for the benefits of the 450GL been done on the basis of recovery in the Southern Basin, as was made clear in the MDBA's "ELST Report", it is almost impossible to achieve positive environmental outcomes in the south from water recovered in the northern Basin [28]. Any attempt to recover the 450GL of extra water for the environment from the Northern Basin would be as good as a broken electoral promise, as there is no credible or peer reviewed science that even suggests that the enhanced environmental outcomes outlined is s.86AA of the Water Act and Schedule 5 of the Basin Plan can be achieved by recovering water in the North. This is ultimately a matter for science, not policy makers, but there is no science that properly supports some wild idea that the 450GL can be recovered from the Northern Basin and still achieve the environmental aims of s.86AA of the *Water Act* and Schedule 5 of the Basin Plan.

22. Assertions have been made in the past (and are currently being made) that voluntary purchases of water for the environment (usually called "buy-backs") cause economic damage to rural or regional communities[29]. What is said is that water entitlement purchases:

(a) cost jobs; and

(b) create a "Swiss cheese" effect leaving irrigation suppliers with customers spread out over greater distances; and

[27] 4.5 GL recovered in ten years when 450GL is needed indicates that prior governments have not seen time as being of the essence.

[28] MDBA, "The Proposed 'Environmentally Sustainable Level of Take' for Surface Water in the Murray Darling Basin," 2011.

[29] For certain very water-dependent towns this might have been true for some acquisitions of water entitlements

(c) harm the social fabric of local communities because they lead to population reduction (and hence closure of schools and services).

23. These assertions are not supported by peer reviewed economic research or papers, or defensible economic reports (there are a few reports floating around, or that have been regurgitated[30], but they do not make persuasive arguments. Much of this kind of work was dealt with by Commissioner Walker SC in his Royal Commission report[31]). What has been established by such work concerning the voluntary purchase of water entitlements is that:

(a) there is no proportional relationship between a reduction in water use and a reduction in agricultural production (and the assertion of such a relationship could be debunked by an "economics undergraduate[32]); and
(b) buying water is by many factors cheaper to government (and hence all taxpayers) than seeking to recover it through efficiency measure infrastructure upgrades; and
(c) the money obtained from sales of water entitlements in the past was almost always spent locally; and
(d) a majority of farmers/irrigators sold only a partial entitlement, kept their delivery rights, and remained in farming/irrigation; and
(e) resulting reductions and debt meant people had more money to spend locally; and
(f) the economic impacts in rural and regional Australia from things like technological change and mechanisation (alone), increased urbanisation, changes in soil condition, and fluctuations in commodity prices are far greater than any impact of the Basin Plan: and
(g) water entitlement purchases are a more certain means of recovering water[33].

24. Often forgotten in the debate concerning the voluntary purchase of water is the economic value of recovering it for the environment. Almost every report prepared on

[30] The correct word
[31] RC report, findings 9.4, 9.5 and 9.6. Pages 61-2; 391-398.
[32] RC Report, finding 9.5 page 61.
[33] There are too many papers (most peer reviewed) to cite here, as well as other evidence. Note also the ONLY independent review of social and economic impacts from on farm efficiency measures.

the economic impacts of water recovery has neglected the non-market benefits of the recovery of water for the environment. The *Water Act* and Basin Plan seek to protect and restore the rivers, wetlands, and watercourses of the Murray-Darling Basin[34]. Some people might consider this a moral obligation, not just a legislative one. It is certainly part of the concept of intergenerational equity, itself an aspect of "environmentally sustainable development" (ESD). Are healthy rivers and wetlands (many of international significance) of no value?

25. The principles of ESD are matters the MDBA was bound to take into account when preparing the Basin Plan, and must also be taking into account by the relevant Minister: *Water Act* s.21(4)(a). Accepting though that money is very important, there is real economic value associated with increased environmental flows. It seems however this is another fact that can be ignored by those that do not support further lawfully required water recovery for the environment. That does however mean relegating almost to insignificance that post the millennium drought domestic tourists alone made more than 17 million trips to the Basin, staying a total of 50 million nights, and generating more than $6.5 billion in revenue. Expenditure from international tourists amounts to about a billion.[35] The direct and indirect economic activity from tourism in the NSW and Victorian Murray regions alone amounts to hundreds of millions of dollars.[36]Presumably none of these tourists came to see dead fish, algal blooms, dead trees, or degraded wetlands. As a matter of obviousness, tourism in the Basin is heavily dependent on the health and wildlife of its watercourses and wetlands.

26. While the 450GL should be recovered by voluntary purchases of entitlements, in principle some of this water might be recovered through efficiency measures, provided real water is recovered, and provided this can be done by 30 June 2024 (which seems highly unlikely). It can be noted here too that even water recovery from efficiency measures has been claimed by some, including governments, to have harmed rural communities. That was debunked by the only independent review of efficiency measures, conducted by Ernst & Young in 2017-18. The authors of that report concluded off-farm measures were of positive benefit, and on-farm measures had no

[34] Water Act, s.3(d)
[35] See Tourism Australia; see also "Australian Regional Tourism NSW" submission to MDBRC.
[36] Regional Tourism Satellite Account Tourism Research Australia.

negative impacts[37]. The Murray-Darling Basin Ministerial Council commissioned this report. It appears to be collecting dust somewhere. Not because it does not represent best economic opinion based on rigorous analysis of data, but seemingly because that opinion was inconvenient to some governments[38]. Similarly, a Report prepared by Marsden Jacobs on the economic impacts of buybacks in the Murrumbidgee Irrigation Area (commissioned by the then Department of Agriculture, Water and Resources) is usually not quoted by governments or opponents of the Basin Plan, presumably because the authors' opinion was that the economic impacts of buybacks were likely to be "very small if not neutral"[39].

27. Related to the recovery of water for the environment, although not addressed in this paper, is the issue of indigenous water justice. Respectfully, that subject matter requires separate discussion, and by a different author. Suffice to say that overuse of water to the extent it degrades our environment is arguably a scam on the First Nations Peoples of the Murray-Darling Basin. So too is inadequate recovery for the environment now.

28. Finally, this observation concerning the purchase of water for the environment should be made. Those that oppose the voluntary sale of water entitlements are in effect saying this:

if you own a water licence or entitlement, you should not be able to sell your water voluntarily to your government for environmental purposes.

The moral and ethical justification for this position has not yet been made clear.

[37] Ernst & Young, "Analysis of Efficiency Measures in the Murray-Darling Basin: Opportunities to recover 450GL in additional Environmental Water by 2024 through Efficiency Measures by 2024 with Neutral or Positive Socio-Economic Impacts – Independent Report to the Murray-Darling Basin Ministerial Council", Jan 2018.
[38] The fierce determination of those governments in respect to the Basin Plan to ignore facts, as well as best science and economics, has at least been consistent.
[39] Dwyer, Clarke, Carr, "Economic Effects of the Commonwealth Water Recovery Programs in the Murrumbidgee Irrigation Area" (Marsden Jacobs), October 2017.

Section 3

SDL Adjustment – 605GL

29. Opponents of the recovery of 450GL of water for enhanced environmental outcomes, whether by efficiency measures or the voluntary sale to the Commonwealth of water entitlements, have so far consistently maintained that the "supply measure" projects under the SDL Adjustment represent a volume of 605GL that need not be recovered. It is claimed these measures will produce "environmental equivalency" against a benchmark without recovering that water.

30. The SDL Adjustment mechanism is best described as an idea or "concept." Whatever word is picked, at the level of concept, using less water for the same environmental outcomes is obviously a good thing if it can be achieved. A mechanism for water recovery under the Plan to be adaptable is also potentially of benefit. The SDL Adjustment mechanism however cannot properly be described as even as a scientific "hypothesis," much less a theory, as it appears only to be based on certain modelling outcomes, not (and contrary to the Basin Plan) actual empirical observations[40]. As such, any contention that it is "best available scientific knowledge" (in other words, lawful) is currently an impossible assertion to make good. The SDL Adjustment on its own risks both the ecological and legal legitimacy of the Basin Plan.

31. The 605GL SDL Adjustment is founded on, in large part, an "Ecological Elements Method". An increase in sustainable diversion limits as a result of the various supply measure projects must have "equivalent environmental outcomes" compared with "benchmark environmental outcomes": section 7.15 of the Basin Plan. The benchmark environmental outcomes are assessed on model runs following the assessment of "benchmark conditions of development." A model run comparing the "benchmark environmental outcomes" is compared to a model run which includes an SDL adjustment for the supply measure contributions. The comparison is conducted using ecologically weighted "scores" using twelve ecological elements: four waterbirds, two fish species, and six "vegetative elements."

[40] See Royal Commission Report p297 and s.7.17(2)(a) of the Basin Plan

32. For any reader of this paper that finds the paragraph above to be confusing, all of this and more is "explained"[41] in Schedule 6 of the Basin Plan[42].

33. It is a mystery why Federal Parliament enacted Schedule 6 of the Basin Plan. How wise it is for a country to legislate highly complex and uncertain "science" can be debated elsewhere [43] . What has been legislated more than risks being described as incomprehensible. Whether or not what has been legislated is science, or only something masquerading as science, no one really seems to know. Not even scientists, as is made clear from what follows.

34. Reports commissioned to support the Ecological Elements Method are highly qualified. Brewsher Consulting conducted one review, and expressed the opinion that the models used had been operated in accordance with Schedule 6 of the Basin Plan. This is hardly of comfort, given that their review expressly excluded the components of the modelling[44]. A computer model might be fine as a form of simplification of reality, but the inputs should be disclosed. A second independent review panel concluded that the Ecological Elements Method was defensible and fit for purpose within the limits of its terms of reference. However – and this is crucial both legally and environmentally – it described the method as *"novel and untried," "without precedent,"* and one in which *"no one should assume that the adoption of the* [method] *is without significant uncertainty or risk"*[45], that is based on a *"limited"* state of scientific knowledge. A separate expert advisory panel said there was a *"substantial error space"* inherent in the model used which was *"heavily reliant on expert judgments"* and *"only partly based on knowledge of robust providence."*[46]

[41] A euphemism
[42] No responsibility for the well-being of anyone who reads Schedules 6 or 6A of the Basin Plan is taken by the author of this paper. Liability Limited by a Scheme under the Professional Standards Legislation.
[43] It was described as "difficult, bordering on impenetrable, statutory drafting" by Commissioner Walker SC in his Royal Commission report at page 293, and an unusual "attempt to distil into statutory language what is a scientific procedure".
[44] Brewsher Consulting, "Independent Review of Hydrologic Modelling for SDL adjustments," 30/9/17
[45] Justin Brookes et al, "SDL Adjustment Ecological Elements Method Development Report: Review of Final Project Report," 30/3/14
[46] Peter Davies et al, "Murray Darling Basin Plan SDL Limits of Change Review: Independent Expert Advisory Panel Report," September 2017

35. If the above is not sufficient to sound the alarm on the SDL Adjustment as not being within light years of legality[47], there is currently no available report, or independent review, which provides support for the volumetric change to the water recovery target under the Basin Plan as a result of the adjustment. That is, there is no publicly available or tested science that supports the 605GL figure. A volume which could have been written on the back of an envelope.[48]

36. All of this ought to be considered very embarrassing. That is not a criticism of the authors of the abovementioned reports and reviews. It is a criticism of the manipulation that has been used to suggest they provide support for a reduction in the Plan of 605GL (or any amount), and that this part of the Plan represents "best science".

