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TO

THE PRODUCTIVITY COMMISSION'S NATIONAL WATER REFORM INQUIRY

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We welcome the opportunity provided by the Productivity Commission (PC) to make a submission to the National Water Reform Inquiry into progress on the reform of Australia's water resources sector and, in particular, the progress of all Australian governments in achieving the objectives, outcomes and timelines anticipated under the Intergovernmental Agreement on a National Water Initiative (NWI).

In this submission, we provide an opening statement and respond to the terms of reference on the following key issues: (1) governance of NWI implementation and delivery; (2) Indigenous issues and interests; (3) water accounting, auditing, efficiency and measurement; (4) environmentally sustainable level of extractions; (5) integrity and accountability; (6) climate change; (7) socio-economic neutrality; (8) community service obligations; and (9) investment in water infrastructure.

Opening Statement

Australia's water reform process has yet to deliver on the promise of the NWI. Progress has stalled, and there are risks of backward steps as trust in governments and markets has eroded and debates have become increasingly divisive. As the PC's 2017 inquiry into national water reform clearly stated, water reform requires perseverance, continuity and long-term commitment from governments, and reform priorities need to include "preventing the re-emergence of outdated policies and avoiding the erosion of hard-won reforms through backsliding" (PC 2017b, p. 2).

Review after review has pointed to a crisis of trust and deficiencies or failures in governance. The end result is water reform that fails to deliver for all. The PC's five-year assessment of the Murray-Darling Basin Plan declared:

> "Many stakeholders do not perceive that Basin Governments have taken the necessary time to listen to and understand their concerns, to conduct the evidence-based analysis required to understand potential impacts and to explore options for managing these. They are also concerned that governments have been unwilling to listen and respond to community views, and they have not considered these views in decision making, or clearly communicated the reasons for their decisions.
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> This has led to distrust, a lack of confidence and growing scepticism on the ability and commitment of Basin Governments to successfully implement and achieve the outcomes of the Basin Plan. Much of the community dissatisfaction is driven by the way Governments have sought to negotiate and navigate their way through issues." (PC 2018, p. 355)

The Socio-economic Assessment Panel Draft Report (Sefton et al. 2020) also found:

> "Across the [Murray-Darling] Basin trust in governments—particularly federal and state—to deliver good long-term policy and support rural and regional communities has been severely diminished. This fall in trust has resulted from a failure to adequately include people in conversations about government policy and their future, especially those who have not been on the upside of change. We heard strong messages that successive governments have hollowed out their local and regional capability and knowledge, and they have failed to provide clear leadership or a compelling vision." (Sefton et al. 2020, p. 1)

Along with the specific changes recommended in this submission, we believe national conversations on water reform are vital to reinvigorate the water debate and help put Australia on track to a sustainable water future. Without well-designed public deliberative processes, we expect that Australia's water crises will continue and, with climate change, get worse.

In our view, these conversations, and national water reform in particular, should focus on three key areas: *(1) information* (data consistency, accessibility, transparency, measurement, monitoring, etc.); *(2) governance* (separation of implementation from auditing and review functions, adequate resourcing, accountability for decision-making, openness, inclusiveness, integrity, etc.); and *(3) justice* (Indigenous rights and interests, inter-generational justice with the delivery of key objects of the 2007 Water Act (such as 3(d)), social justice for communities with deficient (quantity and quality) water supplies). Without meaningful conversations with all Australians, and without achieving better information, governance and justice, national water reform will fail to deliver just and sustainable water outcomes.

1. GOVERNANCE OF NWI IMPLEMENTATION AND DELIVERY

Progress in jurisdictional adoption of NWI principles, objectives and key outcomes is strongly influenced by governance. The implementation of the NWI is suffering from erosion and dismantling of the original governance arrangements conceived to drive, implement, review, audit, and adapt the National Water Reform mechanisms.

Governance arrangements

Paragraph 19 of the NWI agreement made the NWC responsible for advising COAG on national water issues and assisting implementation of the Agreement. The NWC was abolished by the *National Water Commission (Abolition) Act 2015* in October 2014. The claim given for its disbandment, as stated by the relevant Minister, was "…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." (Baldwin 2015). This unfortunate decision has severely disadvantaged water reform in Australia.

The NWC played an essential role in driving forward the NWI water reform initiatives through its overview, research and provision of strategic leadership to jurisdictions and COAG deliberations. This momentum is now absent, and its loss is a major weakness in the national water governance framework that seriously retards the adoption of NWI principles, objectives and key outcomes.

Paragraph 18 of the NWI Agreement conferred to a key ministerial council of the Council of Australian Governments (COAG), the Natural Resource Management Ministerial Council (NRMMC), the responsibility to oversee its implementation, in consultation with other Ministerial Councils, as necessary, and with reference to advice from COAG. Since 2009 these COAG arrangements have degraded in functionality with all councils proposed to be disbanded.

On 29 May 2020, the Prime Minister announced that COAG will cease and a new National Federation Reform Council (NFRC) will be formed, with National Cabinet at its centre. On 26 June 2020, National Cabinet agreed that former Director-General of the Western Australian Department of Premier and Cabinet and former Commonwealth Cabinet Secretary, Peter Conran AM, will lead a review of the former COAG Councils and Ministerial Forums with a view to rationalise and reset their work. The objective is to reset the structure and work programs of the former COAG Councils and Ministerial Forums to better align the work of new Ministerial Forums with the revised federal relations architecture overseen by the National Cabinet and NFRC. The PC Inquiry has a role to assist this reset to ensure that an appropriate Ministerial Forum is in place to drive and overview the implementation of NWI principles, objectives and key outcomes across Australia.

Given that the COAG arrangements are under review, it is of critical importance that the NWI's governance arrangements be reset as a matter of the highest priority. One option we believe that

the PC should seriously consider is a role for an Independent Statutory Authority, properly resourced, that would be responsible for strategic leadership and supporting Australian governments to drive national water reform under a reformed NWI.

Need for vision

The challenges of changing climate and increasing populations highlight the urgency to progress and refine NWI reforms. Experience from both business and public policy indicates that successful efforts to address such challenges require a clearly articulated vision which has been derived through meaningful engagement with First Peoples and, separately, key stakeholders.

The current NWI objectives are framed in terms of optimising economic, social and environmental outcomes (NWI, para 23). As Bret Walker SC, Commissioner of the Murray-Darling Basin Royal Commission (MDBRC), astutely observed, it is not even possible to optimise all economic, social and environmental outcomes simultaneously (MDBRC, 2019, pp. 20-22). Further, the NWI gives no indication of priorities or trade-offs that must, inevitably, be made.

Notwithstanding these matters, optimisation, perhaps best read as "improving" rather than technically optimising, is a means to a largely unstated end. The preamble of the NWI cites several goals, "increase productivity and efficiency"… "service rural and urban communities" … "ensure health of river and groundwater systems" where the overarching objective is "…to provide greater certainty for investment and the environment [and to] deal with change responsively and fairly." Apart from the reference to the health of the river and groundwater systems, these statements fail to identify the vision such steps are meant to achieve.

Clear vision statements:

- Support increased buy-in and commitment from all parties, where they feel heard and respected in the crafting of that statement
- Aid in prioritisation of processes and strategies for achieving that vision
- Encourage a stronger future orientation, in the context of rapid change
- Facilitate flexibility in selecting policies and tools as circumstances change
- Provide a foundation against which policies and regulations may be reviewed, enhancing public accountability

We propose that the NWI's capacity to support better social, economic and environmental outcomes would be enhanced by implementing a rigorous and wide-ranging process of consultation and engagement to establish a shared vision of what those outcomes may look like. Successful vision statements would find an appropriate balance between general 'motherhood' platitudes and more specific goals that are shared or acknowledged across the diverse affected communities; they would be forward looking, including consideration of changing climates and ecosystems, and social, economic, and cultural dynamics. Vision statements would articulate shared values, key attributes of 'what success would look like', and aspirations for the future.

