MACQUARIE RIVER FOOD & FIBRE

[redacted]

9th August 2020

First Flush and Announcement of Supplementary Access in the Macquarie River.

Background

An Assessment of take and protection during first flush flows in the Northern Basin conducted by NSW Department of Primary Industry and Environment (DPIE) in July 2020 provides a background to the outcomes from flows in the Northern Basin during that period. A key finding of this report was that only 16 gigalitres (GL) or 3.3% of the flows into the Barwon-Darling River came from the Macquarie River over the period assessed (DPIE, July 2020).

A Fact Sheet relating to the Macquarie Marshes Drought Recovery (DPIE, May 2020) indicated that flows in the Macquarie River from rains in the catchment and tributaries downstream of Burrendong Dam had made their way into the Macquarie Marshes in March 2020. A total flow around 18 GL was measured past the Pillicawarrina gauge (located between the Southern and Northern Marsh Reserves, Map 1) and into the northern marshes by the end of March. Over 2,600 ha (75%) of the northern reedbed had been inundated by 12th April. Further flows were expected to increase the inundated area of the marshes and reedbeds (DPIE, May 2020).

An area of approximately 3,000 ha of the northern reedbed was damaged by wildfire in October 2019. This area was determined by DPIE as having a critical environmental need. A target flow volume of 30 GL past Pillicawarrina over 3 to 5 months was determined as required to inundate this area. Modelling at that time indicated that an extra 32 GL of water currently transitioning through the system would arrive at Pillicawarrina by 23 April and allowing supplementary access would reduce the total arriving by only 0.4 GL (DPIE, May 2020). This would bring the total flow into the northern marshes of 50 GL over 4 months, well exceeding the target volume, and provide an opportunity to allow supplementary access which would have no impact on meeting the target.

Announcement of Supplementary Access for license holders in the regulated section of the Macquarie River occurred for 2 ½ days in February and again for 6 days in April. However, the April event was delayed and a preliminary decision regarding access was undertaken outside the usual and agreed processes. The volume of water that had reached the Northern Macquarie Marshes and water in transition, flow volume was expected to exceed target volumes and timing. Despite this, access was originally denied by the DPIE. This decision was then revised, and access was subsequently granted.

Introduction

The recent drought has been unprecedented and available water in the river system has been minimal. Flows in the Macquarie River have been so low that releases of regulated water below Warren had ceased. As a result, parts of the regulated Macquarie Cudgegong Water Sharing Plan (WSP) had been suspended by the Minister, however parts of the WSP including the rules regarding **Supplementary Access were still active**.

Rules and procedures relating the to the WSP and Supplementary Access were developed and agreed during the Stakeholder Advisory Panel (SAP) planning process. These rules are then further refined and legislated by the NSW Government. This process has been used for decades to develop guidelines for administration and sharing of water. WaterNSW operates the river under these rules and has an acute knowledge of the WSP rules and the behavior of the river system.

Significantly to the WSP, one of the rules relating to granting Supplementary Access is that there must be a surplus flow in the river of more than 5 gigalitres (GL) per day at Warren. This threshold provides a flush to the river and environment every time there is a significant flow in the river system, and limits the amount of water that can be available for Supplementary Access.