37. It may be that one day the uncertainties in the Ecological Elements Method will be reduced. With improved science, maybe, one day, some iteration of it might constitute "best available scientific knowledge." The fact is, for now, it represents no more than a speculative hope and an uncertain experiment with the environment. It is untenable to suggest that such an approach is countenanced by the *Water Act*. The potential fraud on the environment represented by the 605GL SDL Adjustment was described by Bret Walker SC as a *"gamble that is wholly contrary to the objects and purposes of the Water Act"*[49].

38. The point of all this is that it has been an extraordinary position for governments to take over the last decade or more that the 605GL associated with supply measures should be considered as "in the bag"[50], but we need not bother recovering the 450GL. The massive uncertainties surrounding the non-recovery of 605GL per year based on the supply measure projects[51] is all the more reason why time is of the essence to recover the 450GL of water for the environment pursuant to s.86AA of the *Water Act*. If that means legislative changes to the *Water Act*, so be it. If that means repealing the cap on water buy-backs, so be it. There is no principled way of moving forward other than for the

[47] A paraphrase of Commissioner Walker SC
[48] And is rumoured to have been arrived at this way.
[49] Royal Commission Report p334
[50] Or "in the rivers"
[51] A government acting responsibly might think it a good idea to stand up an independent science review of the SDL adjustment mechanism.

Federal Government to urgently recover the 450GL of water on the best possible terms for all taxpayers – that is, by prompt voluntary purchases of that water.

Conclusion

39. The Basin-wide water recovery target is unlawful, not based on best science, and risks the constitutional validity of the Basin Plan. The SDL Adjustment does not represent best science, and there is no publicly available science which justifies the 605GL reduction in water recovery. It is a potential fraud on the environment, which warrants independent scientific review. Recover of the extra 450GL for the environment is a minimum step toward environmental and legal integrity that should be taken now, primarily (perhaps entirely) by the voluntary purchase of water entitlements in the Southern Basin. Any legislative changes to facilitate this should be promptly enacted.

Richard Beasley SC
Commissioner for Murray River (SA)
16 May 2023.

Annexure C

MURRAY DARLING BASIN PLAN: IMPLEMENTATION REVIEW 2023

SUBMISSION TO THE PRODUCTIVITY COMMISSION

1. Thank you for the opportunity to provide a submission for this Review. Having regard to the Commission's "key questions", I have addressed items 8, 1 and 4 (in that order).

Key Question 8: "Does the implementation of the Plan reflect a commitment to the best available scientific knowledge?"

ESLT determination did not reflect best science

2. The short answer to this question is "no". With respect though, the question could arguably be phrased differently. The word "reflect" is not to be found in s 21(4)(b) of the *Water Act* 2007 (Cth) (**Water Act**). This provision requires the MDBA (and the relevant Minister) to "act on the basis of the best available scientific knowledge" in exercising their functions. For the MDBA, this included the development of the Basin Plan, and in particular the setting of the "environmentally sustainable level of take" (**ESLT**) for the Plan. The ELST is itself defined in s 4 of the Water Act by purely scientific environmental criteria (see [9] below). Perhaps because the constitutional validity of the Basin Plan depends on the external affairs power (Water Act, s 9A), and hence the "faithful implementation" through the Plan of a variety of international environmental treaties and agreements, there is none of the wiggle room here that some might prefer. The Basin Plan is not to be merely "informed by best science", nor is it lawful to simply "have regard to" best science.

3. The MDBA had to "act on" best science in developing the Plan, and determining the ESLT. This did not happen. No-one who has examined this matter in detail could rationally or reasonably (in both the legal and broader sense of that word) reach a different conclusion. Yet politicians and bureaucrats maintain the farcical position that the Basin Plan is lawful. With so much taxpayer money involved (not to mention maters like the Rule of Law, or ethical considerations) it is beyond time the Basin Plan was made lawful.

4. Picking up this theme, the statutory language of the Water Act did not go unlost on the Commission in its March 2010 research report titled "Market Mechanisms for Recovering Water in the Murray-Darling Basin" (**Market Mechanism Report**). Specifically, the

Commission noted that the ESLT was defined by only environmental criteria, and as a level of take that cannot "compromise" those criteria.[1]. It was suggested that some of the statutory language was "ambiguous", but that it "would appear to establish a very high hurdle that could consign all other users to share whatever remains after meeting the environment's needs"[2]. Reference was had to the objectives of the Water Act set out in s 3, and a recommendation was made that if "strict legal interpretation" precludes the ability to "optimise economic, social and environmental outcomes" then "the Water Act should be amended".[3]

5. The statutory language defining the ESLT is not ambiguous. It is clear. The objects of legislation are a tool for construction. They do not change clear text. The setting of the ESLT is by means of consideration only of environmental criteria. No other interpretation is open. Should it be thought desirable to "massage" or reduce the water to be recovered for the environment under the Basin Plan, then as the Commission has observed the Water Act would need to be amended. Remembering though that for validity the Basin Plan must "faithfully implement" a myriad of treaty obligations, there are legal risks in amending the Act in such a manner that would allow the ESLT to be determined by more than environmental criteria. That said, simultaneous optimisation of economic, social and environmental criteria seems a vague notion in any event.

6. The unlawfulness of the Basin Plan was also noted, indirectly, by the Commission in its 5-year Assessment dated 19 December 2018. At page 3 of the 2018 Assessment, the Commission (correctly) said this:

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

[1] Market Mechanism Report p. xxix to xxxi
[2] Ibid
[3] Ibid

7. The "negotiation and compromise", and the "trade-offs", are addressed below. None is authorised by the Water Act. The drafters of the Plan attempted to dress politics up as science. They failed if they thought no one would notice. At a practical level, so far they have succeeded. The integrity of the Plan, the environment, and good governance are the losers.

8. None of the above, or what follows, should be taken as a preference for a legal challenge to be commenced seeking to have all or part of the Basin Plan declared unlawful. That risk remains, but there is evidence that even the current unlawfully determined water recovery (ESLT/SDL) under the Basin Plan has been of some environmental benefit, especially at times of low flows. Improving the Plan is preferable to legal challenge. This could have the added advantage of making it lawful.

9. The ELST is defined in the Water Act as a level of take which, if exceeded, would compromise (i.e., damage):
   (a) key environmental assets; or
   (b) key ecosystem functions; or
   (c) the productive base[4]; or
   (d) key environmental outcomes
   of the Basin.

10. These are solely environmental criteria, within the judgment of appropriately qualified scientists, not policy or law makers. Unsurprisingly then, the Basin Plan, and the ESLT are be prepared and determined by the drafters acting *"on the basis of the best available scientific knowledge"*: s.21(4)(b) of the *Water Act.*

11. As mentioned above, because of the reliance on the external affairs power, The Basin Plan must *"faithfully implement"* international environmental conventions upon which the *Water Act* is based. It has to *"give primacy to the environment"* before social or economic effects are considered. If the Basin Plan is *"incompatible with the environmental conventions, then it will be unconstitutional because it is those conventions that were "relied upon to get the constitutional power for the Water Act."*[5]

[4] "ecologically" productive base
[5] Quote of Professor George Williams: see RC Report, Page 194

12. Science (including "best available science") involves rigour, transparency (not just to reflect what is "science", but in giving effect into the word "available" in the statutory text), testing, and replication. Eminent scientists have said repeatedly (both under oath, and in peer reviewed scientific literature) that the manner in which the 2750GL annual recovery figure was determined is opaque, and as such incapable of being replicated[6]. It either does not reflect an ESLT, or there is no defensible scientific evidence to establish (peer reviewed or otherwise) that it does[7]. Our scientific community, and hence the public, has not been informed in any meaningful way as to how the volume of 2750GL (or the 605GL SDL Adjustment) was determined, and how so called "social and economic" considerations were used to reduce the original volumetric range for Basin-wide recovery (approximately 4000GL to 7000GL[8]) to 2750GL. That was an unacceptable state of affairs in 2012, and remains so today. It means scientists do not have the data and information necessary to interrogate the volumes determined by the MDBA. That is the inverse of good governance[9]. In any event, that the ESLT recovery target "had to commence with a 2" was well known at the MDBA in 2011-12[10]. Sworn evidence was given at the Royal Commission into the Murray Darling Basin was given to this effect, cooborated by many others too fearful to give evidence because of concerns for their employment. Further, at the time the Basin Plan was being finalised, it is beyond argument that the final water recovery target was a "political outcome" not a "best available science outcome"[11]. In short, science was hijacked by politics.

13. There are numerous scientific reports which evidence that the Basin-wide water recovery target does not represent an ESLT. For example, in 2011 the CSIRO (at the invitation of the MDBA) performed a review of the water recovery target which resulted in a report titled "Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray-Darling Basin"[12]. Of the many criticisms of the MDBA's then 2800GL target for water recovery, the authors of this report stated:

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[6] Combined evidence of, amongst others, Professor Jason Brookes; Professor Richard Kingsford, Professor John Williams, Dr Matthew Colloff, Mr Peter Cosier, Dr Theresa Heneker, Professor Jamie Pittock, Dr Celine Steinfeld, at the Murray Darling Basin Royal Commission.
[7] Ibid
[8] See "The Guide" to the proposed Basin Plan, 2010
[9] The OECD has long identified poor water governance as a major risk to the environment/water resources.
[10] Sworn evidence of David Bell at Royal Commission, plus multiple other sources
[11] For example, evidence of Karlene Maywald at Royal Commission
[12] Young et al, CSIRO, November 2011

(a) Modelling data for climate change impacts to 2030 was available, but not used.

(b) A level of take *"represented by the 2800GL/yr. is not consistent with the hydrologic and ecological targets".*

(c) A 2800GL scenario does *"not achieve the majority of the hydrological targets"* and meets only *"55% of the achievable targets at either "high risk" or "low risk" frequency."*

(d) *"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."*

14. The Productivity Commission should make the same findings as Commissioner Bret Walker SC at 5.5 of in his Murray Darling Basin Royal Commission Report (RC Report, p 54) (January 2019) – that is, in "determining the Basin-wide ESLT and then SDL, the MDBA failed to act on the best available scientific knowledge". In short, the ESLT does not reflect best science. It should recommend new determinations be done according to law.

SDL Adjustment does not reflect best science

15. This part of the submission relates to Chapter 7 of the Basin Plan, and Schedules 6 to 6A. The Productivity Commission is well acquainted with the SDL Adjustment mechanism which, through "supply measures", mean 605GL (or perhaps 543GL) of water need not be recovered for the environment due to asserted "environmental equivalency".

16. The best thing that can be said about the SDL Adjustment for supply measures is that it is a good thing that the Basin Plan is adjustable. Nothing else about it is good, or lawful, or could be said to "reflect" the best available science. It could otherwise be described as some kind of "pea and thimble" trick with the environment, or probably more accurately a fraud on it. That word is used in the full understanding and broadest sense of that word.

