Mr Andrew Broad, MP
Chair
Inquiry into the Management and Use of Commonwealth Environmental Water
The House of Representatives Standing Committee on the Environment and Energy

By email: Environment.Reps@aph.gov.au

11 April 2018

Dear Mr Broad,

Thank you for the opportunity to provide input to The House of Representatives Standing Committee on the Environment and Energy's Inquiry into the management and use of Commonwealth environmental water.

Deakin University believes this Inquiry, in examining the current use, monitoring of and community engagement in the use of environmental water, is addressing an important issue for Australia's ongoing regional and rural prosperity. The Inquiry is particularly important given Australia's world-leading position in the allocation and use of environmental water. Water reform in conjunction with the development of the Basin Plan has created a new and evolving arena for which the basic supporting science continues to be developed. The Inquiry represents an opportunity to understand how environmental water has been managed to date and to identify the next steps in developing the sophistication of the current system to continue to increase the value of, and return from, held environmental water. This will ensure a sustainable Basin environment and position Australia as a world leader in the use of environmental water.

Deakin University, as one of Australia's largest and regionally based Universities, has recognised that for regional and rural Australia to prosper we must do things differently. Deakin has established a Centre for Regional and Rural Futures (CeRRF), which draws from a wide range of discipline areas to drive an innovation agenda to achieve positive, transformational change in regional and rural communities, and particularly the sustainable use of water.

I commend this submission to the Inquiry and I look forward to its recommendations. Deakin University remains committed to working with all levels of government to ensure that our regional and rural areas remain vibrant and support the sustainable use of water, including for the environment.

Yours sincerely

[redacted]

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Deakin University
Submission

Inquiry into the management and use of Commonwealth environmental water

PREAMBLE

Deakin University is pleased to contribute to the House of Representatives Standing Committee on the Environment and Energy's Inquiry into the management and use of Commonwealth environmental water. Deakin University is uniquely placed to comment on the use and monitoring of environmental water given its expertise in both the science underpinning the delivery of environmental flows and its depth of knowledge in irrigated agricultural production, water trading and reform. Deakin University has the knowledge to consider the complex socioeconomic and environmental system that is the Murray-Darling Basin (the Basin) and to provide a holistic assessment of the use of water to support environment values.

Deakin supports the House of Representatives Standing Committee on the Environment and Energy's intention to review the current decision making and monitoring processes regarding held environmental water with a view to increasing the value of environmental benefit delivered.

Environmental flows are a critical component in the effort to restore and maintain a resilient and sustainable Murray-Darling Basin. Under the 2012 Murray-Darling Basin Plan (the Basin Plan), a sustainable diversion limit was set for consumptive water use in the Basin. A series of purchases of water entitlements from willing sellers, and savings made through increased irrigation efficiency, created a pool of held environmental water at both the Commonwealth and State levels. This pool is available for diversion to specific environmental assets in order to meet the environmental water requirements of those assets to restore or maintain their environmental values.

The Commonwealth pool of environmental water is held and delivered via the Commonwealth Environmental Water Office (CEWO). In 2014-2015, the CEWO delivered 1,014 GL, which represented 8 per cent of inflows to the Basin that year. In contrast, 35 per cent of inflows were diverted for irrigated agricultural and other consumptive purposes. A further 6 per cent of inflows reached the Murray River mouth and the remainder was lost via infiltration and evaporation. In the 2014-2015 year, the CEWO undertook 85 watering actions in 16 river valleys, mostly wetland inundation events, to enhance environmental values. Environmental monitoring illustrates the success of the current CEWO strategy, including the innovative use of irrigation infrastructure to achieve watering events with less water than would be required naturally.

The current CEWO approach to delivering environmental water relies on adaptive management, whereby decisions are made using best available science, implemented, monitored and evaluated to improve the future decision base. The size, complexity and potentially long timeframes for environmental response make adaptive management essential. Reviews such as this are a key part of that adaptive management process, investigating current arrangements and enabling improvement and innovation.

