Commissioner Jane Doolan
Associate Commissioner John Madden
Australian Government Productivity Commission
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Dear Commissioner Doolan & Associate Commissioner Collins,

RE: REVIEW OF WATER REFORM AND NATIONAL WATER INITIATIVE

Thank you for the opportunity to provide input to the review of progress of reform in Australia's water resources sector. Please find my initial submission below. I would be happy to provide additional information or to attend a hearing if required.

Background to comments in submission

I am providing comments as a Healthy Rivers Ambassadors, a member of a group of individuals from throughout the Murray-Darling Basin who aim to generate support for sustainable management to maintain a healthy Murray Darling Basin for the future.

As a professional environmental scientist, I have worked on sustainable management of natural resources in the Murray-Darling Basin throughout my career, which has covered water policy and governance in the SA environment agencies, practical wetland rehabilitation projects in a conservation NGO, academic research on environmental water needs for floodplain vegetation and wetlands, and environmental consulting on natural resources management. I am aware of the extended history of the development of the Basin Plan, and the extensive and complex process undertaken to this point in implementation of the Plan. I have presented workshops on Australian Water Policy and Governance for the past 15 years and have tracked the evolution of the NWI and the National Water Commission as a key element of water reform. A particular concern has been the lack of effective implementation of critical elements in water reforms under the NWI and in fundamental elements of the Murray-Darling Basin Plan.

Dr Anne E Jensen
Healthy Rivers Ambassador for MDB

General Comments

The development of the National Water Initiative in 1994 and the subsequent signing by all jurisdictions in 2004 were key milestones in water reform in Australia. The supporting documents and the subsequent creation of the National Water Commission and the signing of the Water Act 2007 set Australia on the path to sustainable management of its finite and highly variable water resources. However, the real test for effective water reform is commitment to implementation of often challenging and politically unpalatable measures. This review will be critical in ensuring that implementation processes continue with full commitment from all jurisdictions.

The primary test of the effectiveness of the NWI is the development and implementation of the Murray-Darling Basin Plan, and the examples I provide will draw on this current crucial test of the NWI.

Application of National Water Initiative to Murray-Darling Basin Plan

The Basin Plan is required to have regard to the National Water Initiative (NWI), which includes the principle of allocating water for healthy rivers first, before allocating water for consumptive uses. It also requires water authorities to 'complete the return of all currently over-allocated or overused systems to *environmentally-sustainable levels of extraction*'.

Implementation of water reforms has been slow since the NWI was signed in 2004. Progressive report cards for the NWI from 2007 repeatedly noted slow progress in reducing over-allocation of water, particularly for the Murray-Darling Basin. Initially, good progress was made in areas such as water markets and trading while milestones were linked to tranche productivity payments, but after this requirement was removed, progress on water reforms slowed very significantly. The Living Murray Program took seven years from 2004 to recover 500 GL of water, taking two years longer than agreed to recover a much lower target than the 3000 GL recommended by scientists at that time.

The report card of the NWI published in 2011 stated that the state and federal governments had yet to deliver the intended benefits of the Water Act. The assessment contained 12 major recommendations requiring recommitment to the objectives of the NWI, along with increased funding, stronger community involvement, stronger urban water reform, coordination with natural resources management, review of mining and petroleum impacts, and factoring in climate change.

However, instead of re-committing to the NWI, the National Water Commission (NWC) was abolished in 2013, with the reason given by the Coalition Government being a combination of 'budget savings' (unmeasurable in the scale of the Federal budget) and 'job done'. The opposite was true, as the National Water Commission was about to apply all of their careful research to the task of reducing over-allocation of water resources. Much more work was still needed for full implementation of the many recommended actions arising from a solid body of NWC investigations into sustainable water management while taking into account ecological, economic and social issues. From 2013 the functions of the NWI were split between multiple agencies, and the function of the independent umpire and reviewer in the National Water Commission has effectively been lost.