17. The SDL Adjustment mechanism is an idea or "concept." Whatever word is picked, at the level of concept, using less water for the same environmental outcomes is obviously a good thing if it can be achieved. A mechanism for water recovery under the Plan to be adaptable is also potentially of benefit. The SDL Adjustment mechanism however cannot properly be described even as a scientific "hypothesis," much less a theory, as it appears only to be

based on certain modelling outcomes, not (and contrary to the Basin Plan) actual empirical observations[13]. As such, any contention that it reflects "best available scientific knowledge" (or is lawful) is currently an impossible assertion to make good. The SDL Adjustment on its own risks both the ecological and legal legitimacy of the Basin Plan.

18. The 605GL SDL Adjustment is founded on, in large part, an "Ecological Elements Method". An increase in sustainable diversion limits as a result of the various supply measure projects must have "equivalent environmental outcomes" compared with "benchmark environmental outcomes": section 7.15 of the Basin Plan. The benchmark environmental outcomes are assessed on model runs following the assessment of "benchmark conditions of development." A model run comparing the "benchmark environmental outcomes" is compared to a model run which includes an SDL adjustment for the supply measure contributions. The comparison is conducted using ecologically weighted "scores" using twelve ecological elements: four waterbirds, two fish species, and six "vegetative elements."

19. The Commission should recommend the repeal of Schedule 6 of the Basin Plan. Putting it most politely, legislating complex and uncertain "science" is unwise. What has been legislated more than risks being described as incomprehensible. Whether or not what has been legislated is best science, or only something masquerading as science, no one really seems to know. Not even scientists, as is made clear from what follows.

20. Reports commissioned to support the Ecological Elements Method are highly qualified. Brewsher Consulting conducted one review, and expressed the opinion that the models used had been operated in accordance with Schedule 6 of the Basin Plan. This is hardly of comfort, given that their review expressly excluded the components of the modelling[14]. A computer model might be fine as a form of simplification of reality, but the inputs should be disclosed. A second independent review panel concluded that the Ecological Elements Method was defensible and fit for purpose within the limits of its terms of reference. However – and this is crucial both legally and environmentally – it described the method as *"novel and untried," "without precedent,"* and one in which *"no one should assume that the adoption*

[13] See Royal Commission Report p297 and s.7.17(2)(a) of the Basin Plan
[14] Brewsher Consulting, "Independent Review of Hydrologic Modelling for SDL adjustments," 30/9/17

of the [method] *is without significant uncertainty or risk"*[15], that is based on a *"limited"* state of scientific knowledge. A separate expert advisory panel said there was a *"substantial error space"* inherent in the model used which was *"heavily reliant on expert judgments"* and *"only partly based on knowledge of robust providence."*[16]

21. If the above is not sufficient to sound the alarm on the SDL Adjustment as not reflecting anything that could be described as best science, there is currently no available report, or independent review, which provides support for the volumetric change to the water recovery target under the Basin Plan as a result of the adjustment. That is, there is no publicly available or tested science that supports the 605GL figure. A volume which could have been written on the back of an envelope.[17]

22. It may be that one day the uncertainties in the Ecological Elements Method will be reduced. With improved science, maybe, one day, some iteration of it might constitute "best available scientific knowledge." The fact is, for now, it represents no more than a speculative hope and an uncertain experiment with the environment. It is untenable to suggest that such an approach is countenanced by the Water Act. It should shock nobody that in his Royal Commission Report Commissioner Walker SC found Ch 7 and Schedules 6 and 6A of the Basin Plan to be "an attempt to put into legislative form a complex, and distinctly imperfect, scientific procedure".[18] He found that the Ecological Element Method in Schedule 6 of the Basin Plan had "alarming shortcomings", and the supply measure contribution to be "the result of a highly uncertain experiment with the environment to the Basin … that is not consistent with the requirements of the *Water Act*".[19] Such findings are based on an eminent lawyers consideration of the statutory language of the Water Act, and his analysis of the grave reservations about the Ecological Elements Method made in the reports referred to.

23. The word "fraud" to describe the SDL Adjustment is not used flippantly. The Basin Plan is a scheme that anticipates that it will change, be reviewed, and evolve. That is a good

[15] Justin Brookes et al, "SDL Adjustment Ecological Elements Method Development Report: Review of Final Project Report," 30/3/14
[16] Peter Davies et al, "Murray Darling Basin Plan SDL Limits of Change Review: Independent Expert Advisory Panel Report," September 2017
[17] And is rumoured to have been arrived at this way.
[18] Key Finding 7.1, page 56
[19] Key Finding 7.6, page 57

thing. However, no rational person that has read the published expert opinion concern the SDL Adjustment could be left with any other view than there is tremendous uncertainty about the science behind it, particularly the Ecological Elements Method. How it all amounts to a volume of water – be it 543GL, or 605GL, or even 10GL – is a mystery. That would not be such a problem if it were not also a mystery to people with relevant scientific qualifications and experience. It certainly does not look an adjustment to the Basin Wide Sustainable Diversion (of a huge volume of water) that appears sufficiently science based to be lawful. It more than flirts with falling foul of s.21(4) of the Water Act ("based on best available scientific knowledge"), and it is very difficult to see how in its development or implementation any regard was had to Environmentally Sustainable Development, and in particular the "precautionary principle": see s 21(4)(a) of the Water Act.

24. The Productivity Commission should recommend that the Government establish a full and comprehensive independent review by relevant experts of this part of the Basin Plan. There is sufficient uncertainty regarding the "science" behind it that a responsible government has no proper option but to ensure that there is a fully independent scientific inquiry into the supply measures aspect of the Basin Plan.

Climate science

25. The failure of the Basin Plan to reflect best science concerning climate change is another aspect of its unlawfulness. This is discussed below in response to Key Question 4.

Key Question 1: "What needs to change to ensure water recovery targets are met and that supply and efficiency measures are delivered?"

26. Supply measures should not be delivered. They should be subject to an independent science review as described above. As to efficiency measures, this part of the submission addresses them, and the 450GL referred to in s 86AA(3) of the Water Act, and Schedule 5 of the Basin Plan.

27. The Productivity Commission is also well informed about the issue of the 450GL for the enhanced environmental aims set out in s 86AA(2) of the Water Act, and Schedule 5 of

the Basin Plan. The Commissions December 2018 Review addressed these matters and "efficiency measures".

28. Before making any submission on the 450GL part of the Plan, the following can be briefly noted about efficiency measures as a means of recovering environmental water. First, in its 2010 Market Mechanisms Review, the Commission advised that "purchasing water from willing sellers is generally the most effective and efficient means of acquiring water" and that "[f]unding irrigation upgrades is generally not a cost-effective way for governments to recover water for the environment": see Finding 6.3 and 6.4. Nothing in the Commissions 2018 Assessment contradicts these findings (see, for example, p 107).

29. Secondly, at the current rate of "delivering" the 450GL, another thousand years will be required. Thirdly, there is about 50 years of peer reviewed work throwing real doubt on whether efficiency measures actually recover the water they claimed to. The Commission would no doubt be well aware of all the published material concerning the issue of "return flows".

30. In summary then, efficiency measures have this against them:

(a) They are expensive and inefficient.
(b) They are slow to deliver water (at least for the Basin Plan).
(c) They have reliability/integrity doubts.

31. These are all good reasons for recovering water for the environment, including the 450GL, by means other than such measures.

32. Turning to the 450GL, modelling shows that a Basin Plan that returns 3200GL of water on average per year will hit 17 out of 18 key environmental flow indicator markers in circumstances where constraints are addressed.[20] This can be compared to a 2800GL Plan which only hits 11 out of 18 markers. It is sometimes contended that until "constraints" are addressed, a 3200GL plan would cause flooding and damage, and hence there is no point in recovering the extra 450GL until all issues relating to constraints are addressed.

[20] MDBA, "Hydrologic Modelling of the Relaxation of Operational Constraints in the Southern Connected System: Methods and Results," October 2012.

This is now a fallacious argument, advanced only by those who fail to comprehend the reality of the current Basin Plan and water recovery pursuant to it.

33. In its 2018 Assessment, the Commission addressed the lack of progress on "constraints": see pages 150 to 159. The Commission referred to modelling of the flow rates needed to achieve the s 86AA/Schedule 5 objectives, and it was said that "constraints need to be eased".

34. There is no doubt that progress on constraint management has been slow to say the least. This has probably been deliberate, and is an indictment on some governments. As such it is time that lack of progress on constraints was no longer used in the manner it is as (part of) the excuse for not recovering the 450GL. Further, it is important to remember that the modelling and flow rates referred to address a 3200GL Basin Plan. There is no such Plan. Nor is there a 2800GL Plan, or a 2750GL, or 2670GL Plan. We have a (perhaps at best) 2100GL Plan. Adding 450GL to that does not make it a 3200GL Plan in relation to which constraints might (or might not) cause a delivery issue for planned environmental water flows. There is no evidence that constraints become an issue for any plan less than 2800GL (properly managed environmental flows would not cause flooding at this level of recovery). As such, there is no basis for any claim that the 450GL of water for enhanced environmental outcomes should not be recovered until constraints are fully addressed. The 450GL should be recovered now. It would not be surprising, should this happen, that suddenly progress is made on constraints issues.

Recovery of the 450GL should be largely by buybacks in the southern Basin, supplemented by efficiency measures with integrity

35. The Commission should recommend that the 450GL should largely be recovered for the environment by the voluntary purchase of water entitlements. This must take place in the southern Basin. Not only has the modelling for the benefits of the 450GL been done on the basis of recovery in the southern Basin, as was made clear in the MDBA's "ELST Report", it is almost impossible to achieve positive environmental outcomes in the south from water recovered in the northern Basin (a matter that the Commission has also previously noted) [21]. This is ultimately a matter for science, not policy makers, but there is

[21] MDBA, "The Proposed 'Environmentally Sustainable Level of Take' for Surface Water in the Murray Darling Basin," 2011.

no science that properly supports some wild idea that the 450GL can be recovered from the northern Basin and still achieve the environmental aims of s.86AA of the *Water Act* and Schedule 5 of the Basin Plan.

36. Assertions have been made in the past (and are currently being made) that voluntary purchases of water for the environment (usually called "buy-backs") cause economic damage to rural or regional communities[22]. What is said is that water entitlement purchases:

(a) cost jobs; and
(b) create a "Swiss cheese" effect leaving irrigation suppliers with customers spread out over greater distances; and
(c) harm the social fabric of local communities because they lead to population reduction (and hence closure of schools and services).

37. These assertions are not fully supported by peer reviewed economic research or papers, or defensible economic reports. What has been established by such work concerning the voluntary purchase of water entitlements is that:

(a) there is no proportional relationship between a reduction in water use and a reduction in agricultural production (and the assertion of such a relationship could be debunked by an "economics undergraduate[23]); and
(b) buying water is by many factors cheaper to government (and hence all taxpayers) than seeking to recover it through efficiency measure infrastructure upgrades; and
(c) the money obtained from sales of water entitlements in the past was almost always spent locally; and
(d) a majority of farmers/irrigators sold only a partial entitlement, kept their delivery rights, and remained in farming/irrigation; and
(e) resulting reductions and debt meant people had more money to spend locally; and
(f) the economic impacts in rural and regional Australia from things like technological change and mechanisation (alone), increased urbanisation, changes in soil condition, and fluctuations in commodity prices are far greater than any impact of the Basin Plan: and

[22] For certain very water-dependent towns this might have been true for some acquisitions of water entitlements
[23] RC Report, finding 9.5 page 61.

