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Issues Paper

on the

Mungindi End of System Flow Figure

Prepared by

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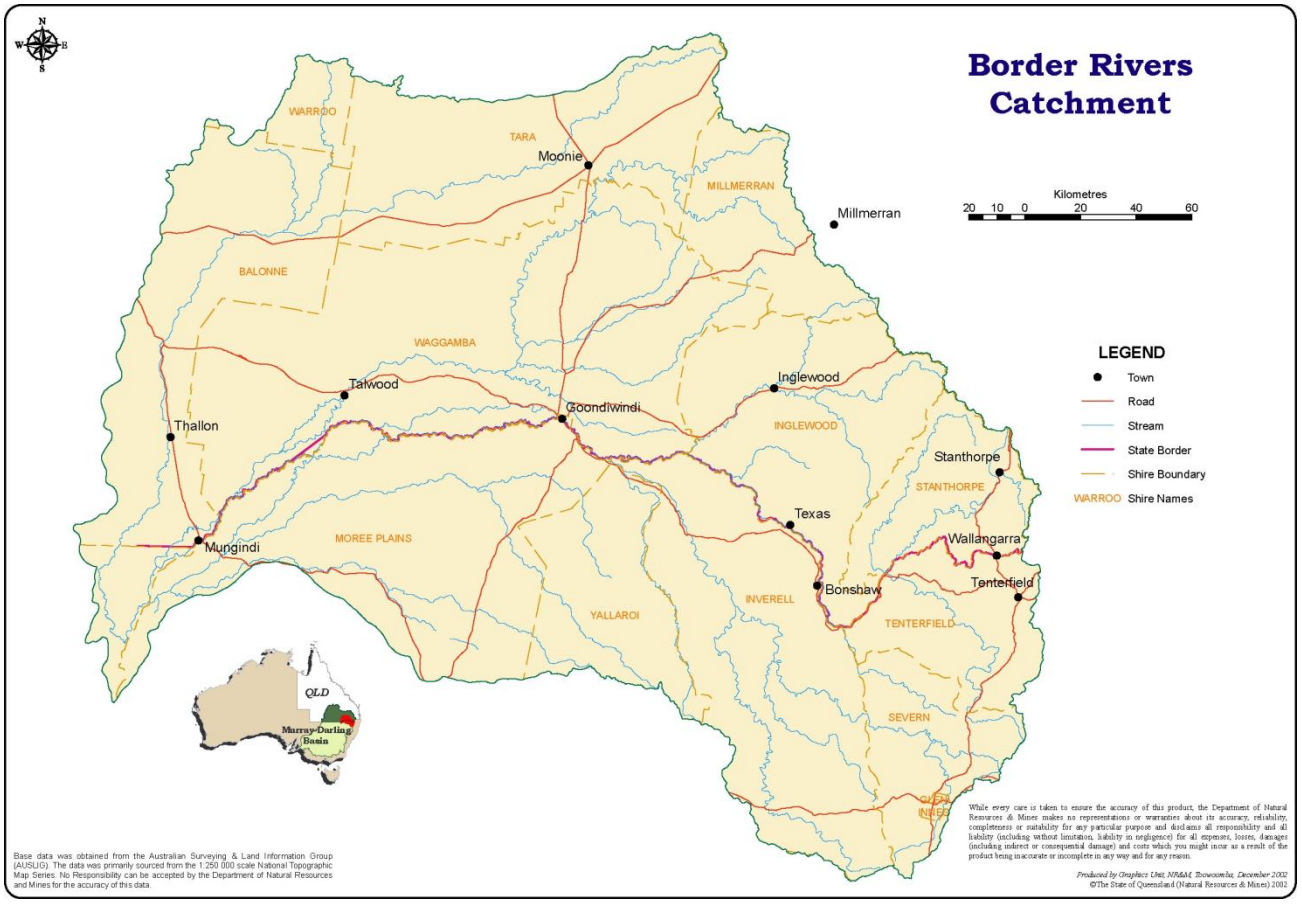
Executive Officer

INTRODUCTION

Border Rivers Food and Fibre (BRFF) represents the water users and entitlement-holders of the Border Rivers region of southern Queensland and northern New South Wales. These water-users responsibly utilise the water resources of the Macintyre Brook, the Dumaresq, Macintyre, Severn, Weir and Barwon River systems and the Eastern Recharge Zone of the Great Artesian Basin. Production from irrigated agriculture includes vegetables, herbs, stone-fruit, hay, cereals, coarse grains and cotton. Its contribution to the local economy exceeds $500 million (farm gate) in average years.