In the context of conflict and divergent values, the crafting of an effective vision or set of vision statements is not easy. It requires difficult conversations that require genuine commitment from and inclusion of First Peoples and participation across all levels of government, business and civil society. Absent a process to develop a shared vision for the NWI, the political and social challenges will persist and grow as water resources become scarcer. Dialogue and 'voice' are not 'silver bullets', and they will not resolve all water reform challenges. But a shared vision is

necessary and essential to a process of co-operation and collaboration that will shape and strengthen future water reform directions.

Subsidiarity

The previous report into National Water Reform by the Productivity Commission called for devolution of the use of held environmental water to the lowest practical level, consistent with the principle of subsidiarity (PC 2017a, pp. 164-166):

> "Over time, the Australian Government should devolve the management of Commonwealth environmental water to the lowest practicable level in situations where:
>
> - the environmental water could be effectively managed by an accountable local or state and territory partner
> - the involvement of the Commonwealth Environmental Water Holder is not required to achieve whole-of-basin outcomes, including by managing trade-offs between catchments and jurisdictions." (PC 2017b, recommendation 5.5, p. 166)

Advantages cited by the PC included local employment, stronger local engagement, and better integration of the planning and management of water with other river, wetland and floodplain management activities.

The subsidiarity principle is appropriate in some, but not all, circumstances and may cause harm and unintended consequences. The PC in this Inquiry should elaborate on what is required to enable devolvement of water to 'be effectively managed'. We submit that effective implementation of the subsidiarity principle relies on good governance arrangements, including clear overarching management frameworks and objectives, cross boundary coordination and cooperation, and strong monitoring and accountability mechanisms. Its success also heavily depends on adequate local capacity and capabilities. Without these elements in place, cross-jurisdictional and national goals and commitments may not be achieved.

2. INDIGENOUS WATER RIGHTS & INTERESTS

The Standing Council on Environment and Water (2013) to the COAG 'Next Steps in National Water Reform: Preparation for the Future' states that "Australia is seen as an international leader in water resource management". This statement is not true in regard to Indigenous Australians and Australia's water reform delivery despite the Indigenous Estate estimated to be up to 40% of Australia's land mass (Taylor and Fry, 2016).

The COAG Water Reform Framework and the Australian Government through the NWI Initiative did *not* develop a whole-of-government approach to water resource management strategy and planning with Indigenous Australians and Indigenous communities across their respective jurisdictions. Murray Radcliffe, a former member of the NWC stated that "amendments sought by Indigenous peoples can be added later to the NWI". But this promise was never delivered.

Australian governments, through the NWI, have failed to meaningfully engage and work with Indigenous Australians and their communities to improve the wellbeing of Indigenous Australia, which includes economic prosperity. The NWI has not responded to Indigenous water requirements, beyond the minimalist approach. A reformed NWI must include (not exhaustive list), for First Peoples: reform opportunities in statutory mechanisms that deliver social, economic and cultural outcomes for water allocation, water entitlements, Australian Drinking Water Quality Guidelines, economies and livelihoods in water production and water trading.

The PC (2020) identifies one of the eleven agreed outcomes under the NWI for water access and planning that "water planning arrangements recognise Indigenous needs in relation to water access and management". But Indigenous Australians cannot meet these needs, which are essential contributors to their wellbeing, As the PC (2020) states, "statutory water plans define how water is shared between consumptive uses including agricultural, industrial, household uses and the environment". Yet there is an ongoing lack of progress on identifying and delivering the 'water needs of Indigenous Australians' and continuing calls for Indigenous water requirements to be recognised as part of the NWI 'entitlement and planning framework' have been largely ignored.

Indigenous Australians and their communities have important traditional and other knowledge and expertise that can support water reform for all. Many Indigenous communities, Indigenous Land Councils, NGOs and Indigenous Peak Bodies also have national and international engagement on climate change and human rights. One of many examples of Indigenous expertise includes the Indigenous Land and Sea Rangers who hold significant knowledge about freshwater and sea country, fire management, climate change knowledge such as environmental indicators and water resource management memory (beyond the introduction of common law to Australia).

Incorporation of inputs and insights (properly supported and funded) of Indigenous Australians and their communities is critical to managing water resources and developing the national framework for 'extreme events', such as the decision rules and the trigger points, in particular in rural and remote Australia. The *Water Act 2007* (Cth) has a mandate to respond to climate change and, in particular, to develop climate change planning: engaging with Indigenous Australians and their communities in order to understand risks and impacts in water planning and water management is essential in refreshing the NWI.

In terms of international human rights standards, the implementation of the NWI has failed to embed the right of self-determination of Indigenous Australians over their water resources under the United Nations Declaration of Indigenous Peoples, the Convention on Biological Diversity and the International Labour Organization Convention 169. Self-determination is a fundamental principle in international law under the United Nations International Covenant on Civil and Political Rights and the United Nations International Covenant on Economic, Social and Cultural Rights.

The Commissioner of the MDBRC stated that "the imperative of fairness or social justice is not exactly large in the scheme of the *Water Act 2007* (Cth)" (MDBRC 2019, p. 17), and he further highlighted that under the *Water Act 2007* (Cth) (and the Murray-Darling Basin Plan) "despite clear obligations under international agreements, in particular in native title law that policies underpinning specific references relevant to Aboriginal people omit policy objectives" (MDBRC 2019, p. 63). Similarly, the NWI will continue to fail Indigenous Australians where Australian governments are not compelled to adhere to specific policy objectives for Indigenous Australians, their water rights and interests. As the National Water Commission Biennial Assessments confirm, the water requirements for Indigenous Australians were 'patchy' and grossly inadequate.

The 2011 NWC review stated that "most jurisdictions have failed to incorporate effective strategies for Indigenous social, spiritual and customary objectives in water plans". Little has changed in the years since this finding. These outcomes are familiar in other areas of Indigenous policy where targets have not been met, for example those in the Australian Government's 'Closing the Gap'.

Implementation of the NWI has failed to adequately recognise, support and improve the water requirements of Indigenous Australians across the various jurisdictions. Further, the NWI itself is not 'fit-for-purpose' in meeting the future water requirements of Indigenous Australians and their communities. Under the NWI there are only three discretionary paragraphs 52, 53 and 54, that deal with native title and water sharing planning. The Commissioner of the MDBRC (2019) stated that "Aboriginal peoples rightly felt that their (water) interests have been marginalised". In chapter 11, 'Aboriginal Engagement', of the MDBRC (2019) the Commissioner explains the impact of the limited understanding of the broader Australian community of Indigenous Australians' significant relationship with water resources (MDBRC 2019, p. 469). Further, he stated, that "contemporary Australian society has a way to go to understand" (MDBRC 2019, p. 470), noting that "Australia's laws do not provide for or clearly recognise Aboriginal values and interests in water" (MDBRC 2019, p. 470). He highlighted that these "insights are more deeply understood in the seminal work of 'Overturning Aqua Nullius: Securing Aboriginal Water rights' (Marshall 2017) which 'provides an Aboriginal ontological perspective of Aboriginal peoples relationships with water that is needed to help bridge the gap between non-Aboriginal and Aboriginal participation in legal and administrative water regimes" (MDBRC Ibid).

The PC (2017b, p. 29) made two important recommendations in relation to national water reform:

Recommendation 3.2 stated "*State and Territory Governments should ensure that: a. Indigenous cultural objectives are explicitly identified and provided for in water plans b. progress in achieving Indigenous cultural objectives is regularly monitored and reported publicly c. there is public reporting of how Indigenous cultural objectives have been considered in the management of environmental water — both held and planned."*

Recommendation 3.3 stated "*Where State and Territory Governments provide access to water for Indigenous communities for economic development they should: a. source water within existing water entitlement frameworks, such as by purchasing water on the market or as part of transparent processes for releasing unallocated water b. ensure adequate supporting arrangements (such as training and business development) are in place to enable Indigenous communities to maximise the value of the resource c. involve Indigenous communities in program design d. specify and implement future governance arrangements e. regularly monitor and publicly report on these provisions (such as the volume of entitlements sourced, water used and supporting arrangements) and their outcomes. Australian, State and Territory Governments should revise relevant provisions in the National Water Initiative to align with recommendations 3.3 (a) to 3.3 (e)".*

These recommendations remain unfulfilled. Their delivery requires Commonwealth, state and territory jurisdictions to pursue national water reform so that Indigenous Australians can secure their water rights and interests.

