



## **Environment Victoria Submission to the Environment, Natural Resources and Regional Development Committee Inquiry the management, governance and use of environmental water in Victoria**

Environment Victoria is the state's peak non-government, not-for-profit environment organisation. Our Healthy Rivers Campaign is dedicated to working with government, business and communities for the restoration and protection of our state's great river systems. Our vision is for a future where healthy rivers sustain abundant life and prosperous communities, providing us with good food, clean water and places to love and enjoy.

We have campaigned for the provision of and independent management of environmental water for more than 15 years. The establishment of the Environmental Water Reserve in 2005 was a result of our proposals for reform and we ran a long campaign for independent management that ultimately led to the establishment of the Victorian Environmental Water Holder (VEWH) in 2011. The provision of secure and reliable environmental flows for all Victoria's rivers has been and continues to be the cornerstone of all our work.

We welcome the opportunity to contribute to this inquiry.

### **Introduction**

Australia's unique climate makes our river systems the most variable in the world. Under natural conditions our rivers either have abundant water spread out on the floodplain or virtually no water at all. 'Average' rainfall years are few and far between, and are becoming even rarer as the climate changes. Yet we people and our cities, animals and crops require water all year, every year.

This basic mismatch between a society that demands water constantly and a climate that supplies it only occasionally poses huge challenges for our government and water managers. The consequences for our rivers, creeks and wetlands have been disastrous.

As a rule of thumb, a river can give up to a third of its water for consumptive use, such as irrigation and drinking, and remain in reasonable health. Some of Victoria's hardest-working rivers like the Yarra, the Murray and the Goulburn give up more than half their water on a regular basis, and even more in dry years. The inevitable result is that the health of our rivers, streams and wetlands has massively declined. Currently, just 23 percent of our rivers are classified as in good or excellent condition and three quarters of wetlands on private land have disappeared altogether since European settlement.<sup>1</sup>

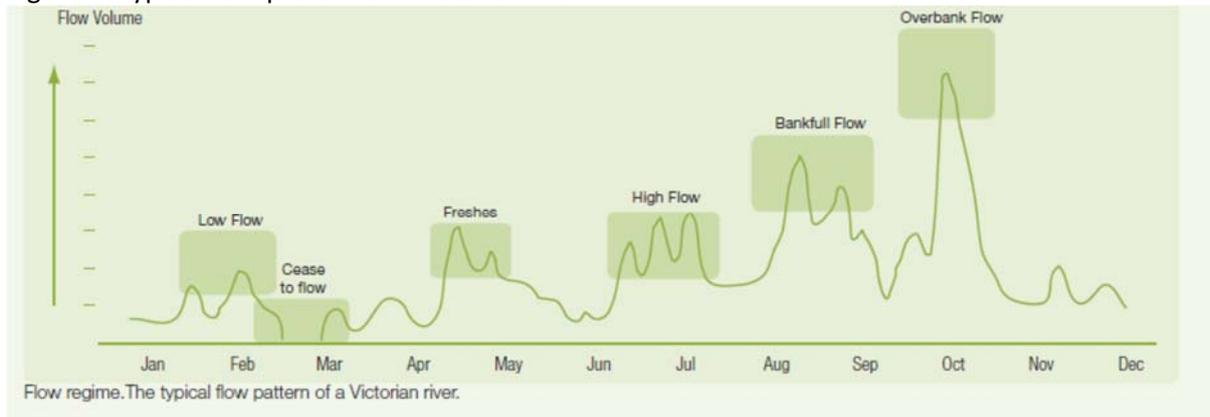
In addition to reducing the volume of water available to rivers, the extraction and storage of water for human consumption has radically altered their flow regimes. Rivers that supply large volumes of

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<sup>1</sup> Commissioner for Environmental Sustainability, Victoria, 2013, *State of the Environment Report* p.137.

water for irrigation have suffered a seasonal inversion, with their highest flows now occurring in summer instead of the natural state of high flows in winter. They also suffer from an inverted temperature profile and thermal pollution with excessively cold water released from large storages in summer. Other rivers have had components of their flow regime removed, with freshes, high flows and bankfull flows captured in storages. In order to maintain ecological processes such as nutrient cycling and fish spawning, a river needs all the components of its flow regime.

Figure 1. Typical flow pattern of a Victorian river<sup>2</sup>



The provision of environmental water is essential to mitigate the impacts of water consumption and to maintain and improve the health of our rivers and wetlands.

