

**PRODUCTIVITY COMMISSION MURRAY DARLING
BASIN PLAN REVIEW SUBMISSION 2023**

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Introduction

I farm along the Yea River, the second largest upstream tributary to the Goulburn River and along with many other farmers along the floodplains, we are impacted by the proposed Goulburn Constraints Measures Project, so many of my comments refer to this deeply flawed strategy.

The Constraints Management Strategy projects have insurmountable and intractable problems. The original intent of these projects together with the 450GL upwater recovery project was to deliver water as far as the Lower Lakes, Murray Mouth and Coorong to achieve “enhanced environmental outcomes.” These projects are all interdependent. One fails and they all fall over.

The Basin Plan has failed on every level, economically, socially and environmentally and will continue to do so while it remains as a political tool used by both sides of government to sway voters.

It was patently clear that as far back as 2013 when the MDBA devised the Constraints Management Strategy, that this was never going to be completed “in full and on time”, that is by June 2024, as touted by whatever politicians were in power at the time.

Federal Water Minister Plibersek stated that with Basin Plan deadlines looming, her focus was to achieve “maximum progress in the time we’ve got.” In my opinion and that of many others, the Minister would be better advised to stop the mad rush for acquisition of greater volumes of water for the environment, re-address what can be achieved with water already held by the environmental water holders and most importantly what can actually be delivered under the Basin Plan’s triple bottom line of environmental, social, economic factors.

STOP PRESS Media Release July 25th 2023

The MDBA has finally made public the fact that the Basin Plan will not and cannot be implemented “in full and on time.”

Community engagement

It is infuriating, insulting and intolerable that after nearly 12 years of supposed community consultation, landowners who in many cases have a long lifetime of lived experience and deep knowledge of the river systems on which they live and work, still find that the Basin Plan bureaucracy, MDBA, State and Federal Government agencies prefer to ignore this bank of experience and knowledge, preferring to rely on modelling and so-called consultants to advise on Basin Plan decisions.

I am sick and tired, like many others, of attending countless committees, inquiries and meetings, writing a myriad of submissions and letters to politicians and Water Ministers in the hope that they will gain some understanding of why and how the Basin Plan was never going to be implemented “in full and on time.” It seems our information generously given since the inception of the Basin Plan is consistently cast aside in favour of endless desktop modelling and favoured expert scientific opinion.

We are now seeing how flawed the modelling and scientific assumptions on which the Basin Plan was established have been. We are seeing the culmination of 12 years of a plan used as a political tool to buy elections, as witnessed by PM Gillard’s promise of an extra 450GL to buy the South Australian vote, with the Basin Plan having a long political agenda throughout its entire lifetime.

When the basin states signed up to the Basin Plan, they were sold a 'pup'. The Federal government and its agency, the MDBA, drafted and designed strategies which were based on 'blue sky thinking' (the 80,000ML/day to the SA border), and aspirational assumptions, then the Commonwealth enshrined these strategies in legislation prior to having any knowledge whether these ambitious targets were realistic, practical or viable and failing to include climate change variables. The basin states were then charged with the responsibility of achieving these strategies.

For many years Basin communities have been alerting the MDBA, State and Federal Governments of the many flaws in the Basin Plan. This advice continually seems to fall on deaf ears, with a blinkered bureaucracy determined to follow the legislated Plan to the letter despite the obvious faults.

Let's Set the Record Straight

1. Total environmental entitlements already held by environmental water holders

The Murray Darling Basin environmental water holders already hold **4622.5GL of water entitlements**. The MDBA Water Take Report is the point of truth. This document published by the MDBA in September 2022 is the bible of held environmental water- see link <https://www.mdba.gov.au/sites/default/files/publications/annual-water-take-report-2020-21.pdf>

This acquired water is far in excess of the 2750 GL agreed benchmark plus the 450GL additional water volume that was stated as needed under the Basin Plan. If the **49GL Bridge the Gap plus approximately 320GL Sustainable Diversion Limit shortfall (estimate anywhere between 300-370GL), plus 450GL is recovered or bought back, it means a TOTAL of 5441.5GL will have been acquired.**

2. Deliverability

Deliverability is the elephant in room that must be acknowledged. The environmental water holders have never delivered their full allocation in any one year. Constraints "relaxation" or man-made manipulated environmental flood flows on a constant basis in the Goulburn and Murray rivers are not acceptable to landowners due to the economic, social and environmental impacts.

The latest hydrological modelling also shows that proposed 'relaxed constraints' flows downstream of Torrumbarry have little to no effect.

Major flood level flows are necessary to achieve flows of 80,000ML at the South Australian border and flows similar to the catastrophic 2016 and 2022 floods in the 4 major river systems are required to keep the Murray Mouth open without dredging for a number of months.

3. Theory of Constraints

The MDBA failed to recognise the theory of constraints, whereby whatever obstruction is preventing the system from achieving a higher output is removed, in reality, when applied to river systems and the vagaries of nature simply cannot work due to the hundreds of constraints within each key constraints focus area, which are all interdependent not only in their own area and river system, but on all downstream systems as well.

4. 450GL IS NOT MANDATORY

It is infuriating that particularly South Australian politicians, the Federal Water Minister and environmental groups keep demanding the full 3,200GL of the Basin Plan, that is the additional 450GL, be delivered via the constraints projects, when it is patently clear that Chapter 7, Part 2, Section 7.09, paragraph (e) of the Basin Plan clearly says the 450 GL is additional to the Plan's 2750 GL water recovery benchmark. It does not say the 450 GL means it is now a 3200GL benchmark.

Throughout all the Basin Plan drafts in later 2012, the benchmark of 2750GL remained consistent. It never changed to 3200GL as a result of the Sustainable Diversion Limit Adjustable Mechanism (SDLAM) being added to the Plan.

Bret Walker, SC, the SA Royal Commissioner in his 2019 final report explains in the context of the Water Act Section 86AA, that:

One thing is mercifully clear from the text of this strange provision: any 450 GL increase in the volume of water available for the environment is not a mandatory requirement, nor (perhaps for obvious reasons) is it mandatory for 'environmental outcomes' to be 'enhanced' in the ways set out in subsection 86AA(2). These outcomes — which relate to the environmental assets of South Australia — 'can' be enhanced in the ways listed, but this leaves open the possibility that this desire will be unfulfilled. P386

5. No Set Target flow to the Sea

Nor did the Basin Plan 2012 set a target flow to the sea. The Basin Plan established a series of objectives and targets in relation to openness of the Murray Mouth, levels of the Lower Lakes, and improvements in the condition of the Coorong, Lower Lakes and Murray Mouth from 1st July 2019. These objectives are set out in section 8.06 and Schedule 7 of the Basin Plan.