In support of our view that Indigenous water interests require urgent attention, we note that a recent assessment of Indigenous water entitlements in New South Wales showed almost one fifth of First Peoples water holdings by volume were lost between 2009 and 2018 and current holdings represent only 0.2% of available surface water (Hartwig et al. 2020). First Peoples have experienced severely limited water rights and suffered serious disadvantage in acquiring and maintaining water entitlements due to administrative changes to rules over access, cultural water licencing and forced water sales from liquidation of assets when First Peoples organisations enter into administration. These factors, and the lack of government commitment to restore water rights to First Peoples communities continues water injustice.

Critical reforms remain stalled. Without recognition and planning mechanisms that deliver water rights and entitlements for First Peoples, National Water Reform is seriously deficient, and this, in turn, diminishes Australia's international reputation. Critical assessment and reform of the legal, administrative and governance arrangements for water entitlements and water markets is urgently needed to overcome structural inequalities for First Peoples.

3. WATER ACCOUNTING, EFFICIENCY, MEASUREMENT, MONITORING AND INDEPENDENT AUDITING

Paragraph 23 (vii) of the NWI Agreement prescribes water accounting to meet the information needs of different water systems with respect to planning, monitoring, trading, environmental management and on-farm management. This is set out in more detail in paragraph 80 where the Parties to the NWI agree that the intended outcome of water resource accounting is to: (i) ensure that adequate measurement, monitoring and reporting systems are in place in all jurisdictions; and (ii) support public and investor confidence in the amount of water being traded, extracted for consumptive use, and recovered and managed for environmental and other public benefit outcomes.

Water accounts

The Bureau of Meteorology (BoM) publishes a National Water Account that comprises 10 regions, including the Murray-Darling Basin (MDB). These water accounts include information such as changes in inflows, outflows and storages (BoM 2019a). In preparing water accounts, BoM has statutory obligations in relation to: collect, interpret and disseminate water information; conduct regular national water resources assessments; publish an annual National Water Account; provide regular water availability forecasts; issue national water information standards; advise on matters relating to water information; and enhance understanding of Australia's water resources (BoM 2019b).

BoM partners with State and Territory water agencies—as well as with other Australian Government agencies, water utilities and various water agencies—to collect the data used to construct the National Water Account. New South Wales (NSW) considers itself to be a leader in implementing General Purpose Water Accounting Reports (GPWAR) that seek to provide consistent and transparent information to water stakeholders, internal staff, external government agencies, universities, water brokers and the general public (NSW DOI 2019a). Notwithstanding the gaps in existing water accounts, the BoM and state water accounts could form the basis of a comprehensive audit of the MDB.

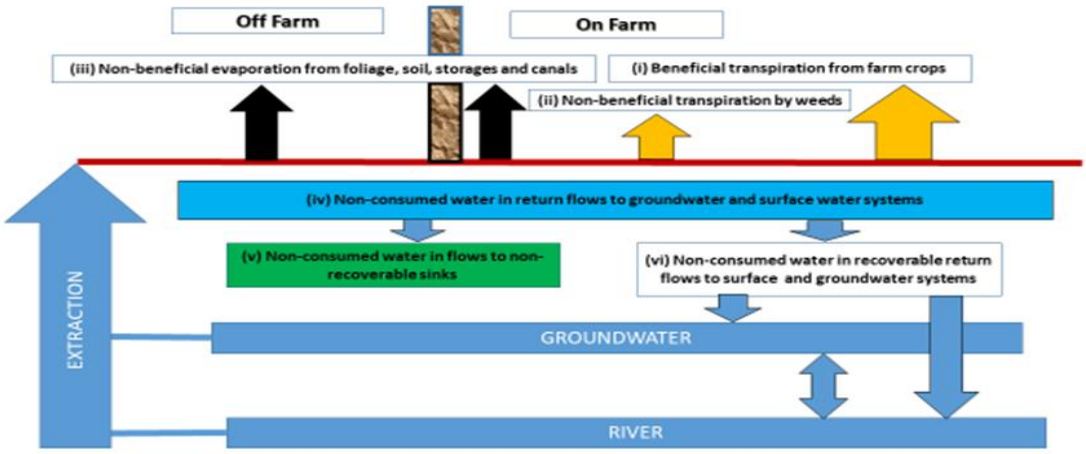
While there has been some intermittent progress by some jurisdictions in terms of water accounting, Australia still does not have a set of National Water Accounts in place which can be subject to independent audit (Grafton and Williams 2019). The critical need for such accounts is supported by a number of high-level enquiries in relation to water use and governance in the MDB. These include the Murray-Darling Basin Royal Commission (MDBRC 2019), the Productivity Commission 5-year assessment of the Basin Plan (PC 2018), an Academy of Science Review (AAS 2019) on the Menindee Lakes Fish Kills at the end of 2018 and early 2019, and several enquiries in relation to monitoring and compliance of water diversions. In addition, both the Australian Competition and Consumer Commission (ACCC) and the Australian National Audit Office (ANAO) have tabled reports which confirm the need for auditing and the establishment of a transparent, comprehensive set of Australian water accounts. The current deficiency in this key requirement is the cause of large uncertainty and social division over current and future levels of water diversions, especially within the Northern Rivers of the MDB.

The PC's draft report on the first five year assessment of the Murray-Darling Basin Plan found "There is no evidence Department of Agriculture and Water Resources undertakes systematic assessments of return flows in its current programs" (PC 2018, p. 89). The final report highlighted that "The Department of Agriculture and Water Resources has accounted for the impacts of improving irrigation efficiency on return flows in some major water recovery projects but has not done so in all cases. The Department has committed to monitor impacts in future water recovery programs, but the framework for doing this is not yet clear." Further, the PC considered that "The overall impact of improved irrigation efficiency on water resources is not precisely known, but recent independent work indicates it to be relatively small". In reaching this conclusion, the PC appears to have relied on a review commissioned by the Murray-Darling Basin Authority (MDBA) by Wang et al. (2018). Yet these authors also strongly support the need for more careful measurement of return flows and argued for "…more intensive and on-going data collection, regular evaluation and review of impacts on river flow from groundwater Sustainable Diversion Limits (SDLs), irrigation efficiency projects and other factors". We recommend that the PC revisit this unresolved question and report any further evidence on this matter.

The MDBA and State agencies currently either do not know or do not make publicly available: (1) the volumes of water in private storages; (2) the volume of water diverted through floodplain harvesting; and (3) the downstream flow effects of increases in irrigation efficiency. Yet remote sensing methods are available to deliver such information by relevant agencies (Breteger et al. 2020). This should be a matter of concern for both irrigators and all Australians. Importantly, uncertainty over private water storage, floodplain capture and return flows can undermine the perceived integrity of holders of water entitlements, increase the likelihood of errors in decision-making, and diminishes trust in decision-making by water governance agencies, especially by the owners of water entitlements.

To appreciate the critical importance of water accounting for good water governance, we highlight the key flows in terms of a water balance (see Figure 1). Water diverted for irrigation that is not consumed (transpired or evaporated) and that returns to groundwater or streams represents recoverable return flows (Williams and Grafton 2019; Walker et al. 2020). Return flows to various groundwater systems and to rivers and streams and other water flows associated with irrigation diversions are illustrated in Figure 1.

Figure 1. Water Balance Off and On Farm



The non-consumed water in recoverable return flow to groundwater systems, rivers and streams cannot be avoided in the computation and measurement of a set of water accounts.