(g) water entitlement purchases are a more certain means of recovering water[24].

38. The Commission addressed the impacts and effects of recovering water for the environment in its 2018 Assessment: see especially pages 109-117. I would defer to the Commissions work in relation to some districts or towns that suffered adverse consequences from water recovery for the environment, not all of which was perhaps done strategically in the past. I note however that when the Basin Plan and Water Act were first discussed, it was anticipated that such a large reform would almost certainly have some negative impacts for some towns or irrigation districts. This is perhaps stating no more than that large environmental and economic reform has positive and negative consequences. The idea was though for structural adjustment, and not to leave affected areas unassisted or ignored. That, as a matter of obviousness, should not happen.

39. Often forgotten in the debate concerning the voluntary purchase of water is the economic value of recovering it for the environment. Almost every report prepared on the economic impacts of water recovery has neglected the non-market benefits of the recovery of water for the environment. The Water Act and Basin Plan seek to protect and restore the rivers, wetlands, and watercourses of the Murray-Darling Basin[25]. Some people might consider this a moral obligation, not just a legislative one. It is certainly part of the concept of intergenerational equity, itself an aspect of "environmentally sustainable development" (ESD). Are healthy rivers and wetlands (many of international significance) of no value?

40. The principles of ESD are matters the MDBA was bound to take into account when preparing the Basin Plan, and must also be taking into account by the relevant Minister: *Water Act* s.21(4)(a). Accepting though that money is very important, there is real economic value associated with increased environmental flows. It seems however this is another fact that can be ignored by those that do not support further lawfully required water recovery for the environment. That does however mean relegating almost to insignificance that post the millennium drought domestic tourists alone made more than 17 million trips to the Basin, staying a total of 50 million nights, and generating more than $6.5 billion in revenue. Expenditure from international tourists amounts to about a billion.[26] The direct and

[24] There are too many papers (most peer reviewed) to cite here, as well as other evidence. Note also the ONLY independent review of social and economic impacts from on farm efficiency measures.
[25] Water Act, s.3(d)
[26] See Tourism Australia; see also "Australian Regional Tourism NSW" submission to MDBRC.

indirect economic activity from tourism in the NSW and Victorian Murray regions alone amounts to hundreds of millions of dollars.[27]Presumably none of these tourists came to see dead fish, algal blooms, dead trees, or degraded wetlands. As a matter of obviousness, tourism in the Basin is heavily dependent on the health and wildlife of its watercourses and wetlands.

41. While the 450GL should be recovered by voluntary purchases of entitlements, in principle some of this water might be recovered through efficiency measures, provided real water is recovered. It can be noted here too that even water recovery from efficiency measures has been claimed by some, including governments, to have harmed rural communities. That was debunked by the only independent review of efficiency measures, conducted by Ernst & Young in 2017-18. The authors of that report concluded off-farm measures were of positive benefit, and on-farm measures had no negative impacts[28]. The Murray-Darling Basin Ministerial Council commissioned this report. It appears to be collecting dust somewhere. Not because it does not represent best economic opinion based on rigorous analysis of data, but seemingly because that opinion was inconvenient to some governments[29]. Similarly, a Report prepared by Marsden Jacobs on the economic impacts of buybacks in the Murrumbidgee Irrigation Area (commissioned by the then Department of Agriculture, Water and Resources) is usually not quoted by governments or opponents of the Basin Plan, presumably because the authors' opinion was that the economic impacts of buybacks were likely to be "very small if not neutral"[30].

42. Following these reports, certain socio-economic criteria were agreed to at MinCo in December 2018. These criteria are absurd. They appear designed to stymie the recovery of the 450GL rather than to ensure it happens. I am sure that the Commission does not want a legal opinion, but they are also almost certainly invalid. I have a reasonable degree of confidence that I am not the only lawyer that would hold this view. They are simply not consistent with s.7.17(2)(b) of the Basin Plan. <u>The Commission should recommend their abandonment.</u>

[27] Regional Tourism Satellite Account Tourism Research Australia.
[28] Ernst & Young, "Analysis of Efficiency Measures in the Murray-Darling Basin: Opportunities to recover 450GL in additional Environmental Water by 2024 through Efficiency Measures by 2024 with Neutral or Positive Socio-Economic Impacts – Independent Report to the Murray-Darling Basin Ministerial Council", Jan 2018.
[29] The fierce determination of those governments in respect to the Basin Plan to ignore facts, as well as best science and economics, has at least been consistent.
[30] Dwyer, Clarke, Carr, "Economic Effects of the Commonwealth Water Recovery Programs in the Murrumbidgee Irrigation Area" (Marsden Jacobs), October 2017.

Key Question 4: "How well is the Plan responding to a changing climate? How should this be improved?'

> *There's this notion that you hear, "Australia has always been a land of droughts and flooding rains and it will rain again and it will all be right", and we hear that routinely. It lulls some people into a very dangerous false sense of security. Yes, it will rain again, yes this drought will break, but if droughts start lasting a little longer, start a little earlier – so instead of a three year drought, you get a five year drought, that's catastrophic to people on the land. And we lull them into a false sense of security by the narrative we get from our senior decision makers. I think that's really regrettable.*[31]

43. In 2006, significant parts of the Basin were near environmental collapse. Two factors were at play: a changing climate (less run-off into the rivers), and decades of overallocation of water (by state governments) for the expansion of irrigated agriculture. The Basin Plan does not sufficiently contemplate the likelihood of such conditions not just returning, but returning suddenly.

44. In October 2008, the CSIRO published a report titled "Water Availability in the Murray Darling Basin". It informed us that it's going to get hotter and dryer in most of the Basin in the decades to come. For every 1 degree Celsius the average daily temperature goes up (we are currently on track for a 2 to 4C daily average rise), we will have 15% less run off.

45. When the MDBA was preparing the Basin Plan, the CSIRO told it that in doing its sums on the amount of water that has to go back to the rivers, "future climate scenarios" need to be incorporated into the modelling. The MDBA instead determined the ESLT based on climate data from 1895 to 2009. The CSIRO then advised that not including climate projections into the modelling for the Basin Plan was *"not scientifically defensible",* reminding it that without more water for the environment*, "climate change will be likely to lead to irreversible ecological degradation".*

46. Commissioner Walker SC made these findings in his Royal Commission Report about using the data of "stationarity" only (1895 to 2009) instead of also incorporating climate change projections:

[31] Evidence of Prof. A Pitman at Murray Darling Basin Royal Commission

- "a head in the sand approach to the certainty of higher temperatures and less water in the Southern Basin".
- "flawed from a standard risk management approach".
- "represents a failure to prepare the Basin Plan on the basis of the best available scientific knowledge".
- Not consistent with obligations in the Climate Change Convention.
- "unambiguously demonstrates the almost farcical approach to climate change".

47. Whatever the reasons were for not including climate projections for the 2012 Basin Plan, the Commission should recommend that decision be reversed for the Review of the Plan in 2026. That work should have started.

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Annexure D

SUBMISSION TO SENATE ENVIRONMENT AND COMMUNICATIONS LEGISLATION COMMITTEE

SUBMISSION ON WATER AMENDMENT (RESTORING OUR RIVERS) BILL 2023

SUBMISSION OF RICHARD BEASLEY SC,
COMMISSIONER FOR MURRAY RIVER (SA)

Introduction

1. Thank you for the invitation to make a submission to the Committee.

2. The Summary of the *Water Amendment (Restoring our Rivers) Bill 2023* (**the Bill**) suggests that it seeks to amend the *Water Act 2007* (Cth) (**Water Act**) and *Basin Plan 2012* (Cth) (**Basin Plan**) in order to:

   (i) expand the type of projects that can deliver the Basin Plan target of 450 GL of additional environmental water;

   (ii) repeal the statutory 1500 GL cap on Commonwealth Water purchases;

   (iii) enable funds from the water for the environment special account to be used to enhance environmental outcomes in the Basin;

   (iv) provide additional time for Basin States to deliver sustainable diversion limit (**SDL**) adjustment mechanism projects;

   (v) enable the Inspector General of Water Compliance to determine SDL compliance and require action plans;

   (vi) provide for a road map for the delivery of constraints relaxation projects that cross the southern basin;

   (vii) delay the review of the Plan from 2024 until 2027; and

(viii) implement recommendations of the Water Market Reform: Final Road Map Report in relation to Water Markets and Water Management in the Basin.

3. I have primarily made submissions in relation to items (i), (ii), (iii) and (iv) above, and have made brief submissions related to items (vi) and (vii).

Context for considering the Bill

4. Without a proper understanding of the drafting and implementation of the current Basin Plan, the Bill is apt to be misunderstood.

5. In relation to the 450GL, s 86AA of the Water Act seeks to "enhance … environmental outcomes" for the Basin in certain ways: s 86AA(2). In summary those ways relate to:
   (a) salinity in the Coorong;
   (b) water levels in the lower lakes;
   (c) keeping the mouth of the Murray open;
   (d) discharging salt;
   (e) increasing flows through to the Coorong through the barrages;
   (f) providing further opportunities for environmental watering to the River Murray system;
   (g) increasing flows of rivers and streams in the River Murray system:

   (see Water Act s 86AA(2)(a)-(h) and Schedule 5 of the Basin Plan).

6. Annexure A to this submission is a paper I have previously prepared entitled *"The Unrecovered 450GL of Water for the Environment under the Basin Plan"* (16 May 2023). This Paper forms part of my submission.

Statutory Requirements for a Valid Basin Plan

7. The Water Act is an "environment first law", or one that "gives primacy to the environment"[1]. While its objects refer to "promoting the use and management of the

[1] Professor George Williams, quoted in Murray Darling Basin Royal Commission Report, January 2019, Commissioner Bret Walker AO SC (**RC Report**).

Basin Water Resources in a way that optimises economic, social and environmental outcomes"[2], the essential task the Act sets for the drafting of the Basin Plan is the determination of an "Environmentally Sustainable Level of Take" (**ESLT**). While this concerns the setting of the Basin-wide Sustainable Diversion Limit (**SDL**) (and an SDL for each water resource area within the Basin), it is perhaps best understood as a water recovery target. That is, the Water Act set the drafters of the Basin Plan the task of determining how much water on a yearly average needs to be returned to the environment from consumptive uses (like irrigated agriculture) to stop the ongoing degradation of the environment.

8. As described below, this is a matter for science, not policy-makers (or lawyers for that matter, with the exception of relevant aspects of statutory construction). Further, and perhaps understandably, given the task is a scientific one, the criteria for determining the ESLT are entirely environmental, and hence a matter for expert scientific judgment. In short, the task given to the drafters of the Basin Plan by the Water Act was to determine the volume of water that can be taken from the Basin's water resources which, if exceeded, would "compromise" (i.e. damage):

   (a) key environmental assets; and

   (b) key ecosystem functions; and

   (c) the (ecologically) productive base of the water resources; and

   (d) key environmental outcomes.[3]

9. Aside from the above, there are a few **facts** concerning the determination of an ESLT that are sometimes ignored by commentators on the Basin Plan. Some of these are addressed in the following paragraphs, as they too are relevant to a consideration of the Bill.

