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Executive Officer  
Environment, Natural Resources and Regional Development Committee  
Parliament House, Spring Street  
East Melbourne VIC 3002  
enrrdc@parliament.vic.gov.au

Dear Sir/ Madam

**Submission to the Inquiry into the Management, Governance and Use of Environmental Water**

I am writing on behalf of the River Basin Management Society (RBMS) to provide our submission to the Inquiry into the Management, Governance and Use of Environmental Water.

The River Basin Management Society is a member-based organisation comprising policy professionals, scientists, engineers, economists and practitioners from academia, not for profit organisations, government and private enterprise working in the field of catchment and waterway management. The RBMS has approximately 300 members with an average work experience of 10 years, creating a substantial knowledge base and vision for Victoria's future water management. The objectives of the RBMS include:

- To provide a forum in Australia for interchange of multidisciplinary knowledge and skills in the field of river basin management.
- To recognise, declare, promote and disseminate advances in river basin management.
- To encourage the interchange of those engaged in river basin management within Australia and overseas.
- To provide independent professional comment when required on river basin management issues.

The scope, effectiveness, efficiency and governance of the management of Victoria's waterways and catchments are of particular interest to the RBMS. We welcome the opportunity to make a submission to this important inquiry and direct you to our detailed submission that accompanies this cover letter.

Before reading the detail of our submission, the RBMS feels it is vitally important that the inquiry recognises and emphasises that contemporary environmental water management is largely 'trapped' within the confines of a regulated water supply system and governance arrangement that was designed to support harvesting and extraction of water for consumptive use. The framework for water management in Victoria (i.e. in which environmental water management is operating) has evolved from a focus on water regulation and extraction, and this results in significant legacy issues that constrain the environmental watering program. This predicament is no fault of the environmental watering program; rather it is the fault of the historical neglect to adequately consider and accommodate environmental values and ecosystem services.

The RBMS notes that each of the topics forming the terms of reference for the inquiry are classic examples where the environmental watering program is constrained by the need to operate within a framework geared for water regulation and extraction. For example, if environmental water management were able to operate outside of an extraction-focused framework it could:

- avoid the use of large storages, which would in turn reduce blackwater risk and reduce fees and charges;
- adopt a water year that is better suited to the timing of environmental watering events rather than summer irrigators, which would reduce the need for carryover and trade; and
- provide flows onto naturally flood-prone land, which would reduce the impact of operational constraints and barriers on achievement of desired ecological outcomes.

The following detailed submission of the RBMS was developed in conjunction with engagement of our 300-strong membership of catchment management professionals. This involved several mechanisms including a breakfast reading group and workshop in Melbourne where we discussed the terms of reference for the inquiry with our membership (17 August 2017), and convening and collating feedback from our membership via direct email and online social media platforms (throughout August 2017).

We understand that all submissions will be made publically available. The RBMS supports an open and transparent approach to consideration of submissions and welcomes this decision. We recognise that meaningful consultation also requires acknowledgement of how public input influenced the progression of the inquiry and its outcomes. The RBMS recommends the production of a concise 'Community Feedback' report to provide an overview of the main themes from submissions and outline how these were considered in the inquiry.



**Alison Miller**

President - River Basin Management Society

Prepared on behalf of the River Basin Management Society and its members

## **Assessment of the role of environmental water management in preventing or causing 'blackwater' events**

### *What are blackwater events?*

Blackwater events are naturally occurring and are an important part of the carbon cycle which drives productivity in aquatic systems. Blackwater events occur when there is an accumulation of organic matter on the floodplains of rivers which is either inundated by flood waters or washed into the river during a rainfall event. When microbes in the water break down this organic matter, oxygen is consumed. If oxygen is consumed faster than it can be replenished the dissolved oxygen content of the water can reach critically low levels, leading to potential suffocation of aquatic animals.

### *The influence of anthropogenic impacts on flood frequency and timing*

Compared to natural conditions, blackwater events have become more frequent and are now occurring on a greater scale as a result of river regulation and land use change associated with European settlement. This pattern can be attributed to several important factors:

- Firstly, because of the dams and storages built on our rivers, there are now less frequent periods of floodplain inundation than prior to river regulation. This allows organic matter to build up on the floodplain for a longer period of time, so when flooding does occur, it imports greater volumes of organic matter than would have naturally been available.
- Secondly, when floods do occur they are often later in the season (e.g. in summer) than under pre-regulated conditions, due to the time taken for storages to fill prior to spilling. In summer the water is warmer and microbial activity is faster, leading to a quicker depletion of oxygen than occurs during colder months.
- Thirdly, climate change has also contributed this problem because in many areas natural floods are also occurring later in the season as a result of changes in the temporal pattern and intensity of rainfall.