A refreshed NWI would clarify the meaning of 'water-use efficiency'

The lack of comprehensive water accounting is compounded by on-going misunderstanding, including within the Australian government, about water-use efficiency. Importantly, water-use efficiency is not defined in the NWI. There are many possible definitions, each measuring something different. When used to direct reform, choice of definition matters because different definitions will drive outcomes in different directions.

An economic definition of water-use efficiency takes into account how water resources are allocated and used to achieve the greatest overall net benefit to the community. A water allocation is economically efficient if there is no other allocation that would generate a higher value or net benefit. This is different from physical water-use efficiency, which is often used to define the relationship between water (as one input) and production (as an output), such as tonnes of rice per megalitre of water, or the volume of water received at the farm gate as a percentage of the volume of water leaving storages.

Physical water-use efficiency is neither necessary nor sufficient to achieve an economically efficient use of water. Adoption of an irrigation technology that increased physical water-use efficiency would reduce economic efficiency; for example, if the costs of adopting the technology outweighed the benefits from its adoption. Impediments to the economically efficient use of water may justify government intervention (if benefits to the wider community were generated that exceeded costs). But existence of less physically efficient irrigation practices or technologies does not, by itself, justify such intervention (PC 2006).

Water-use efficiency should not be prioritised over more efficient & effective overall resource use

Specifying an economic definition of water-use efficiency would be consistent with clarifying the overarching objective of the NWI, to manage surface and groundwater resources for rural use in a way that 'optimises economic, social and environmental outcomes' (NWI para 23). Irrigators (like other producers) take account of all farm inputs, not just water. A focus on any single input can lead to perverse outcomes. Energy requirements for water efficient infrastructure are often high, and recent escalation of electricity costs may have slowed or even reversed the uptake of water efficient infrastructure, in opposition to the NWI's goals of enhancing water-use efficiency and optimising economic, social and environmental outcomes.

Government support for energy-intensive infrastructure upgrades to enhance water-use efficiency may in fact expose irrigators to greater risk and harm their ability to respond to changes or 'shocks', such as droughts, (Adamson, Loch, Wheeler and Connor 2017), and thereby lead to outcomes contrary to the NWI. Thus, we support the ACCC's previous call for the PC to "clarify that water use efficiency should not be prioritised over achieving more efficient and effective overall resource use" (ACCC 2017, p3) and agree with the ACCC's assessment that "this will be particularly important if the shift in policy from water purchase to water infrastructure upgrades as the major mechanism for recovering water for environmental purposes is ongoing" (ACCC 2017, p3).

Water audits

Along with a comprehensive set of Australian water accounts, a regular, transparent Water Audit is essential to developing credibility and public trust in NWI implementation. Auditing is an activity of verification, checking, evaluation and interpretation of a set of accounts. It is most widely applied to the auditing of financial statements. Financial auditing may include: the

checking of accounting records; verification of the validity and reliability of accounting information based on the information available; and comments on the adequacy of the accounts to determine the state and the financial health of the organisation. Our call for a national water audit is based on these same auditing principles, namely, to verify, check, evaluate and interpret catchment and basin-scale water accounts to establish progress against the objects of the Water Act (2007).

Large unmitigated risks will remain for all water users without transparent and audited water accounts that include measures or reliable estimates of recoverable return flows, floodplain water harvesting and climate change (Wheeler et al. 2020). These risks jeopardise the successful implementation of the NWI principles, including future levels of SDLs, and also the reliability of water entitlements and water trading within Catchments and Basins. Thus, there is an urgent need for a water audit to make the best use of existing water accounts and to identity and resolve gaps in knowledge and a hydrological audit, using the best available science, of water storages (including privately-owned storages), end-of-system flows, diversions, and return flows by catchment for all categories of water diversions within Australia. In addition to quantity or volume data, information needs to be collected regularly on basic water quality measures (salinity, biological oxygen demand, acidity, nutrient concentrations) at key locations to allow water users and water planners to make judgements about how the water they access can be used.

4. RETURN OF WATER TO OVER-ALLOCATED OR OVERUSED SYSTEMS TO ENVIRONMENTALLY SUSTAINABLE LEVELS OF EXTRACTION

One of the key objectives of the NWI reforms stated in paragraph 23 (iii and iv) is the statutory provision for environmental and other public benefit outcomes, and improved environmental management practices, including the return of all currently over-allocated or overused systems to environmentally-sustainable levels of extraction. In addressing currently over-allocated and/or overused systems in NWI, paragraph 41, the Parties to the agreement note that existing commitments require that allocations to provide a better balance in water resource use (including appropriate allocations to the environment) must be substantially completed for all river systems and groundwater resources which have been over-allocated or are deemed to be stressed. Further, in NWI, paragraph 44, States and Territories agree that substantial progress will be made by 2010 towards adjusting all *over-allocated* and/or *overused* systems in accordance with the timelines indicated in their implementation plans. A clear and transparent audit is required to evaluate progress in jurisdictional adoption of NWI principles, objectives and key outcomes.

From the public documentation available, it does not appear that we know the level of achievement or otherwise with respect to **"**return of water to over-allocated or over-used systems to environmentally sustainable levels of extraction". This was a fundamental objective of the NWI following the widespread public recognition that many of our rivers and groundwater systems were over-allocated and stressed and action was needed to move towards sustainable levels of take.

Progress on this important objective is surrounded by much uncertainty. The Wentworth Group of Concerned Scientists (2019) evaluated whether environmental water recovery has led to observable increases in river flows at two key sites along the MDB. This assessment found that 2,016 GL of water has been accredited as recovered for the environment (63% of that envisaged under the Basin Plan) at a cost of $8.5 billion, and during several wet years in the period from 2010-2018. Yet, the environmental flow targets set by the MDBA, which are required to be met to produce environmental improvements, have not been achieved for these key sites. In general,

excluding natural flood events, annual average flows can be up to 40% to 60% smaller than expected under the Basin Plan (Wentworth Group 209, p. 1). Importantly, the Wentworth Group (2019, p. 1) found that the observed flows are similar to, or less than, the baseline (pre-Basin Plan) model results. Instead of an increase, there has actually been no improvement or even a decline in water flows since the implementation of the Basin Plan. In a subsequent catchment-by-catchment report, the Wentworth Group (2020) found that from 2012/13 to 2018/19, 25% of flows expected under the Basin Plan were not realised, at 27 of 27 sites, amounting to 387 GL per year on average, even after accounting for drought years and the volume of water accredited as recovered for the environment. While some sites received the expected flows, most sites, including those upstream of Ramsar wetlands, did not. Some 17 sites received less than 75% of expected blows and three received less than half. Thus, there has been no overall improvement in flows since the Plan was implemented and flow targets set by the MDBA have not been achieved.

This return of water to environmentally sustainable levels of extraction is a fundamental NWI objective. This inquiry needs to give attention to the apparent failure to achieve it through the Murray Darling Basin Plan, despite large expenditures on water recovery, especially subsidies for water infrastructure. We strongly urge the Productivity Commission to review more recent research since the last inquiry into national water reform and the 2018 assessment of the Murray-Darling Basin Plan and update its findings and recommendations (e.g. Grafton et al. 2018; Grafton 2019; Grafton and Wheeler 2019; Williams and Grafton 2020; Wheeler et al. 2020).

5. INTEGRITY AND ACCOUNTABILITY

In the issues paper for this enquiry, the PC (2020) highlighted in relation to transparency of water planning: "The Commission should seek to identify areas of better practice and areas where improvement is required" (p. iv) and that "compliance with water access conditions underpins both the integrity of the entitlement system, and public confidence in water management" (p. 8). We argue that issues of integrity and public trust in water management extend well beyond the planning process and compliance and water entitlements to all aspects of water reform. We further argue that public trust has been significantly undermined, particularly in relation to the implementation of the Murray-Darling Basin Plan.