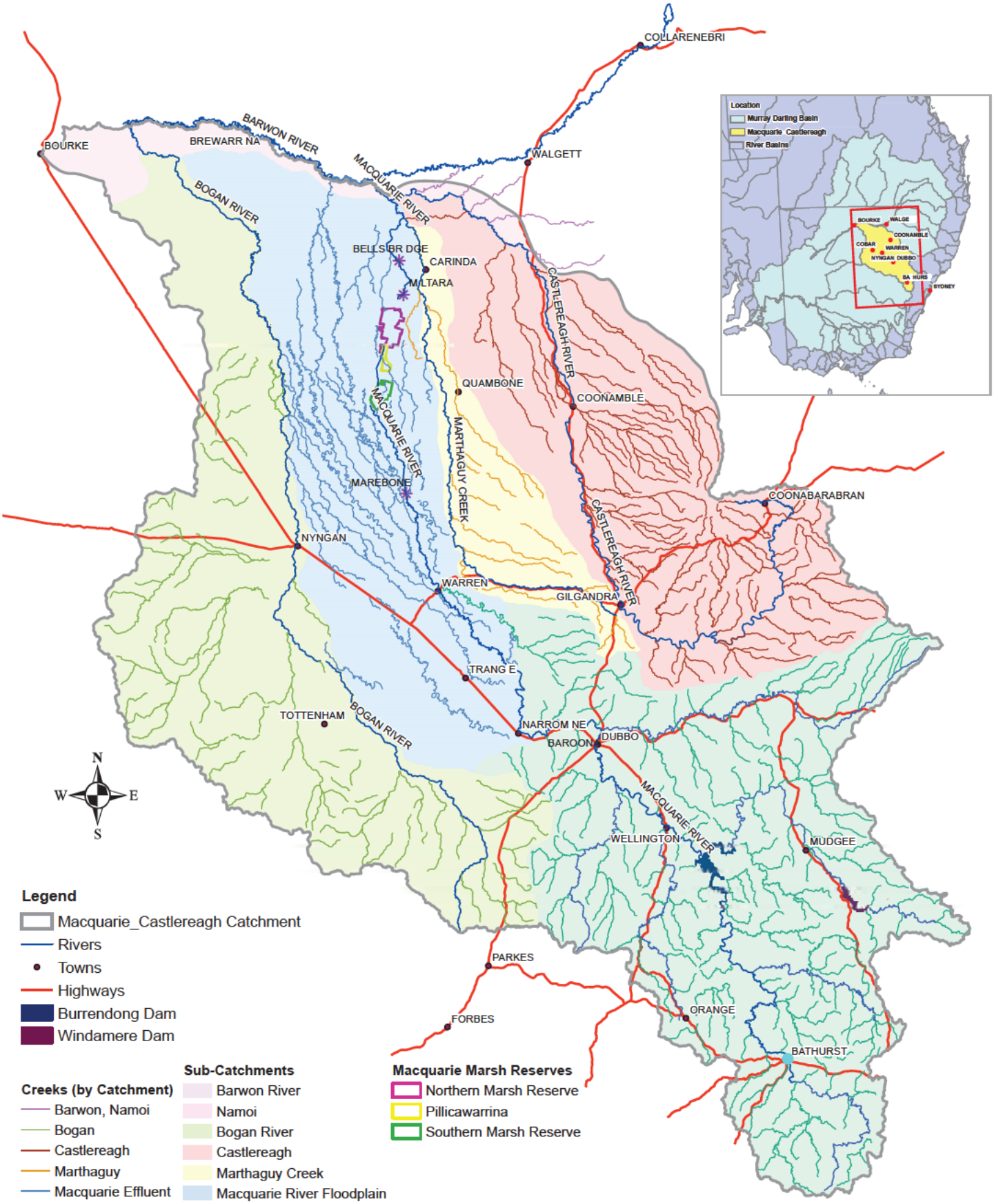
A unique feature of the Macquarie River is that it gains water from tributaries upstream of approximately Narromine, and below Narromine it loses water (Map 1). The diminishing channel capacity beyond this point and along the river, spreads water via effluent creeks draining away from the main river channel. This feature provides a relief valve to the system and allows water to spread across the floodplain where it is used by creeks, swamps and to wet up the floodplain environment. The Macquarie Marshes is at the lower end of this system and as a result of water spreading and draining away from the main river upstream, only part of the upstream flow reaches the marshes.

Interim Targets and restrictions were developed to meet critical human needs and critical environmental needs. These targets included both flow volume and duration at key locations along the Macquarie River and the Macquarie Marshes wetland system (DPIE, undated).

River Flows and Supplementary Access

Rain in the catchment from January to March 2020 had provided over 110 GL of flows into the river system at Baroona (near Narromine, Map 1), the last river gauging station in the 'gaining' section of the Macquarie River system. These flows were then distributed along the river, into effluent creeks, broke out across the floodplain and part flowed into the Macquarie Marshes. Approximately half of this water flowed beyond the regulated section of the river system at Marebone (gauging station for measurement of flows into the Macquarie Marshes) and into the Macquarie Marshes (Map 1), with 18 GL reaching the northern marsh. Only 0.6 GL (0.5%) of the flow reached the Barwon River illustrating the poor connection between the Macquarie River and the Barwon. The balance of the flows upstream of Marebone were used to support the effluent creeks broke out and inundated the floodplain. A short period of Supplementary Access was granted during the peak of the flow in February (Appendix 1) when water was breaking out of the river system, allowing approximately 12 GL of water to be extracted.