The Basin Plan saw a Basin-wide Environmental Watering Strategy developed which assumed a series of anticipated flow outcomes for the Coorong, Lower Lakes and Murray Mouth. These are not targets, but outcomes it was **assumed** could be achieved based on hydrological modelling of the Basin Plan.

6. Agreed Socio-Economic Criteria

The 450GL cannot be recovered unless it adheres to the Agreed Socio-Economic Criteria, which was agreed to by all basin states. It is totally dependent on the 'constraints relaxation' projects as shown in the Water Act 2007, subsection 86AA(3) which provides that the object of Part 2AA is to be achieved by easing of constraints on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin, and increasing the volume of the Basin water resources that is available for environmental use by 450 gigitalitres. It is totally futile to be recovering 450GL until it is shown that the myriad of constraints can be overcome and mitigated in an acceptable manner avoiding economic, social and environmental impacts.

7. Feasibility of Constraints

Modelling of Relaxation of Operational Constraints in the Southern Connected System Hydrologic Modelling (HMROSCS) states - *"Modelling indicated that relaxing constraints would provide relatively subtle changes to outcomes for the Coorong, Lower Lakes and Murray Mouth*

(CLLMM).” The document states there were only “minor scale changes to the CLLMM indicators in modelling in the relaxed constraints scenario.”

The 3,200GL option showed *“marginal improvements in some outcomes; but no significant improvement for mid- and high-level floodplain environments in the southern Basin. This was because river operating constraints were found to limit the ability to deliver sufficiently high flows to inundate mid- to high-elevation floodplains; thus, outcomes such as watering vegetation communities like river red gum and black box woodland on these floodplains was unachievable, regardless of the SDL volume. Within the boundaries of these constraints and the consideration of social and economic impacts, MDBA therefore proposed an SDL reflecting a 2,750 GL/y reduction in diversions.”*

Excerpts from Senate Estimates Inquiry 2016

Mr Colin Mues, Executive Director, Environmental Management Division, Murray-Darling Basin Authority:

“Once the Basin Plan was finalised, we developed the Basin-wide environmental watering strategy, which went to quantifying the environmental outcomes that would be achieved under the plan, within the existing constraints as they stood at the time. We published that in terms of the outcomes—river connectivity, native birds, native fish and vegetation outcomes. **Those outcomes were all achievable within the existing operating constraints at the time.”**

Mr Russell James, Executive Director, Policy and Planning Division, Murray-Darling Basin Authority:

“The Basin Plan was done on the basis that no particular additional constraints needed to be addressed. **The 2,750 can be delivered without additional constraints being addressed.** The constraints process does provide an opportunity to be more efficient and effective in the way that we do that, but we do not need that”

CHAIR: “**You do not need to flood anyone to meet your targets?”**

Mr Dreverman: “**Correct.”**

Mr James: “**We can use the existing rules to deliver the 2,750.”**

Mr James: “The 2,750 figure in the Basin Plan is based on science, but not only science. It was also a social and economic judgement made in relation to that figure... I think it is important to mention as well that the 2,750 figure was based on an assessment of the environmental watering needs all the way down the system.”

8. No Cost/ Benefit Analysis for Constraints Projects

Constraints Strategy projects have no integrated policy or management framework across the basin states and no Cost/ Benefit Analysis has been undertaken, so how on earth can fair and equitable implementation across states occur?

9. Enhanced Environmental Water Delivery (EEWD)

The environmental flows being proposed under the Constraints Strategy will be created by releasing water from Eildon Weir to “piggy-back” on top of high natural unregulated tributary flows, to increase either the flow peak and/or duration of the event. In the upper Goulburn catchment with its steep topography and flashy, fast rising tributaries, this strategy is fraught with danger for landowners and communities.

Extent to which the Basin Plan is on track to be delivered within statutory timeframes

It was patently clear that as far back as 2013 when the MDBA devised the Constraints Management Strategy, that this was never going to be completed “in full and on time”, that is by June 2024, as touted by whatever politicians were in power at the time.

The Goulburn Constraints measure has continually failed to be proven technically feasible and like all other constraints projects has yet to move past the feasibility stage. It started out as a proposed supply measure, but after investigation was deemed to supply such a small volume, that it became known as the New Goulburn Constraints Project. It was then shelved due to inadequate technical investigations until becoming part of the Victorian Constraints Measures Program, which is now waiting delivery of a feasibility report to the Victorian State Water Minister Shing by the end of 2023.

These Sustainable Diversion Limit Adjustment Mechanism (SDLAM) constraints projects, we were told, were totally inter- dependent and along with the EEWD or Enhanced Environmental Water Delivery project and recovery of the 450GL needed to all be successful to achieve the “enhanced environmental outcomes” at the end of the Murray system.

The Menindee Lakes Project after at least 14 attempts has failed dismally and has been abandoned, the Goulburn Constraints Measure, the Hume-Yarrowonga and Yarrowonga to Wakool Constraints projects have major socio-economic implications for landowners, businesses and public infrastructure, which have not even started to be addressed. With over 3,000 private landholders to contact and many, many issues to be resolved, even if these projects proceeded past feasibility stage, it would take many, many years to finalise. On top of this, constraints projects on the Murrumbidgee, Murray and Lower Darling, involve negotiating flood easements over at least 4000 landholders’ properties.

The MDBA’s modelling which underpins the Constraints Management Strategy and the recovery of an additional 450GL known as the ‘Hydrologic modelling of the relaxation of operational constraints in the southern connected system: Methods and results October 2012’ makes it clear that the benefits of the additional 450 gegalitres of water will only be realised if the eight key constraints are all relaxed.

The Water for the Environment Special Account (WESA) Bill states these projects must be ‘implementation ready’ by June 2024. The Goulburn Constraints Measures Project is solely funded by WESA and it is stated that if not ‘implementation ready’ by June 2024, funding will cease.

The Goulburn Constraints project has not got a hope in hell of being delivered within the statutory timeframes, if ever.

The 'constraints relaxation' projects should be abandoned as the environmental, social and economic impacts simply cannot be mitigated and as stated by MDBA executives the 2750GL can be delivered without the need to flood private property.