For example, the MBRC found "an unfathomable predilection for secrecy… an obstacle to the democratic and informed design and improvement of public policy" on the part of the MDBA and the CSIRO in relation to science that underpinned the Basin Plan (MDBRC, 2019, p. 20).

We strongly endorse the PC's intent to identify areas for improvement in transparency and integrity and urge it consider practical measures for the adoption, implementation and enforcement of key principles of integrity and transparency in public administration, including for publicly-funded research agencies and research that supports national water reform.

6. CLIMATE CHANGE IMPACTS ON WATER RESOURCES

Australian rivers, and particularly those in the MDB, are sensitive to changes in water flow characteristics induced by climate change because of their latitude and possible reductions in cool season rainfall and river flow (CSIRO 2012; Whetton 2017), as well as the potential for increased warm season rainfall in the northern tributaries of the Darling River system (AAS 2019, Appendix 5, p. 119). In CSIRO's 'dry climate scenario' (CSIRO 2012) there are projected to be large reductions in runoff and water availability throughout the Basin. In CSIRO's 'wet

climate scenario' there could be substantial increases in runoff and water availability in the Northern Basin, grading towards little change in the south. Importantly, if daily extreme rainfall increases, as projected, then even if average rainfall were to decline, floods might increase in severity.

CSIRO's 2012 projections were based on hydrological models assuming stationarity, namely, that natural systems fluctuate within an unchanging envelope of variability. However, climate change undermines the presumption of stationarity that has been used for historical modelling and decision-making in relation to water supplies, water demands, and climate variability (Milly et al. 2008). This is important because a lack of stationarity in climate and hydrological processes increases the uncertainty associated with water planning. Importantly, the 2012 Basin Plan SDLs were based on a historical climate without modelling climate change impacts (Pittock et al. 2015).

Climate projections suggest that a rise of 1°C in the surface temperature may result, on an annual basis, in an approximate 9% reduction in subsurface soil moisture in the Southern MDB (Cai et al. 2009; Milly and Dunne 2018). But uncertainties still need to be resolved around these projections because Milly and Dunne (2016); and Yang et al. (2019) show that an increase in evapotranspiration demand of the atmosphere may be offset by a decrease in evapotranspiration caused by decreased stomatal conductance in crops and pasture as a result of an increased concentration of carbon dioxide in the atmosphere. Further, even with an unchanged average rainfall in the MDB, increased temperatures could increase variability of flows, and also reduce flows (Milly and Dunne 2018). If this were to occur through increased evaporation, this would result in additional uncertainties in terms of the possible future effects on Basin ecosystems. These effects for other river basins have received less attention and the uncertainties under climate are yet to be fully explored in the context of the Murray-Darling Basin Plan.

Implementation of a revised NWI must address this issue in the MDB and Australia-wide to promote exploration of new ways to manage river flow regimes and groundwater recharge/discharge by extraction and consumption limits that maintain hydrological and ecological function under climate change. In the MDB, this will require a re-think of the current concept of Sustainable Diversion Limits and their definition and determination.

7. SOCIO-ECONOMIC NEUTRALITY

By signing the NWI, MDB, signatory jurisdictions[1] agreed that:

- Water recovery would be based primarily on cost-effectiveness, with a view to managing socio-economic impacts (NWI para 79 ii c).
- Water recovery by government would consider all available options including (but not limited to) considering all available options for water recovery (such as investment in more efficient water infrastructure; purchase of water on the market, by tender or other market based mechanisms; investment in more efficient water management practices; and investment in behavioural change to reduce urban water consumption) (NWI para 79 ii a).
- Governments would address significant adjustment issues affecting water access entitlement holders and communities that may arise from reductions in water availability as a result of implementing the NWI reforms (para 97). Assistance to affected industries would be

[1] The signatory jurisdictions of the NWI were the Commonwealth of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory.

considered on a case by case basis, taking into account matters including the scale of the changes sought and the speed with which they are to be implemented (para 97 i c; para 97 ii).

The NWI agreed role for government is markedly different from the December 2018 socioeconomic neutrality criteria agreed for efficiency measures in the MDB. As Marden Jacobs (2019) observed, the agreed neutrality criteria do not include cost-effective delivery as a primary role of Government. Instead, the agreed criteria say any future water recovery investments:

- should not reduce the overall productive capacity of the relevant region and should not impact negatively on regional jobs.
- should not have negative third-party impacts on the irrigation system, water market or regional communities.
- must contribute to the current and future viability of proponent businesses and irrigation districts.

Requiring a project to demonstrate zero negative impacts would effectively block any additional water recovery: there will always be an impact on some market participant, whether it be through upward pressure on water prices due to reduced water available for consumptive use, or to changes in demand for water and trade patterns. The lack of detail in the criteria means that their application is essentially up to each jurisdiction. Different applications may return very different results. Effectively, the December 2028 criteria allow for a veto for investment that might be in the net national (or MDB) interest, even if the negative impacts on the most directly affected communities were fully ameliorated.

The PC could usefully reflect and comment on the consistency of the socioeconomic neutrality test with the NWI and assess the consistency and transparency in its use between jurisdictions. Basin governments should focus on directly addressing substantial local negative socioeconomic impacts of recovering water and re-open the possibility of an outcome in the net national (or MDB) interest.

8. COMMUNITY SERVICE OBLIGATIONS

The NWI allows for the provision of community service obligations (CSOs) for water storage and delivery in both urban and rural systems (NWI para 66 v c) but offers no guidance on when and how they should be implemented. Further, the NWI does not provide a framework to guide CSO development and application.

In its last inquiry into national water reform, the PC primarily focussed on better processes for funding of *future* infrastructure, cautioning that unless future infrastructure is financially viable and can meet ongoing environmental requirements, "there are risks that public funds will be wasted, water users left with assets they cannot afford and costly environmental damage imposed on future generations" (PC 2017b, p. 23). While fully supporting this view, the substantial public funds that have already been invested in new or upgraded water efficient irrigation infrastructure with the intention of recovering water for the environment must not be overlooked. Importantly, this infrastructure will require maintenance as well as replacement or refurbishment as that infrastructure ages.

As noted by the ACCC, "CSO payments could be a major issue for the water sector in future as 'gifted' public infrastructure matures, in light of the ongoing requirement to realise water savings from the infrastructure in perpetuity" (ACCC 2017, p. 4).

The PC should also draw attention to the challenge that past gifting of infrastructure creates for asset renewal. In particular, the PC should address the treatment of gifted assets and CSOs in a regulated asset base**.**

The NWI pricing principles stipulate that:

- continued movement towards upper bound pricing (which includes the full cost of asset consumption) for all rural systems, where practicable; and
- where full cost recovery is unlikely to be achieved in the long term and a CSO is deemed necessary, the size of the subsidy is to be reported publicly and, where practicable, jurisdictions to consider alternative management arrangements aimed at removing the need for an ongoing CSO (NWI cl. 66 v b and c).

The ACCC observed that while the NWI pricing principles provide for contributed assets (gifted by government) to be excluded from the regulated asset base so that users are not required to pay charges to finance the original contributed cost of the assets, an annuity charge may be applied to recover future costs of replacing or refurbishing contributed assets (ACCC, 2017).

The NWI called for rural water systems to achieve at least *lower bound pricing*, which includes provision for future asset replacement or refurbishment, as well as the recovery of operating and maintenance costs. If this principle is followed, operators should charge customers amounts sufficient to fund refurbishing or replacing previously gifted assets. Notwithstanding this NWI commitment, as the ACCC noted, benchmarking of performance efficiency has all but lapsed (ACCC 2017). This makes it difficult to assess the extent of implementation of the goals of lower or upper bound pricing. The PC should consider recommending reporting that would make transparent the extent of this emerging issue which may give rise to claims on public funds to pay for these costs when the need arises.