Macquarie Castlereagh and Bogan Rivers Catchment and Sub-Catchments



Legend

- Macquarie_Castlereagh Catchment
- Rivers
- Towns
- Highways
- Burrendong Dam
- Windamere Dam

Creeks (by Catchment)

- Barwon, Namoi
- Bogan
- Castlereagh
- Marthaguy
- Macquarie Effluent
- Macquarie Tr butory

Sub-Catchments

- Barwon River
- Namoi
- Bogan River
- Castlereagh
- Marthaguy Creek
- Macquarie River Floodplain
- Macquarie River Tributory

Macquarie Marsh Reserves

- Northern Marsh Reserve
- Pillicawarrina
- Southern Marsh Reserve

0 25 50 100
Kilometres

Maps produced by Sustainable Soils Management, Warren.
Base Data
Towns, roads and rivers: NSW Geology
Catchment Boundary: MDBA

SSM Sustainable Soil Management

Map 1

The lower Macquarie district received over 400 mm of rain during late summer and early autumn. This large amount of rainfall wet the landscape and localized areas were flooded. As a result of this flooding, flooding from river flows was able to spread further and inundate a larger area of land than would have been possible under a drier scenario.

During April, a significant rainfall event generated a further 134 GL of flows at Baroona, specifically with 110 GL over 10 days and a peak flow of 18 GL per day (Figure 1, Appendix 1). This event was predicted to cause minor flooding below Warren for several days. In this case, part of the river flow downstream of Warren would be spread across the floodplain because the capacity of the river channel had diminished to a size that is could not carry it. Such flooding and break outs provide support to the effluent creek system and floodplain. Water remaining in the river would continue to provide support further along the river and into the Macquarie Marshes.