### *The role of environmental water management in preventing and mitigating blackwater*

The RBMS believes that environmental water is a critical tool in the prevention and mitigation of blackwater events. Environmental water can be particularly effective as a preventative measure, when used to inundate areas of the river channel or floodplain in cooler months, to reduce the volume of organic matter that could potentially cause an anoxic blackwater event during warmer months later in the season. Environmental water can also be used as a mitigating measure, to respond to small, localised blackwater events by diluting and flushing the poor quality water in the river channel.

The RBMS also feels that the ability of environmental water managers to effectively prevent or respond to blackwater events is limited by physical or operational constraints (e.g. policies preventing managed flooding of flood-prone private land or infrastructure constraints preventing a sufficient volume of water being released). It would greatly benefit environmental water managers, communities and the environment if constraints could be addressed to enable more effective use of environmental water, and in turn, more effective responses to blackwater events. Increased investment in water quality monitoring and hydrological models would also be able to improve environmental water managers' predictive capabilities and could help more effective response to blackwater events.

The RBMS does not believe that environmental water management is a primary cause of blackwater events. The overwhelming majority of blackwater events are a result of the impacts of river regulation and land use change (refer discussion above) - the very threats that have significantly altered our river and floodplain ecosystems and that environmental water management is responding to.

## **How environmental water and environmental water managers interact with, and utilise, management tools such as carryover and whether the carryover of environmental water impacts on the availability of water for irrigators**

### *What is carryover and trade?*

Carryover, trade and other relevant tools are governed by Victoria's water entitlement and planning framework, which clearly defines how water is shared, held, used and traded in Victoria. This framework has been developed and improved over a number of years in consultation with all water entitlement holders.

Carryover is a tool that allows a water holder (either environmental or consumptive e.g. irrigators) to hold onto unused water in their account and use it during the next year. Carryover is proportional to the volume of the water holdings and there are clear rules about how water holders can utilise and manage their carryover water. The carryover rules vary somewhat across the state; in some systems there are minor penalties (e.g. a small percentage of the carried over water is debited from the account to compensate for evaporative losses or storage costs), and in some systems there are financial costs. There is also some variation in the amount that can be carried over.

Trade is another tool that provides flexibility for all entitlement holders, and involves buying and selling water allocations.

### *How is carryover and trade used?*

Carryover and trade is used by water holders to provide flexibility in managing their risk profiles. In the 2016/17 water year, environmental water holders in Victoria (Victorian and Commonwealth) carried over a similar proportion of their total allocation as irrigators and urban/domestic did. Environmental water holders also use trade to move water allocations around the state to where they are most needed - there is a publically available trade strategy developed by the environmental water holder each year outlining intended water trades.

In doing so, environmental water managers take into account scientific FLOWS studies, environmental water management plans, regionally-developed seasonal watering proposals, environmental condition monitoring and climate forecasts to determine which locations should be watered in which years. Carryover is essential for this multi-year planning. Environmental water holders use carryover with careful planning to respond to:

- Dry periods, when annual water allocations would be insufficient to achieve ecological objectives. In drought times carryover is absolutely vital, to stretch available water out over a few years and meet critical water needs to keep fish populations and other values alive.
- Wet periods, when natural watering (i.e. from rainfall) is sufficient to meet ecological objectives, and water in the environmental account can be reserved for future.
- Circumstances where there is difficulty in delivering the full planned flow event due to operational constraints, and the flow event therefore needs to span multiple water years.
- Circumstances where environmental watering is required early in the season, before allocations have been made available (e.g. as a preventative action to address a blackwater threat).

### *What are the indirect impacts of carryover?*

Tools such as carryover prevent the environmental water holders from needing to purchase more water from the consumptive pool to meet environmental objectives. This fact has been demonstrated time and time again through hydrological modelling undertaken by the Department of Environment, Land, Water and Planning and its predecessors.

The concept of carrying-over water allocations started with environmental water, and is now available to benefit consumptive water holders too. Over the past decade, environmental water management has evolved from single year planning to multi-year and long term planning, and now involves management of a diverse portfolio over space and time. Tools such as carryover and trade allow environmental objectives to be met, while still allowing sufficient water for consumptive users to support Victoria's agricultural industries.