The scale of payments for the ongoing requirements to provide water savings obtained through past provision of water infrastructure, and who will bear their costs, should be made clear well in advance of the need to refurbish or replace that infrastructure. Irrigation Infrastructure Operators (IIOs) need to be more transparent with their irrigation customers about the implication of off-farm infrastructure investments for future IIO fees and charges when off-farm investments are being evaluated.

The standards of service offered by infrastructure also need close examination. The standard chosen directly influences costs and charges payable by the users. Preferences for the standard of refurbishment or asset replacement may differ between water users and may also be higher than needed to provide the water savings for the environment. Where public benefits are provided by IIOs through their assets, these services should be recognised. The expectations of the level of service and the government's contribution to the maintenance of those services should be set out each year in a transparently documented CSO. Expenditure on any upgrades for private benefit should be fully cost-recovered from users. The NWI pricing principles should be reviewed to clarify the treatment of these issues.

9. INVESTMENTS IN WATER INFRASTRUCTURE

Paragraph 69 of the National Water Agreement states that Parties to the NWI agreed to ensure that proposals for investment in new or refurbished water infrastructure continue to be assessed as economically viable and ecologically sustainable prior to the investment occurring (noting paragraph 66 (v)).

PC Information Request 12 for this inquiry asks: "Are there examples of projects that have not met the NWI criteria for new water infrastructure investment?" We respond to this issue by assessing the 24 National Water Infrastructure Development Fund (NWIDF) projects referred to in the following statement on the National Water Grid Authority website: "funding is committed to the following water infrastructure projects" (see NWGA 2020a). The total value of the NWIDF is $1.5 billion.

The National Water Grid Authority does not provide project documentation on its website. A document search was conducted for all 24 projects across the websites of the North Queensland Water Infrastructure Authority, relevant state/federal government agencies, local councils, water service providers, and other project proponents. Where this search yielded no results, google searches were undertaken of each project name, NWIDF funding amounts, and other available information. Documents considered in the assessment included those that provide detailed information and evidence, such as preliminary and detailed business cases, that enable assessment against the NWI criteria. Project summaries and media releases were not considered sufficient information to support this task.

The guidelines for the NWIDF expression of interest process (NWGA 2019) and the related $2 billion National Water Infrastructure Loan Facility (RIC 2020a) indicate that eligible projects must be compliant with NWI principles, but do not provide specific details of how such compliance is evaluated. The assessment below has been conducted according to the following interpretations of NWI criteria to be met prior to investment occurring:

- *Economic viability* – A demonstrated benefit-cost ratio (BCR) >1 or, equivalently, net present value for the project >0
- *Ecological sustainability* – The project has developed an Environmental Impact Statement (EIS), Environmental Effects Statement (EES), Environmental Review Document or other environmental assessment that has been approved by an independent regulatory process
- *Full cost recovery in rural/groundwater systems* – A plan for or other stated commitment to pricing that seeks full cost recovery from water infrastructure users

Table 1 summarises the assessment of the 24 NWIDF infrastructure projects. The key results relevant to PC Information Request 12 are as follows:

- There is insufficient publicly available information to assess 21 projects (with a total Australian Government funding commitment of $1.15 billion) against all NWI criteria;
- For the remaining 3 projects (with a total Australian Government funding commitment of $398 million):
    - 2 have not demonstrated economic viability (Rookwood Weir & Hughenden Irrigation Scheme) (see Building Queensland 2017, NineSquared 2020);
    - 1 has not demonstrated ecological sustainability (Hughenden Irrigation Scheme) because it has not yet developed an Environmental Impact Statement; and
    - all 3 (Rookwood Weir, Emu Swamp Dam, Hughenden Irrigation Scheme) are not pursuing full cost recovery because irrigation water prices are deemed unaffordable without government funding (see Building Queensland 2017, p.235; Jacobs 2019, p.276-79; Energy Water Management 2020, p. 206-9).
- Other insights from the assessment include:

- the NWGA website states that Australian government funding is committed to all 24 projects, but only 11 projects[2] are subject to a current Schedule between federal and state/territory governments under the National Partnerships Agreement for the NWIDF capital component (see COFFR 2019a, 2019b, 2020a, 2020b);
- business cases for only 2 projects have been submitted to an independent evaluation process (see Infrastructure Australia 2017, 2018a);
- at least 7 projects have received stated commitments of Australian Government on the NWGA website funding prior to the completion of detailed business cases and/or environmental approval processes, including
- 4 projects[3] that are listed as having received committed Australian government funding through the capital component of the NWIDF (NWGA 2020a) and are also listed as receiving Australian government funding for preparing current feasibility studies, detailed business cases, or environment impact statements (NWGA 2020b).

Given that feasibility studies completed under the NWIDF are intended to inform future water infrastructure decisions, an assessment was also undertaken of their public availability. The National Water Grid Authority (2020b) website states that as "these studies are completed, the relevant state or territory government is responsible for making reports publicly available as appropriate." Table 2 reports the results. Overall, 20 of the 38 completed feasibility studies were publicly available. Links to all publicly available documents on NWIDF infrastructure and feasibility study projects obtained during this assessment can be found in the Appendix.

Lack of data prevented assessment against NWI criteria of Australian Government investment via the NWILF to date. No details on specific projects are provided on the relevant pages of the National Water Grid Authority (2020c) website nor the Regional Investment Corporation (RIC) website (2020a). The 2018-19 RIC annual report indicates that no water infrastructure projects were approved during that reporting period (RIC 2020b).

Government funding principles

The National Water Grid Authority was established by the Australian Government in 2019 to "play a key role in shaping national water infrastructure policy and investment" (NWGA 2020d). This newly formed agency and the RIC, thereby, have an important opportunity to set a national benchmark for the efficient, transparent, and sustainable investment in Australia's water infrastructure by all levels of government.

Best-practice processes for public investment are particularly important for construction of new large dams because these projects are highly susceptible to major cost overruns (see Ansar et al. 2014 for a global review). In an Australian context, Petheram et al. (2019) found that the median and mean cost overruns (relative to immediate pre-construction estimates) were 49% and 120% respectively for a sample of 40 historical projects where sufficient data was available.

The NWI criteria provide an appropriate framework for assessing funding or financing decisions. However, more precise definitions of "economic viability" and "ecological

[2] Scottsdale Irrigation Scheme (TAS); Northern Adelaide Irrigation Scheme, Coolanie Water Scheme, McLaren Vale Treated Water Storage (SA); South West Loddon Rural Water Supply Project, Macalister Irrigation District (MID) 2030 Phase 1B, Sunraysia Modernisation Project 2, Mitiamo and District Reticulated Water Supply Project, East Grampians Rural Water Supply Project (VIC); Mareeba-Dimbulah Water Supply Scheme Efficiency Improvement, Warwick Recycled Water for Agriculture Project Stage 2 (QLD).

[3] Big Rocks Weir, Hughenden Irrigation Scheme, Emu Swamp Dam, and the Southern Forests Irrigation Scheme.

sustainability" will support the National Water Grid Authority, RIC and other government agencies to make evidence-based decisions on committing public funds.

It is notable that a stated funding objective for the NWIDF and NWILF is that projects should support regional economic growth. In order to facilitate assessment against this objective, project proponents or state/territory government partners should be required to conduct a cost-benefit analysis for the use of Australian government funding for alternative regional growth programs in the specific location, including but not restricted to infrastructure construction.

The National Water Grid Authority (2019, pp. 6-7) Expression of Interest Guidelines for the NWIDF state 7 criteria for applications, their weighting, and description of their interpretation as follows:

1. "The proposed project involves construction of permanent water infrastructure that will increase supply and access to water (20%)
2. The proposed project will be compliant with the National Water Initiative (10%)
3. The proposed project will be of public benefit (10%)
4. The proposed project has received the required Commonwealth and state regulatory and administrative approvals required to proceed to construction (10%)
5. Business case and demand for the project (30%)
6. Co-funding greater than 50 per cent of the total project cost (15%)
7. Stakeholder and Indigenous engagement (5%)"

It is a matter of public interest to know whether and how many of these criteria were met by each of the 24 infrastructure projects prior to receiving a funding commitment from the Australian Government via the NWIDF. The assessment undertaken above appears to indicate that some of these projects have received a funding commitment that is conditional and yet to be finalised; in that case, the conditions that have been met and remain outstanding should be publicly stated for each project. Final funding commitments should also be clearly indicated on the NWGA website.