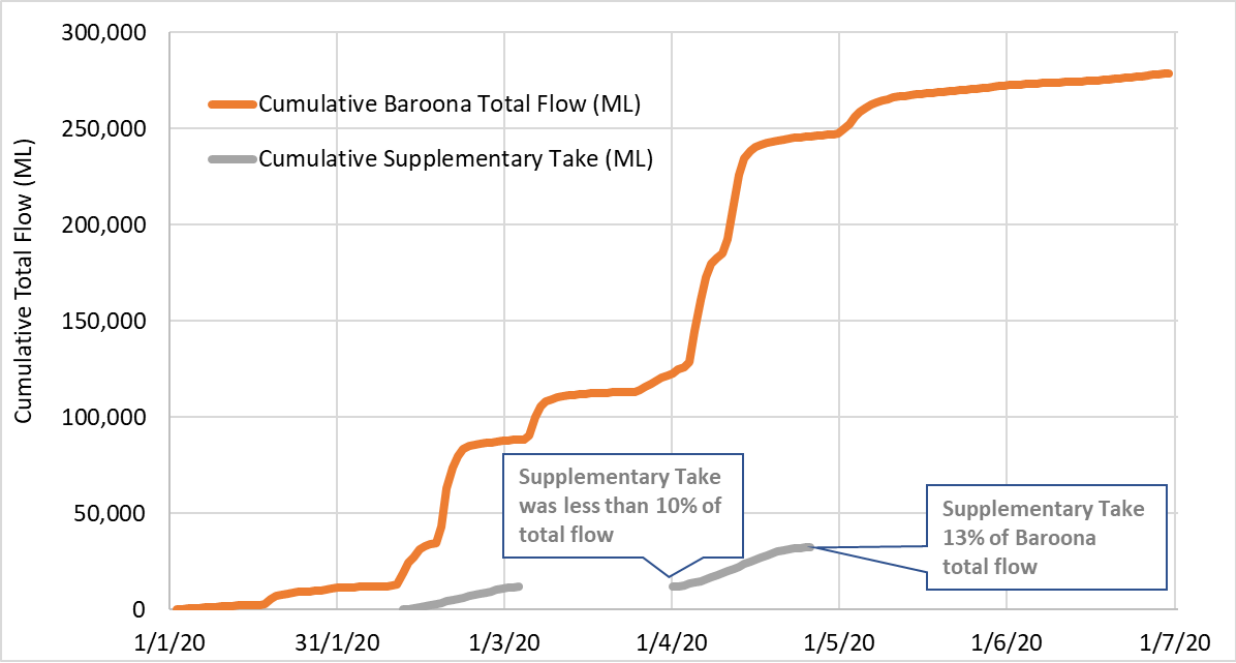


Figure 1. Cumulative flow at Baroona and volume of Supplementary water extracted from 1/1/2020 to 1/6/2020. From data supplied by WaterNSW and accessed on 7/8/2020 from https://realtimedata.waternsw.com.au/?ppbm=421_MACQUARIE&rs&2&rsvm_org

In early April, triggers for the announcement of Supplementary Access under the rules of the WSP had been met or water was in transition that would meet them. Due to the predicted flow rate below Warren, a significant portion of the April river flow would break out and subsequently not enter the Macquarie Marshes. Belatedly and with short notice, access was granted on the 5th April for 3 days.

Further, a week later a decision by DPIE was made before a predicted rainfall event over the Easter break, which denied Supplementary Access. Following correspondence with DPIE, assess was later granted for 3 ¼ days.

From late January to the end of April, 235 GL of water had flowed past Baroona to the top of the floodplain (Figure 1, DPIE, July 2020), 115 GL passed Marebone and 50 GL of water passed the Pillicawarrina gauge, and the resulting outfall into the Barwon Darling River was only 16.5 GL or 7% of the Macquarie flow (DPIE, July 2020). The total outfall into the Barwon by then end of April represented only 3.3% of the Barwon flow

The combination of local rainfall and river flows contributed to approximately 34,500 ha of the Macquarie Marshes (including the critical northern reedbed and Ramsar listed areas) to be inundated, plus large tracts of riparian areas and floodplains downstream of Warren.

Issues and Concerns

We are concerned that the decision of DPIE in April regarding Supplementary Access for the Macquarie license holders was influenced by factors outside the agreed process of the WSP. One of the decisions was also initially made prematurely and prior to forecast rainfall. Factors outside the WSP and targeted outcomes appear to have influenced DPIE decision making because:

- broader targets of the Northern Basin were exceeded;
- flow and duration targets in the Macquarie had been exceeded;
- only a very minor part of the Macquarie River flow entered the Barwon;
- critical environmental needs including those created for the northern reedbed outside of normal environmental targets were met;
- critical human needs, basic landholder rights, stock and domestic flows and replenishment flows in the creek had been met;
- despite the drought and no flows, the antecedent conditions in the lower Macquarie were favorable because of large rainfall events across the district;
- the rules regarding Supplementary Access in the WSP were still Active;

Yet, despite exceeding these targets DPIE failed to adopt the rules of the WSP.

We believe that the knowledge and experience of WaterNSW and advice and recommendations from them appears to have been ignored given there was a clear case to allow access.

During the SAP planning process, it was decided by ALL stakeholders to NOT change the rules regarding Supplementary Access as they had been well tested in the previous 17 years and because stakeholders did not trust DPIE. The decision by DPIE discussed above has verified the reasoning of the Stakeholder Advisory Panel.

We believe that WaterNSW should be the agency responsible for the determination and announcement of Supplementary Access because they hold the knowledge and understanding of the behavior of the river and flood flows. This role should remain with WaterNSW during extreme events and operations.

Michael Drum
Executive Officer

References

NSW Department of Primary Industry and Environment, May 2020. Macquarie Marshes Drought Recovery Fact sheet. PUB20/231

NSW Department of Primary Industry and Environment, July 2020(a). Assessment of take and protection during first flush flows in the Northern Basin. PUB20/730.

