

Submission to the  
Standing Committee Inquiry  
into the Water Amendment  
(Water for the Environment  
Special Account) Bill 2012

## 1.0 BACKGROUND

*‘Water for Rivers has demonstrated that there is sufficient water for all sectors if it is managed properly.’*

Governments and institutional arrangements have been focussed on absolute recovery number(s) for too long, demonstrating an alienation of regional community, through a legitimate fear of change and legitimate questions surrounding the veracity of volumes to be recovered across the Basin.

It is time for people and their community to be taken on a journey, supported by proven delivery and institutional arrangements that bring the productive sector and the environment together, through a ‘real outcomes’ process and not one based on absolute terms.

The Chair of the MDBA recently stated:

“We have moved away from the ‘big cut on one day’ scenario to what we are now doing, which is trying to manage the system using adaptive management techniques; and recognising that this [process] is more than just about a volume of water. It’s about how you run the river; how you recognise its constraints and all those sort of things”.

“There are a few things: the process of adaptive management; Tony Windsor’s work; and the opportunity for localism. That is the chance to give people a say on how they may want to manage their section of the river in better ways than we can, based on local knowledge and information, and new knowledge over time.

Water for Rivers has the longest history of water recovery in the basin 2003 – 2012. During this period of operation it has worked with community, irrigation companies, river operators and regulators to achieve triple bottom line outcomes. Water for Rivers has exceeded its target, on time and budget, while leaving behind a legacy of more infrastructure providing more efficient water use and improved environmental outcomes.

This success has been achieved without adversely impacting production of food and fibre, in fact it can be argued that productivity has increased.

## 2.0 THE INTENTION OF THE WATER AMENDMENT (WATER FOR THE ENVIRONMENT SPECIAL ACCOUNT) BILL

The Water Amendment Bill introduces two changes to the Water Act:

- the sustainable diversion limit adjustment mechanism, and
- the Government’s proposed \$1.77 billion for infrastructure projects in the Basin.

Whilst the target of environmental water for the Basin has been agreed at 2,750 gigalitres, the Bill provides the mechanism to increase that to 3,200 gigalitres using the adjustment mechanism in the proposed Basin Plan. In essence the Bill facilitates water above the 2,750 gigalitre headline figure, to be returned through water-saving efficiency projects and infrastructure improvements, where those can be shown to return more water to the Basin without any additional negative socio-economic effects on Basin communities.

The Draft Murray Darling Basin Plan has proven testing to deliver as communities' multiple and often competing objectives and expectations have challenged the process.

Fundamental to issues being confronted in delivering a Plan has been:

- The trade-off between water for consumptive purposes and the environment and the subsequent flow on impacts;
- Cost of infrastructure investment over purchasing water in the market to recover water for the environment; and
- Transparency and accounting and reporting processes that support policy positions and ongoing best management of water resources.

Fundamentally Water for Rivers (owned by the Commonwealth) supports the objects of the Act however it believes, (demonstrated over the last eight years of its operations) the opportunity exists to achieve far superior solutions with closer alignment between stakeholders, with smart (cost effective) investment in infrastructure using leading edge world first technology which further builds the knowledge base for future MDB management. This in turn opens a path for continual improvement in knowledge, better water resource management process and accountability for the future use of the limited basin water resources.

It is anticipated that such an approach if adopted by the Water Amendment Bill would go a long way in addressing the three fundamental issues outlined above, which are not being presented as solutions to Basin river communities, hence their legitimate concern.

### **3.0 THE NEED TO RESPOND AND IMPLEMENT THE RECOMMENDATIONS OF THE LAST INQUIRY TO IMPROVE THE SPENDING OF THE \$1.77 BILLION AS A LEGITIMATE APPROACH**

During the last referral to the House of Representatives Standing Committee on Regional Australia, it noted that the Commonwealth has committed to providing a water recovery strategy to outline how water will be recovered, principally through infrastructure projects, but to date has not released this document. It recommended: **“That the Commonwealth Government release a water recovery strategy well in advance of the introduction of the Basin Plan to the Parliament.”**

The Committee also reiterated the recommendations made in its previous report which focused on improving river management, monitoring and auditing aimed at maintaining the economic viability, productive capacity and environmental sustainability of the Basin. The Committee went on to recommend: **“That the Commonwealth Government as a matter of urgency, look seriously at further initiatives to improve river and irrigation management and modeling”** after hearing evidence from a number of submissions about the benefits of achieving water savings through the use of smart river technologies.

The question needs to be raised, why there has not been a response to the urgent need to better manage the Basin Rivers through the use of an effective **water recovery strategy and initiatives to improve river and irrigation management and modeling**, which would assist all stakeholders to better manage our basin rivers and water supply, to irrigation and the environment. This should if it hasn't, be incorporated into the Bill to improve the legitimacy of the proposed government expenditure.

Under the National Water Initiative water accountability, measurement and use of the resource is key to the future development of river and environmental watering plans, as well as efficient delivery of water to customers both irrigators and the environment.

