Northern NSW Irrigator Groups
C/-Zara Lowien
Executive Officer
Gwydir Valley Irrigators Association

Ph 02 67521399
Mob 0427 521399
Fax 02 67521499
zara.lowien@gvia.org.au
100 Balo Street
(PO Box 1451)
Moree, NSW, 2400

Preliminary review of the "Draft Water Sharing Plan Review of the Barwon-Darling Unregulated and Alluvial Water Sources 2012" report prepared by the Natural Resources Commission.

Daren Barma of Barma Water Resources was asked to undertake a review of the "Draft Water Sharing Plan Review of the Barwon-Darling Unregulated and Alluvial Water Sources 2012" report prepared by the Natural Resources Commission.

Daren Barma is a hydrologist with thirty years experience with policy and river system model development and analysis in the Murray Darling Basin. This has included numerous investigations into the hydrology and policy settings of the NSW MDB Northern Valleys. He was involved in development of the original Interim North West Flows Unregulated Management Plan, the Cap on the Barwon Darling and has advised the Murray Darling Basin on river system modelling aspects relating to the Basin Plan. Daren most recently completed work as part of the Panel for Independent Assessment of Fish Deaths in the Lower Darling.

Owing to the short timeframe this review is preliminary in nature. Consequently, the following high-level observations are made:

i) The report is unnecessarily lengthy and repetitive. Clarity would be improved by restructuring the document to minimise repetition.

ii) The report largely ignores the contribution of water recovery under the Bain Plan in meeting many of the objectives that have been identified as not being achieved by the current plan. The report calls for:

- implementation of provisions enabling an updated Interim Unregulated Flow Management Plan for the North-West without requiring a section 324 order.
- alteration of existing commence and cease to pump (called thresholds – they are the same).
- alteration of existing carry over arrangements.
- implementation of IDELs and TDELS.

Before any review or revision of the Barwon Darling plan rules occurs, an assessment of how water recovery under than Basin Plan together with initiatives to improve connectivity currently being undertaken by DPIE Water meet plan objectives and flow targets (ether current or proposed) should occur. If these targets are found to still not be met, only then should alterations to existing plan rules be considered. As an example, there is a high likelihood the Interim Unregulated Flow Management Plan for the North-West is no longer

required due to Basin Plan water recovery. In fact, water recovery was effectively assessed on the basis that this had not been implemented, as the river system models that underpin Basin Plan development did not include it when water recovery amounts were assessed.

.

iii) The report would benefit from a tabular summary identifying for each recommendation:

- any activities currently underway in DPIE Water to address the recommendation.
- whether the recommendation is likely to be influenced/affected bywater recovery under the Basin Plan.
- whether the recommendation is likely to result in diversions being below the Long-term Average Annual Extraction Limit (LTAAEL).

iv) There is a consistent failure throughout the report to adequately quantify/separate impacts in the Barwon Darling between those which are:

1. a result of climate and runoff response,(the Vertessy report demonstrated that for many upstream tributaries, inflows into their headwater dams and into the Barwon Darling are the worst on record over the past 24 months)
2. those that are a result of upstream tributary extractions,
3. those that are result of extractions within the Barwon Darling.