10. The **first** is that when Parliament enacted the Water Act it decided to make the damage done by over extraction of the Basin's water resources a statutory fact: s 21(2)(a)(i). The damage done then by decades of over-extraction of the water resources of the Basin is not something that is just scientifically provable (and obvious), it is recognised in the

[2] S 3 Water Act
[3] S 4 Water Act

law by dint of a statutory fact. The harm done to the environment is so great that a special measure was required to stop that ongoing damage: the drafting and implementation of a Basin Plan: s 21(2)(a)(ii).

11. The **second** fact is that the Basin Plan exists as a compromise. The Water Act does not require a return to the conditions of the Murray Darling prior to the widespread adoption of irrigation. Rather, it seeks a balance between the environment, and consumptive uses. We can, in short, take as much water as we want or need to for the making of profit through the growth of food and fibre (and other consumptive uses), but we must stop at the point where we start to damage the environment.

12. **Third**, the determination of the ESLT water recovery amount is not to be determined on a whim. It is required to be determined on the basis of the "best available scientific knowledge" (s.21(4)(b) of the Water Act), and by having regard to environmentally sustainable development, including the precautionary principle. It can easily be understood that "best science" might produce a range for an average Basin-wide recovery target, rather than a precise volume. However, it is not something to be negotiated, or bargained over. The volume must be the result of a scientific determination, not the outcome of an auction or some other bartering process between irrigation lobbyists, bureaucrats or politicians (or any other interested parties).

13. **Fourth**, for its constitutional basis the Water Act relies on the external affairs power given to parliament in The Australian Constitution (s.51(xxix)): s.9 of the Water Act. Unsurprisingly then, the objects of the Water Act include giving effect to various international environmental treaty and agreement obligations: s.3(b) and (c) of the Water Act. These include the Ramsar Convention, the Biodiversity Convention, and various Migratory Bird Agreements amongst others: s.4 of the Water Act. Unless the Basin Plan can be seen to be a statutory instrument that is seeking to "faithfully implement" these treaties and agreements, then its constitutional validity is at risk.

The Basin Plan, in part, is unlawful

14. Sadly, the Basin Plan was not drafted on the basis of the best available scientific knowledge. Its constitutional validity is very much in doubt, a view which might be too optimistic.[4]

15. Aspects of the Basin Plan's unlawfulness can be revealed like the figures within a Matryoshka doll. The **first** and most fundamental is that the ESLT was determined as a political compromise, not on the basis of best available science[5]. Reports authored by the CSIRO, Goyder, and the MDBA itself all indicate that a plan that recovers less than 3200GL on a yearly average will not meet the flow rates or achieve the ecological outcomes set as needed. Amongst several similar reports is: Young et al, "Science Review of the Estimation of an Environmentally Sustainable Level of Tak for the Murray-Darling Basin", CSIRO, November 2011. In this report the CSIRO expressed the view that a Basin Plan that recovered 2800GL on yearly average (the current recovery is about 2100GL) "does not achieve the majority of hydrological targets" and meets only "55% of the achievable targets at either "high risk" or "low risk" frequency". A more recent study has concluded that in the 10 years since the Basin Plan was legislated, "over two thirds of environmental water requirements assessed were not achieved"[6].

16. **Secondly**, climate change projections were not included in the determination of the ESLT, despite strong warnings from the CSIRO, including the advice that to not do so would "not be scientifically defensible", and risked "irreversible environmental degradation". In his Royal Commission Report, Commissioner Walker AO SC described this decision in these terms:

- "a head in the sand approach to the certainty of higher temperatures and less water in the southern Basin".
- "a slight on all those who live outside the Basin but who have an interest in either its economy or environment.. [and] includ[ing] anyone who pays tax".

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[4] RC Report Findings 5.1 to 5.7 pages 53-55
[5] RC Report Finding 5.5
[6] Sheldon et al, "Testing the achievement of environmental water requirements in the Murray-Darling Basin, Australia", Marine and Freshwater Research, August 2023

- "flawed from a standard risk management approach".
- "represents a failure to prepare the Basin Plan on the basis of the best available scientific knowledge".
- Not consistent with obligations in the Climate Change Convention.
- "unambiguously demonstrates [an] almost farcical approach to climate change".

17. **Thirdly**, the 605GL supply measure SDL adjustment represents a gamble with the environment "that is wholly contrary to the objects and purposes of the Water Act"[7], and hence unlawful. Various reviews of the "Ecological Elements Scoring Method" associated with this adjustment have pointed to its "significant uncertainty and risks", its large "error space"[8], and its novelty. Finding a peer reviewed or defensible report that suggests that the supply measure scheme under the Basin Plan actually represents 605GL of "environmental equivalency" (or event 10 GL) is hard to come by. It seems that this part of the Basin Plan has only been persisted with, despite its "lack of robust providence",[9] through some form of combination of bloody-mindedness, a failure to consider the relevant reviews, and the elapsing of time. Legislators and policy makers should give proper consideration to this part of the Basin Plan. A fully independent scientific review of the whole 605GL supply measure adjustment part of the Basin Plan should be stood up immediately by the government.

450GL and the Bill

18. The proposed amendments to the Water Act and the Basin Plan concerning the 450GL and its enhanced environmental objectives should therefore be seen against the background of:

(a) an unlawful and probably constitutionally invalid Basin Plan that already is recovering significantly less water for the environment than it should be;

(b) a 605GL SDL adjustment with alarming integrity and validity issues; and

[7] RC Report p 334
[8] Brookes et al, "SDL Adjustment Ecological Elements Method Development Report: Review of Final Project Report", 30 March 2014.
[9] Davies et al, "Murray Darling Basin Plan SDL Limits of Change Review: Independent Expert Advisory Panel Report", September 2017

(c) an 11-year period to recover approximately 20GL of 450GL.

19. Seen in that proper context, and subject to certain concerns addressed below from [25], the amendments proposed in the Bill to the Water Act and the Basin Plan for the 450GL are vital. In particular, it is essential that the proposed amendments that would allow the voluntary purchase of water entitlements to contribute to the 450GL be passed by the Parliament.

Voluntary Purchases of Water for the environment

20. A lawyer's opinion about the impacts of "buybacks" is only as good as the information he or she relies on. That said, an analysis of the defensible expert literature on this issue reveals that it has been associated with more disinformation than any other.

21. The various studies concerning buybacks indicate:

(a) Reducing consumptive water extraction does have a negative impact on irrigated agriculture.

(b) There is, however, no proportional relationship between a reduction in water and a reduction in farm production.

(c) Positive impacts of buybacks (spending money in local towns; reduction of debt, etc.) are ignored in many studies.

(d) Many irrigators or farmers who have sold water entitlements voluntarily in the past did not leave farming.

(e) Negative impacts of buybacks are frequently overstated.

(f) There have been many negative impacts to rural economies over the last 10 years other than the Basin Plan.

(g) Few studies factor in the positive benefits from more water to the environment.

22. A great deal of literature could be referred to that address each of the points outlined above. A convenient summary however can be found in a recent independent report commissioned by the MDBA: Wheeler et al, "Identifying the Water-related Economic Values of the Murray Darling Basin and Rating the Quality of Water Economic Studies", School of Economics and Public Policy, University of Adelaide, 23 June 2023, Peer Review by Professor Jeff Connor. In addition to matters related to [21] above, this report also provides an analysis of some of what the authors describe as the "low quality" studies, often referred to by opponents of voluntary sales of water entitlements. In relation to many consultancy studies, the authors said this:

> *The review identified many internal and external validity issues in the economic modelling studies. These issues included: small sample sizes; statistical modelling issues; causal policy impacts; sample selection biases; inadequate documentation; and no independent peer review. What was also clear was that studies that predicted significant impacts from water recovery were rated as low quality in our quality assessment, versus studies that suggested the impact was far less – which were much more likely to be rated as high quality.*[10]

23. Two further things that can be said on this issue: **first**, it is remarkable that anyone would think that a large environmental and economic reform like the Water Act and Basin Plan would not have outcomes that are both positive and negative. To the extent that the Basin Plan, and the recovery of the 450GL, is proven to have serious negative social or economic consequences, those consequences should be avoided where possible. Where established, they should be the subject of reasonable structural adjustment measures. So much was said by former Prime Minister Howard at the National Press Club in January 2007, when he first mooted the drafting of what became the Water Act.

24. **Secondly**, no study I have seen that emphasises the asserted negative impacts of buybacks addresses the "moral" obligation of protecting the environment, or obligations of inter-generational equity. And none explain the ethical case for

[10] Wheeler et al (2023) p xii

preventing a water entitlement holder from selling that entitlement to their government for an environmental purpose.

Concerns about the Bill

25. The proposed repeal of s 86AD(4) and of the 1500GL cap (Div 5 of Part 2, s 85C and D) is welcome. However, I am concerned about some of the wording of the proposed amendments to s 86AD(2)(a), s 86AD(2)(b) and the insertion of the proposed s 86AD(2A): items 2, 3 and 6 of the Bill.

26. The wording to be omitted is "further the object of this **Part**", with the insertion instead of "promotes the objects of this **Act** and has a substantial aim of furthering the object of this Part". Such a change is unnecessary and inappropriate. The 450GL relates to the objectives of Part 2AA of the Water Act: see [6] above, and s 86AA(2)(a) to (h) and Schedule 5 of the Basin Plan. To relate the 450GL to the objects of the *Act* instead of to these objectives is an imprudent attempt to dilute what this water seeks to achieve environmentally. The proposed words "substantial aim" are weasel words that defy precise definition. What would constitute "substantial" in the context of this provision? Why is "substantial" necessary?

27. Of concern is that these proposed changes are related to the notion I have heard that Water for the 450GL can be purchased from the northern Basin rather than the southern Basin. I have two main objections here. **First**, as a matter of science, I am not aware of any expert report which provides evidence that the acquisition of water for the environment in the northern Basin can achieve the enhanced environmental objectives outlined in s 86AA(2) of the Water Act, and Schedule 5 of the Basin Plan. There is, as a matter of obviousness, no connectivity (or limited connectivity) between the northern Basin and the southern Basin when conditions are dry. I note that all of the modelling for the enhanced environmental outcomes for the 450GL was done assuming water recovery in the southern Basin: see Schedule 5 of the Basin Plan. I am unaware of any modelling that has been done (or made publicly available) relating to recovery of the 450GL in the northern Basin to achieve the environmental outcomes specified in the Act and Schedule 5 of the Basin Plan.

28. **Secondly**, as a matter of law, s 86AA(2)(h) expressly refers to the modelling just referred to. That indicates to me that the statutory warrant for the acquisition of entitlements for the 450GL is limited to acquisitions in the southern Basin. However, to aid certainty, the Bill should include a provision that purchases of water entitlements towards the 450GL should be in the southern Basin.