### *The environmental water reserve and the role of the VEWH*

The Water Act establishes the Environmental Water Reserve (EWR) “to preserve the environmental values and health of water ecosystems”.<sup>3</sup> The largest component of the EWR is ‘above cap’ water, which is water left over after consumptive demand has been met. It is highly susceptible to the impacts of drought and climate change and is often non-existent. The second largest component of the EWR is ‘rules based’ or ‘planned’ environmental water which depends on the delivery of consumptive water and is readily (and frequently) redirected to consumptive use when times get tough.<sup>4</sup> The third – and most reliable – component of the EWR is environmental entitlements, which have similar security and reliability to consumptive entitlements but a much smaller volume (around 650 GL across the state as compared to 6000 GL of consumptive entitlements). The VEWH holds and manages the environmental entitlements.

The objectives and functions of the VEWH are clearly set out in the Water Act. They are to manage the water holdings to ‘maintain the environmental water reserve in accordance with the environmental water reserve objective; and to improve the environmental values and health of water ecosystems, including their biodiversity, ecological functioning and water quality, and other uses that depend on environmental condition’.<sup>5</sup> The functions of the VEWH are to apply and use the water in their holdings in accordance with their objectives and to acquire or purchase rights or entitlements and dispose or otherwise deal with rights and entitlements in accordance with the Act.<sup>6</sup>

<sup>2</sup> Taken from DSE (2007) *Why rivers need water*

<sup>3</sup> Victorian Water Act 1989, s 4b

<sup>4</sup> Victorian Auditor-General’s Office, 2010, *Restricting Environmental Flows during Water Shortages*.

<sup>5</sup> Victorian Water Act 1989 s33DC

<sup>6</sup> Victorian Water Act 1989 s33DD

The Minister is able to issue directions to the VEWH but cannot direct them to use water in a particular location or to buy or sell particular entitlements.<sup>7</sup>

The Commonwealth Environmental Water Holder (CEWH) also holds entitlements in northern Victoria. However even though the CEWH has a significant portfolio of entitlements, these account for only a small proportion of water use in the Murray-Darling Basin. The National Water Accounts for 2015/16 show that of the 9,232 GL of water supplied only 15% was for environmental use. 80% went to individual users.<sup>8</sup>

## Benefits of environmental watering

Environmental watering has become a key tool for maintaining and improving the environmental values and condition of freshwater ecosystems in Victoria and has developed rapidly over the last 10 years. It played an absolutely vital role in mitigating the worst impacts of the Millennium drought when it was used to provide refuge habitat for fish, frogs, turtles and birds. For example, emergency watering in 2007 prevented the extinction of the Murray hardyhead in Victoria<sup>9</sup> and brought struggling red gums at our internationally recognised Ramsar sites back from the brink.

Since the end of the drought, environmental managers have been able to use environmental water over a much wider range of climatic conditions and made really significant advances in understanding how to use it to best advantage. For example, timing of water releases is critical to creating the right conditions for golden perch to spawn in the Goulburn<sup>10</sup>, and sometimes trial and error is the only way to learn.

Ecological response to watering can occur really quickly, for example there was a 130% increase in plant species richness at Moodie's swamp within weeks of environmental water being delivered in 2008.<sup>11</sup> Other responses take much longer – for example black box trees at Hattah Lakes are only just beginning to respond to repeated environmental watering over a number of years.<sup>12</sup>

In addition to its vital role in protecting and restoring river and wetland health, environmental water brings enormous community benefits. It supports cultural values for Aboriginal people, builds fish populations for anglers, provides opportunities for boating and brings enormous amenity and recreational benefits for everyone from dog walkers and cyclists by the Yarra to recreational fishers on the Goulburn and Campaspe, canoeists on the Snowy and water skiers on lakes and rivers across the state. It is also crucially important to the tourism industry. The state government is subjected to requests for environmental water delivery for a wide range of recreational and community purposes from trout fishing and duck hunting to tourism operators wanting water delivery during school holidays to communities desperate to stop their lake from drying out during drought.

It is difficult to overstate the community benefits of environmental water, particularly its role in enhancing wellbeing and providing recreational benefits. However it is important to remember its primary role is to protect and improve the environmental values and health of water ecosystems and the other benefits flow directly from this primary purpose.

