

MDBA ANALYSIS OF THE SDL OFFSETS IN THE LOWER MURRAY NSW

PROPOSAL BUSINESS CASE

PROPONENT: NSW

The MDBA's advice covers the following criteria in the Basin Officials Committee agreed *Phase 2 Assessment Guidelines for Supply and Constraint Measure Business Cases* (the Guidelines reference shown in brackets):

- Eligibility (3.1)
- Ecological values of the site (4.2)
- Ecological objectives and targets (4.3)
- Anticipated ecological outcomes (4.4)
- Hydrology of the area and environmental water requirements (4.5)
- Operating regime (4.6)
- Assessment of risks and impacts of the operation of the measure (4.7)
- Complementary actions and interdependencies (4.9)
- Project governance and project management arrangements - legal and regulatory requirements (4.11.2)

Key points/summary

- The proposal meets the Basin Plan supply measure definition.
- The majority of ecological targets are not supported by evidence and the relationship between site specific ecological targets for this project and the site specific objectives and targets in the Environmentally Sustainable Level of Take (ESLT) report are not addressed. It is recommended that the proponent clarify the evidence base for these.
- The business case states that a defined baseline or benchmark will be identified to refine targets where necessary and inform reporting of progress. Further information on when this baseline will be established would be useful particularly as trial weir manipulations have commenced.
- Given that monitoring and evaluation is therefore integral to the successful implementation of the proposed measure, there should be the clear identification and confirmation of a funding source for ongoing monitoring to support these information needs. This would be expected as part of ongoing operational and maintenance costs.
- The proponent should identify how the new measures will be operated in conjunction with maximising inflows to Lake Victoria in view of the operational constraints.
- The proposal effectively seeks a 52,000 ML/d flow at lock 9 to provide flows to the CCB creek system year round. This appears to be an above natural flow through this system based on the hydrological analysis presented in Figure 7-4 and further consideration of the operating regime is required.

1. Eligibility (3.1)

The proposal meets the requirements under the Guidelines for further assessment and consideration in the SDL adjustment mechanism.

1.1 Supply measure requirements (3.1.1)

The proposal would meet the definition of a supply measure under the Basin Plan (cl.7.03 and cl.7.15) to:

- operate to increase the quantity of water available to be taken in a set of surface water SDL resource units compared with the quantity available under the benchmark conditions of development;
- achieve equivalent environmental outcomes with a lower volume of held environmental water than would otherwise be required; and
- have no detrimental impacts on reliability of supply of water to holders of water access rights that are not offset or negated.

noting that a final determination will require MDBA modelling, and that effects on reliability are determined by the proponent/s.

1.2 Measures not included in the benchmark conditions of development (3.1.2)

The MDBA confirms that the measure was not in the benchmark conditions of development (cl.7.02 of the Basin Plan).

2. Ecological values of the site (4.2)

The description of the site's ecological values in the business case is generally consistent with the assessment criteria in the Guidelines.

A detailed description of the ecological values and features of the Lock 8 and 9 weir pool, Frenchmans Creek and the Carrs, Capitts and Bunberoo creek system is provided (Chapter 3; Ecological Associates 2013, Weir Pool Manipulation Optimisation Plan – Analysis Report).

It is noted that vegetation communities have been mapped and classified differently on either side of the River Murray, which makes it difficult to compare values and targets. The SDL adjustment assessment framework does accommodate this difference.

3. Ecological objectives and targets (4.3)

Ecological objectives and targets specified in Table 4-12 of the business case are generally consistent with the assessment criteria, including provision of draft quantitative targets. However, there is a lack of evidence supporting targets and there has been no reference to the site-specific targets and objectives of the ESLT report. It is recommended that the proponent provides further justification for the selected targets, clarifies the evidence base and cross-references the relationship between project site-specific targets and the site-specific objectives and targets of the ESLT report.

It is also difficult to assess whether proposal targets are adequate or meaningful in the absence of a defined baseline or benchmark. The business case states that a defined baseline or benchmark will

be identified to help refine targets where necessary and inform reporting of progress against these. It is recommended that the proponent advise when this information will be made available.