The Victorian Government policy regarding 'relaxed constraints flows', as initiated by previous Water Minister Lisa Neville and reiterated by her successor, Minister Harriet Shing is that:

- No flooding of private property will occur without landowner permission
- No easements will be compulsorily acquired
- All flows to be in-channel

With regard to the 450GL, Victoria and NSW have unequivocally stated they will not allow any further water to be removed from their state's supply due to it causing economic hardship.

The following are factual statements and evidence of the inability to deliver the proposed man-made environmental flood flows downstream to South Australia and achieve the proposed 'enhanced environmental objectives' under the basin plan legislation:

The Victorian Government recognises that *"any relaxation of constraints will pose third party flooding related risks which can impact public and private land, infrastructure, stock and people."* and *"Victoria will not flood private property without consent, or undertake compulsory acquisition of land or easements,"* and these measures must be agreed to by landowners.

The decision to proceed with constraints projects rests with the Basin States.

The latest modelling of a maximum 14,000GL/day proposed environmental flows in the upper Goulburn River gauged at Molesworth (where there is still no operating streamflow gauge) causes flooding on private property and also cuts off access to private floodplain property.

For the last 6 weeks we have seen flows at the Molesworth Choke of approximately 14,000ML/day, which has inundated parts of private property, cut off access to riverplain land and to the Molesworth Caravan Park, so locals know only too well the severe impacts this has on their ability to productively manage their property. This has placed huge grazing pressure on the hill portion of their properties and necessitated the purchase of extra fodder.

Bureaucrats, environmentalists and landowners who have no skin in the game, that is they are not in any way impacted by these higher flows, have decided to investigate 14,000ML/day man-made environmental flows through the Molesworth Choke, but no productive property can withstand this level of flooding on improved pasture for up to 10 days (5 days inundation plus rise and fall) for 7 years in every 10 during the Winter-Spring period. This period is when river flats are used for hay and silage making to provide fodder for the following winter and are utilised as the prime fattening or finishing paddocks for stock being supplied to the fat markets.

The Productivity Commission paper on the scope of the inquiry states the *"Commission should make findings on progress to date and recommendations on any actions required to ensure full implementation of the Basin Plan."* Why would you want to ensure the full implementation of a Plan that in its first 12 years has failed so drastically.

So many flawed assumptions have been made in the Basin Plan. With the duration of time, it is obvious to even the most inexperienced that many of the basin plan strategies are doomed to fail

and attempts at implementation have been at a massive cost to the Australian taxpayer. Continuation with water recovery strategies will decimate the Southern Connected Basin.

Likelihood and extent to which activities and arrangements currently in place will ensure that these provisions and timeframes CANNOT be met.

These flawed assumptions show the reality of the fact that the Basin Plan in its current format simply cannot be delivered in full.

FLAWED ASSUMPTION 1

That landowners will allow easements to be placed on their titles so that their private property can legally be flooded forever into the future.

At the Senate Rural and Regional Affairs and Transport Legislation Committee Estimates Hearing on February 28th 2017 Senator Bridget McKenzie asked how the Constraints Strategy continues to pass the MDBA's phased evaluation criteria that states, *the proposal must be technically feasible and that it can actually be accomplished*, when very clearly landowners have stated they are resolute in their intention to refuse to allow the creation of easements on their private property and both federal and state governments and also the CEWH all have declared that they will not intentionally inundate properties without the consent of landholders.

Landowners still stand by the statement below drawn up in 2015, when 'relaxed constraints' flows of 20,000ML/day were proposed. The maximum flow now proposed in the latest modelling is 14,000MLday, but as stated this still impacts their farming enterprises.

Statement Regarding the Proposed Creation of Easements over Private Property in relation to the Murray Darling Basin Plan Constraints Management Strategy

From the Upper Goulburn River Catchment Association (UGRCA) 15 September 2015

The UGRCA, representing many concerned landholders along the Goulburn River and its tributaries around Yea/Molesworth/Alexandra/Rubicon would like to make a clear statement in relation to the creation of easements across private property, as proposed by the MDBA's Constraints Management Strategy.

It is clear to the UGRCA that landholders, whose properties will be inundated by environmental flood flows, as proposed by the MDBA, in order to deliver man-made manipulated flood flows to the Lower Goulburn, Murray and South Australia, **are NOT prepared to negotiate** the creation of flood easements over our properties.

All our UGRCA land holders know that the MDBA floods, will cause an untenable loss in productivity of our farms, significant loss of amenity, increased major flooding risk and will lead to a serious devaluation of our properties. The Goulburn River flats in our area are some of the most productive and valuable farming land in the country. Land holders will not stand by and see their equity eroded by man-made floods.

An easement is not mitigation. It simply attempts to absolve the river operator, Goulburn Murray Water and the Goulburn Broken Catchment Authority from responsibility and liability from third party impacts.

Given the in-channel capacity of the Goulburn River at Molesworth is 9,500 ML per day, and the proposed MDBA environmental flood flows of 20,000ML/day are over double the bank full volume, landowners in the Upper Goulburn Catchment stand to suffer very severe and significant inundation of their properties on a continuing basis, and no amount of compensation can mitigate this.

We are resolute in our position that the creation of flood easements will not be negotiated.

End of Statement.

FLAWED ASSUMPTION 2

The environmental outcomes from the Constraints Supply measure would outweigh the costs.

Phillip Glyde, Chief Executive MDBA at a Senate Estimates hearing stated that *"The constraints measures are a pretty critical part of the supply measures that have been nominated."*

Previous Victorian Water Minister Lisa Neville had expressed concern that the Goulburn Constraints supply measure had not delivered the offsets that were expected, in fact less than 4GL, which means there were very little benefits to be gained from the Goulburn Constraints project as a supply measure.

FLAWED ASSUMPTION 3

Socio-economic impacts can be financially mitigated with the meagre amount of \$200 million for the entire basin.

The total amount now calculated needed to mitigate the Basin Plan constraints project is in the vicinity of \$1.3 Billion. The amount of \$200 million funded by WESA is now to be used for mitigation in the Goulburn project only, but will be totally insufficient.

In the words of Mr Glyde, the previous Chief Executive of MDBA, the Constraints Management Strategy was devised *“as a way of trying to minimise the social and economic impact of returning water to the environment.”* The grand plan was for constraints measures to use water more effectively to achieve their environmental goals and limit the socioeconomic damage, however no amount of mitigation in the form of a one off, upfront payment can compensate the degradation caused by constant flooding and loss of productivity, devaluation of property, environmental impact of collapsing banks, loss of hundreds of mature red gums and depleted income.