This document represents the views of the members of BRFF, though individuals are entitled to their own views relating to their own circumstances.

BRFF is also a member of the NSW Irrigators Council and National Irrigators Council. Whilst generally endorsing their views, we maintain the right to hold independent positions.

Background

It has long been acknowledged that the MUNGINDI gauge only gave a rough indication of the true flows that flow down the Barwon River from the Macintyre and its connected streams during higher flows. The acknowledged shortcomings with the gauge figures are to do with the gauge only being capable of measuring flows within the banks of the river at the gauging point, at Mungindi Weir (Refer to Fig 1). During periods of high flows (> 4.8m @ Mungindi), significant quantities of water leave the main channel of the river upstream of Mungindi. The main 'flood-runners' or effluent streams are the Boomi and Little Boomi Rivers, Whalan Creek, Gravelly Creek and Little Weir River.

A couple of streams enter the main river from the Queensland side as well, namely the Weir River upstream of Mungindi and the Moonie River downstream of Mungindi, but upstream of Mogil Mogil gauge. Most of the effluent streams are on the NSW side.

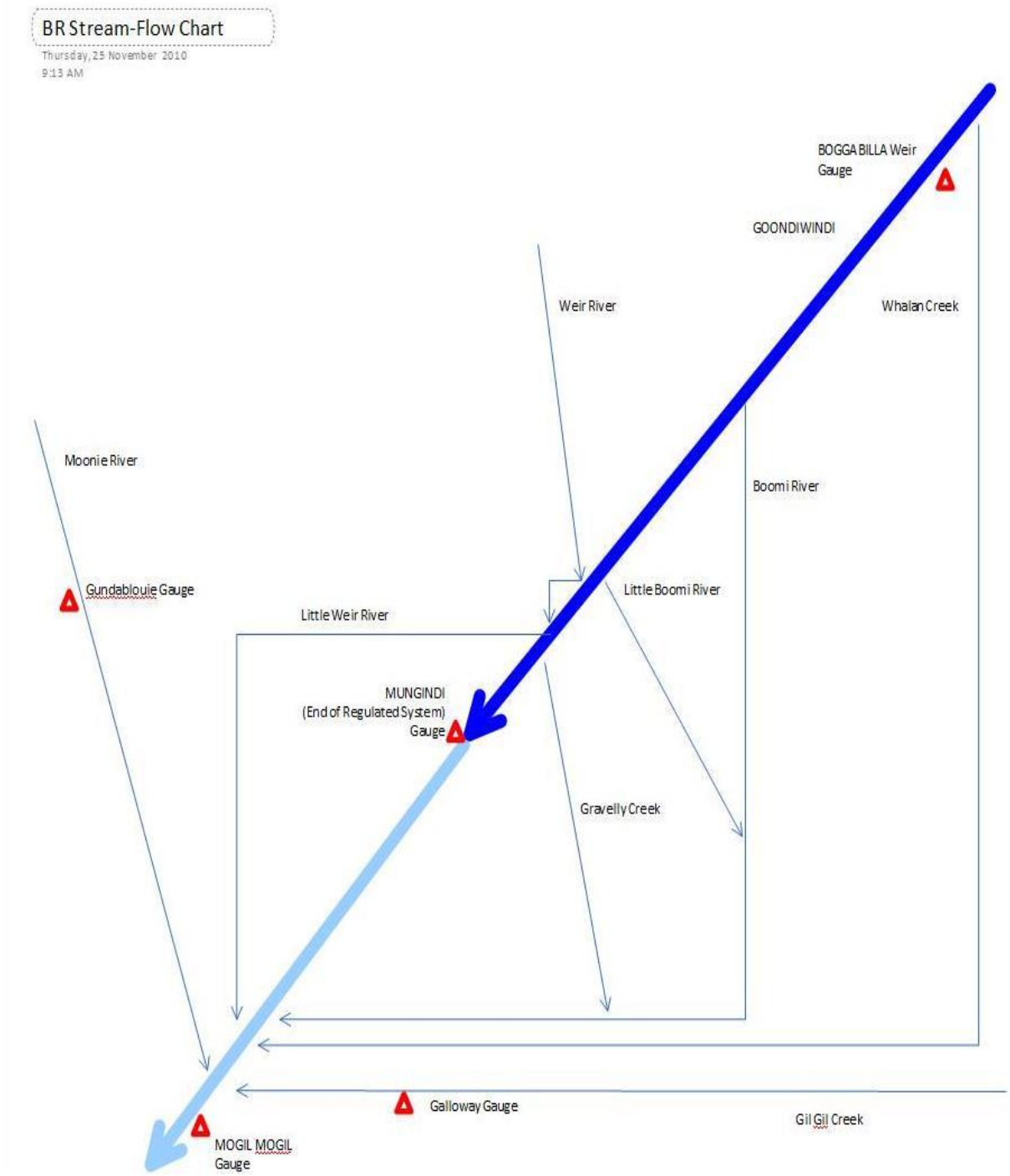
At full flood levels there are also large quantities that flow over land in the general inundation of what is a very flat floodplain landscape. While all these flows are occurring, only the flows at the gauging point within the banks of the main stream are being gauged accurately. There have been undertakings made by QLD Department of Water that the hydrology figures would be updated and End of System Flow (EOSF) figures corrected for future planning purposes, but this has never been done. While some manual gauges are in place on the effluent streams, when the flows are occurring it is not possible to access those sites to read them. Common sense would suggest that automatic gauging stations be installed, but the frequency of these flood events apparently makes it unviable for that investment to be made.