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<sup>7</sup> Victorian Water Act 1989 s 33DS

<sup>8</sup> <http://www.bom.gov.au/water/nwa/2016/mdb/index.shtml>

<sup>9</sup> VEWH (2016) *Reflections: Environmental watering in Victoria 2015-16*

<sup>10</sup> <http://www.vewh.vic.gov.au/news-and-publications/news-archive/golden-perch-thriving-in-the-goulburn>

<sup>11</sup> Australian Ecosystems (2008) *Ecological response of four wetlands to the application of environmental watering: Final report on monitoring from May to July 2008*

<sup>12</sup> VEWH (2016) *Reflections: Environmental watering in Victoria 2015-16*

## General comments about the Victorian Environmental Water Holder

The VEWH was established in 2011 as ‘an independent statutory body responsible for holding and managing environmental entitlements and making decisions about their best use, including trade and carryover, to achieve the highest environmental value. In undertaking its functions the VEWH will be able to promote efficient investment and management to protect and enhance the value of water-dependent ecosystems throughout Victoria’.<sup>13</sup>

The statewide approach is a very important attribute. The VEWH needs to make decisions across regions and catchments based on maximising the environmental benefits of available water. Its decision making and prioritisation frameworks must be clear, robust and transparent and readily communicable to and understood by affected individuals and communities. The VEWH needs to be able to buy, sell and carryover entitlements and allocations to maximise benefits and some decisions may not accord with community expectation. For example, the VEWH may decide to carry over water rather than deliver it to a wetland that is in a drying phase, contrary to community expectations about water delivery. Or the VEWH may choose to deliver environmental water at a time when temporary water prices are high. These types of decisions must be explained so that the community becomes more informed about and supportive of the aims and objectives of environmental watering.

The VEWH also needs to be smart about how it uses its precious water and make every drop count. Where possible, watering can be coordinated across sites so that one water release can hit several ecosystem targets as it move downstream. This is particularly important in northern Victoria where water released in the Goulburn or Campaspe can be reused downstream in the Murray and to water wetlands. Similarly water that is on its way downstream for consumptive use (for example irrigation in Sunraysia) can be released in a particular pattern or supplemented with environmental water to deliver maximum benefits in the most efficient way possible.

Figure 2 shows how the VEWH used these types of measures to maximise environmental outcomes in 2014-15.<sup>14</sup>

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<sup>13</sup> DSE (2009) *Northern Region Sustainable Water Strategy, Action 7.2*

<sup>14</sup> VEWH (2015) *Reflections: Environmental watering in Victoria 2014-15*