## **Consideration of what barriers exist to the more efficient use of environmental water and how these may be addressed**

### *Understanding water use*

A greater understanding of water use during delivery events is needed to enable the most efficient use of environmental water. The current level of available metering and monitoring data is often insufficient to prevent over- or under-watering. The RBMS believe that an enhancement to the gauging and telemetry networks is a relatively simple and economical way to improve monitoring that can directly lead to greater efficiencies in environmental water deliveries.

A combination of the implementation of a strong compliance regime, improved modelling, and consideration of an increase in funding to improve scientific knowledge within specific river basins would yield greater efficiencies and more targeted allocation of resources.

### *Commitment to the purpose of environmental watering*

Recent years have seen an increasing focus on the achievement of 'shared benefits' from environmental watering, where environmental watering contributes to improved societal outcomes for amenity, recreation, liveability etc. The RBMS believes that shared benefits from environmental watering should be maximised wherever possible, but not at the expense of environmental outcomes; the environment must be maintained as the primary beneficiary of environmental water. Other non-environmentally focused stakeholders should continue to be informed and engaged in the environmental watering program, but should not hold decision making responsibilities, as their various and often competing objectives will often be to the detriment of efficient environmental water use.

### *Water management tools*

It is vital that we maintain the ability of environmental water holders to carry-over and maintain levels of flexibility of environmental water trading, to ensure that water is delivered where it is needed and barriers to efficiency and time constraints for releases are minimised. Likewise, environmental watering programs should continue to consider multiple ecological objectives at a site (e.g. wetland inundation for vegetation recruitment and geomorphic correction simultaneously) and between sites, by protecting the ability to utilise "return flows" and use consumptive water en route when possible to achieve environmental outcomes.

### *Physical constraints*

Physical constraints in the waterway and water supply network have long been known to affect the efficiency and effectiveness of environmental watering in Victoria. The resultant reduction of water for the environment arising from physical barriers can result in substantial interruptions to the supply of environmental water. The mitigation, removal or modification of these barriers would be achieved by working closely with all water users and planning ahead for greater equity amongst users.

To address this further modelling, analysis and investigations of various delivery constraints in the existing infrastructure is warranted. Such analysis and investigations would prevent further storage constraints by developing a more integrated approach, that has a greater understanding of each user's capacity and intentions for water allocations. This information should be used for planning purposes to ensure any new water user downstream will be allocated a portion that is consistent with the reduced capacity of the delivery infrastructure, taking into consideration environmental water needs.

## **Assessment of fees and charges applied to environmental water and whether these differ from those imposed on other water users**

### *The concept of beneficiary pays*

The fees and charges applied to environmental water have been intentionally developed to differ from those imposed on other water users – for good reason. While most extractive water users take water for private benefits, the environmental watering program is focused on the attainment of public benefits. The RBMS believes that it is entirely appropriate for users seeking private benefits to be subject to a different fee and charging regime than those users providing public benefits. Those users (most notably the environmental water managers) who provide public benefits should be financially supported by both government and the entire community.

Where ‘discounted’ fees and charges are currently being applied to environmental water, this has generally been in recognition of the considerable investment that government has already made through water recovery programs i.e. the water cost was paid upfront rather than on an ongoing basis.

Under the current arrangements, the fees and charges associated with environmental watering in Victoria are paid from State revenue and are therefore shared across the general tax-paying community. An argument may well be made that local water users receive a disproportionately high benefit from the environmental watering program (e.g. through the maintenance of ecosystem services in their water supply system), and that it would be fairer to impose a greater share of the environmental watering fees and charges on other local water users, in turn reducing the financial burden of these fees and charges on the general community.

### *Preventing dilution of the environmental watering account*

Another important issue is to ensure that any fees do not compromise the ability of the environmental watering program to provide the environmental outcomes it plans for. In this regard the RBMS feels it is particularly important that there is no net sale of environmental water to raise money to pay fees and charges. This would result in environmental water effectively being transferred back to the consumptive pool, diminishing the environmental returns.

This has occurred previously. For example in 1997-1998 a total of 13,700 ML of environmental water was delivered at a cost of \$155,802 (or \$11.37 / ML) to cover delivery fees and charges. Environmental water had been sold specifically to pay these delivery charges, which meant less water was available to meet environmental objectives. The water, once it is sold, could be used by irrigators. The end result was that a volume of water, specifically allocated for environmental use, ended up being used for irrigation.

### *Departmental review*

The RBMS notes that the Department of Environment, Land, Water and Planning is currently undertaking a review on the fees and charges applied to environmental water and other water users. It is assumed this will explore any inconsistencies in the charging structure.