FLAWED ASSUMPTION 4

That the tributaries to the major river systems, apart from at the immediate confluence, would not be affected.

It is very obvious to landowners along the upstream tributaries that when the Goulburn River levels are higher, that is channel capacity or overbank for a longer duration, the tributaries cannot drain freely, therefore keeping floodplain country inundated for longer than normal.

No mitigation compensation has been considered or factored in to the Goulburn Constraints project for landowners along these fast-flowing tributaries.

It is obvious that “limiting socio-economic damage” does not extend to the landowners along the tributaries.

FLAWED ASSUMPTION 5

That State owned entities such as GMW river operators will accept responsibility for flooding impacts.

At a Senate Estimates Hearing Senator McKenzie asked who has legal liability for operational decisions to release water that will flood private property.

In response, Mr Russell James, Executive Director Policy and Planning MDBA, stated *“the legal liability would rest with the relevant river operator. In the Goulburn Valley it would be Goulburn Murray Water.”*

As GMW is a state-owned entity, liability reverts to the Victorian Government. Doubtless GMW would be required to meet any liability and would have to pass increased charges to GMW's customer shareholders, that is the irrigators, if it was to meet its responsibility.

GMW have stated they will not see liability risks transferred to its customers.

FLAWED ASSUMPTION 6

The Basin Plan implementation will assure socio-economic impacts will be neutral or positive or able to be beneficially mitigated.

Irrigators in the GMID who have not only had their entitlements reduced, but will also themselves be flooded if their properties are along the Goulburn or its tributaries, stand to suffer a triple whammy. The great irony being that water which has been taken from them as 'water savings' will then be used to flood their own properties and properties of their fellow farmers.

As GMW is liable as the responsible party, shareholder or irrigators will then be required to pay increased fixed charges to resolve liability issues.

If a further 450GL upwater is to be removed from irrigation areas, the consumptive pool of the GMID in particular would have insufficient water left to run the system, as ALL water taken as so-called savings is to be given direct to the CEWH.

The GMID is at the tipping point.

FLAWED ASSUMPTION 7

Only '*minor over bank flows*' would be required to achieve proposed environmental flows downstream.

It is well documented that to achieve the MDBA proposed flows of 80,000ML/day at the SA. border, a combined upstream peak from the main river systems of 160,000ML/day is required.

The 2016 floods gave clear evidence of the damage and impacts that would ensue if 80,000ML/day was to be delivered as part of the 'relaxed' constraints strategy.

As a result of major flooding in September/ October 2016 in the Murrumbidgee, Murray and Mid Goulburn, flows to South Australia were of the volume, or in excess of the volume, being proposed by the MDBA under the Constraints Management Strategy, that is, in excess of 60,000ML/day for over 5 weeks at the border. Flows of 60,000ML/day over the South Australian border commenced on 11th November 2016, peaked at 94,246ML/day on 30th November and were then in excess of 65,000ML/day till 18th December 2016. These flows still did not clear the Murray mouth for more than 3 weeks.

FLAWED ASSUMPTION 8

The over-arching principle which is to guide implementation of the Constraints Strategy states any solutions will not create new risks to the reliability of entitlements.

The so-called on-farm efficiency measures costing \$1.5 Billion will create enormous risks to the reliability of entitlements and the ability to even use those entitlements as the removal of another 450GL out of the system puts an irrigation system that is already at tipping point in the realms of bankruptcy. Irrigators water security and water rights will be undermined by the loss of more water out of the consumptive pool with the recovery of the 450GL upwater.

FLAWED ASSUMPTION 9

Relaxing constraints would allow the delivery of proposed environmental flows downstream to the SA border and Murray Mouth and achieve 'enhanced environmental outcomes.'

The MDBA in devising the Constraints Management Strategy used the core concept of the desktop Theory of Constraints normally used in business management or manufacturing, whereby a single constraint if removed then improves total throughput.

The problem being in an ancient river system there are a myriad of constraints or limitations including many channel chokes and extremely low gradient streams that slowly meander their way through flat, arid country. For example, at Albury the stream gradient of the Murray is 125mm/1km(5inches/km) down to Wentworth, which is a mere 33 metres above sea level.

The decision to proceed with a Constraint Management Strategy, in order to deliver greater volumes of environmental water downstream, was based on no evidence whatsoever that the channel restrictions in the 4 major river systems or the multitude of other constraints throughout the basin could, in actual fact, be 'relaxed' and the proposed flows actually delivered. The document Hydrologic Modelling of Relaxation of Operational Constraints in the Southern Connected System PAGE xiii states:

"Undertaking detailed assessments an analysis to identify whether any of the constraints tested in this study could actually be relaxed was not within the scope of this report."

This was the basis on which it was decided to approve the Constraints Strategy.

FLAWED ASSUMPTION 10

The proposed man-made flood flows of 80,000ML/day to the SA border **COULD** actually be delivered.

The MDBA Constraints Modelling Review Report by NSW and Victorian Ministers' Independent Expert Panel 2018 Wilson Report.

"...irrespective of improvements in real time river operation models, they will still require weather forecasts as an input, the accuracy of which falls away beyond several days. Given that it takes one to two months for water to flow through the length of the Murray system, a degree of uncertainty and residual risk will remain. This limits the confidence that can be achieved in real time river operating models. The Panel has been advised that given these uncertainties, flows of 80,000ML/day at the South Australian border will occur when there is a coincidence of large rainfall and 'natural' flow events in the Murray or its key tributaries, but river operators will not be creating 'managed' 80,000ML/day flows at the South Australian border."

FLAWED ASSUMPTION 11

The MDBA also constantly states in the Constraints Management Strategy and associated documents that the environmental flows **"will not exceed minor flood levels."**

This gives decision makers the impression that flows are small flows with little impact. The Bureau of Meteorology flood classification levels have little or no relevance for those of us who live and farm along the Goulburn and its upstream tributaries, due to distance from existing gauges.

As the Goulburn River Reach Report states on Page 11:

“As you move away from the gauge, the river situation can be quite different from what is being recorded at the gauge. This can mean that flood warning categories may not be timely or relevant, especially for rural areas with large amounts of ungauged catchment, flow from unregulated tributaries and long distances between river gauge...”