It is clear that any spending of new funds should be based on a comprehensive water recovery strategy that will cost effectively recover water through infrastructure works, based on a **total river solution, integrating all water efficiency delivery and recovery projects (including government spending, avoiding duplication and waste) and achieving efficiencies from head works (dams) to the user on farm**. These links are critical to cost effective water delivery as defined by the Productivity Commission.

Water for Rivers in its last submission to the Regional Australia Committee highlighted that, Water recovery and efficiency should be planned from a **‘total river system approach’**, from headworks to on-farm/environmental asset i.e. similar in concept to the root, trunk and branch approach to tax reform. The alternative is a demonstrated discontinuous approach which leads to sub-optimal ineffective and costly water recovery, to the detriment of the irrigation sector, our regions and will result in less water for the environment.

The equitable delivery of water to all consumptive users and the environment requires cost effective and efficient ‘real time’ water delivery control management; this is the only way to acceptably achieve future SDL's as determined by the MDBA and the Australian Government.

In other words, smarter use of river water and continuous ‘real time’ river valley flow measurement and water accounting with improved control will deliver better solutions and outcomes for the Basin community, as well as providing far superior environmental watering outcomes in absolute quantity/response terms, using efficient water delivery.

It will also significantly improve river operator ability to improve connectivity and capacity constraint management, highlighted by the current Bill, more accurately account for and manage rules based water and would underpin the future MDBA Environmental Management Plan, watering requirements, and enable on line trading with water options.

The current Bill appears to be limited to man-made physical constraints and adopts a simplistic approach to river management by removing the constraints only that limit river height, rather than firstly improving the management of the natural river based constraints (flow capacity) using smart river hydraulics and modelling to better deliver water at the right quantity, time and place and for the desired flow duration and at a predetermined and managed river height.

Amendments have been proposed in Appendix 1 to provide for or make it more explicit the opportunity to better utilise public funds to maximise water resource management, flows and water accounts.

#### **4.0 COMPUTER AIDED RIVER MANAGEMENT (CARM) – Smart investment in infrastructure**

CARM is a Decision Support System (DSS) created to inform operational, resource management and future investment decisions within the Murrumbidgee regulated system. CARM integrates internationally utilized modelling software with real time metering, Bureau of Meteorology data and State Water’s online and data control systems to provide forecasts of future river inflows and automatically updates the model so that it continuously emulates the real time behaviour of the river. It is intended that CARM will ultimately replace the largely manual operational tool “CAIRO” currently being used by NSW State Water and optimise river operations.

Through utilising real-time data CARM offers a tool which has the capacity to:

- Generate cost effective water savings and reduce pressures on existing water entitlements i.e. reduce the gap to Sustainable Diversion Limits without impacting water entitlements held in the consumptive pool
- Improve the management of the riverine environment (including associated wetlands)
- Provide transparency around the use of water for consumptive and environmental purposes
- Assist decision making to optimise water use efficiency and flood control within the regulated river systems
- Improve service levels to customers.
- CARM is currently being rolled out in the Murrumbidgee Catchment through a partnership between Water for Rivers and NSW’s State Water Corporation.

Water for Rivers have recently commissioned GHD to undertake an independent review of CARM to gauge its effectiveness, lessons learnt and opportunity to refine and enhance as it is rolled out to other catchments in NSW.

## 5.0 FINDINGS OF GHD'S INDEPENDENT REVIEW OF CARM

IQQM modelling undertaken by the New South Wales Office of Water (NOW) has concluded that CARM will generate an average annual stored operational surplus of 100GL which would be largely utilised to offset potential third party impacts such as inflows to the Murray system and Lowbidgee with 5 GL/year attributed to a water saving licence.

GHD believes the validity of these potential 3rd party impacts need to be more fully tested in light of the framework provided by the Murrumbidgee Water Sharing Plan.

Notwithstanding this the timing and control of this surplus offers additional significant opportunities. NOW has noted that its work did not consider the following which could potentially provide further significant operational surplus SDL offsets:

- Impact of channel hydraulic simulations on dam release optimisation
- Automation of inputs
- Broader and much more frequent availability of operational data
- Better future AUD calculations and better historical datasets.

GHD recognises that significant additional water savings are likely to be generated as a result of channel hydraulic simulations of dam releases however quantification of such savings is problematic with the limited available data.

GHD's scope of work has concluded that CARM when fully operational with comprehensive real time data feeds (e.g. metering, rainfall, gauging data etc) offers the following broad benefits:

- Improved delivery of environmental water
- Streamlined State Water business and information flow to customers
- Greater transparency of accounting and reporting
- Improved community communication potential
- Maximisation of environmental benefits
- Enabling of operational surplus by creating a robust platform for management efficiency.

CARM is also an enabling tool in that it provides a platform for continual improvement of river operations and customer service improvements.

In summary, GHD believes that the CARM system developed for the Murrumbidgee River system is based on sound scientific principles and state of the art models to better understand hydraulic and quantify the hydrological processes in the river and it will help significantly to reduce operational surpluses in the river and generate a range of further benefits.