The Border Rivers IQQM model, as used by both NSW and QLD departments in the course of the State planning process for the Border Rivers, acknowledged that the flow figures for the MUNGINDI gauge were not completely accurate and provided only a 'point of initialisation' for the Plans. The figure agreed on by both states for the End of System Flow (EOSF) figure in the IQQM was **60.8%** of pre-development flows and both plans were developed using that figure as a starting point.

The point is that, while that 60.8% EOSF figure may have been appropriate as an initialisation point for state plans, it is not an accurate measurement of that figure and as such cannot be used as a legitimate performance indicator in the assessment of the performance of the Basin Plan, or anywhere else where EOSF figures are used as an important indicator of hydrological condition of a stream.

The flows that have occurred in the valley between August and December 2010 provided an excellent opportunity to get a more accurate picture of what the actual flows are in total. This series of events had large flows coming down the main river and breaking out into its effluent streams and overland flow channels, but little in the way of inflows locally, which can introduce misleading figures at the downstream gauging point of MOGIL MOGIL.

Fig. 1 Border Rivers Stream Schematic



As shown in Fig 1, the effluent streams Whalan Creek, Boomi River, Little Boomi River and Gravelly Creek all re-join the main river (Barwon River) above the Mogil Mogil gauge, as does the Gil Gil Creek. The Moonie River also joins above Mogil Mogil, but the gauge at Gundablouie can be used to subtract that figure from this example

END OF STREAM FLOW CALCULATIONS

Data sourced from NSW Office of Water Real-time Data website

Flow event: 1st August to 14th December 2010		
Gauges	ML	
416002 Boggabilla Weir	1551601	
416001 Mungindi Weir	767716	
416052 Galloway	12048	Gil Gil Creek flows in the Barwon just below this gauge
417001 Gundablouie	82171	Moonie River flows into the Barwon just below this gauge
422004 Mogil Mogil	1360212	
Mogil Mogil less Galloway and Gundablouie		1265993
Mungindi flow as % of net Mogil Mogil flow		60.4

This simple example shows that the Mungindi gauge only accounted for **60.4%** of the net flow measured at Mogil Mogil and that, in this series of flows, **nearly 40% of the flow is not being measured at Mungindi**. Obviously, further hydrological modelling needs to be undertaken on this issue before any EOSF numbers can be confidently put forward as a realistic number, as Mungindi is a Hydrological Indicator Site for the Border Rivers in the Basin Plan.

While this series of flows was a 'medium sized flood', in larger events the proportion of actual flows measured by the Mungindi gauge would obviously be far smaller given the extra amounts bypassing the Mungindi gauge via overland flow channels and general inundation.

This paper is not intended to be a detailed analysis of the Mungindi EOSF problem, but is intended to be an indicator that the accepted figure of 60.8% is not accurate for the purposes that the MDBA seems to be intending to use it, namely as an indicator of stream condition. We submit that the figure should not be used for any other purpose than that for which it was intended, as the initialisation figure for the Border Rivers State Plans. This demonstration should bring to the attention of the MDBA that the true figure for the Border Rivers End of System Flow is not known accurately, but is in fact higher than the 60.8% figure commonly used throughout the Basin Plan Guide.

Local knowledge and a common sense view suggests that it is **greater than 70%** of pre-development flows, making it far more sustainable than the figures used in the Guide would indicate.