The steep mountain and hill country particularly in the Upper Goulburn Catchment where unpredictable flash flows occur, make for unpredictability of fast flowing streams. Tributaries in the upper catchment, the Acheron, Taggerty, Rubicon, Yea Rivers and King Parrot Creek are fast flowing streams rising out of the mountains where average rainfall is 1400-2,000mm/yr. Localised run-off from the steep surrounding hills can be very significant with streams rising to overbank flows in just a few hours.

“There certainly are issues in the Goulburn, because it is a system where there are a lot of tributaries flowing into the main river, and not all of those tributaries are monitored for flow. There is a lot of experience in that part of the country that where you get unexpected large rainfall, for example, you get dramatic changes in flow rates. There is a level of anxiety about how the system works in practice. So, there is a legitimate concern amongst those people that we do not exacerbate those sorts of issues, which is why I am particularly conservative in systems like the Goulburn where you have that sort of geographical arrangement.” David Papps (CEWH) Senate Inquiry 5th Feb. 2016

The Constraints projects and delivery of the 450GL together with the Enhanced Environmental Water Delivery (EEWD) project are all inextricably intertwined and interdependent

Knowledge and Science

The MDBA have always maintained they have used the best available science to progress the Basin Plan. I and many other “citizen scientists” disagree as even common sense will tell you that natural physical constraints of our vast country have not been taken into account.

1. We are the flattest, driest inhabited continent on earth, meaning there are massive attenuation and evaporation losses as flows so slowly wend their way towards the Murray Mouth and Southern Ocean. It takes a release of approximately 3 megalitres at Eildon to get 1 megalitre at Mildura. There is no manner of mitigating these losses in our hot, arid, flat land. Here are the reasons why vast volumes of water will never reach the Lower Lakes or Southern Ocean, making it impossible to keep the Murray Mouth open 95% of time.

All tributaries worthy of naming, are in the upper reaches of our main rivers The Darling once it leaves Queensland has virtually no tributaries. The Murray from the point of confluence of the Darling has no tributaries The Goulburn below Shepparton has virtually no tributaries. The Murray at Albury takes 4 weeks to reach South Australia.

The Murray at the confluence with the Goulburn River is 1992 kms. from the Murray Mouth and a mere 124.9 metres above sea level. Mildura is still 878kms from the Murray Mouth but only 34.5 metres above sea level. The Darling River at the Queensland border is about 3,218 river kilometres from the sea and only 500 metres above sea level. Once the Murray and Darling Rivers leave the Great Dividing Range their stream bed gradients are so low that their waters flow at a phenomenally low rate. After wandering 1350 river miles to Wentworth, the Darling

River flows into the Murray at 100 feet above sea level. Throughout that distance it falls only 3 and ½ inches (90mm) to the mile At Albury the stream gradient of the Murray is 125mm/km (5 ins.) down to Wentworth, which is a mere 33 metres above sea level for the last 100 kms. in South Australia, the stream gradient is only 12mm./km (1/2in.) - (*Rivers of History*)

In 2016, peak flood flows in the Murray River at Tocumwal, reached a huge 204,000ML/day, yet with attenuation and evaporation as flows slowly wound their way seaward, less than 50% actually reached the South Australian border.

2. The MDBA have based their computer modelled environmental flows on a fundamentally flawed perception of how the river and its estuary system works.

Assumptions that large volumes of water delivered to the end of the Murray would achieve a Murray Mouth open to the sea for 95% of time was based on modelling that failed to account for the Southern Ocean's role in moving sand to block the flows.

Bruce Thom, an Emeritus Professor at Sydney University and lead author of the paper in River Research and Applications journal, said the omission was stark not least because the region is *"one of the most high energy exposed beach coasts in the world."* Professor Thom said, *"The sand is winning and it will continue to win as sea levels rise [with climate change]."*

This echoes the Wentworth Group's finding that *"under climate change, it is likely to be increasingly difficult to maintain freshwater values in the lower lakes."*

Jamie Pittock, a professor at ANU's Fenner School of Environment said the failure to model coastal sand movements was *"a big oversight and it means the main basin plan targets are unachievable."*

3. **The Murray–Darling Basin Authority Review of the Environmental Watering Plan March 2021**
https://www.mdba.gov.au/sites/default/files/pubs/review-of-environmental-watering-plan-march-2021_0.PDF

PAGE 17 states, (2)(d) *condition of the Coorong and Lower Lakes ecosystems and Murray Mouth opening regime. Murray Mouth and Coorong targets being met through Basin Plan mechanisms alone was flagged as potentially unachievable under a changing climate.*

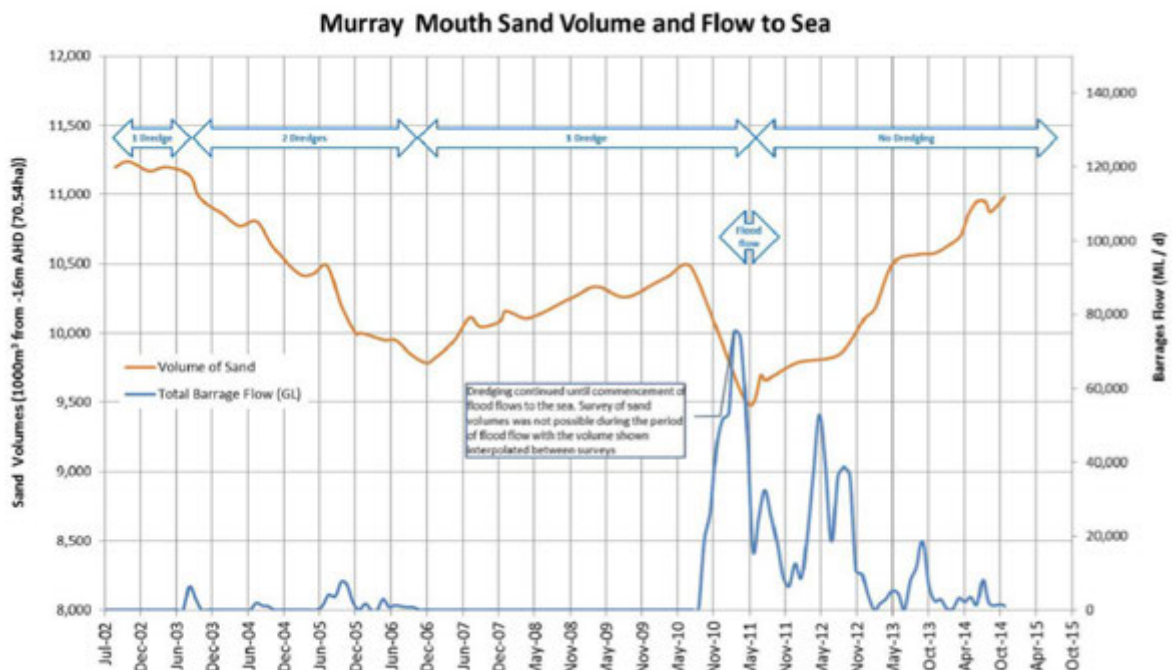
- Mr Dreverman (MDBA): *"There are two parts. You need large flows—probably in excess of 75,000 megs a day for in excess of 10 days—to flush large volumes of sand out. Then you need smaller flows to slow the ingress, because every tide is bringing sand in and there is not sufficient energy to take it back out. That is because the wave action picks up the sand on the sea side but you have no equivalent mechanism on the outgoing tide to lift the sand and take it back out. So, you get this net ingress of sand only stopped when you have an imbalance in the total flow. So, we are not expecting the dredging to ever totally cease. Whenever the flows in the system are low, we will expect to keep dredging in that system."* (Senate Estimates 25th May 2018)