NSW Department of Primary Industry and Environment, undated. PUB20/292 accessed at https://www.industry.nsw.gov.au/__data/assets/pdf_file/0015/301416/northern-basin-restriction-triggers-and-principles-fact-sheet.pdf

https://www.industry.nsw.gov.au/__data/assets/pdf_file/0020/314543/draft-report-iap.pdf

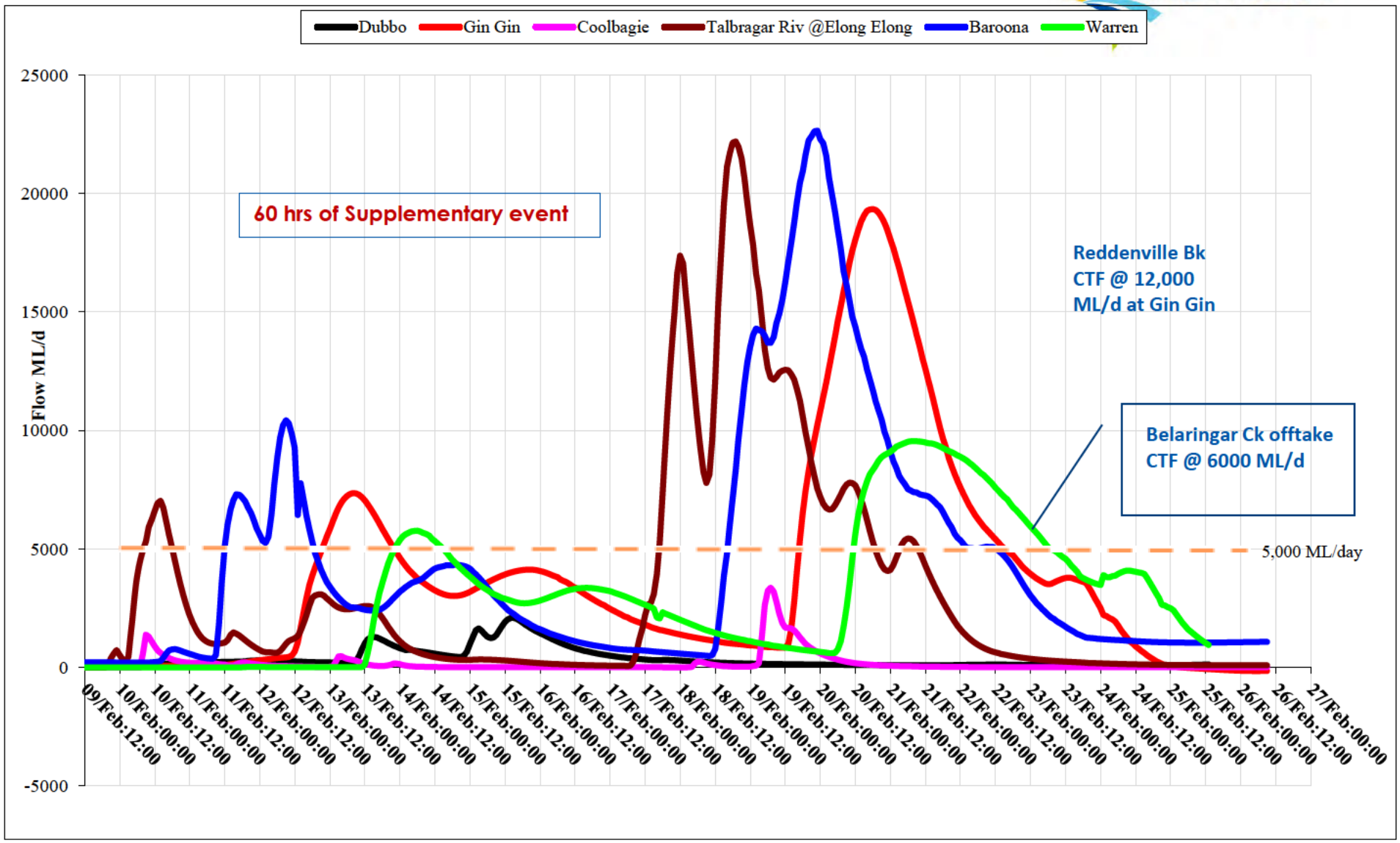
https://www.waternsw.com.au/__data/assets/pdf_file/0008/157193/Macquarie-ROSSCo-Presentation-20-May-2020.pdf