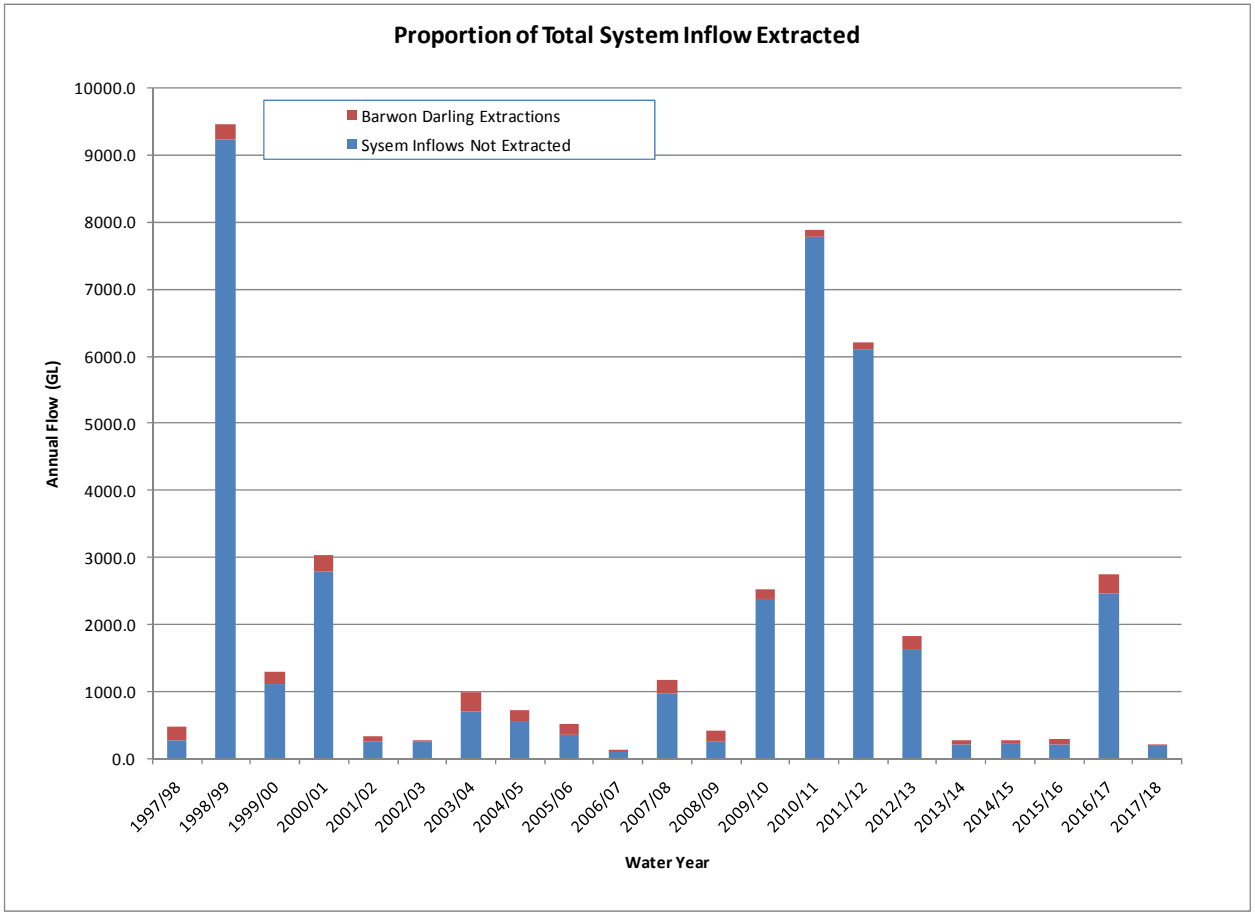
The report acknowledges that development of a contemporary predevelopment model is required. Development of this model would go a long way to addressing this issue. In its absence, it is recommended that extreme caution should be used presenting conclusions based on expert opinion in relation to the impact of extractions within the Barwon Darling on the recent flow regime. The drivers of flow regime change in the Barwon Darling are extremely complex, and conclusions that are not supported by appropriate hydrologic river system modelling have a high risk of being unfounded.