Responses to Information Requests

INFORMATION REQUEST 1

- *whether the signatories to the NWI are achieving the agreed objectives and outcomes of the agreement*

The NWI is a sound, objective, comprehensive list of the policies and actions needed for effective water reform in Australia. These include a major package of challenging and politically unpalatable actions needed to shift management of water resources in Australia to a sustainable footing. Extensive multiple investigations and reports by the National Water Commission 2004-2013 underpin the recommended actions. Significant progress has been made in some key areas but other critical areas are lacking commitment, resources and political will.

The major failing of the NWI is what could be termed 'failure-to-implement'. Many of the key actions required to give effect to the NWI have not been completed to their full extent or in a timely fashion. Initially progress was satisfactory, with completion of progressive deadlines tied to significant tranche payments to state governments and providing serious incentives to complete required actions. Once the link to tranche payments was cut, progress on implementation slowed and major deadlines were missed. There has been no penalty for not meeting deadlines, and major deadlines were put back by such large margins that the critical end date for effective implementation of the Murray-Darling Basin Plan of 2024 is now in serious doubt (as noted in the Productivity Commission five-year review of the Basin Plan).

It should be noted that this 'failure-to-implement' syndrome is common to many other policy areas in Australia, not just water. The typical political response to any issue of concern is to launch an activity such as an investigation or even Royal Commission, taking many months to report, by which time the urgency to act has lessened and the recommended actions can be largely ignored.

It is of critical importance that measures be taken to ensure that the recommended actions are taken effectively 'on time and in full', as our politicians are so happy to quote but no so happy to put into effect.

- *which elements of the NWI have seen slow progress*

The item showing slowest progress and least effective implementation is the fourth objective of the NWI:

- ***complete the return of all currently overallocated or overused systems to environmentally-sustainable levels of extraction.***

Progress with implementation of the NWI has been subject to regular audits. NWI Water Audits from 2007-2011 showed many positives but consistently reported lack of progress in addressing the issue of over-allocation of water, as summarised below:

- 2007 – considerable progress, <u>but more work needed to improve and accelerate implementation, particularly reducing over-allocation of water</u>

- 2008 – real improvements in trading, pricing and accounting, but slow progress in reducing over-allocation
- 2009 – not improving fast enough, need to re-double efforts to renew and invigorate essential water reforms
- 2010 – progress in other areas but did not meet deadline for addressing over-allocation
- 2011 – yet to deliver intended benefits, 12 major recommendations on recommitment, stronger community involvement, stronger urban water reform, coordination with natural resources management, review mining & petroleum impacts, factor in climate change.

Notwithstanding these strong recommendations for accelerated action and the repeated lack of progress in recovery of over-allocated resources, the National Water Commission was disbanded in 2014. The reason stated by the Abbott government was:

> *given the substantial progress already made in water reform and the current fiscal environment, there is no longer adequate justification for a stand-alone agency to monitor Australia's progress on water reform.*

However, the issue of over-allocation, particularly in the Murray-Darling Basin, continues to be a highly volatile and vexed area, as seen by irrigator protests in Canberra and the 'Can the Plan' campaign. As the recent Keelty report noted, irrigator groups are still looking for access to more water and putting pressure on politicians to reduce the amount of water recovered (Interim Inspector-General of Murray–Darling Basin Water Resources, 2020).

A key missing instrument for effective water reform is the continuing lack of credible measurement and register of water trading, allocation and diversion. This lack was also identified in the Keelty report, contributing to the misunderstandings over water sharing arrangements and lack of transparency over how and where water is being diverted.

- *whether there are cases where jurisdictions have moved away from the actions, outcomes and objectives of the NWI*

In the application of the actions, outcomes and objectives of the NWI to the Murray-Darling Basin Plan, there are clear examples of jurisdictions undermining the intent of the Plan and failing to delivered the actions required to implement the Plan as intended. The Victorian and New South Wales state governments have been arguing that they cannot deliver elements of the Plan, such as the 450 GL of 'up' water, and going slow on delivering constraints and supply projects while at the same time arguing vigorously for reduced water recovery volumes via other mechanisms.