Appendix 1

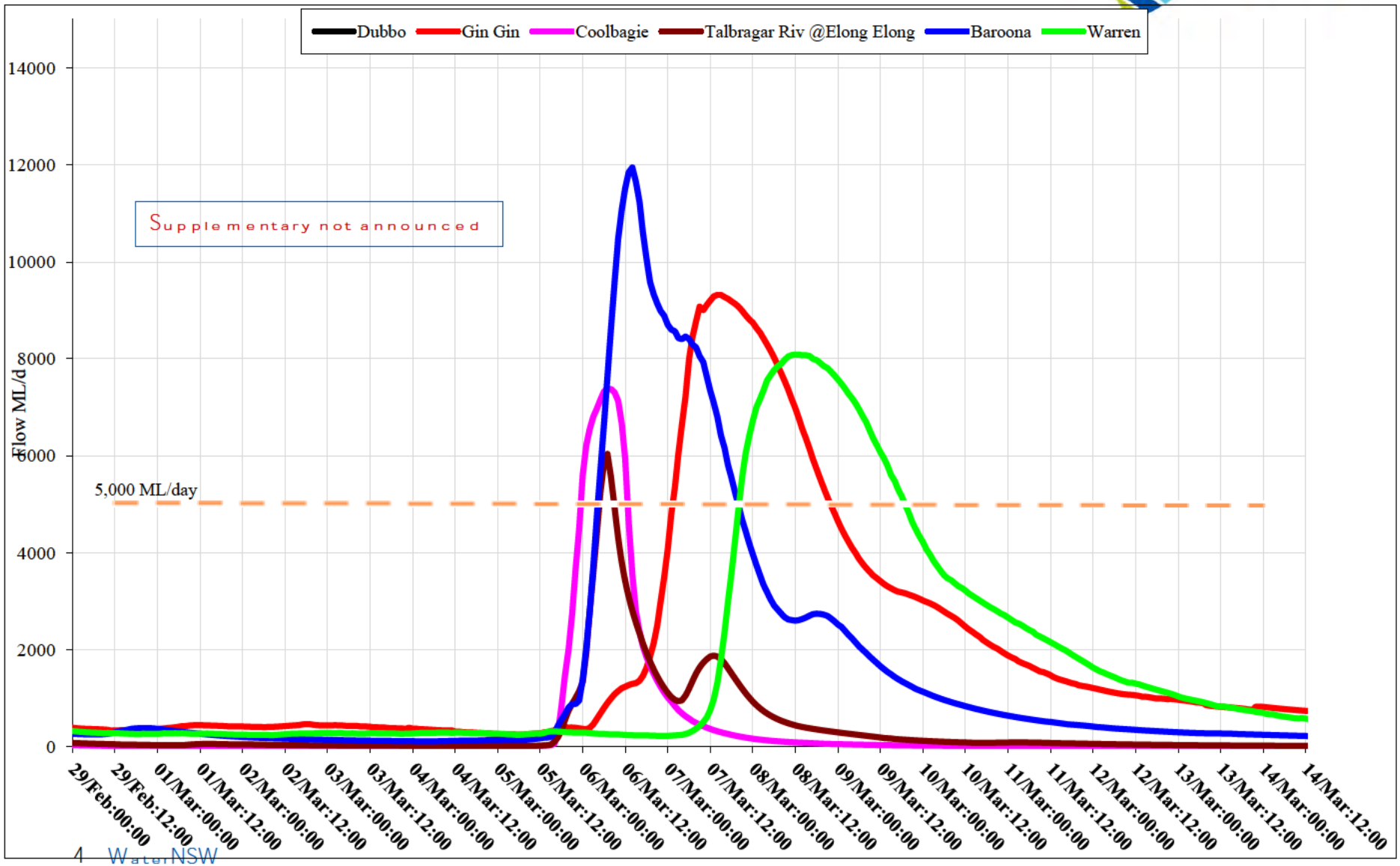
Outcomes from Macquarie River tributary flows in February, March and April 2020.