29. The recovery of the 450GL should be completed by the extended date of 2027. The Bill does not provide for this, which is an omission. By this time it will be more than 15 years since the Basin Plan was legislated. In circumstances where the Plan is already recovering insufficient water for the environment, this is already an unduly long time. Further, the proposed s 7.08B of the Basin Plan (item 21 of the Bill) seems to provide that environmental water recovered after 31 December 2027 will not contribute to "held environmental water". And yet there is no provision guaranteeing the recovery of the 450GL by 31 December 2027. The proposed s 7.08B of the Basin Plan should therefore not be enacted in its current form.

30. I can see no good reason for what is proposed as the amendment to s 7.15(2)(b) of the Basin Plan: item 37 of the Bill. As stated above, all aspects of the Supply Measure SDL adjustment should be the subject now of an independent scientific review. In the meantime, I do not understand the reason behind seeking to give the MDBA unilateral approval power over any amendment to a method.

Efficiency Measure schemes for recovery of the 450GL

31. While the majority of the 450GL will need to be recovered through voluntary purchases, there might be some (limited) scope for some water for the enhanced environmental outcomes by efficiency measures. This would depend on cost, and the integrity of any approved measures.

32. As a matter of obviousness, using water as efficiently as possible must be a good thing. However, while again it is a matter for expert opinion, there exists decades of peer reviewed and defensible science that suggests water recovery through efficiency schemes may in fact be an inefficient, uncertain, and unduly expensive means of recovering water for the environment. This includes work of the UN's Food and

Agriculture Organisation[11]. Apart from issues of "return flow" (on which there are numerous studies), it is uncontroversial that recovery of water from efficiency measures is at least three times more expensive to taxpayers than voluntary purchases.

33. Another difficulty for any efficiency measures scheme remains the criteria agreed for them at the Ministerial Council meeting of December 2018. While these criteria have not found their way expressly into the Basin Plan, they apparently are "government policy". In my opinion, there are a number of difficulties with these criteria, including (but not limited to) the following:

(a) They are invalid: they are inconsistent with s 7.17(2)(b) of the Basin Plan.

(b) They are incomprehensible, in that no guidance is provided about what, precisely, they mean. As one example, the criteria require that "anticipated socio-economic impacts" for an efficiency measure be "addressed". What constitutes an "impact"? How is such an impact to be measured, or analysed? By whom? Under what parameters? As another example, an efficiency measure must "contribute to regional investment and development". Contribute in what way, and to what extent? Who determines this, and upon what evidence is this assessed? Hearsay? Anecdote? Modelled or peer reviewed economics?

(c) They would prevent any efficiency measure being approved.

34. For these reasons the 450GL should entirely or primarily recovered by voluntary purchases of entitlements in the southern Basin.

Conclusions

35. On the basis of the matters outlined above:

(a) It is crucial that the 450GL of water for enhanced environmental outcomes be recovered as soon as possible. The Basin Plan as currently legislated recovers too

[11] Perry and Seduto, "Does improved irrigation technology save water?", Food and Agriculture Organisation of the United Nations (2107).

little water for the environment, and is in part invalid for the reasons outlined at [14] to [17] above.

(b) The repeal of s 86AD(4) and of the 1500GL cap (s 85C and 85D) would be steps in the right direction.

(c) The proposed changes to the wording of s 86AD(2)(a) and (b) by seeking to align the provision to the objects of the Act rather than to the objects of Part 2AA (and Schedule 5 of the Basin Plan), and the insertion of proposed s 86AD(2A), are inappropriate for the reasons outlined above at [25] to [28].

(d) The Bill should include a provision guaranteeing the recovery of the 450GL by the end of 2027. It should include a provision that the water be recovered by voluntary purchases of water entitlements in the southern Basin: see [20] to [24] and [27] to [29] above.

(e) The proposed s 7.08B of the Basin Plan should not be legislated in its current form: see [29] above.

(f) S 7.15(2)(b) of the Basin Plan should not be amended as proposed. Instead, an independent science review of the entire supply measure SDL adjustment should be established: see [30] above.

(g) The socio-economic criteria agreed to at MinCo in December 2018 should be abandoned as government policy, and perhaps by repeal of s 7.17(2)(c) of the Basin Plan: see [33] above.

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28 September 2023

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Annexure A

The unrecovered 450GL of water for the environment under the Basin Plan

Executive Summary

1. The revenue generated by agriculture in the Murray Darling Basin is substantial. When criticism of the Basin Plan is made however, rarely is there focus on the benefits (economic and otherwise) of water recovered for the environment. Some of those benefits, particularly in relation to tourism revenue, are mentioned later in this paper. Tourism revenue, which all Basin States share, amounts to about $11 billion annually[12]. Depressed ecologists aside, it is anticipated less people not more would visit permanently degraded rivers and wetlands.

2. The Basin Plan is a child of the commonwealth *Water Act* 2007. That Act, which was drafted to facilitate a compromise between agriculture and healthy ecosystems, has recovered too little water for the environment, not too much. The Basin Wide water recovery target of 2750GL – 605GL – 70GL + 4.5GL/450GL: (see this "equation" in its fully inglorious form at [11] below) does not reflect an *"Environmentally Sustainable Level of Take"* as it must under the *Water Act*. Nor is it a volume determined on *"the basis of the best available scientific knowledge,"* as the law also requires[13]. While the water recovery target for the Basin Plan should have been determined lawfully and in accordance with the requirements of the relevant legislative provisions, the point of this document is not to make out the obvious case for that. It is to highlight that in circumstances where insufficient water for the environment has been recovered under the Basin Plan (environmentally and legally), it is imperative that the Federal Government fulfil its election promise to recover the 450GL now.

3. The assertions put forward in opposition to the recovery of the 450GL for "enhanced environmental outcomes" are just that: in general they amount to no more than claims

[12]MDBA, "The Murray Darling Basin and why it is important", (mdba.gov.au)

[13] These are not mere assertions. They represent findings made by Bret Walker SC in his "Murray Darling Basin Royal Commission Report" (**RC Report**), and are based on thousands of pages of oral evidence, dozens of expert reports, and hundreds of submissions.

that lack a proper evidentiary foundation. They are not based on either the best available scientific or economic knowledge. Recovery of the 450GL is mandatory. The object of s.86AA of the *Water Act* "is to be achieved"[14]. Further, failure to recover this water threatens not just the environmental integrity but also the constitutional validity of the Basin Plan, as outlined in Section 2 below.

4. The proposed 605GL SDL Adjustment from "supply measures" is also not based on best available science[15]. There is no independent report, or peer reviewed article that supports this precise volume, as described in Section 3. Again, the purpose of this document is not to advocate for the abandonment of the SDL Adjustment (although an independent science review is needed). Rather, it is to call attention to the enormous environmental risk associated with not recovering this water, which also make it imperative that the Federal Government now recover the 450GL.

5. The combination of the matters summarised in [1] – [3] above, and outlined in more detail below[16], are why the additional 450GL for the environment must be recovered from the Southern Basin immediately.

[14] S.86AA(3)
[15] A further finding of Walker SC in the RC Report.
[16] No proper understanding of the complexities of the Basin Plan can be gleaned from merely reading this Executive Summary.

Section 1

Environmentally sustainable level of take

6. No discussion of the 450GL of water that must be recovered for the environment under s.86AA of the *Water Act* can meaningfully take place unless that discussion is had in proper context. That begins with the fact that even if all of the 450GL had by now been recovered as "real" water, the Basin-wide recovery amount would still be so low that it fails to meet the objectives of the *Water Act*, and threatens the validity (including constitutional validity) of the Basin Plan. While that is unacceptable, even the current inadequate water recovery under the Basin Plan has been of some environmental benefit, especially at times of low flows. While it is currently at legal risk, "blowing up" the Basin Plan through legal challenge might be counterproductive. The alternative approach advocated here is to immediately improve it, and the environmental benefit it provides.

7. The water recovery target for the Basin Plan must be based (but currently isn't) on an *Environmentally Sustainable Level of Take* [17]. For the Basin (or any of its individual water resource areas) this means a level of take which, if exceeded, would compromise (i.e., damage):

   (a) key environmental assets; or

   (b) key ecosystem functions; or

   (c) the productive base[18]; or

   (d) key environmental outcomes

   of the Basin.

8. These are solely environmental criteria, and are entirely within the judgment of appropriately qualified scientists, not policy or law makers. That is the law Federal Parliament enacted. Unsurprisingly then, the Basin Plan, and the *Environmentally Sustainable Level of Take*, "must" be prepared and determined *"on the basis of the best available scientific knowledge"*: s.21(4)(b) of the *Water Act.* If Parliament wanted the *Environmentally Sustainable Level of Take* to be merely "informed" by science, or

[17] S.4 Water Act

[18] "ecologically" productive base

partly based on science but equally based on certain defined economic considerations, or on the phases of the moon, or on the whims and desires of lobby or industry groups[19], it could have enacted such a law. It didn't. It instead passed what is undeniably an "environment first" law.

9. The Basin Plan is a legislative instrument of the Federal Parliament. To be legally valid, it must *"faithfully implement"* international environmental conventions upon which the *Water Act* is based. It has to *"give primacy to the environment"* before social or economic effects are considered. If the Basin Plan is *"incompatible with the environmental conventions, then it will be unconstitutional because it is those conventions that were "relied upon to get the constitutional power for the Water Act."*[20]

10. Not every policy or law maker has found the "environment first" nature of the *Water Act* to be convenient, or appealing. Returning water to the environment has consequences. It means that there is less water available for consumptive use such as the growing of food and fibre. Of course, the provisions of the *Water Act* do not require a restoration of the Murray Darling system to what it was pre-1788, or before the introduction of widespread irrigated agriculture. It requires a compromise to be made. It assumes consumptive uses like irrigated agriculture will continue. It legislates though for science to determine when the level of water take from those uses has reached a limit where the environment will be damaged. It is likely that most rational people, which include environmentalists but also that group of Australians who would simply prefer the environment not to be wrecked, consider this legislative compromise to be both reasonable and sensible. They no doubt include those Australians who, while not (necessarily) part of the radical left[21], believe that this country is unlikely to fall into ruin should it fulfil its international environmental treaty obligations, as the *Water Act* requires. Even that group who "prefers people to fish"[22] in general would consider it non-controversial that we should not degrade the environment through the overuse of water, and should base our efforts to restore and sustain it based on science, not press releases.

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[19] God forbid.
[20] Quote of Professor George Williams: see RC Report, Page 194
[21] A small group in Australia, unrepresented by anyone in the media
[22] A philosophy or creed that perhaps requires extensive context to be fully understood.