In addition to the NWI and other criteria for making final funding/finance decisions, a program for distributing public funds requires a set of foundational principles. The 11 Infrastructure Decision-making Principles developed by Infrastructure Australia (2018b) are a valuable tool for this purpose. They could guide measures to enhance the administration of the NWIDF and NWILF, including defining community expectations of decision-maker accountability.

Below, we highlight four of these principles and outline potential options for their incorporation into the NWIDF and NWILF with reference to issues raised in the assessment conducted in this submission.

Principle Five: "Governments should undertake detailed analysis of a potential project through a full business case and should not announce a preferred option or cost profile before undertaking detailed analysis involving multiple options."

- The publicly available evidence indicates that NWIDF projects are being listed as receiving committed funding from the Australian government prior to the completion of full business cases and relevant environmental approvals. It is not clear whether infrastructure funding commitments are finalised or conditional.

- *Option:* The National Water Grid Authority and RIC report the current stage of the development process for each infrastructure project under funding/finance consideration and the milestones that need to be fulfilled prior to a final commitment being made.

Principle Seven: "Project proposals should be independently assessed by an appropriate third-party organisation."

- *Option:* Transparent rules are identified for project size or funding amount whereby a project is assessed by an independent third party at the national or state/territory level. The NWGA and RIC publicly identify and report the relevant independent assessor for different project types and locations.
    - Two existing statutory bodies of the Australia Government standout as potential candidates to independently assess prospective NWIDF/NWILF projects against NWI criteria and other funding requirements:
        - Infrastructure Australia – the agency has a transparent Assessment Framework (Infrastructure Australia 2018c) and assessments of major infrastructure investments are one of its core functions;
        - Australian Competition and Consumer Commission (ACCC) – for economic viability and full cost recovery criteria, the ACCC has relevant institutional experience (through the Australian Energy Regulator) administering the Regulatory Investment Tests for Transmission (RIT-T) and Distribution (RIT-D); these are public cost-benefit tests for electricity network augmentation projects estimated to cost more than $6 million and $5 million respectively (see AER 2020).
    - National-level review of major water infrastructure proposals would be a natural core function of a re-established National Water Commission or another dedicated, independent statutory authority charged with overseeing implementing the National Water Initiative.

Principle Nine: "Governments and proponents should publicly release all information supporting their infrastructure decisions. This should include all analysis underpinning long-term plans, option development and assessment, through to full business cases once they have been independently assessed. Governments' and proponents' protection of information should be genuine and justifiable. In particular, commercial-in-confidence protections should only be used where a material commercial risk exists. Where risks are time-limited, governments and proponents should release information in full once risks are no longer relevant."

- The limited public information available for assessment of NWIDF and NWILF projects in this submission demonstrates the substantial room for improvement in the reporting and knowledge-sharing associated with these schemes.
- *Option:* The National Water Grid Authority and RIC develop and or publicly release reporting guidelines pertaining to prospective and funded projects, including:
    - Documentation used to assess a project against NWI criteria, and consistent with Infrastructure Australia Principle Nine, is made publicly available on the website of the agency administering the relevant scheme within a defined period prior to the final decision. Such documents should include preliminary and detailed/final business cases, environmental impacts statements/assessments, and independent project assessments.

- The relevant agency maintains an accessible, publicly available repository of project documentation for projects that are under consideration for or have received funding.
- All feasibility studies commissioned under the NWIDF are published on the National Water Grid Authority website.

Principle Eleven: Where projects are funded as part of a broader program, the corresponding decision-making processes should be robust, transparent and prioritise value for money.

- *Option*: The National Water Grid Authority and RIC provide detailed information and guidelines on their decision-making processes regarding NWIDF and NWILF funding.
- *Option*: The National Water Grid Authority and RIC develop a policy or guidelines explaining to project proponents, stakeholders, and the public how the NWI criteria are interpreted when making funding decisions.
- *Option*: The National Water Grid Authority provides an annual report on operational activities.
- *Option*: Regular reviews are conducted of NWIDF and NWILF funding programs and decision-making processes through independent agencies, such as the Australian National Audit Office, to inform options to improve alignment of these programs with the National Water Initiative and the Infrastructure Australia Decision-making Principles.

Table 1. Assessment of Australian Government funded water infrastructure projects according to NWI criteria

Project Name (Location)	**Funding committed by Australian Government** ($ million)	**Publicly available cost-benefit analysis?** (Y/N)	**Publicly available environmental impact/effects statement or assessment?** (Y/N)	**Project met NWI Criteria prior to investment?**			**Notes**
				Economically viable (Y/N/?)	**Ecologically sustainable** (Y/N/?)	**Full cost recovery pricing (rural)** (Y/N/?)	
National Water Infrastructure Fund Projects							
1. Wyangala Dam Raising (NSW)	$325	N	N	?	?	?	Final business cases and EISs to be delivered in 2021
2. Dungowan Dam (NSW)	$240	N	N	?	?	?	
3. Mareeba-Dimbulah Water Supply Scheme (QLD)	$11.6	Y	Y	Y	?	?	BCR>1; preliminary project documents
4. Warwick Recycled Water for Agriculture (QLD)	$0.8	N	N	?	?	?	No detailed public information
5. Rookwood Weir (QLD)	$176.1	Y	Y	N	Y*	N	BCR=0.64; viability requires ↑ irrigation water demand
6. Emu Swamp Dam (Granite Belt Irrigation Project) (QLD)	$42	Y	Y	Y	Y*	N	Project viability contingent on 3.9GL of new water entitlements
7. Hughenden Irrigation Scheme (QLD)	$180	Y	N	N	N	N	Estimated BCR=0.47-0.72 Detailed business base under development
8. Big Rocks Weir (Hells Gates Dam) (QLD)	$30	N	N	?	?	?	Business Case due end July 2020
9. Charleston Dam Facility (QLD)	$13	Y	N	?	?	?	BCR>1 contingent on ↑ popn. from new agri projects
10. Northern Adelaide Irrigation Scheme (SA)	$45.6	N	N	?	?	?	No detailed public information
11. Coolanie Water Scheme (SA)	$0.7	N	N	?	?	?	No detailed public information
12. McLaren Vale Treated Water Storage (SA)	$2.5	N	N	?	?	?	No detailed public information
13. Scottsdale Irrigation Scheme (TAS)	$25.3	N	N	?	?	?	No detailed public information
14. Tasmanian Irrigation Tranche III: Phase One	$100	N	N	?	?	?	No detailed public information
15. Sunraysia Modernisation Project 2 (VIC)	$3	N	N	?	?	?	No detailed public information
16. Macalister Irrigation District Modernisation Project Phase 1B (VIC)	$20	N	N	?	?	?	No detailed public information
17. South West Loddon Rural Water Supply Project (VIC)	$20	N	N	?	?	?	No detailed public information
18. Mitiamo & District Reticulated Water Supply Project (VIC)	$14.5	N	N	?	?	?	No detailed public information
19. East Grampians Water Supply Project (VIC)	$32	N	N	?	?	?	No detailed public information
20. Macalister Irrigation District Modernisation Project Phase 2 (VIC)	$31.3	N	N	?	?	?	No detailed public information
21. Western Irrigation Network (VIC)	$48.1	N	N	?	?	?	No detailed public information
22. Lindenow Valley Water Security Scheme (VIC)	$10	N	N	?	?	?	No detailed public information
23. Myalup-Wellington Project (WA)	$140	Y**	Y	Y	?	N	BCR>1 but govt investment case unclear
24. Southern Forests Irrigation Scheme (WA)	$39.7	Y	Y***	Y***	?	N	Environmental assessment outcome 2021

Notes: Information correct as of 24 July 2020. *EIS approved with conditions. ** CBA summary reproduced by Infrastructure Australia (2017). *** Preliminary project documents only.