Any conclusions based on expert opinion should clearly identify areas of uncertainty. If information has been referenced from other literature, then any areas of uncertainty identified in the original literature should also be presented in the NRC report to maintain context and not expose the original authors to unjust criticism. One example that is repeated numerous times throughout the report is that "expert opinion suggests extractions pushed the river below Bourke into hydrologic drought three years earlier than upstream sections of the river" Ref Page 5 Executive Summary. The term hydrologic drought is not defined, the technical analysis behind the three-year time frame is not presented, and the locations of the extractions that allegedly led to this are not specified. Care should be taken when making such emotive statements, as whilst upstream extractions may have led to the onset of very low flows earlier than would have occurred if extractions had not been allowed, the time frame associated with this may been considerably smaller than three years due to the high losses associated with flows downstream of Bourke.

v) The review confuses climate change and climatic variability. BWR agrees that future planning should consider both, and the review should acknowledge that DPIWater are making headway in addressing this issue through collaborative initiatives with the University of Newcastle.

vi) The report compares total system extractions to flows at Bourke. This is hydrologically flawed, extractions should be compared to total system inflows, so as not to have proportions skewed by transmission losses along the Barwon Darling. A figure like the one below would be better.

Figure 1: Proportion of all extractions in Barwon Darling compared to inflows (Data Sourced from NSW DPIE, NSW Water Register, and WaterNSW Real Time Data))



vii) There continues to be debate in relation to the impact of A class extractions of low flows. Unfortunately, this will only go away when A class extractions and their impact are modelled more robustly.

Concessional Conversions

The plan allows for users to adjust their C, B and A Class license through concessional conversions so that active users can re-instate their history of use to that which existed prior to the issuing of Cap license shares to all users. Each licence eligible for a concessional conversion is subject to a concessional conversion limit, which is equal to the benchmarked history of extraction in a particular licence class (1995 – 2005). Conversions occur within the existing pool of Cap shares available and do not result in new shares being created. This was done to ensure that growth in usage above Cap levels cannot occur.

Changes to A Class Extraction Rates

A previous restriction on A class licences to use a maximum pump size of 150 mm was also removed. Importantly this was not a plan provision but an administrative arrangement. Concessional conversions and the removal of the A class pump size restriction have been controversial because the net effect is to potentially allow A class extraction of water to occur in a more boom and bust pattern. The long-term extractions volumes associated with A class remain largely unchanged. Modelling by DOI Water as presented in the *"November 2017 Water Resource Planning Model Scenario Report- Barwon - Darling A class increased pumping capacity"*found that increasing the rate of pumping for A class users did not alter