Deakin's specific responses to the Inquiry Terms of Reference follow.

DEAKIN UNIVERSITY'S SPECIFIC RESPONSES TO THE TERMS OF REFERENCE

1. **Maximising the use of environmental water for the protection and restoration of environmental assets**

   As Australian populations grow, there will be increasing pressure on Basin water resources, increasing the need to generate and demonstrate value from the use of environmental water. Australia is at the forefront of environmental watering worldwide, with many other countries watching our approach with a view to implementing similar programs. Under the Basin Plan, Australia's system of held environmental water and evidence-based decision-making regarding its use is the envy of many. Despite our world-leading position, there are still improvements that can be made to maximise the use of environmental water for the protection and restoration of environmental assets, including the following:

   - **A systems approach**: One of the major impediments to maximising the benefits derived from environmental water is in the tendency to consider assets, objectives and watering events independently. One of the great advantages to a river system such as the Murray-Darling Basin is the ability to utilise environmental water in one location, regain some of that water and utilise the same water to achieve additional environmental benefits downstream. Similarly, watering events designed to achieve a given environmental objective such as supporting colonial nesting water bird breeding are also likely to have additional benefits towards achieving other objectives (e.g. inundating vegetation communities). Flows that are designed with multiple complementary objectives in mind may, however, be able to achieve much greater environmental benefit than flows designed for a single objective. Furthermore, multiple flows may be needed through time to achieve long-term goals.
   - **The use of complementary measures:** The majority of environmental assets in the Basin are affected by multiple interacting stressors, of which changes in flow regime is just one. This means that, in many cases, providing environmental water alone may not be sufficient to maximise the benefit of that water to the environment. Instead, a coordinated approach, where measures other than environmental flows (referred to as 'complementary measures' by the Murray-Darling Basin Authority) such as pest animal control or fishway construction can dramatically increase the environmental benefit from a given volume of environmental water. A method to assess such complementary measures was developed by CSIRO for the Murray-Darling Basin Authority in 2017 (mdba.gov.au/publications/independent-reports/csiro-complementary-measures-assessment-method), with Deakin University experts participating in the scientific leadership team that guided the method development. This method of assessment should be implemented to identify and evaluate complementary measures that could result in much greater environmental benefit than would be possible via the restoration of flows alone.

2. **Considering innovative approaches for the use of environmental water**

   As the system of held environmental water developed under the Murray-Darling Basin Plan matures, innovative approaches for the use of environmental water will emerge and should be encouraged. Two approaches Deakin University suggests are:

   - **Identify multiple benefits from the use of environmental water:** Many of the objectives for which environmental water is used are synergistic. Recreational and cultural objectives, in particular, are often compatible with environmental objectives. While environmental water should continue to be held for environmental purposes and the environmental benefits derived from that water should not be compromised, potential additional benefits associated with environmental water should be considered. This would involve exploring multiple methods to achieve desirable environmental objectives and selecting the method that also delivers the greatest additional benefit for recreational, cultural or other environmental values. Not all environmental objectives will be able to be explored in this way, and there will be some situations where there are no synergistic benefits elsewhere, but developing an approach that explicitly considers the possibility of synergies would lead to innovation in the use of environmental water that will deliver other benefits to other parts of the Basin community.

- **Acceptance of some risk in outcomes:** The current system for bidding for environmental water on the part of the jurisdictions requires those jurisdictions to justify the value of each environmental watering event. This is entirely reasonable in the Murray-Darling Basin where there are multiple competing demands for water, but it tends to result in risk aversion, where innovative approaches that may involve higher risk of failing to achieve the target objective, at least as the approach is trialled. This tends to reduce the likelihood that innovative approaches will be trialled and perfected. Encouraging a process in which innovation is encouraged and higher risk levels associated with that innovation are accepted will encourage the development of better and more diverse uses of environmental water into the future.