The collective effect of these actions and attitudes on implementation of the Basin Plan has been to reduce the volume of water recovered for river and ecosystem health while maximising the amount of water available for extraction. The most prominent current example is the continued, even expanding, unsustainable over-allocation of water from the Upper Barwon-Darling rivers by the New South Wales government, with catastrophic effects on downstream communities and ecosystems. Southern Basin irrigators are continuing to chase a perceived pool of supposedly unallocated water for additional diversions.

Another area which moved away from the objectives of the NWI was the Sustainable Diversion Limits (SDL) Adjustment Process, which recommended reduced water recovery in the southern MDB by 605 GL, on the basis of delivering 'equivalent environmental outcomes' through supply projects. This reduced recovery volume was approved in advance in 2019, when the supply projects were yet to be designed and approved, and did not have to deliver these supposed environmental benefits until 2024. It is already clear that key supply projects will not be completed and a major proportion of assumed environmental benefits will not be delivered by that date (as also noted in the Productivity Commission five-year review of the Basin Plan).

Concept of Equivalent Environmental Outcomes

The Basin Plan includes provision for adjustments in the water recovery target on the basis that somehow equivalent environmental outcomes can be delivered from smaller volumes of water which are delivered via engineered means. As an environmental scientist, I find this concept to be very seriously and fundamentally flawed. The proposition that less water delivered by an engineering project can somehow deliver equivalent environmental outcomes cannot be justified in ecosystem science.

Water reaching a wetland via a pipe or filling a wetland using a regulator will not provide connectivity or return flows in the same way as natural flows. While an environmental outcome may be achieved, such as filling the well-defined wetlands at Hattah Lakes, it will not be equivalent to the outcomes achieved with natural flows.

The process of water flowing over floodplains to fill wetlands and then receding back to mainstreams is integral to the connectivity of ecosystems. Delivering water via pumps and pipelines into a wetland water body does not replicate important ecological functions or allow connectivity to operate, for example where organisms are unable to return to the mainstream. Engineering works create barriers to fish passage and prevent return of nutrients and aquatic organisms to the mainstream.

The very narrow basis of the scientific modelling applied to assess environmental equivalence missed the major question of whether environmental targets can be met with the reduced flows. Instead it compared the difference at a reach scale between the inadequate 2750 GL volume with up to 22% less flows and found no significant difference in the environmental outcomes for each river reach. However, neither of the scenarios which were tested for the Southern Basin could deliver all the targets in the Basin Plan.

A similar approach was used for modelling two flow scenarios for the Northern Basin review, again finding no significant difference between two scenarios which each only delivered ~50% of Basin Plan targets for that region.

The modelling comparisons should instead have been conducted on the basis of testing whether environmental targets could be met, using similar methodology to evaluations conducted earlier to assess whether flow targets would be met for icon sites (eg Gibbs *et al.* 2012). Those evaluations found that environmental targets in the Basin Plan could not be met for icon sites with 2800 GL, even with all constraints projects in place.

- *any other data and information sources that might be useful for assessing progress.*

The recent Keelty report found that South Australia and Victoria managed their water resources conservatively, ensuring that water was kept in reserve to ensure supply during dry times (Interim Inspector-General of Murray–Darling Basin Water Resources, 2020). In contrast, New South Wales is much less conservative in managing its water resources, releasing more water in wet times, leading to lack of supply in dry times. The result has been zero allocation to general security licences for three consecutive years, leading to major discontent and economic decline in irrigation communities. The Keelty report identified a lack of understanding of general security licence conditions and the likelihood of access to full allocations in the over-allocated NSW systems.

This finding suggests that the NSW water management system needs to be managed to the same conservative level as SA and Victoria, to avoid repeated declarations of zero allocations for general security licences.

The revised NWI could also establish standard principles around minimum storage of drought reserves and minimum end-of-system flows for all jurisdictions.