Table 2. Public availability of completed feasibility studies conducted under the National Water Infrastructure Development Fund

Project Name (Location)	**Funding committed by Australian Government** ($ million)	**Feasibility study made publicly available by state/territory govt?** (Y/N)
Border Rivers Infrastructure Investment Feasibility Study (NSW)	$0.55	N
Peel Water Infrastructure Investment Feasibility Study (NSW)	$0.85	N
Cobar and Nyngan Water Supply Feasibility Study (NSW)	$0.85	N
Walcha Water Security Feasibility Study (NSW)	$0.1	Y*
Ord Stage 3 Feasibility Study (NT)	$2.5	Y
Northern Territory Irrigation Feasibility Study (NT)	$0.99	Y
Nullinga Dam Feasibility Study (QLD)	$5	Y
Bundaberg Channel Capacity Upgrade Feasibility Study (QLD)	$0.75	Y
Gayndah Regional Irrigation Development Feasibility (QLD)	$1.2	Y
Lockyer Valley Aquifer Recharge Feasibility Study (QLD)	$0.12	Y
Burdekin Falls Dam Raising Feasibility Study (QLD)	$0.4	Y
Burdekin Haughton Channel Capacity Upgrade Feasibility Study (QLD)	$1.9	Y
Lower Fitzroy River Infrastructure Business Case (QLD)	$2	Y
Clermont Water Security Feasibility Study (QLD)	$0.23	Y
North West Queensland Strategic Water Storage Feasibility Study (QLD)	$1.8	Y
Urannah Dam Feasibility Study (QLD)	$3	Y
South East Queensland Treated Effluent for Agricultural Production Feasibility Study (QLD)	$0.65	Y
Emu Swamp Dam Feasibility Study (QLD)	$3.97	Y
Lakeland Irrigation Area Feasibility Study (QLD)	$0.83	Y
Hells Gates Dam Feasibility Study (QLD)	$2.2	Y
Tablelands Irrigation Project Feasibility Study (QLD)	$0.75	Y
Northern Adelaide Irrigation Scheme Feasibility Study (SA)	$2.5	N
Northern Reservoirs Feasibility Study (SA)	$1.2	N
Agriculture and Job Growth to the West of Melbourne Feasibility Study (VIC)	$0.54	N
Lindenow Valley Water Security Feasibility Study (VIC)	$0.56	N
Coldstream Recycled-Water Pipeline (CROPS) Feasibility Study (VIC)	$0.3	N
Macalister Irrigation District MID2030 Phase 2 Development Feasibility Study (VIC)	$0.68	N
Southern Victorian Irrigation Development Feasibility Study (VIC)	$0.68	N
Dilwyn Aquifer Infrastructure Feasibility Study (VIC)	$0.1	Y
South East Melbourne Regional Water Plan Pre-feasibility Study (VIC)	$0.92	N
Mitiamo Reticulated Water Supply Feasibility Study (VIC)	$0.75	N
Moonambel Water Supply Feasibility Study (VIC)	$0.18	N
Ord Stage 3 Feasibility Study (WA)	$2.5	N
Western Trade Coast Managed Aquifer Recharge Feasibility Study (WA)	$0.69	Y
Peel Business Park Nambeelup Managed Aquifer Recharge Feasibility Study (WA)	$0.7	N
Myalup-Wellington Infrastructure and Water Use Improvement Project Feasibility Study (WA)	$1	N
Oakover Valley Irrigation Precinct Prefeasibility Study (WA)	$0.27	N
Pilbara Irrigated Agriculture Feasibility Study (WA)	$0.96	N**
Ord Siphon Feasibility Study (WA)	$0.16	N

Notes: Information gathered on or before 24 July 2020. * feasibility study made available by local council. ** project report available upon request to WA Department of Primary Industries and Regional Development.

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Appendix. Summary of publicly available documentation (as of 29 July 2020) for projects funded under the Australian Government's National Water Infrastructure Development Fund (NWIDF)

(i) Water Infrastructure Projects

Queensland

Mareeba-Dimbulah Water Supply Scheme (Sunwater)

- Preliminary business case: https://buildingqueensland.qld.gov.au/business-case/nullinga-dam/

Rookwood Weir (Sunwater)

- Detailed business case: https://buildingqueensland.qld.gov.au/business-case/lower-fitzroy-river-infrastructure-project/
- Infrastructure Australia's Project Evaluation Summary: https://www.infrastructureaustralia.gov.au/sites/default/files/2019-06/Lower_Fitzroy_IA_evaluation_summary_0.pdf
- Project's Environmental Impact Statement and Queensland Coordinator-General's assessment: https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/completed-projects/lower-fitzroy-river-infrastructure-project.html

Emu Swamp Dam (Granite Belt Water Limited)

- Detailed business case: https://qldgov.softlinkhosting.com.au/liberty/opac/search.do?corporation=DERM&branch=All&operator=AND&mode=ADVANCED&sortDirection=ASC&limit=All&sortField=relevanceRanking&action=search&anonymous=true&queryTerm=gbip&includeNonPhysicalItems=true&resourceCollection=All#
- Project's Environmental Impact Statement and Queensland Coordinator-General's assessment:https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/completed-projects/emu-swamp-dam-project.html

Hughenden Irrigation Scheme (Hughenden Irrigation Project Corporation)

- Preliminary business case and appendices: https://hipco.com.au/preliminary-business-case/

Charleston Dam Facility (Ethridge Shire Council)

- Economic impact/benefit cost analysis: https://www.etheridge.qld.gov.au/downloads/file/222/cummings-economic-reportpdf

Western Australia

Myalup-Wellington Project (Collie Water)

- 2017 Infrastructure Australia evaluation https://www.infrastructureaustralia.gov.au/sites/default/files/2019-08/mwwp_summary_30112017_2.pdf

(ii) Completed Feasibility Studies (as of 29 July 2020)

New South Wales

Walcha Water Security Feasibility Study

- https://www.walcha.nsw.gov.au/f.ashx/March-2018-Report-6.1-Attachment-Walcha-Water-Security-Options-Summary-Final-Report.pdf

Northern Territory

Ord Stage 3 Feasibility Study

- https://www.territorystories.nt.gov.au/jspui/bitstream/10070/755309/1/A%20Feasibility%20Assessment%20of%20Irrigated%20Agriculture%20on%20the%20Keep%20River%20Plains.pdf

Northern Territory Irrigation Feasibility Study

- https://www.territorystories.nt.gov.au/jspui/bitstream/10070/307566/1/Northern%20Territory%20irrigated%20agriculture%20feasibility%20study%20-%20Preliminary%20business%20case%20for%20investment.pdf

Queensland

Feasibility studies for all the Queensland projects listed below can be found at: https://www.business.qld.gov.au/industries/mining-energy-water/water/industry-infrastructure/supply-planning/nwidf-feasibility-studies

Victoria

Dilwyn Aquifer Infrastructure Feasibility Study

- http://www.srw.com.au/wp-content/uploads/2016/05/Dilwyn-Infrastructure-Ownership-Study-Final-Report-1.pdf

Western Australia

Western Trade Coast Managed Aquifer Recharge Feasibility Study

- https://jtsi.wa.gov.au/what-we-do/offer-project-support/industrial-land/wtc-mar-feasibility-study

Myalup-Wellington Infrastructure and Water Use Improvement Project Feasibility Study

- Infrastructure Australia evaluation: https://www.infrastructureaustralia.gov.au/sites/default/files/2019-08/mwwp_summary_30112017_2.pdf

The CSIRO

Northern Australian Water Resource Assessments Project

- https://www.csiro.au/en/Showcase/NAWRA