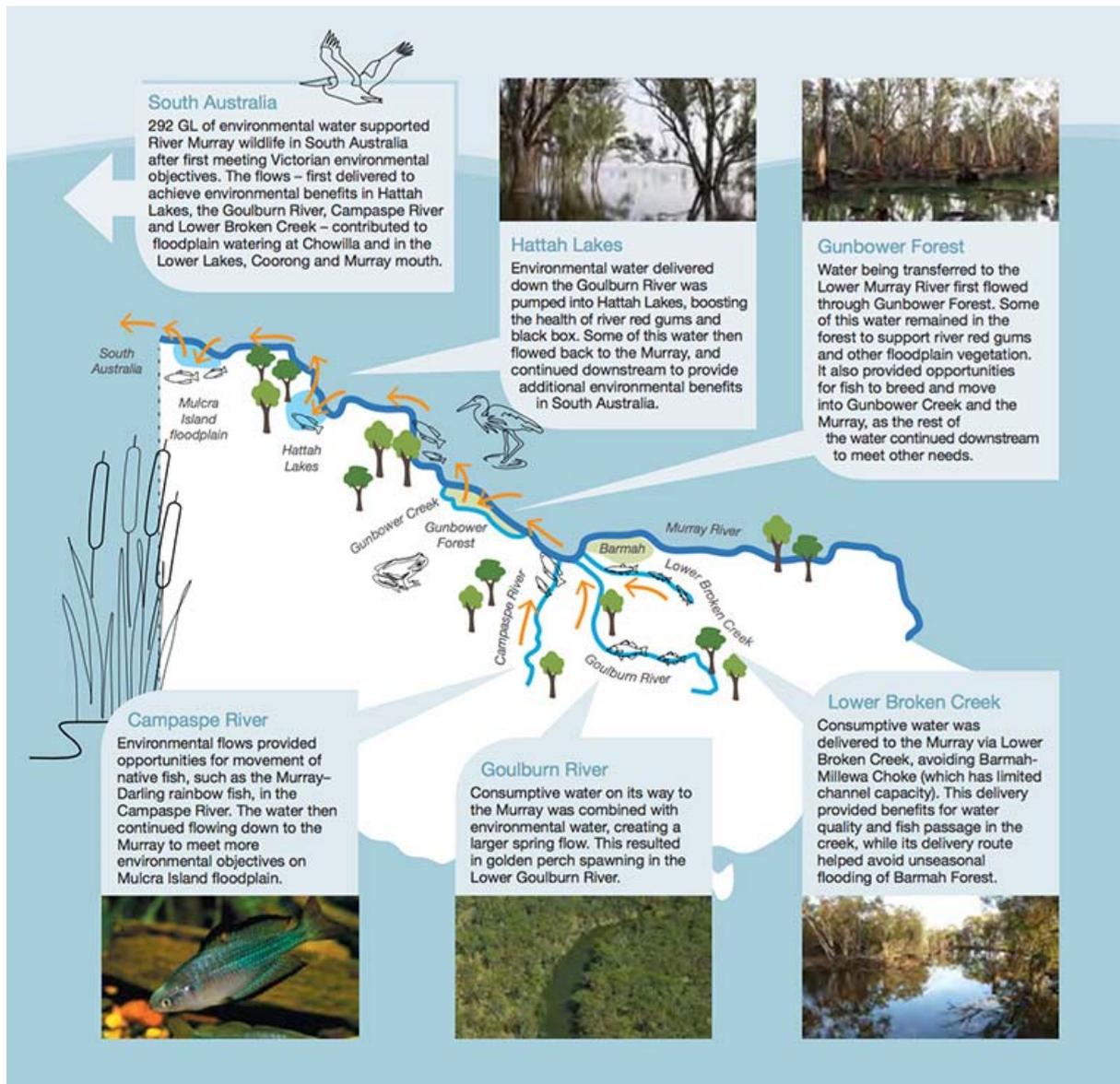


Figure 2. Tools used by the VEWB to maximise environmental outcomes in northern Victoria

## Comments on the Terms of Reference

- *The assessment of the role of environmental water in preventing and causing ‘blackwater’ events*

Blackwater is a naturally occurring phenomenon. It occurs typically after floods when large quantities of organic material (leaf matter and other debris) are transported off the floodplain and into the river channel. The organic material can then undergo rapid microbial decomposition that depletes the oxygen content of the water, resulting in fish and crustacean mortality. If the water is warm the problems may be exacerbated by increased levels of harmful bacteria in the water. However in the long run, blackwater events are very beneficial for rivers because they increase the amount of carbon and other nutrients available that is the base of the food chain that supports all aquatic life.<sup>15</sup>

<sup>15</sup> <https://www.mdba.gov.au/managing-water/water-quality/blackwater>

While blackwater events are a very significant cause of mass fish deaths, particularly in wet years, they are not the only cause or even the most common cause. During drought years the situation is very different. The EPA analysed 181 reported fish kills, spread over 130 different waterways across Victoria, over the 10 year period 1998-2007.<sup>16</sup> Only 8 of these events could be attributed to blackwater. Low dissolved oxygen resulting in fish deaths was more frequently caused by low flows, warm temperatures or algal blooms than by blackwater and 23 fish kills were attributed to pollution. Environmental water can be used to mitigate the impact of these types of event.

In late 2010 the millennium drought was followed by unprecedented rainfall across much of Victoria. Unseasonal spring and summer rain washed years' worth of accumulated organic matter into the river systems and resulted in a major blackwater event in the Murray-Darling Basin that extended over 2,000km and continued for several months. Widespread fish kills resulted, although species were affected to differing degrees and the magnitude of the fish kills was lower than expected given the extent and severity of the event.<sup>17</sup>

The severity of the 2011 event was caused by the unusual situation of prolonged drought followed by exceptional and repeated rainfall events. A number of other blackwater events have followed in recent years when rainfall has been above average, including a major event in the Edwards-Wakool in 2006, when dissolved oxygen levels fell below 4mg/L. While there have been suggestions in the media that this event was exacerbated by the delivery of environmental water,<sup>18</sup> there has been no monitoring or other scientific evidence to support this claim.