Extracts from:
https://www.waternsw.com.au/__data/assets/pdf_file/0008/157193/Macquarie-ROSSCo-Presentation-20-May-2020.pdf

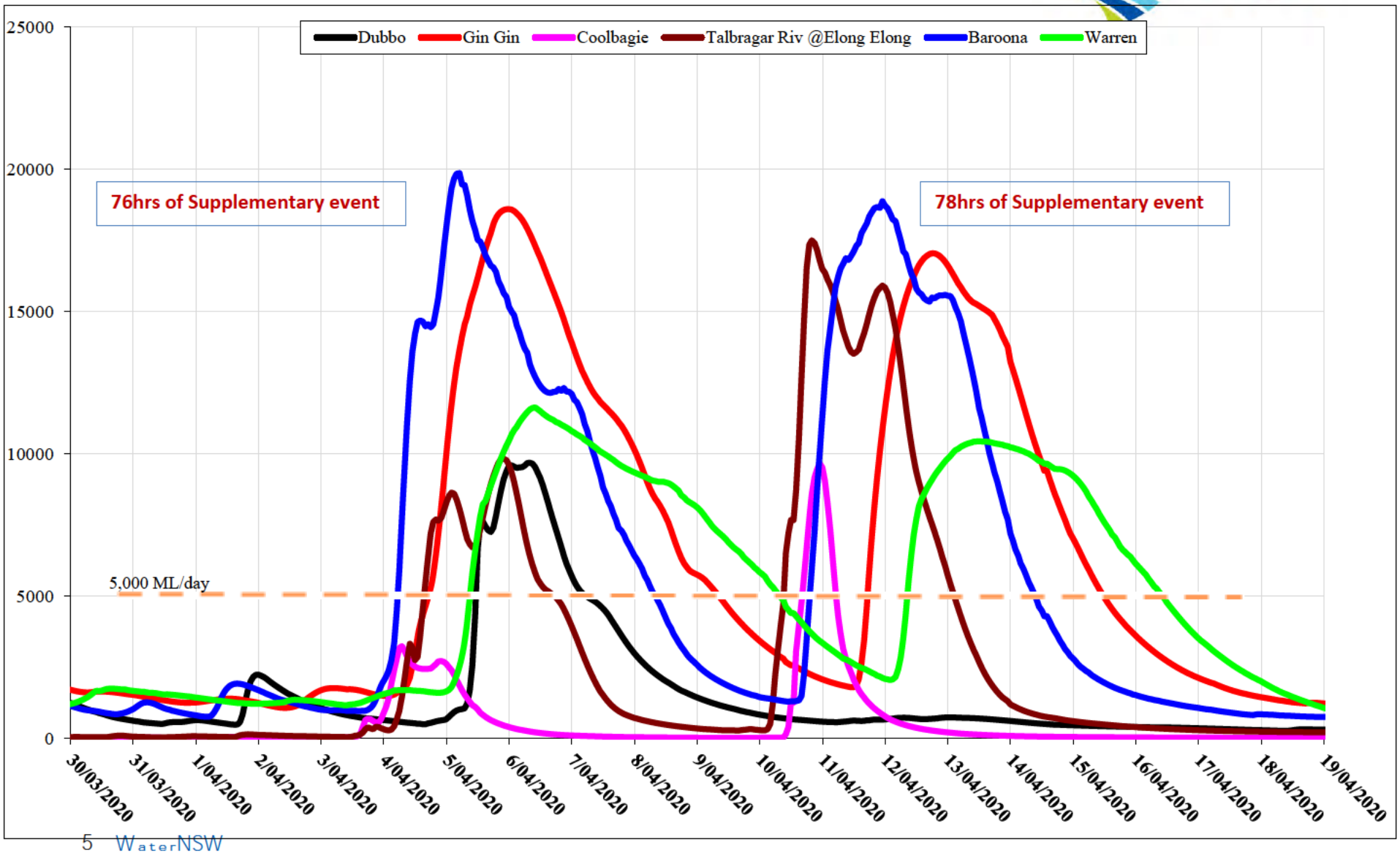
Outcome of Talbragar Flows d/s - Feb Event



Outcome of Coolbaggie/Talbragar Flows d/s - Mar Event



Outcome of Coolbaggie/Talbragar Flows d/s - April Event



MACQUARIE RIVER FOOD & FIBRE

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Response to Draft Report Independent Panel Assessment of the Northern Basin First Flush Event.