INFORMATION REQUEST 2

Is the NWI adequate to help Governments address the identified challenges?

The NWI and associated supporting documents already contain the key principles for sustainable water management. However, the implementation process has been too slow and seriously ineffective in key areas, particularly recovery of water in over-allocated systems.

The pace of water reform slowed very significantly when the nexus with tranche payments was broken. Serious delays have occurred in completion of critical water sharing plans and development of supply projects which underpin a large proportion of the 605 GL SDL adjustment volume which was agreed in advance. Failure to deliver these projects on time has potentially very significant costs if replacement water has to be purchased in 2024.

Going forward, there need to be significant penalties and incentives added to the NWI to keep water reform on track, linked to implementing projects and meeting deadlines.

Are there any other current or emerging water management challenges where the NWI could be strengthened?

The projected decline in rainfall and run-off will result in significantly reduced water resources, with river flows predicted to reduce by 30-50% in the Murray-Darling Basin and other catchments in south-eastern Australia. Long term rainfall decline and step changes in run-off have already been noted in catchments for water supply for capital cities. The future for the Murray-Darling Basin (and other Australian river systems) must be re-configured to operate with much less water. This needs to include reserving minimum flows in rivers and reserving minimum flows to identified drought refuges. A requirement for minimum end-of-system flows should be restored for all Australian rivers.

INFORMATION REQUEST 3

The Commission welcomes feedback on the matters that should be considered for inclusion in a renewed NWI.

An important shift is needed in the under-lying philosophy of the NWI (and flowing into Australian water governance), to acknowledge the limitations of Australia's highly variable and finite water resources. The focus needs to shift away from searching for more water with assured security to acknowledging that water sources are finite and putting the focus on using less water more effectively. The goal should be to manage sustainably within Australia's limited water means, with provision to retain minimum flows in all river systems. We need to move away from the current philosophy of trying to find more water from another source, either surface or groundwater.

We also need to change the view that water flowing out to sea is wasted, and to acknowledge the priceless value of water flowing from source to sea in any river system, sustaining ecosystem functions and providing ecosystem services to communities all along its path. Recent research findings have recorded more than 30% decline in productivity in the marine environment adjacent to the Murray Mouth due to significantly reduced outflows (Auricht *et al.,* 2018).

The solution is in our hands – we need to revegetate Australia, to establish surface cover, encourage penetration of rain into soils, to increase soil moisture, reduce dust, reduce temperatures and increase evapo-transpiration rates to boost regional rainfall.

Australia can't be drought-proofed and we can't just keep trying to get more water from other sources to grow unsustainable crops – we need to live within our natural means and get a whole lot smarter about how we use our natural resources. It has been predicted that Australia is the first 'First World' nation where society will collapse because of mis-use and over-use of natural resources (Diamond, 2005).

All the reports from catastrophic bushfires in summer 2019-2020 referred to tinder dry soil and vegetation conditions, lack of rain and lack of soil moisture creating severe fire conditions – all symptoms of the effects of applying European farming methods to a very different continent and failing to understand its limitations. We have been trying for 220 years to turn ancient impoverished soils and highly variable and unreliable water sources into a European landscape of fertile soils and permanent reliable water sources, and it can't be done.

There is increasing acceptance that regional declines in rainfall and river flows are linked to climate change. However, there is also important evidence that 50% of the cause is linked to mass vegetation clearance, which has disrupted hydrological cycles (Pitman *et al*., 2004; McAlpine *et al*., 2007; Andrich & Imberger 2013). The driest continent is getting drier as a result of how Australian landscapes have been managed for 220 years. The increasing dryness of soils is a major contributing factor to the increased frequency of catastrophic bushfires.

The solution to the impacts of both climate change and declining rainfall lies in integrated management of soil, water and vegetation, as outlined in the report by the National Soil Advocate, Michael Jeffery, '*Restore the Soil, Prosper the Nation*' (Jeffery 2017).