Continued refinement and enhancement of the CARM DSS model will lead to more efficient river operations in which water is released only when required, improving control, reducing non-beneficial river losses, increasing transparency and improving services to customers – including the environment. CARM is innovative and will assist alignment of policy decisions with operational objectives and offers a positive step change in regulated river operations.

(A full copy of GHD's Report, including a comprehensive list of suggested benefits of CARM, can be provided on request.)

To demonstrate the operation of CARM the Committee are encouraged to view a You Tube demonstration of the operation of this river management technology and the simulation of more efficient watering of 200 wetlands.

The delivery and targeting of water for the environment is one of the many benefits of CARM river operations. CARM uses sophisticated hydraulic modelling to simulate the movement of water in the river and the wetlands. Therefore it can deliver water at the right time and place, in many cases, using less water compared to traditional river operations. This will in turn maximise the efficient use of environmental water with the aim of achieving the same ecological outcome with potentially less water.

The CARM model on the Murrumbidgee includes the sill levels and storage capacities of over 200 individual wetlands which are connected to the river. As the hydraulic model simulates both flows and levels, it allows specific wetland inundation targets to be translated into equivalent channel flows.

In this model simulation water is released from Burrinjuck Dam but in sync using real time flow data with a tributary inflow from Tarcutta Creek below the dam. This enables the dam release to piggyback back on top of the natural inflow. Being able to accurately utilise these natural flows with environmental releases reduces the amount of environmental water required.

The You tube can be viewed at - <http://youtu.be/fycVSp1hUhw>

What this highlights is that there is a significant and equal need for the Bill to stipulate requirements that funding is provided in such a way to not only improve the 'quantity' but also to provide the Basin river managers with the right tools to improve 'quality or control of flows' to improve Basin river management.

The only reference to this in the second reading speech on the Bill is:

*The enhanced environmental benefits from the provision of an additional 450 gegalitres of water and the removal of physical constraints are many. The government intends, with a combination of real-time management and the additional 450 gegalitres of water, to achieve outcomes such as.....*

Suggested amendments are recommended to section 18. Sub-paragraph 86AD(2)(a) of the Bill as outlined in Appendix 1 to enable funding of SDL credits associated with improved river management and environmental water delivery.

## **6.0 RIVER FLOW SERVICES AND IMPROVED PRODUCTIVITY (ECOLOGICAL) FOR THE ENVIRONMENT AND IRRIGATORS**

Fine tuning environmental flows can lead to enhanced ecological outcomes such as bird and fish breeding events, equally the efficient delivery of irrigation water to customers when supported with complimentary information (such as irrigation scheduling and forecast data) has the capacity to lift on-farm productivity across the basin and enhance and strengthen rural industries and the communities they support. We can do more with less if we understand the needs of environmental assets and deliver enhanced services when delivering irrigation water.

CARM can provide environmental managers with the “levers” needed to place environmental water into wetlands when it is needed with the level of transparency being demanded by the community.

An improved predictive capacity of the environment’s and irrigators’ needs will allow the system to be managed more efficiently and productively. A smart system, which has a good demand predictive capacity, will give river systems operators the tools to meet the multiple objectives of a healthy environment and a productive and efficient irrigation system.

## **7.0 CONCLUSION**

Water for Rivers is a very successful model in engaging with stakeholders, building consensus and delivering water for the environment.

Water for Rivers supports the objectives of the Water Amendment Bill and the recovery of water by investment in SMART infrastructure SOLUTIONS.

Water for Rivers believes that Computer Aided River Management (CARM) provides a unique opportunity for broad scale Government investment which will go a long way in addressing the three hurdles in delivering a successful Murray Darling Basin Plan i.e.:

- The trade-off between water for consumptive purposes and the environment and the subsequent flow on impacts

- Cost of infrastructure investment over purchasing water in the market to recover water for the environment
- Transparency and accounting and reporting processes that support policy positions and ongoing management of water resources

CARM is an innovative response that will assist to align policy decisions with operational objectives, and offers a positive step change in regulated river operations.

## APPENDIX 1

Suggested amendments highlighted.

18. Sub-paragraph 86AD(2)(a) provides that amounts standing to credit of the Account may be debited for the purposes of making payments in relation to projects whose aim is to further the object of the new Part 2AA by:

- i. improving the water efficiency of the infrastructure that uses Basin water resources for irrigation;
- ii. improving the water efficiency of any other infrastructure that stores, delivers or drains Basin water resources for the primary purpose of providing water for irrigation and the environment;
- iii. improving or modifying infrastructure (including bridges and roads) that constrains the delivery of environmental water to the environmental assets of the Murray-Darling Basin in order to ease or remove those constraints;
- iv. increasing the capacity in dams and storages, and improved river operational management to increase the efficiency and capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin;
- v. entering agreements to acquire an interest in land (including easements) to facilitate environmental watering of the environmental assets of the Murray-Darling Basin; and
- vi. improving the rules, policies, practices and procedures in relation to the use and management of the Basin water resources.