11. Regrettably, the inconvenience of the *Water Act* resulted in the Basin Plan not being prepared on the basis of the best available scientific knowledge. That is not to say science did not play a role, but that role became secondary to the political compromise[23] that resulted in the ultimate determination of the *Environmentally Sustainable Level of Take*. Science, and no less "best available science," involves rigour, transparency, testing, and replication. Eminent scientists have said repeatedly (both under oath, and in peer reviewed scientific literature) that the manner in which the 2750GL annual recovery figure was determined is opaque[24], and as such incapable of being replicated[25]. It either does not reflect an *Environmentally Sustainable Level of Take*, or there is no proper evidence that it does[26]. Our scientific community, and hence the public, has not been informed in any meaningful way as to how the volume of 2750GL (or the 605GL SDL Adjustment) was determined, and how so called "social and economic" considerations were used to reduce the original volumetric range for Basin-wide recovery (approximately 4000GL to 7000GL[27]) to 2750GL. That was an unacceptable state of affairs in 2012, and remains so today. It means scientists do not have the data and information necessary to interrogate the volumes determined by the MDBA. That is the inverse of good governance[28]. In any event, that the *Environmentally Sustainable Level of Take* recovery target "had to commence with a 2" was well known at the MDBA in 2011-12[29]. Sworn evidence has been given to this effect, which was unchallenged. Further, at the time the Basin Plan was being finalised, it is beyond argument that the final water recovery target was a "political outcome" not a "best available science outcome"[30]. In short, science was hijacked by politics, and resulted in this equation for the water recovery target in the Basin Plan:

Water Recovery average yearly volume for an Environmentally Sustainable Level of Take:

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[23] Not authorised by the Water Act
[24] A polite term for it having a woeful level of transparency.
[25] Combined evidence of, amongst others, Professor Jason Brookes; Professor Richard Kingsford, Professor John Williams, Dr Matthew Colloff, Mr Peter Cosier, Dr Theresa Heneker, Professor Jamie Pittock, Dr Celine Steinfeld, etc, etc
[26] Ibid
[27] See "The Guide" to the proposed Basin Plan, 2010
[28] The OECD has long identified poor water governance as a major risk to the environment/water resources.
[29] Sworn evidence of David Bell at Royal Commission, plus multiple other sources
[30] For example, evidence of Karlene Maywald at Royal Commission

= **3856GL** (representing a "high level of uncertainty" of meeting the watering requirements for the Basin's key environmental assets) to **6983GL** ("low level of uncertainty")

becomes (after non-disclosed change to computer modelling):

2750GL (on an average yearly basis)

minus 605GL (SDL Adjustment)

plus 4.5GL (should be 450GL**)**

minus 70GL (Northern Basin Review)

not including any consideration of climate change projections

= (approximately) **2079GL.**

An insufficient number of people seem embarrassed by this equation.

That is so even without also considering the further matters below.

12. There are numerous scientific reports which evidence that the Basin-wide water recovery target (for simplicity, 2750GL on an average yearly basis) does not represent an *Environmentally Sustainable Level of Take*. There are no published scientific reports or peer review reports which evidence a contrary opinion. There are non-scientific assertions to this effect, but they amount to no more than a *Humpty Dumpty-like* claim of "2,750GL is a lawful plan because we say it is".[31] For example, in 2011 the CSIRO (at the invitation of the MDBA) performed a review of the water recovery target which resulted in a report titled "Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray-Darling Basin"[32]. Of the many criticisms of the MDBA's then 2800GL target for water recovery, the authors of this report stated:

(a) Modelling data for climate change impacts to 2030 was available, but not used.

(b) A level of take *"represented by the 2800GL/yr. is not consistent with the hydrologic and ecological targets".*

[31] Apologies to Lewis Carroll for dragging him into the politics of the Basin Plan

[32] Young et al, CSIRO, November 2011

(c) A 2800GL scenario does *"not achieve the majority of the hydrological targets"* and meets only *"55% of the achievable targets at either "high risk" or "low risk" frequency."*

(d) *"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."*

13. Each of the matters opined above at (a) to (d) by the CSIRO have been confirmed and reinforced by sworn oral evidence, and in substance by other expert reports.[33] There is apparently no published or peer reviewed work that challenges the opinions expressed in these reports, which amount to an admission that the recovery target of 2750GL is NOT reflective of an *Environmentally Sustainable Level of Take*.

14. The second part of context relates to the tired assertion that it is pointless to recover an extra 450GL for the environment until such time as all "constraints (relaxation) measures" are in place. Modelling shows that a Basin Plan that returns 3200GL of water on average per year will hit 17 out of 18 key environmental flow indicator markers in circumstances where constraints are addressed.[34] This can be compared to a 2800GL Plan which only hits 11 out of 18 markers. It is sometimes contended that until constraints are addressed, a 3200GL plan would cause flooding and damage, and hence there is no point in recovering the extra 450GL until all issues relating to constraints are addressed. This is a fallacious argument, advanced only by those who fail to comprehend the reality of the current Basin Plan and water recovery pursuant to it.

15. The Basin Plan is not a 3200GL water recover plan. Nor is it a 2800GL Plan, or a 2750GL, or 2670GL plan. It is a 2079 GL plan. Adding 450GL to that does not make it a 3200GL plan in relation to which constraints might (or might not) cause a delivery issue for planned environmental water flows. Even accepting against all the evidence

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[33] 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," 28/3/12. Chrissie Bloss et al, "Hydro-ecological Analysis of the Proposed Basin Plan – South Australian Floodplain," March 2012; Heneker and Higham, "Review of the Basin Plan Water Recovery Scenarios for the Lower Lakes, South Australia: Hydrological and Ecological Consequences", March 2012.

[34] MDBA, "Hydrologic Modelling of the Relaxation of Operational Constraints in the Southern Connected System: Methods and Results," October 2012.

that supply measures work perfectly and account for an equivalency of 605GL, that water is not added to the environment. It simply does not have to be recovered. Even with an extra 450GL of environmental water, the Basin Plan would be one in which about 2500GL of real water has been recovered for the environment. There is no evidence that constraints become an issue for any plan less than 2800GL (properly managed environmental flows would not cause flooding at this level of recovery, or likely beyond). As such, there is no basis for any claim that the 450GL of water for enhanced environmental outcomes should not be recovered until constraints are fully addressed. The tired argument that there should be no recovery of this extra environmental water until there is progress on or achievement of constraints measures should be finally rejected now.

16. The third part of the context for the 450GL is the SDL Adjustment involving the thirty-six supply measures said to make up an equivalency of 605GL of water on an average annual basis. These measures and the adjustment do not represent "best available scientific knowledge." They represent a gamble with the environment for which there is no statutory warrant[35]. This matter is addressed in more detail in Section 3 below.

17. The overuse of Basin water resources (a statutory fact pursuant to s.21(2) of the *Water Act*), combined with an inadequate water recovery target that does not reflect an *Environmentally Sustainable Level of Take*, are reason alone for the urgent recovery of the 450GL of water referred to in s.86AA(3)(b) of the *Water Act* and Schedule 5 of the Basin Plan.

[35] RC Report, page 334

Section 2

450GL

18. There is some misconception that the 450GL of extra water for enhanced environmental outcomes is optional rather than mandatory. The targeted for "aims" of s.86AA(2)) are of course not mandatory. They relate to environmental outcomes which are to be aimed for, but cannot be mandated. For example, you cannot mandate that two million tonnes of salt will be discharged from the Murray Darling Basin as a long-term average, any more than you can mandate that the health of forests or the habitats of fish will be improved. The overall object of s.86AA of enhancing environmental outcomes by an increase in the volume of water available for the Basin by 450GL is however mandatory. It "is to be achieved.": s.86AA(3).

19. Leaving aside the text of 86AA, the 450GL is mandatory for another reason. This extra water for the environment is essential for the Basin Plan to be considered a law that seeks to "faithfully implement"[36] the international treaty obligations that underpin the constitutional validity of the *Water Act*. Any person that says that either the 450GL is either not mandatory or not essential is saying this (wittingly or not):

The Basin Plan is constitutionally invalid, but I don't care.

It should not have to be stated[37], but policy and law makers, and governments, should care about this.

20. Delivery of the 450GL of extra environmental water was an election commitment by the Albanese Labor Government. At its core, it is an overdue commitment to act in a manner heading towards lawfulness. In the great tradition of cooperative Federalism, all of the Basin States made this pledge back in 2012. This commitment clearly cannot be construed as one of going down the same path (aimlessly, and not very far) that we have been over the last decade. That would see the 450GL recovered in about a

[36] This is constitutionally required, given the reliance on s.51.xxix of the Constitution for the validity of the Basin Plan

[37] But does, based on conduct over the last ten years.

thousand years[38]. Neither on-farm or off-farm efficiency measures are going to achieve anything like the recovery of 450GL being returned to the environment. That is obvious, as found by the authors of the *"Second Review of the Water for the Special Account,"* (December 2021). In any event, the previous Federal government abandoned on-farm efficiency measures, and the same review found that the 450GL could not be recovered by off-farm efficiency measures.

21. There should be no need now to refute the view that the 450GL should largely be recovered for the environment by the voluntary purchase of water entitlements. This must take place in the Southern Basin. Not only has the modelling for the benefits of the 450GL been done on the basis of recovery in the Southern Basin, as was made clear in the MDBA's "ELST Report", it is almost impossible to achieve positive environmental outcomes in the south from water recovered in the northern Basin [39]. Any attempt to recover the 450GL of extra water for the environment from the Northern Basin would be as good as a broken electoral promise, as there is no credible or peer reviewed science that even suggests that the enhanced environmental outcomes outlined is s.86AA of the Water Act and Schedule 5 of the Basin Plan can be achieved by recovering water in the North. This is ultimately a matter for science, not policy makers, but there is no science that properly supports some wild idea that the 450GL can be recovered from the Northern Basin and still achieve the environmental aims of s.86AA of the *Water Act* and Schedule 5 of the Basin Plan.

22. Assertions have been made in the past (and are currently being made) that voluntary purchases of water for the environment (usually called "buy-backs") cause economic damage to rural or regional communities[40]. What is said is that water entitlement purchases:

(a) cost jobs; and

(b) create a "Swiss cheese" effect leaving irrigation suppliers with customers spread out over greater distances; and

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[38] 4.5 GL recovered in ten years when 450GL is needed indicates that prior governments have not seen time as being of the essence.

[39] MDBA, "The Proposed 'Environmentally Sustainable Level of Take' for Surface Water in the Murray Darling Basin," 2011.

[40] For certain very water-dependent towns this might have been true for some acquisitions of water entitlements

(c) harm the social fabric of local communities because they lead to population reduction (and hence closure of schools and services).

23. These assertions are not supported by peer reviewed economic research or papers, or defensible economic reports (there are a few reports floating around, or that have been regurgitated[41], but they do not make persuasive arguments. Much of this kind of work was dealt with by Commissioner Walker SC in his Royal Commission report[42]). What has been established by such work concerning the voluntary purchase of water entitlements is that:

(a) there is no proportional relationship between a reduction in water use and a reduction in agricultural production (and the assertion of such a relationship could be debunked by an "economics undergraduate[43]); and

(b) buying water is by many factors cheaper to government (and hence all taxpayers) than seeking to recover it through efficiency measure infrastructure upgrades; and

(c) the money obtained from sales of water entitlements in the past was almost always spent locally; and

(d) a majority of farmers/irrigators sold only a partial entitlement, kept their delivery rights, and remained in farming/irrigation; and

(e) resulting reductions and debt meant people had more money to spend locally; and

(f) the economic impacts in rural and regional Australia from things like technological change and mechanisation (alone), increased urbanisation, changes in soil condition, and fluctuations in commodity prices are far greater than any impact of the Basin Plan: and

(g) water entitlement purchases are a more certain means of recovering water[44].