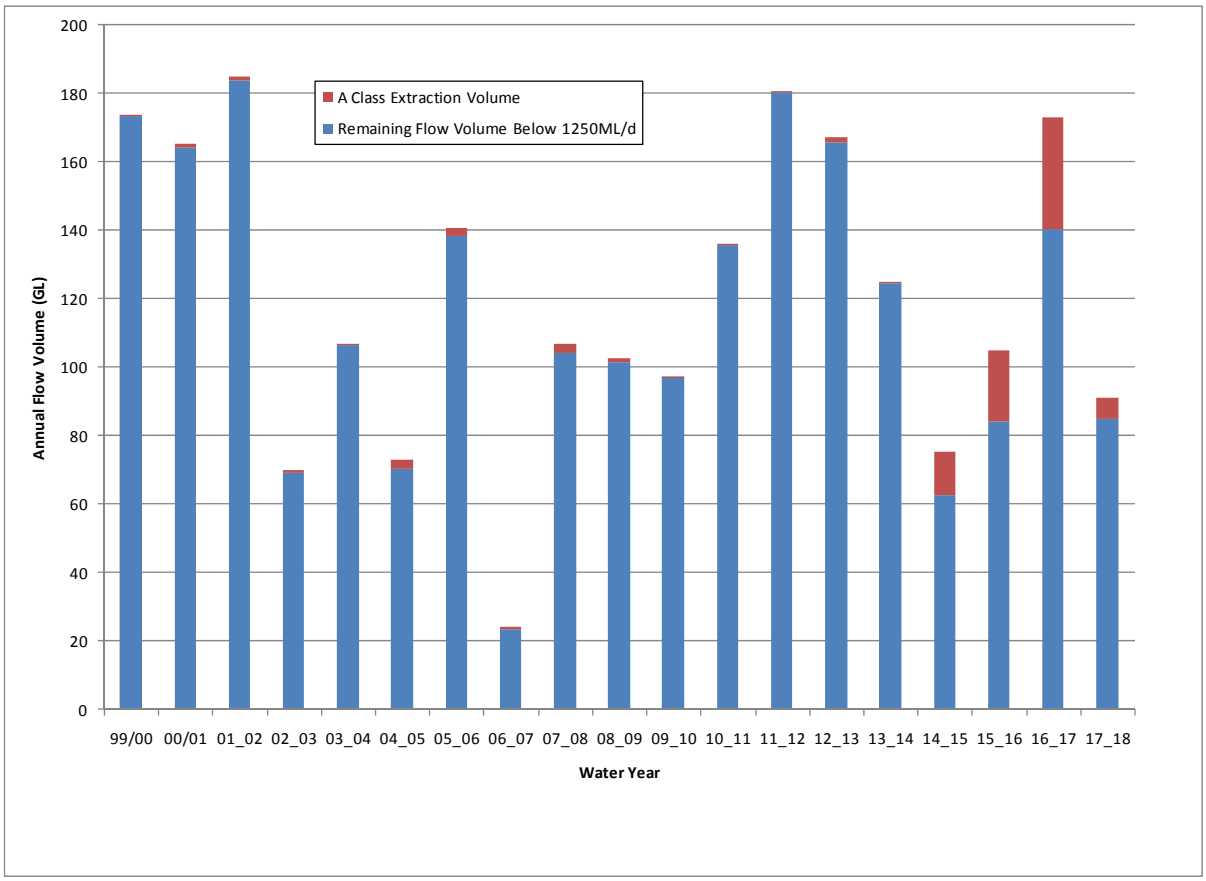
diversions by any material amount for small-scale water users, and increased diversions by 66ML/Yr for all A class users. There were no changes to B and C class take.The analysis also concluded that the increased rate of A class take allows extraction earlier in the year, and in the right circumstances, can cause the tops and early parts of small flow events to be chopped off in the baseflow and small fresh flow classes. In summary, the analysis indicated that the small volume of A Class Shares limits the scale of changes to events and thus flow volumes that can occur. In addition, event reductions early in the season were often offset by gains in later flow events.

Whilst the model analysis is likely to correctly predict the long-term impacts, it does not reflect the recent behavioural changes associated with users having earlieraccess to A Class. Recorded usage data prior and after 2012 suggests an increase extraction after 2012, and that under the right climatic circumstances, large amounts of accrued carry over opportunity will result in runs of years where flow conditions mean that extractions are large followed by longer periods where no A Class extraction occurs. A true indication of the impact of A class extractions on the low flow regime of the Barwon - Darling can only occur once the river system model has been updated to reflect contemporary wateruser behaviour.

Historic A Class Behaviour

The volume of A class extraction relative to the flow volume below 1250ML/d at the Warraweena Gauge.() is shown below. Warraweena is upstream of most A Class extraction and 1250ML/D is the upper bound for A Class extraction at the Bourke Town Gauge. Whilst A class extraction has increased from 2014/15 onwards it is still a small proportion of the annual volume.

Figure 2: Porportion of A Class extraction compared to 1250ML/d at Warraweena (Data Sourced from NSW DPIE, NSW Water Register, and WaterNSW Real Time Data))



viii) The report recommends that the Barwon Darling be subject to more regular independent review and amendment than other plans due to its uniqueness. The unique aspects should be identified here in order to justify this statement.

ix) Expediting the transition from IQQM to Source **WILL NOT** address issues with respect to modelling low flows and cease to flows. Rather, inclusion of the weirs in the model and updating the model to more accurately represent contemporary user behaviour and system transmission losses will allow for more informed analysis in relation to the impact of extractions and plan rules on low flows.

Yours Sincerely

Daren Barma

Director
BWR Consulting Pty Ltd
22/08/2019