The ecological targets presented in Table 4-12 have an achievement date of 2040. It seems unlikely that it will take until the year 2040 to see an ecological response to the works for all of these targets. Some targets have specific timelines already implied (e.g. 100% increase in dissolved organic carbon sampled from wetlands within two weeks of refilling) and it would be beneficial to revisit these target achievement dates for consistency.

4. Anticipated ecological outcomes (4.4)

4.1 Anticipated ecological benefits (4.4.1)

Anticipated ecological benefits described in the business case generally meet assessment criteria.

Trial weir manipulations have commenced and provide preliminary information to assist with the assessment of the business case. Based on the trial it appears the information presented in the business case may overestimate the increase in area of vegetation inundation for lock 9 as there are constraints to surcharging the weir pool to +0.3m. Pending resolution of issues with the Lock 9 access track, updated data will need to be provided to allow modelling of this supply measure with a realistic operating range informed by the ongoing trials.

With respect to the established assessment framework, the proponent anticipates the ecological benefits of both inundation and drying/drawdown as well as the potential evaporative savings generated will contribute to a SDL adjustment. The proponent has not demonstrated this through analysis or modelling of the potential change in ability to achieve Basin Plan surface flow indicators, which does not allow for an assessment of this information against guideline criteria.

As noted by the proponent, the current SDL adjustment assessment framework cannot adequately assess in-channel and fish habitat/fish passage parameters, and qualitative assessment of the ecological benefits will be required. Consequently, these aspects of the proposal will not directly contribute to SDL adjustment calculations.

The business case notes that a detailed monitoring and evaluation plan will be developed if the proposed works proceed, with monitoring data used to plan weir pool raising and lowering regimes, manage risks and refine ecological objectives. Furthermore, it is stated that weir pool manipulation has the flexibility (with timing, duration and extent) to be refined to maximise benefits. Given that monitoring and evaluation are therefore integral to the successful implementation of the proposed measure, there should be the clear identification and confirmation of a funding source for ongoing monitoring to support these information needs. This would be expected to be part of a confirmed budget for ongoing operations and maintenance. Monitoring and evaluation are also essential to address the mitigation of priority ecological risks (enhanced pest fish recruitment and poor operability of fishway constructed), discussed below.

There is no long term commitment by either the NSW Office of Environment and Heritage or the Commonwealth Environmental Water Holder to provide water for the CCB creek system element of the project. The proponent anticipates that established processes for planning and prioritising watering events in line with Basin Plan and site specific watering would guide such decisions. One option that could be considered is to develop explicit planned environmental water rules in the

Murray Water Resource Plan to meet the revised CCB creek system requirements, noting the existing Murray Water Sharing Plan identifies water in excess of the long-term extraction limits as planned environmental water. Further clarity regarding the process and timing of resolving this issue is sought.

The business case indicates that the proposed CCB creek system infrastructure measures will allow equivalent environmental outcomes to be achieved with a lower volume of held environmental water. While the determination of equivalent environmental outcomes will be undertaken through the SDL adjustment assessment framework, it appears the works will actually lead to an increase in the amount of environmental water needed to reconnect previously isolated areas and achieve the consequent environmental benefits.

The proponent could give consideration to enhancing project outcomes through constructing a fishway at the Lake Victoria outlet to Rufus River, a much shorter distance to connect Lake Victoria to the River Murray than the proposed option to construct a fishway on Frenchmans Creek. This option would also provide a complementary set of flow cues for fish movement into and out of the lake in addition to those provided by the proposed Frenchmans Creek connection at the inlet regulator.

4.2 Potential adverse ecological impacts (4.4.2)

Potential key ecological risks resulting from the works operation are assessed with mitigation measures developed. The business case highlights the very high risk of enhanced carp recruitment and notes that mitigation strategies are only marginally effective (i.e. reduced from very high to high or very high to medium depending on the proposal element). As highlighted by the proponent and in the MDBA's "Interim advice on supply measures - November 2015", the potential for increased carp populations is of concern for all environmental works.