24. Often forgotten in the debate concerning the voluntary purchase of water is the economic value of recovering it for the environment. Almost every report prepared on

[41] The correct word
[42] RC report, findings 9.4, 9.5 and 9.6. Pages 61-2; 391-398.
[43] RC Report, finding 9.5 page 61.
[44] There are too many papers (most peer reviewed) to cite here, as well as other evidence. Note also the ONLY independent review of social and economic impacts from on farm efficiency measures.

the economic impacts of water recovery has neglected the non-market benefits of the recovery of water for the environment. The *Water Act* and Basin Plan seek to protect and restore the rivers, wetlands, and watercourses of the Murray-Darling Basin[45]. Some people might consider this a moral obligation, not just a legislative one. It is certainly part of the concept of intergenerational equity, itself an aspect of "environmentally sustainable development" (ESD). Are healthy rivers and wetlands (many of international significance) of no value?

25. The principles of ESD are matters the MDBA was bound to take into account when preparing the Basin Plan, and must also be taking into account by the relevant Minister: *Water Act* s.21(4)(a). Accepting though that money is very important, there is real economic value associated with increased environmental flows. It seems however this is another fact that can be ignored by those that do not support further lawfully required water recovery for the environment. That does however mean relegating almost to insignificance that post the millennium drought domestic tourists alone made more than 17 million trips to the Basin, staying a total of 50 million nights, and generating more than $6.5 billion in revenue. Expenditure from international tourists amounts to about a billion.[46] The direct and indirect economic activity from tourism in the NSW and Victorian Murray regions alone amounts to hundreds of millions of dollars.[47]Presumably none of these tourists came to see dead fish, algal blooms, dead trees, or degraded wetlands. As a matter of obviousness, tourism in the Basin is heavily dependent on the health and wildlife of its watercourses and wetlands.

26. While the 450GL should be recovered by voluntary purchases of entitlements, in principle some of this water might be recovered through efficiency measures, provided real water is recovered, and provided this can be done by 30 June 2024 (which seems highly unlikely). It can be noted here too that even water recovery from efficiency measures has been claimed by some, including governments, to have harmed rural communities. That was debunked by the only independent review of efficiency measures, conducted by Ernst & Young in 2017-18. The authors of that report concluded off-farm measures were of positive benefit, and on-farm measures had no

[45] Water Act, s.3(d)
[46] See Tourism Australia; see also "Australian Regional Tourism NSW" submission to MDBRC.
[47] Regional Tourism Satellite Account Tourism Research Australia.

negative impacts[48]. The Murray-Darling Basin Ministerial Council commissioned this report. It appears to be collecting dust somewhere. Not because it does not represent best economic opinion based on rigorous analysis of data, but seemingly because that opinion was inconvenient to some governments[49]. Similarly, a Report prepared by Marsden Jacobs on the economic impacts of buybacks in the Murrumbidgee Irrigation Area (commissioned by the then Department of Agriculture, Water and Resources) is usually not quoted by governments or opponents of the Basin Plan, presumably because the authors' opinion was that the economic impacts of buybacks were likely to be "very small if not neutral"[50].

27. Related to the recovery of water for the environment, although not addressed in this paper, is the issue of indigenous water justice. Respectfully, that subject matter requires separate discussion, and by a different author. Suffice to say that overuse of water to the extent it degrades our environment is arguably a scam on the First Nations Peoples of the Murray-Darling Basin. So too is inadequate recovery for the environment now.

28. Finally, this observation concerning the purchase of water for the environment should be made. Those that oppose the voluntary sale of water entitlements are in effect saying this:

if you own a water licence or entitlement, you should not be able to sell your water voluntarily to your government for environmental purposes.

The moral and ethical justification for this position has not yet been made clear.

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[48] Ernst & Young, "Analysis of Efficiency Measures in the Murray-Darling Basin: Opportunities to recover 450GL in additional Environmental Water by 2024 through Efficiency Measures by 2024 with Neutral or Positive Socio-Economic Impacts – Independent Report to the Murray-Darling Basin Ministerial Council", Jan 2018.
[49] The fierce determination of those governments in respect to the Basin Plan to ignore facts, as well as best science and economics, has at least been consistent.
[50] Dwyer, Clarke, Carr, "Economic Effects of the Commonwealth Water Recovery Programs in the Murrumbidgee Irrigation Area" (Marsden Jacobs), October 2017.

Section 3

SDL Adjustment – 605GL

29. Opponents of the recovery of 450GL of water for enhanced environmental outcomes, whether by efficiency measures or the voluntary sale to the Commonwealth of water entitlements, have so far consistently maintained that the "supply measure" projects under the SDL Adjustment represent a volume of 605GL that need not be recovered. It is claimed these measures will produce "environmental equivalency" against a benchmark without recovering that water.

30. The SDL Adjustment mechanism is best described as an idea or "concept." Whatever word is picked, at the level of concept, using less water for the same environmental outcomes is obviously a good thing if it can be achieved. A mechanism for water recovery under the Plan to be adaptable is also potentially of benefit. The SDL Adjustment mechanism however cannot properly be described as even as a scientific "hypothesis," much less a theory, as it appears only to be based on certain modelling outcomes, not (and contrary to the Basin Plan) actual empirical observations[51]. As such, any contention that it is "best available scientific knowledge" (in other words, lawful) is currently an impossible assertion to make good. The SDL Adjustment on its own risks both the ecological and legal legitimacy of the Basin Plan.

31. The 605GL SDL Adjustment is founded on, in large part, an "Ecological Elements Method". An increase in sustainable diversion limits as a result of the various supply measure projects must have "equivalent environmental outcomes" compared with "benchmark environmental outcomes": section 7.15 of the Basin Plan. The benchmark environmental outcomes are assessed on model runs following the assessment of "benchmark conditions of development." A model run comparing the "benchmark environmental outcomes" is compared to a model run which includes an SDL adjustment for the supply measure contributions. The comparison is conducted using ecologically weighted "scores" using twelve ecological elements: four waterbirds, two fish species, and six "vegetative elements."

[51] See Royal Commission Report p297 and s.7.17(2)(a) of the Basin Plan

32. For any reader of this paper that finds the paragraph above to be confusing, all of this and more is "explained"[52] in Schedule 6 of the Basin Plan[53].

33. It is a mystery why Federal Parliament enacted Schedule 6 of the Basin Plan. How wise it is for a country to legislate highly complex and uncertain "science" can be debated elsewhere[54]. What has been legislated more than risks being described as incomprehensible. Whether or not what has been legislated is science, or only something masquerading as science, no one really seems to know. Not even scientists, as is made clear from what follows.

34. Reports commissioned to support the Ecological Elements Method are highly qualified. Brewsher Consulting conducted one review, and expressed the opinion that the models used had been operated in accordance with Schedule 6 of the Basin Plan. This is hardly of comfort, given that their review expressly excluded the components of the modelling[55]. A computer model might be fine as a form of simplification of reality, but the inputs should be disclosed. A second independent review panel concluded that the Ecological Elements Method was defensible and fit for purpose within the limits of its terms of reference. However – and this is crucial both legally and environmentally – it described the method as *"novel and untried," "without precedent,"* and one in which *"no one should assume that the adoption of the* [method] *is without significant uncertainty or risk"*[56], that is based on a *"limited"* state of scientific knowledge. A separate expert advisory panel said there was a *"substantial error space"* inherent in the model used which was *"heavily reliant on expert judgments"* and *"only partly based on knowledge of robust providence."*[57]

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[52] A euphemism

[53] No responsibility for the well-being of anyone who reads Schedules 6 or 6A of the Basin Plan is taken by the author of this paper. Liability Limited by a Scheme under the Professional Standards Legislation.

[54] It was described as "difficult, bordering on impenetrable, statutory drafting" by Commissioner Walker SC in his Royal Commission report at page 293, and an unusual "attempt to distil into statutory language what is a scientific procedure".

[55] Brewsher Consulting, "Independent Review of Hydrologic Modelling for SDL adjustments," 30/9/17

[56] Justin Brookes et al, "SDL Adjustment Ecological Elements Method Development Report: Review of Final Project Report," 30/3/14

[57] Peter Davies et al, "Murray Darling Basin Plan SDL Limits of Change Review: Independent Expert Advisory Panel Report," September 2017

35. If the above is not sufficient to sound the alarm on the SDL Adjustment as not being within light years of legality[58], there is currently no available report, or independent review, which provides support for the volumetric change to the water recovery target under the Basin Plan as a result of the adjustment. That is, there is no publicly available or tested science that supports the 605GL figure. A volume which could have been written on the back of an envelope.[59]

36. All of this ought to be considered very embarrassing. That is not a criticism of the authors of the abovementioned reports and reviews. It is a criticism of the manipulation that has been used to suggest they provide support for a reduction in the Plan of 605GL (or any amount), and that this part of the Plan represents "best science".

37. It may be that one day the uncertainties in the Ecological Elements Method will be reduced. With improved science, maybe, one day, some iteration of it might constitute "best available scientific knowledge." The fact is, for now, it represents no more than a speculative hope and an uncertain experiment with the environment. It is untenable to suggest that such an approach is countenanced by the *Water Act*. The potential fraud on the environment represented by the 605GL SDL Adjustment was described by Bret Walker SC as a *"gamble that is wholly contrary to the objects and purposes of the Water Act"*[60].

38. The point of all this is that it has been an extraordinary position for governments to take over the last decade or more that the 605GL associated with supply measures should be considered as "in the bag"[61], but we need not bother recovering the 450GL. The massive uncertainties surrounding the non-recovery of 605GL per year based on the supply measure projects[62] is all the more reason why time is of the essence to recover the 450GL of water for the environment pursuant to s.86AA of the *Water Act*. If that means legislative changes to the *Water Act*, so be it. If that means repealing the cap on water buy-backs, so be it. There is no principled way of moving forward other than for the

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[58] A paraphrase of Commissioner Walker SC
[59] And is rumoured to have been arrived at this way.
[60] Royal Commission Report p334
[61] Or "in the rivers"
[62] A government acting responsibly might think it a good idea to stand up an independent science review of the SDL adjustment mechanism.

Federal Government to urgently recover the 450GL of water on the best possible terms for all taxpayers – that is, by prompt voluntary purchases of that water.

Conclusion

39. The Basin-wide water recovery target is unlawful, not based on best science, and risks the constitutional validity of the Basin Plan. The SDL Adjustment does not represent best science, and there is no publicly available science which justifies the 605GL reduction in water recovery. It is a potential fraud on the environment, which warrants independent scientific review. Recover of the extra 450GL for the environment is a minimum step toward environmental and legal integrity that should be taken now, primarily (perhaps entirely) by the voluntary purchase of water entitlements in the Southern Basin. Any legislative changes to facilitate this should be promptly enacted.

Richard Beasley SC

Commissioner for Murray River (SA)

16 May 2023.

[1] [INSERT]

[1] Find in 5.5, Royal Commission into the Murray Darling Basin (January 2019) page 54 per Commissioner Bret Walker SC.

[1] [INSERT]

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