

WENTWORTH GROUP

OF CONCERNED SCIENTISTS

Mr Peter Cosier, Dr Richard Davis, Prof Tim Flannery, Dr Ronnie Harding, Prof Lesley Hughes,
Prof David Karoly, Prof Hugh Possingham FAA, Mr Robert Purves AM,
Dr Denis Saunders AM, Prof Bruce Thom AM, Dr John Williams FTSE.

DOES A 3,200GI REDUCTION IN EXTRACTIONS COMBINED WITH THE RELAXATION OF EIGHT CONSTRAINTS GIVE A HEALTHY WORKING MURRAY-DARLING BASIN RIVER SYSTEM?

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There has never been any scientific analysis, released by the Murray-Darling basin Authority or any other scientific institution, to suggest that returning 3,200GI of water to the rivers of the Murray-Darling Basin will deliver a healthy working river system.

Having said that, the information presented in the latest modeling suggests that 3,200GI with eight relaxed constraints will deliver significantly more benefits than the 2,750GI currently proposed.

The problem is, the Authority is also proposing to increase groundwater extraction by 1,700GI.

Groundwater is linked to river water.

Even if 25% of the increased groundwater take impacts on the rivers, then in reality there will be less than 2,800GI available and the outcomes claimed in the MDBA 3,200GI scenarios will not be achieved.

A net target of 2,800GI has no chance of restoring the rivers of the Murray-Darling Basin to health.

Whatever reduction target is finally set by the Minister, he should not present a plan to Parliament that allows any increase in groundwater extraction unless he is satisfied that it is either not likely to result in loss of river flows, or if it does and the volume can be quantified a surface water entitlement can be purchased to compensate for the loss.

The recent report by the Murray-Darling Basin Authority on surface water modeling shows a 3,200GI reduction in extractions combined with relaxing eight constraints which prevent the effective use of environmental water will achieve better outcomes for the environment than 2,800GI with the constraints in place. Common sense tells you that would be the case, and the modeling confirms this.

The real question is does 3,200GI (with eight constraints relaxed) result in a healthy working Murray-Darling Basin river system?

To answer this question the Wentworth Group has looked at four areas:

- Outcomes for the whole of the Murray-Darling Basin
- Real world outcomes once groundwater extraction is included
- Modeled maximum dry periods
- Modeled outcomes according to the South Australian river health targets

Modeled outcomes for the whole of the Murray-Darling Basin, not just the Murray River

The Murray-Darling Basin Authority report states that 17 of the 18 “actively managed” river channel and floodplain environmental flow indicators are achieved for the Murray River in the 3,200GI relaxed constraints scenario.

It must be restated that the *Water Act 2007* and its objects, including “*to ensure the return of environmentally sustainable levels of extraction for water resources that are overallocated or overused*” apply to the entire Murray-Darling Basin, not just the Murray River.

3,200GI with eight constraints relaxed achieves 66% of the 112 targets (environmental water requirements¹) set by the Murray-Darling Basin Authority to deliver a healthy working river. While better than the outcomes in the proposed Basin Plan, 3,200GI with eight constraints relaxed is still only 2/3rds of the way to a healthy working river and achieving the objects of the *Water Act 2007*.

Real world outcomes once groundwater extraction is included

The 3,200GI with eight relaxed constraints scenario is a surface water model. It does not take into account the Basin Plan’s proposed increase in groundwater extractions of over 1,700GI.

The Authority has not released any information on what the impact of the 1,700GI increase will be on the surface waters of the Basin. Some of the aquifers from which this increased groundwater extraction comes are closely connected to surface waters. Taking groundwater from these aquifers will mean less flow in the Basin’s rivers.

If, for example, 25% of the increased groundwater take (i.e. 425GI) comes from these aquifers, then a return of 3,200GI of surface water to the river will in reality equal less than 2,800GI and the outcomes claimed in the MDBA 3200 scenarios will not be achieved.

It is impossible to assess whether or not the Basin Plan meets the requirements of the Water Act 2007 until the impacts of increased groundwater extraction on surface water are quantified.

Thankfully there is a precedent on assessing the impacts of increased groundwater extraction on Matters of National Environmental Significance. In 2010, under the authority of the *Environmental Protection and Biodiversity Conservation Act 1999*, Minister Burke approved a coal seam gas development in Queensland which proposed to extract a maximum of 20GI/year².