In addition, international research published in July 2019 shows that planting 1.2 trillion native trees across the world could remove two-thirds of all carbon already in the atmosphere (Bastin *et al.* 2019). There is room to plant enough trees without hindering agricultural production or encroaching on urban areas. Australia has been identified as one of six international hotspots for revegetation, with the potential to make a substantial contribution to reducing international impacts of climate

change while creating major benefits for Australia by increasing soil moisture and returning carbon to soils.

A renewed NWI can incorporate a new vision to move to sustainable farm and land management, to re-hydrate and revegetate this driest continent while managing limited, highly variable water resources wisely and sustainably.

A New Vision

It would be a good start to have a vision of re-vegetating large areas of landscapes, to increase soil moisture, to retain carbon, to shade the soil surfaces to reduce temperatures and increase habitats for insect-eating birds, among many benefits. We also need a vision of how to manage a landscape with such large variability in water availability and temperature, to develop sustainable farming techniques which do not continue to deplete resources and can support farming communities through inevitable periods of drought.

Stock need shade and shelter, windbreaks improve crop yields, and mature trees transpire water and support the evapo-transpiration cycle which leads to rain. They also transfer water into the soil and root zones of the trees, maintaining moisture levels and retaining carbon.

Urban communities need to be involved too, to manage water conservatively to reduce demand and also to improve urban environments. There are multiple examples of adaptation in urban centres to incorporate water-sensitive urban design to include re-use, recycling, aquifer recharge, permeable pavements and sustainable designs for housing and infrastructure. There are also significant health benefits to the community from incorporating biodiversity into urban settings and benefits from reducing the 'heat island' effect in cities.

INFORMATION REQUEST 4

How effective are water plans at managing extreme events such as severe drought? Are NWI principles being applied at these times?

Standard principles of sustainable allocation need to be set as the basis for all water plans, and associated operating rules and regulations also need to be included in review and accreditation processes.

There is currently too much leeway for the production of plans which do not set sustainable limits on diversions and do not guarantee minimum flows in drought.

The water planning process needs to reinstate minimum end-of-system flows and low flows to maintain drought refuges.

Barwon-Darling Water Sharing Plan

In the example of the critical Barwon-Darling Water Sharing Plan, which determines flows to the Lower Darling and critical fish habitat, upstream extractions in the Barwon-Darling system need to be reduced to a sustainable level of take and minimum flows should be guaranteed to the end of the Barwon-Darling system.

The Barwon-Darling Water Sharing Plan 2012 included a relaxation in regional conditions controlling irrigator take, allowing larger diameter pipes, take at a lower level of river flows and the ability to take up to 300% of annual allocations, with water allowed to be stored on-farm in shallow dams. Those legal but unsustainable practices continued from 2013, with the Lower Darling running dry in

2015-16, and again in 2018-19 with catastrophic effects on Basin native fish populations and Lower Darling communities.

The Water Sharing Plan needs to include minimum flows to the end of the system, to ensure that the whole system can build resilience and survive future drought conditions. Without minimum flows and flows to the end of each sub-catchment, the impacts of water allocations within any sub-catchment are transferred to downstream communities and threaten livelihoods and river health in other communities. *This principle should apply to all Water Sharing Plans for every sub-catchment in the Murray-Darling Basin.*

In addition, environmental flows need to be protected from irrigation take during their passage through the sub-catchment, so that the full allocation can reach the target site which may be further downstream. These flows have been purchased with taxpayer funds to improve ecosystem health, so they should be delivered in full for that purpose. Interception by irrigators represents a financial windfall to individuals with very significant costs for the environment and for downstream communities.

The recent changes to regulations with respect to allowing floodplain harvesting do not take into account the impacts on inflows to the river systems. The interception of water before it reaches river channels should be counted as extraction having equal impact compared to diversions out of river channels, and these extractions should be measured and included in total water accounting for the Barwon-Darling system.

What steps have been undertaken — or should be undertaken — to plan for long term changes in climate?