Issues and Concerns

We are concerned that the decision of NSW Department of Primary Industries and Energy (DPIE) in April regarding Supplementary Access for the Macquarie license holders was influenced by factors outside the agreed process of the WSP. One of the decisions was also initially made prematurely and prior to forecast rainfall. Factors outside the Water Sharing Plan (WSP) and targeted outcomes appear to have influenced DPIE decision making because:

- broader targets of the Northern Basin were exceeded;
- flow and duration targets in the Macquarie had been exceeded;
- only a very minor part of the Macquarie River flow entered the Barwon;
- critical environmental needs including those created for the northern reedbed outside of normal environmental targets were met;
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- despite the drought and no flows, the antecedent conditions in the lower Macquarie were favorable because of large rainfall events across the district;
- the rules regarding Supplementary Access in the WSP were still Active;

Yet, despite exceeding these targets DPIE failed to adopt the rules of the WSP.

These concerns are further described in the draft report where supplementary access was not allowed following advice from DPIE EES and local landholders.

The information quoted in the draft report referring to a statement from Healthy Rivers[1] is incorrect. Whilst some 12 GL of water was extracted during the peak of the flow in February, this extraction did not reduce the extent of inundation of the reedbeds, nor is the value of a peak flow 'exponentially higher' than subsequent flows. This is because the peak flows that trigger Supplementary Access create breakouts along the river and run effluent creeks that drain away from the river upstream of Marebone. This water subsequently does NOT reach the reedbeds. The flow rate to target the northern reedbed is far less than that creating over bank flows between Warren and Marebone. As was determined during the April event, allowing supplementary access (which yielded an extraction of 18 GL), would only reduce the total reaching Pillicawarrina by 0.4 GL. We are concerned that misinformation such as this is used to inform decisions that were made outside of the water sharing plan.

[1] *Referenced as footnote 34 on page 44 of the Draft Report.*

Response to Draft Report Recommendations

Recommendation 1.

The report identified that 0.5% of the water that flowed past Baroona in February and March this year entered the Barwon River via the regulated section of the Macquarie River and through the Macquarie Marshes. This proportion increased to 7% of the flow by the end of April. The total outfall from the Macquarie contributed only 3.3% of the flow to the Barwon during this event. These numbers typify the connectivity of the Macquarie River with the Barwon, indicating that it is poor. We believe water management should understand this feature of the Macquarie River.

Recommendation 2.

"First Flush" should be clearly defined. The Macquarie Cudgegong Water Sharing Plan (WSP) has a provision for **every** tributary flow where the flow must be >5,000 ML/day at Warren above orders before Supplementary Access can be announced. This threshold is slightly greater than the full channel capacity of the river at Marebone, immediately upstream of the Macquarie Marshes. Flows greater than this will break out of the river and run effluent creeks draining away from the main river channel and Macquarie Marshes. This threshold provides a "first flush" through the river and to the marshes for every tributary flow.

We believe "First Flush" should be defined as the first flows that occur in the river after the river system has been declared in Stage 4 Drought.

Recommendation 3.

"First Flush" events in the Macquarie are managed by the Water Sharing Plan and the 5,000 ML/day threshold. Adherence to the WSP principles and processes should be included in any First Flush event management plans.

Recommendation 4.

First Flush can be managed through the WSP. Learnings from events should be discussed with community and others, however the WSP should not be changed. The Stakeholder Advisory Panel (SAP) is the appropriate vehicle to consider any proposed change.

Recommendation 5.

We support science based evidence and welcome this recommendation.

Recommendation 6.

Any update to incident management systems for managing first flush must be reviewed by the SAP process.

Recommendation 7.

We believe the WSP is the correct framework to manage first flush events. Procedures in the WSP are well documented, rigorous and have been legislated. Introducing another level of management and policy are likely to be unnecessary.

Recommendation 8.

We support improved flow forecasting and monitoring and welcome this recommendation.

Recommendation 9.

We believe all reform programs should have clear implementation plans with distinct goals and objectives that are measurable. Plans should be reviewed and communicated to stakeholders.

Recommendation 10.

Improved co-ordination of information and communication to stakeholders is vital to ensure understanding of decisions regarding water. Improved capability must be matched with processes to ensure plans are implemented and monitored.

Michael Drum
Executive Officer

9/8/2020