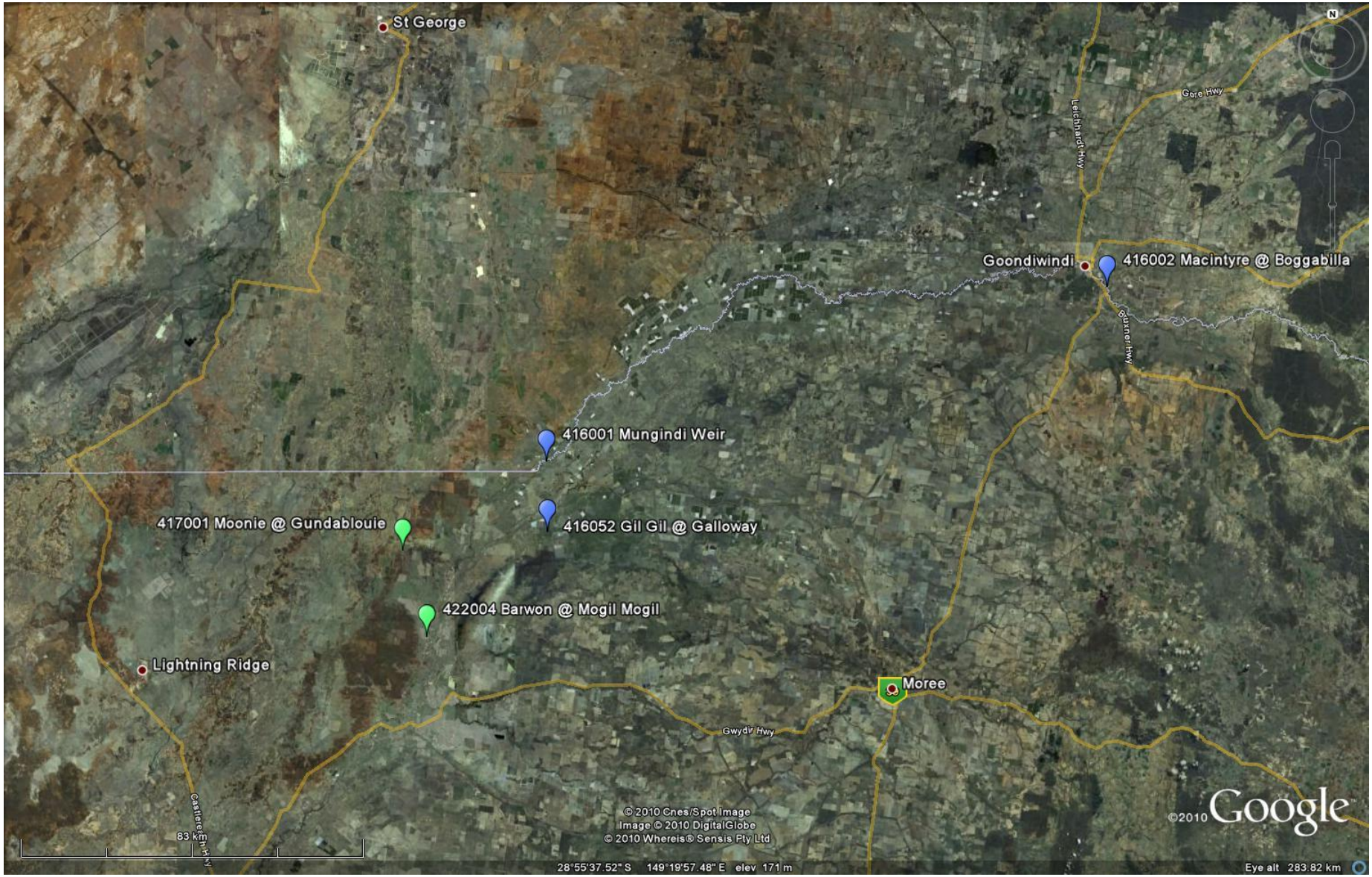

St George
Goondiwindi
416002 Macintyre @ Boggabilla
416001 Mungindi Weir
416052 Gil Gil @ Galloway
417001 Moonie @ Gundablouie
422004 Barwon @ Mogil Mogil
Lightning Ridge
Moree
Gwydir Hwy
Leichhardt Hwy
Gore Hwy
Carnarvon Hwy
Castlereagh Hwy
83 km
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Image © 2010 DigitalGlobe
© 2010 Whereis® Sensis Pty Ltd
©2010 Google
28°55'37.52" S 149°19'57.48" E elev 171 m
Eye alt 283.82 km