In fact the evidence points in the opposite direction and environmental water can be used to mitigate the impacts. For example, heavy rain caused floodwater with a heavy organic load from Pranjip, Castle and Seven Creeks to enter the Goulburn River on 29 December 2016. As the water turned black and some fish deaths were reported, Goulburn Broken CMA made the decision to release environmental water from the Goulburn Weir to help re-oxygenate the water and avoid a larger event. The strategy proved successful and disaster was averted.<sup>19</sup> Environmental water was also used in the Loddon River in 2017 to reduce the risk of a blackwater event, which did not eventuate.<sup>20</sup>

In addition to its role in mitigating the impacts of blackwater events already underway, environmental water can be used to reduce the risk that they will occur. Black water is caused by the build-up of organic matter on the floodplain. More frequent environmental watering can reduce the level of build-up. Water should be delivered during cool weather and before peak litter accumulation is reached. Increased flow can also be used to dilute floodplain discharge in receiving channels.<sup>21</sup> However there are many constraints to the delivery of environmental water to floodplains (see below) and until these are dealt with the full benefits of environmental water as a risk management tool will not be realised.

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<sup>16</sup> Fish deaths reported to EPA Victoria 1998-2007 <http://www.epa.vic.gov.au/~media/Publications/1175.pdf>

<sup>17</sup> <http://www.mdfrc.org.au/publications/factsheets/201313133694.asp>

<sup>18</sup> For example <http://www.riverineherald.com.au/regional/2016/10/28/58039/environmental-water-leads-to-more-kills-chair>

<sup>19</sup> <http://www.riverineherald.com.au/rural/2017/01/03/67940/blackwater-flush-kills-goulburn-river-fish>

<sup>20</sup> <http://www.vewh.vic.gov.au/rivers-and-wetlands/northern-region/loddon-river>

<sup>21</sup> <http://www.mdfrc.org.au/publications/factsheets/201313133694.asp>

- *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*

Environmental water holders (EWHs) employ risk management strategies just like any other water user. One of these is the use of carryover to provide for future watering needs.

Late winter and early spring are peak seasons for environmental watering. Water is needed at this time to mimic the natural flow events that trigger fish spawning and bird breeding. However the water year begins on 1 July and watering is often required before seasonal allocations are made. The VEWH and CEWH therefore make extensive use of carryover to meet these needs.

This use of carryover does not impact on irrigator or water corporation rights. Carryover in excess of entitlement volumes is held in a 'spillable water account' which is exactly that – spillable. This means that when dams reach capacity the first water to spill is carryover water, which is debited pro rata irrespective of ownership. Subsequent inflows are then allocated according to system rules. In fact the early use of carryover water by EWHs frees up air space in dams to accommodate spring inflows that support seasonal allocations.<sup>22</sup>

EWHs also make extensive use of carryover to guard against low seasonal allocations. In dry years environmental water plays an absolutely key role in maintaining drought refuges and EWHs need adequate water in their accounts to meet these needs. Carryover is a key risk management tool for EWHs, and is used by them in a similar way to water corporations establishing a system operating reserve before seasonal allocations are made. If environmental water spills, EWHs lose some of their risk management capability and they should not be penalised.

In northern Victoria EWHs hold water entitlements with the same conditions and characteristics as those held by irrigators. This is essential to enable entitlement trade between water holders and irrigators. If the characteristics of environmental water holdings were changed, for example with respect to carryover rules, this would make trade between different sectors extremely difficult.

Finally, the volume of water carried over by EWHs is not as large as is sometimes imagined. At the end 2015/16, the CEWH, which is one of largest entitlement holders in northern Victoria, carried over a total of 135 GL. The volume for 2016/17 will be around 207 GL.<sup>23</sup> These are small volumes compared to the capacity of Hume (3005GL) and Eildon (3390GL) dams and are unlikely to have a major impact on any other water user under any circumstances.

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

A river is more than just a channel. Floodplains and wetlands have a vital role to play in maintaining river health, filtering out pollutants, providing carbon and other nutrients and storing floodwaters. In many areas of Victoria from the Yarra to the Goulburn to the Wimmera the connection between river channel and floodplain has been lost to the severe detriment of both. Environmental water has a key role to play in re-establishing that connection.