Keeping the Murray Mouth open 95% of time without dredging and achieving ‘enhanced environmental outcomes’ is not possible and the MDBA have now admitted as much, but not in the public arena.

It is time that the Federal and State Governments called an end to the Constraints Management Strategy and the additional 450GL upwater, which can neither be recovered or delivered without creating very significant social and economic impacts.

4. *“In the 1930’s the Government made the decision to construct barrages at the mouth of the Murray to prevent salt water intrusion into the Lower Lakes. This was in response to demand for increased freshwater diversions from the Lakes themselves and upstream users. As a consequence, reduced flows and barrage construction has altered the morphology of the Murray estuary and Mouth, increasing the threat of Murray closure. This has significantly impacted on the environmental, economic and social values of the region, including the Coorong.”* Foreword by Don Blackmore MDBC July 2002 The Murray Mouth Exploring the Implications of Closure or Restricted Flow

5. Graph from South Australian Government agency, SA Water PowerPoint December 2014



This graph shows sand volume at the Murray Mouth and flows to the sea. As soon as flows drop below about 20,000ML- 30,000ML/day, sand starts to accumulate.

Even if the 450GL could be attained (which it can't) and delivered (which it can't) this volume only equates to 1200ML/day all year round and so is minimal in comparison to the flow volumes required to keep the Murray Mouth open.

To take this analysis further an average outflow through the mouth of 25,000ML/day equates to 9000GL/year, 20 times greater than the 450GL upwater volume. This shows the sheer absurdity of legislating a Constraints Strategy and 450GL in the misguided assumption that this would keep the MM open 95% of time without the need for dredging.

6. As we have just seen, volumes in excess of the proposed flow of 60,000-80,000ML/day at the SA border have been totally inadequate to flush the Murray Mouth clear of sand bars, and would also need to coincide with high outgoing tides to have any effect whatsoever.

It is completely pointless attempting to deliver computer modelled environmental flood flows through very extensive hot, flat, arid areas where the river system simply does not have the ability to force flows through the Lakes and out the Murray Mouth with sufficient energy to scour the sand bars. Once the Murray enters the drowned estuary of Lake Alexandrina, the *“waters creep to the sea with a fall of an inch per mile.” (Rivers of History)*

As Neil Motton, Geologist (B. App. Sc., MAusIMM, MAIG) explained several years ago, we have *“a mature river system coming off an old Palaeozoic (200-600 million years old) continent, where the erosional nature of the continent has reached a low-energy system. As always, these systems have barrier estuaries clogged by years of sedimentation. Sediments held in suspension by freshwater systems invariably drop out of suspension when they hit the salt water interface of the sea, thus creating these clogged estuaries.*

As a result, at the Murray River Mouth, we have at least 100km of the Youngusband Peninsula, which is made up of sand dunes. These dunes and beaches are like a large sponge where 90per cent to 100 per cent of the water coming down from the river seeps out to the sea, apart from the water that doesn't evaporate in the large shallow basin known as Lake Alexandrina.”

7. The MDB Plan is based on the assumption that if you inundate an area of floodplain for a set period of time, you will restore the health of that system (MDBA 2012a). This single measure approach is not an ecological reality. Since the inception of the Basin Plan sole focus has been on achieving volumetric targets.

The Independent Expert Advisory Panel Peter Davies et al, The MDB Plan Limits of Change Review September 2017 further states that *“the use of volumes as a measure of base flow achievement or shortfall has no ecological underpinning. There is no set of established relationships between base flow volume, river level/stage and habitat areas that allow base flow magnitudes to be translated into ecological risks or benefits.”*

Environmental water management- Environmental Issues, Monitoring and Evaluation

1. Since the inception of environmental flows, we have seen massive environmental degradation throughout the major river systems with collapse of banks, loss of soil and sediment downstream, loss of thousands of mature red gums. This may not be caused by purely environmental flows, but a combination of higher volumes of irrigation water being sent further and further downstream plus more frequent environmental flows and a high number of flood flows in the last 13 years. But it is the cumulative impact of all these factors

that continues to be ignored or monitored by the MDBA.

2. We are seeing the constant flooding of the Gunbower Forest after 3 consecutive wet years and many local residents are reporting that the trees are in poor condition with no viable understory. Just as we have experienced in the recent 2022 floods with prolonged inundation, the soil becomes anaerobic or devoid of oxygen, so nothing grows and weeds eventually take over. While river red gums have the capacity to withstand 7-9 months of inundation and waterlogged soil, they cannot do it year after year. If you have successive years of waterlogged soil, in some older, stressed trees, the root systems use up their carbohydrate reserves. They literally start starving and so start to die back. The longer the period of inundation persists, the poorer the soil conditions and the more rapidly and significantly the health of the tree deteriorates.

“it should not be forgotten that flooding, water-logging and anoxia can also lead to high levels of ethanol, lactic acid, hydrogen sulphide, carbon dioxide, ethylene, methane, nitrogen, sulphur and cyanogenic compounds in soils, some of which are toxic to trees or influence plant growth and function (Martens-Mullaly, 2012; Iles and Gleason, 2008). The longer the period of inundation persists, the poorer the soil conditions and the more rapidly and significantly the health of the tree deteriorates.” Moore G M (2012) Flooding following Drought: A Swift and Silent killer of Trees. Lawry, B. Merrett Editors, Proceedings of the Thirteenth National Street Tree Symposium, 13pp, University of Adelaide/Waite Arboretum, Adelaide, ISBN 978-0-9805572-5-1.