The Ministers approval requires the proponent to “...*develop a regional scale, multi-layer, transient groundwater flow model of the cumulative effects of multiple CSG developments*”³ in order to avoid or minimise direct or indirect adverse impacts on Matters of National Environmental Significance (i.e. RAMSAR).

Using this approval as a precedent, the Minister should remove from the Basin Plan, any proposed increase in groundwater extraction until such time as he is satisfied that any extraction is not likely to result of loss of river flows, or where it does the volume can be quantified and surface water can be purchased to compensate for the loss.

This will require as a minimum, the development of a regional scale, multi-layer, transient groundwater flow model linked to the existing surface water models to assess the cumulative effects of the proposed increase in groundwater extraction.

Modeled maximum dry periods

The pattern and duration of dry spells are critical factors contributing to the overall health of water dependent ecosystems. The length of a dry period has important implications for ecological outcomes⁴.

Across the four sites looked at in the MDBA modeling of the River Murray system there are 25 flow indicators. Even with the 3,200GI relaxed constraints scenario 16 of the 25 sites have a maximum dry period at least double the period that occurred naturally.

An example of this is the river red gum forests on the Chowilla floodplain, the Gunbower – Koondrook – Perricoota Forest and the Barmah Millewa Forest which once had a maximum period between drinks of 5 years. Under the 3,200GI relaxed constraints scenario these forests will now have to be able to survive a maximum dry period of 13 years between drinks.

The Murray-Darling Basin Authorities 3,200GI relaxed constraints report does not give any indication of the ecological impacts of these extended dry periods other than to say:

“...an inspection of the baseline model output data indicates that the dry periods with the greatest potential for ecological impact generally comprises the longest 25% of dry spells”

In the modeling report for the 3,200GI and relaxed constraints scenario the Murray-Darling Basin Authority state “an inspection of the baseline model output data indicates the dry periods with the greatest potential for ecological impact generally comprise the longest 25% of dry spells”⁵

To reduce the duration of these long dry spells the frequency of flooding events would need to be increased. Importantly increasing the frequency of these events will not need any further constraints to be relaxed as it is simply increasing the frequency of events that can already be delivered under the eight relaxed constraints scenario.

Modeled outcomes according to the South Australian river health targets

The South Australian Government has 20 environmental water requirement floodplain and channel targets. These are “the water regimes needed to sustain the ecological values of aquatic ecosystems including their processes and biological diversity at a low level of risk”⁶.

The South Australian Government has asserted the Basin Plan “must adopt an environmentally sustainable level of take that will not compromise key environmental outcomes for environmental assets, ecosystem functions, water quality and biodiversity”⁷.

A 3,200GI reduction in extractions with a relaxing of eight constraints only achieves three of the of the 20 (15%) South Australian environmental water requirement targets.

An analysis of the benefits of the 3,200GI with relaxed constraints scenario undertaken by the South Australian Department of Environment, Water and Natural Resources⁸.

The Goyder Institute peer review of the Departments analysis concluded: “*While there are marked ecological improvements evident with 3,200GI compared to the 2,800GI scenario, many of the South Australian Government defined metrics are still not fully met. This suggests a further increase in flow might achieve even greater environmental benefits.*”⁹

The buildup of salt is a problem for South Australia. The South Australian Government stated in a recent submission to the Federal Water Minister that there were key environmental outcomes “located in South Australia which must be met by any proposed environmental water recovery volume.”¹⁰ One of these was the exporting of salt loads of 2 million tonnes per year over a three year rolling average.

The analysis undertaken by the South Australian Department of Environment Water and Natural Resources finds that for the period 1976 to 2007 the salt export volume on a three year rolling average is below the target of 2 million tonnes 65% of the time¹¹. Flows would need to be increased beyond the 3,200GI scenario if the salt export target set by the South Australian Government is to be met.

Conclusion

From the analysis of the four areas it appears that the 3,200GI with eight constraints relaxed scenario, although delivering improved outcomes on 2,800GI in the Proposed Basin Plan, still falls well short of satisfying the requirements of the Commonwealth *Water Act 2007* to deliver a healthy working Murray-Darling Basin.

References

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- ⁶ Gibbs MS, Higham JS, Bloss C, Bald M, Maxwell S, Steggles T, Montazeri M, Quin R and Souter N, 2012, *Science Review of MDBA Modelling of Relaxing Constraints for Basin Plan Scenarios*, DEWNR Technical Note 2012/01, Department of Environment, Water and Natural Resources, Adelaide pp142
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