3. Monitoring and evaluating outcomes for the use of environmental water

Monitoring and evaluation are critical to support the refinement of scientific and management knowledge of how to improve the environmental condition of the Basin. The use of environmental water cannot improve in the absence of knowledge as to the impact of previous watering events. It is imperative that the future plans for the Basin include:

- **A mix of scales and targets:** Programs such as the Long Term Intervention Monitoring program are critical to invest in to demonstrate and refine the use of environmental water to achieve environmental objectives. However, an integrated strategy is also needed, nesting monitoring in space and time. This would involve high-level monitoring at broad spatial scales across multiple years or decades (e.g. satellite imagery of vegetation condition) complemented by increasing levels of detail at smaller spatial and temporal scales. A holistic suite of monitoring that spans the Basin at the largest scale, with detailed biological monitoring at high-value sites, will provide the best basis for ongoing management of the Basin as a whole.
- **Monitoring ecological processes:** The Basin Plan, and the associated monitoring programs, are primarily focused on supporting specific biotic communities, mostly vegetation, birds and fish. This arose, in part, because of the value that society places on those aspects of the environment and because of our greater understanding of those parts of the system. However, it can be difficult to understand whether the replacement of one bird species with another in a wetland, for example, constitutes an improvement or a deterioration in condition in many instances. A more transparent way to assess changes in condition is to monitor the processes that support biodiversity (e.g. recruitment, decomposition, nutrient cycling, in addition to connectivity, which is already monitored). By establishing solid baselines for each process, managers will rapidly develop a robust suite of indicators that will enable changes in individual species to be placed in the context of the role that they play in the environment. Such an approach has been used for a number of years in the European Union (using the Functional Assessment of Wetlands approach developed by Professor Ed Maltby) and adapting the approach has begun for semi-arid wetlands in southern Australia by Deakin University researchers, focusing on decomposition, carbon sequestration and functional connectivity of biota, illustrating the feasibility of the approach.

4. Options for improving community engagement and awareness of the way in which environmental water is managed

Use of water for environmental purposes is particularly contentious because of pressures on agricultural communities. Many farmers rely on consumptive water from the Basin to support their livelihoods and see held environmental water as a direct threat to their revenue stream. Furthermore, many communities feel excluded from key decisions that affect and will affect those livelihoods. Deakin University believe that for communities to be engaged and aware of the way that environmental water is managed, consumptive and environmental uses of water must be managed in a coordinated and synergistic manner incorporating:

- **An holistic approach to water management:** To reduce the level of contention that exists regarding the use of water for environmental purposes is to improve the value of produce generated from consumptive water, by working with communities to identify niche markets and increase the value of crops raised.
- **The use a community-led approach:** Each region in the Basin has specific geographic, environmental and socioeconomic conditions that mean that the challenges and opportunities in each region differ. By working at a local level to understand the issues facing communities across

socioeconomic, environmental and cultural spheres, communities can be supported to develop greater resilience to future challenges such as changing international markets, increasing population, climate change and continued water reform. Addressing these concerns in a holistic manner will greatly improve community engagement and awareness of the ways that environmental water is managed, and will increase community buy-in to the process.

RECOMMENDATIONS

Deakin University makes four recommends for the Inquiry into the management and use of Commonwealth environmental water:

1. Maximise the use of environmental water for the protection and restoration of environmental assets by:
    a. adopting a systems approach to consider how environmental watering decisions occur in space and time
    b. pairing environmental flows with the use of complementary measures (i.e. measures in addition to environmental flow such as pest management).
2. Consider innovative approaches for the use of environmental water by:
    a. identifying multiple benefits from the use of environmental water
    b. accepting higher risk levels to encourage innovation in water use.
3. Monitor and evaluate outcomes for the use of environmental water using:
    a. a mix of scales and targets to integrate monitoring in time and space
    b. explicit monitoring of ecological processes (e.g. connectivity and carbon sequestration).
4. Explore options for improving community engagement and awareness of the way in which environmental water is managed by:
    a. adopting a holistic approach to water management
    b. using a community-led approach.