Water sharing volumes in the Murray-Darling Basin Plan are unsustainable as they are based on modelling which does not include the predicted effects of climate change reducing water availability.

The modelling for the Murray-Darling Basin needs to be re-done urgently to incorporate the predicted very significant reduction in available water and to assess the impact on currently agreed volumes in water sharing arrangements.

What lessons have recent extreme events (bushfires and COVID-19) provided for planning?

As noted above, active measures are needed to rehydrate Australian soils in order to reduce the risk of catastrophic bushfires. Mass revegetation programs would give multiple benefits in increased soil moisture, sequestration of carbon, improved biodiversity and increased rainfall. Revegetation projects can offer mass employment opportunities in regional areas (Bastin et al., 2019).

INFORMATION REQUEST 5

How could the NWI be amended to support best practice monitoring and compliance across jurisdictions?

Following the Four Corners program 'Pumped' in 2017, investigations have outlined the need for effective monitoring and enforcement of compliance, eg the Mathews report (Mathews 2017). These recommendations need to be implemented and progress reported regularly to CoAG, with associated incentives and penalties to ensure compliance. Dedicated funding is needed for monitoring and maintenance of a centralised database for transparent water accounting.

INFORMATION REQUEST 6

Are environmental outcomes specified clearly enough in water plans to guide management actions, monitoring and accountability?

Are institutional and administrative settings effective in supporting these outcomes? Do environmental water managers have the necessary authority, resources and tools to achieve agreed outcomes?

Is the monitoring and assessment of environmental outcomes sufficient?

How effective has adaptive management and planning decision-making been during the recent drought?

Environmental watering is constricted by bureaucratic arrangements and the accounting system which treats environmental water in same way as irrigation allocations. This approach imposes restrictions which work against the delivery of environmental water requirements. Accounting requirements and the approvals process mean that no watering can occur in the months of June or July. Watering must finish by the end of May to allow water accounts to be finalised by 30 June. Approvals for the next water year are rarely completed by the end of July and watering most commonly starts from September. This means that no watering can occur through the cooler months, when significant benefits can be achieved by 'priming' a wetland in advance of a spring watering event.

In river ecosystems still recovering from immense damage during the Millenium Drought, not enough water is available to deliver fully on environmental water requirements which will support recovery. Stressed river red gums and black box require up to three years consecutive watering to recover condition and a further two year to support development of healthy seed crops. Limits on available volumes mean that there is not enough water for sufficient duration, extent and serial watering events at priority sites.

Floods in 2010-12 broke the Millenium Drought, triggering mass germination of river red gums and black box. However, the floods were followed by four dry years before a short flood which peaked in December 2016 and receded extremely rapidly. There have been a further four years dry since the 2016 flood and monitoring has shown that trees have moved into a dormant state, reducing their fruit and seed production (Jensen 2020).

Another concern is the CEWO 'good neighbour' policy, which tends to place environmental water second in priority to irrigation uses. There is also reluctance by CEWO to use full allocations when irrigators' general security licences have reduced allocations, even though environmental water is available from high security licences. The revised NWI needs to emphasise the benefits of environmental watering to the whole community along the length of all rivers, maintaining river health and water resources for the benefit of all water users.

INFORMATION REQUEST 13

Are there any areas for future reform of the NWI that have not been raised in this issues paper that should be investigated for inclusion?

As outlined above, the renewed NWI should link water resource management to vegetation and soil management in whole catchments, as proposed in Michael Jeffery's report (Jeffery 2017).

It is critical that evaporation should be acknowledged as a critical element in the hydrological cycle, not treated as a 'loss' which needs to be saved.

Comprehensive, transparent water audits are essential for effective water management and compliance.

Contrary to the view of the Abbott government, there is urgent need for a stand-alone agency to monitor Australia's progress on water reform. A replacement is needed to continue the work of the former National Water Commission. The recently announced National Independent Water and Catchment Policy Centre sponsored by the Potter and Myer Foundations may provide a useful vehicle.

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