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<sup>22</sup> See Victorian Water Register for detailed explanation of carryover rules.

<sup>23</sup> <http://www.environment.gov.au/water/cewo/about/water-holdings>

There are many barriers or ‘constraints’ to the delivery of environmental water to wetlands and floodplains out of the river channel. In northern Victoria the MDBA has identified many of these in the Constraints Management Strategy as part of Basin Plan implementation and the federal government has set aside \$200 million for remediation.<sup>24</sup> However these projects are unpopular with a vocal minority and there is a lack of political will to bring them to fruition. The Victorian government has recently restricted the Goulburn constraints management project to in-channel only,<sup>25</sup> meaning that environmental objectives for the Lower Goulburn floodplain cannot be met.

Constraints management brings many benefits including:

- **Maximising the benefits from limited environmental water available**

It is in everyone’s interest to gain the maximum benefits from water returned to the environment, to which communities and taxpayers have made a very significant contribution. Making optimal use of environmental water will reduce the need for future water recovery.

- **Resolving long standing problems of minor flooding in rural and urban areas**

Minor flooding in towns and urban areas can disrupt the use of public infrastructure such as low-lying roads, caravan parks, playgrounds and sporting facilities. Repairs and maintenance costs to local, state and federal governments have traditionally been a drain on finances and resources. In rural areas minor flooding can affect landholders in both positive and negative ways – it is a nuisance but it brings fertility to the soil. Creating easements to allow environmental water delivery would also allow for the passage of minor flood events and reduce inconvenience to landholders. Making use of available constraint management funding to upgrade low lying infrastructure such as roads and bridges is an obvious benefit to communities.

- **Upgrading aging levees and flood control measures**

Many flood protection levees across northern Victoria are in disrepair and at risk of failure, with ownership and responsibility for management disputed. Clarifying the status, condition and effectiveness of current levees as part of a constraints management program opens up opportunities to resolve these issues and for strategic improvements to enhance their flood protection value.

- **Increased flood protection**

Jurisdictions are investing heavily in flood protection planning and infrastructure after the flood events of recent years. Integrating consideration of the delivery of environmental water into this process and pooling resources with constraints management would be a significant budget benefit.

Opportunities exist throughout Victoria to maximise the benefits of environmental water AND mitigate the impacts of minor flooding. We should be on the lookout to take advantage of these to benefit communities and the environment.

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

EWs are required to pay both headworks and delivery charges for their water holdings in the same way as other water users. However charges vary significantly between catchments and entitlement type and are different in northern and southern systems.

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<sup>24</sup> <https://www.mdba.gov.au/basin-plan-roll-out/managing-constraints>

<sup>25</sup> <https://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/sdl-adjustment-proposals-state-projects>

Government policy with respect to charging for environmental water delivery has evolved significantly over the last 10 years. *Water for Victoria* spells out current policy and sets out the following principles:

- Prices for environmental services will reflect costs
- Prices are to reflect the level of service received
- Prices are to provide signals for the efficient and sustainable use of water infrastructure
- Prices will not deter environmental water

Action 3.7 states that “Water corporations will work with DELWP and environmental water holders to ensure clear, transparent and equitable charging arrangements (service levels and prices) in line with the above principles”.<sup>26</sup> It is important the government follows through on this and establishes appropriate fees for the level of service provide, which may not be the same as that provided to irrigators.

Water prices in Victoria are regulated by the Essential Services Commission (ESC). However the ESC does not have oversight of all environmental entitlements in Victoria. For example the Goulburn and Murray environmental entitlements allow Goulburn-Murray Water to calculate delivery charges and enable G-MW and the VEWH to agree to vary the method for determining delivery costs. This process is not subject to independent review by the ESC. However the established independent regulatory process is focussed on pricing regimes for traditional water users rather than pricing for environmental water needs. These issues need further investigation, discussion and deliberation to ensure equitable outcomes for all.

Finally, the governance of the VEWH must be strengthened so that it is on a level playing field with respect to other players, with the same commercial rights and protections. EWHs are dependent on government for their income rather than on customer fees and charges, and have not been established as arm’s length statutory authorities. At present water corporations tend to regard the VEWH as an arm of government rather than as a large, independent and valued customer. This has to change.

Environment Victoria requests to appear before the Committee to discuss the issues raised in this submission.

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<sup>26</sup> DELWP (2016) *Water for Victoria* Action 3.7