3. The MDB Plan policies have encouraged large, water intensive developments of monoculture plantations such as almonds and olives, which have no underlying ecological benefit, such as those that were found on all irrigation properties with many waterholes, outfalls, channels. These plantations are not growing a life sustaining food source, and are thousands of kilometres distant from the upstream storages, subsequently evaporation and run of the river losses have increased dramatically. It would be much more practical and environmentally sustainable to plant water intensive crops closer to the water source. Instead, large volumes of water are foolishly being pushed at great environmental detriment further down the system past the fertile irrigation districts to semi-arid regions.

This is just one of the many unanticipated consequences of the Basin Plan.

It is purely a result of MDB Plan policies which has seen a dramatic change in ownership of water and trading rules allowing vast volumes of water to be sent thousands of kilometres downstream. Ironically, we were told irrigation modernisation in the Goulburn Murray Irrigation District (GMID) was necessary to save water from leaking old channels and inaccurate meters, but now we are seeing massive water losses incurred due to delivering large volumes thousands of kilometres downstream from storages.

4. The MDBA when questioned at the Senate Environment and Communications Legislation Committee Estimate Fri. 17th Feb. 2023 stated that the Authority undertook NO monitoring of carp, despite their massive proliferation and damage caused by them in the MDB rivers.
5. The MDBA are failing to evaluate and monitor the many, many detrimental environmental impacts caused by the Basin Plan. There has not been one document that we have seen that has comprehensively reported on damaging impacts created by environmental flows. They

appear to be only monitoring the benefits and deliberately turning a blind eye to negative impacts? How then, can the effectiveness of the Basin Plan be evaluated?

6. There must be a review of 'enhanced environmental outcomes' before any more water is acquired.

We were promised an adaptable, flexible Basin Plan, but instead there has been a sole focus on acquiring water volumes at any cost. There must be a multiple complimentary measure approach to improve the ecological health of the Basin.

7. We have seen the selection of specific icon sites to the detriment of all else, e.g. previous on-farm sites, channel outfalls to hundreds of swamps and waterholes. Birdlife Murray Goulburn states Gemmill Swamp near Shepparton used to be a good ibis rookery; however, this is no longer after cessation of channel outfall which has been brought about by irrigation modernisation to gain water savings under the Basin Plan.

Climate change

The Commission is interested in whether the Plan is sufficiently robust and adaptable to deal with climate change challenges.

The MDBA has only ever taken a re-active role rather than pro-active, only changing its stance when public protests and furore have demanded it adapt facets of the plan.

The CSIRO was commissioned by the MDBA to undertake the science review of estimation of ESLT for the MDBA 2011 and found:

“MDBA has determined SDLs using the historical climate and inflow sequences and has not modelled the consequences of future climate on the ability to meet the hydrologic targets under the proposed SDLs.

“It is not clear why an investigation of the risk climate change poses to the environmental objectives of the Basin Plan has not been undertaken.”

MDBA Operating Report 2017-2018 p.4 states: *“The climate is changing and the River Murray system has experienced record-breaking droughts, summer floods, and extreme temperatures in the last decade. The Bureau of Meteorology reports that southeast Australia has experienced a decline in late autumn and early winter rainfall since the mid1990s. The traditional river system planning methods (adopted in this document) use observed historical inflow and demand patterns as a foundation. Such observations may no longer represent the variability of future seasons and the MDBA works closely with the Bureau of Meteorology to ensure the latest information on trends and outlooks are factored into the operation of the River Murray.”*

Well hallelujah, finally the MDBA have acknowledged climate change, albeit a little bit late. The MDBA Basin Plan have only in more recent years begun to model future climate scenarios. Instead of using climate data from the previous 2 centuries (1895-2009) they have been forced to adapt, by recommendations such as that of the Victorian Government, which states when assessing climate change impacts on water availability a 'current climate' baseline period from July 1975 to the current date be used and four plausible future climate scenarios also be considered.

Why has it taken the MDBA so long to identify 'adapting to climate challenges and increasing resilience' as one of the six priority areas for the future and to make recommendations and commitments to enhancing climate resilience and adaptation in the Basin (MDBA 2020b, p. 118)?

Changing climate in the form of decreased rainfall, increased temperatures and more frequent floods and droughts have been known of, since well before the inception of the Basin Plan, by the many communities who live and work in the basin.

Enhanced Environmental Water Delivery (EEWD), Hydro-Cues, Piggy-backing – different names over the course of 11 years of Basin Plan, but all have the same meaning. In effect it means *"flows being proposed will be created by releasing water from storage in response to natural cues to 'top up' unregulated tributary inflows, to increase either the flow peak and/or duration of the event."*

This strategy is fraught with danger for people living in the Upper Goulburn River catchment, particularly with the rainfall events becoming more intense and unpredictable.

In-channel top of bank flows when combined with the proposal to "piggy-back" releases from Eildon Weir on top of high tributary flows is of great concern to floodplain landowners who from experience know the unpredictability of fast flowing floods in the Upper Goulburn Catchment and fear that they will severely impacted.

The steep mountain and hill country in the Upper Goulburn Catchment means we see unpredictable, rapidly rising stream flows occurring which gives landowners a very short period of time to react to move stock to higher ground. Localised run-off from the steep surrounding hills can be very significant with streams rising to overbank flows in just a few hours.

"There certainly are issues in the Goulburn, because it is a system where there are a lot of tributaries flowing into the main river, and not all of those tributaries are monitored for flow. There is a lot of experience in that part of the country that where you get unexpected large rainfall, for example, you get dramatic changes in flow rates. There is a level of anxiety about how the system works in practice. So, there is a legitimate concern amongst those people that we do not exacerbate those sorts of issues, which is why I am particularly conservative in systems like the Goulburn where you have that sort of geographical arrangement." David Papps CEWH Senate Inquiry 5th Feb 2016

How foolish to allow continuing expansion and development of monoculture plantations in our semi-arid regions which then require large volumes of water from storages thousands of kilometres upstream when it is quite clear that stream flows are reducing. A UNIVERSITY OF NSW HYDROLOGY report has found that the amount of rainfall converted into streamflow is falling, evaporation losses are rising and soils are drier. The study found a clear pattern that reduced stream flows despite increased rainfall intensity was due to the soil-drying effect of increased temperatures. Using observed flow and rainfall data from across the world and NOT uncertain model simulations has shown a real-world effect that on average river flows are reducing. (Stock and Land 24th August 2017)

Lack of perfect forecasting of rainfall, real-time run-off figures. *"The availability of, and access to, up to date rainfall and river flow/level data is critical for flood forecasting in rapidly reacting river catchments. Without this data, the BoM is limited in its ability to fit and then utilise a rainfall runoff model for the catchment and limits its ability to provide timely and accurate flood predictions."* (The Comrie Report December 2011 Page 49)

There is a paucity of real-time telemetry streamflow gauges- 45% of the Yea/Murrindindi catchment is not gauged. 57% of the Goulburn catchment from Eildon to Trawool is ungauged. Despite the assurance that more telemetry gauges are being installed the latest hydrological modelling for the Goulburn Measures Constraints Project has been undertaken, in spite of the fact that in 2013 and again in 2016 it was acknowledged there was insufficient data available to make fully informed decisions on the feasibility of constraints.

To my knowledge there has been no increase in the number of gauges in the Upper Goulburn Catchment since well before the Constraints strategy was even first proposed.

Economic

The 450GL cannot be recovered either through buybacks or efficiency measures due to the massive social, economic and environmental impacts that would ensue. This water would come out of the consumptive pool in the southern connected basin, mainly from the Goulburn Murray Irrigation District (GMID) as this is where there is predominantly high security water.

We would see the collapse of the Goulburn Murray Irrigation District, the dairy and fodder industries in the Southern Connected Basin and destruction of multiple towns, communities and collapse of the social fabric that holds country regions together.

The security of the nation's food bowl is at stake.

An investment on the scale of \$13 billion should have required an analysis of the financial investment and actual ability to deliver the water. We have never seen an extensive and detailed cost/benefit analysis which quantifies the environmental, private and public benefits against the environmental, social and economic costs.

Instead, we have seen \$13 billion dropped into a money trough, which has fed a constant supply of consultants, consultants and more consultants, bureaucrats, modellers, scientists who have all soldiered away for 13 years attempting to make the plan fit idealistic and aspirational theories.

We are now at the "pointy end" of the plan where the jigsaw puzzle was all supposed to fit together and be finished "in full and on time."

It seems reality has finally hit.

As Professor Peter Gell, (Water Research Network, Faculty of Science and Technology, Federation University Australian, Mt Helen, Victoria) states, *"There is a clear risk that the ecological response of the system to environmental watering will come up well short of expectations commensurate with the considerable government investment. There is also a clear risk that the ecological benefits will not offset the socioeconomic costs to regional communities who are expected to forego valuable water rights."* (Prospects for Ecological Recovery in Wetlands Limited by Muddy Murray Flows")

There have already been far too many unanticipated outcomes that have resulted from the implementation of the Basin Plan. The loss of thousands of jobs - particularly connected to irrigated agriculture. Communities have been destroyed by loss of water out of their regions creating the domino effect of job and industry losses, school closures, loss of service industries. This has been documented in many socio-economic studies.

A significant quantity of the 450GL upwater would come from the GMID and connected southern basin, as this is where the high security water is. (Frontier and TC & A Report on socio-economic impacts of the Basin Plan in Victoria commissioned by Victorian Water Minister Lisa Neville)

Currently 83% of water recovered under the Basin Plan for environmental flows is actually coming from the Southern Connected System, particularly NSW Murray and northern Victoria (MDBA)

The removal of 450GL from the GMID will cruel irrigators and destroy the viability of the irrigation system, which now has less than half the available water it used to have and is destined to have left only one third of its high security water.

\$2.2 Billion has already been spent on Foodbowl Modernisation with another approximate \$500,000 million on other water savings schemes, for example Central Goulburn Channels 1-4 and Living Murray.

Why would you want to put this expenditure and investment at risk?

The cumulative effects of drought, floods, the buy-back of water, free trade water market, reduced water entitlements have forever and permanently changed our agriculture sector and once a certain level, is reached, industries and communities begin to collapse.

If the Federal Water Minister proceeds to recover through buy-backs the remaining 750GL (approximately) water, that has not yet been recovered via the 450GL and SDL projects, there will be major social and economic upheaval in country regions in the southern connected basin.

GMW submission Senate Inquiry 2nd Feb 2016 stated:

“We consider that further water recovery by purchase of entitlements or proposed EMP measures to recover 100% of water savings are detrimental to the communities and economy of Northern Victoria and should not proceed.”

Recovering further water prior to finalising the feasibility of constraints is like putting the cart before the horse. This means environmental water holders are holding water in storages, that river operators cannot deliver.

This is exactly what is currently happening. In October 2022 we had Eildon Weir full, with one – third of the weir’s capacity being environmental water. We had a significant rain event and consequently a very major flood.

The fact is that Basin Plan policies have completely turned water ownership and usage on its head, exacerbating flooding.

Prior to the Basin Plan, irrigators would on average use 30% annually of the weir’s capacity, starting according to the season, in late Winter, Spring. Now irrigators have far less water and have changed their farm management to start irrigating in early Autumn.

Environmental water holders have not used their entire allocation in any one season, with the CEWH stating they use approximately 70%, hence there is also a large volume of carryover taking up air space.

Conclusion

The Productivity Commission should take on board the many social, economic and environmental impacts that are being felt by those impacted by unrealistic and illogical basin plan strategies and inform the Federal Government that in many cases the purely aspirational water recovery targets CANNOT be met.

We all know that the additional 450GL was used as a political tool to bring South Australia in to the fold. We also know that the man-made, environmental flood flow constraints policies are not required for delivery of 2750GL.

To make recommendations on actions required for full implementation of the Basin Plan in its current format is essentially “just kicking the can further down the road”, ensuring continued pain for basin communities, destroying our nation’s food security and ultimately complete failure of the triple bottom line social, economic and environmental values on which the Basin Plan is based.

As for the Constraints Management Strategy, the MDBA surely, cannot believe they have the ability to manipulate flows from the upstream catchments in at least 3 of the 4 main river systems, coincide releases from major dams, ‘piggy-back” them on top of high tributary flows, deliver these into the major rivers downstream so that they combine to deliver flows over the SA border of specifically 60,000-80,000ML/day for a sustained period of 5-6 weeks and keep the Murray Mouth open 95% of time by coinciding these flows with a strong outgoing tide!

They’re Dreamin’

End of Submission