Recent carp population modelling undertaken by the Arthur Rylah Institute highlight the significant risk that works sites provide conditions favourable to carp. Mitigation measures and monitoring will be essential to address the issue and proposed trials which look to enhance native fish outcomes and exclude carp recruitment opportunities are part of the mitigation measures.

It is suggested that the monitoring and evaluation plan should also include consideration of the potential for reduced ecological benefits associated with ponded water during manipulations. For the Frenchmans Creek fish passage works, it was surprising to see the risk of 'poor reliability / operability of fishway constructed at the inlet regulator leading to hampered fish passage' only being reduced from a high to a moderate risk as a result of mitigation measures (pg. 52). The proponent should specify what factors cause this residual level of risk.

5. Hydrology of the area and environmental water requirements (4.5)

5.1 Current hydrology and proposed changes to the hydrology (4.5.1)

There are two parts in this proposal, evaporative water savings through weir pool manipulation and enhancing connectivity of local creek systems.

The evaporative water savings are based on MDBA hydraulic and hydrologic modelling and therefore enough information is available describing the current and proposed hydrologic regimes.

Although CCB creek system environmental works are relatively small in their scale, there is not enough information provided to determine hydrological and ecological impacts. This information has been requested from NSW.

5.2 Environmental water requirements (4.5.2)

Information on environmental water requirements has generally been provided to the appropriate level of detail to meet Guidelines criteria. However, the proponent is requested to provide further information regarding the rationale and evidence base underpinning the proposed inundation regimes in Tables 4-1 to 4-11 (and subsequently repeated in Table 8-2). The Ecological Associates (2013) document which is used as the base report does not reference relevant scientific literature or provide any rationale for the proposed duration, frequency and timing of inundation. As an example, the proposed minimum duration for floodplain inundation of one month is short compared to widely accepted literature (e.g. Roberts and Marston 2011). In addition there are some inconsistencies between the information presented in Chapter 4 and 8. For example, the preferred timing for aquatic macrophytes is spring in Table 4-1 and late winter, spring, early summer in Table 8-2 yet both reference Ecological Associates (2013). Similarly, the duration for waterbirds is inconsistent.

The proposal effectively seeks a 52,000 ML/d flow at lock 9 to provide flows to the CCB creek system year round. This appears to be an above natural flow through this system based on the hydrological analysis presented in Figure 7-4 and further consideration of the operating regime is required.

In a number of instances it is not apparent how the environmental water requirements recommended relate to the proposed operating regime e.g. how does the proposed weir manipulation regime satisfy the various environmental water requirements and how does the CCB creek system operating scenario relate to the optimum regime?

Further information and justification is sought for these issues.

6. Operating regime (4.6)

The proposal states that watering plans for the CCB creek system will be consistent with operational constraints but does not specifically identify how the new measures will be operated in conjunction with maximising inflows to Lake Victoria, discussed further below.

It is also important to note that Table 9-2 implies that Lock 9 has been held 40 cm below full supply level (FSL) in February and March (no year quoted), however, this has not occurred in practice and is currently not possible without impacting on pumping to Lake Cullulleraine.

The operating rules appear to have been developed without considering the influence on nearby sites, notably Wallpolla Island. For example, Victoria's works project at Wallpolla Island is entirely reliant upon high river flows without raising the Lock 9 weir pool. Manipulating the Lock 9 weir pool to reduce evaporation losses will potentially impact upon the intended outcomes at Wallpolla.

7. Assessment of risks and impacts of the operation of the measure (4.7)

No investigation has been made into the capacity of Frenchmans Creek to deliver an additional 2,000 ML/day to the CCB creek system when maximising inflows to Lake Victoria. Operationally, the maximum regulated inflow to Lake Victoria via Frenchmans Creek is 10,000 ML/day. MDBA

discussions with SA Water, who manage the system, have suggested that the flow constraint is at the Lake Victoria inlet, however this is not certain and it may be the inlet to Frenchmans Creek. If capacity in Frenchmans Creek is constrained at the junction with the River Murray, delivery of water to the CCB creek system would be limited to the spare capacity volume in the creek when water is being delivered to Lake Victoria. For example: since 1 July 2000, flow into Lake Victoria was greater than 8,000 ML/day on 202 occasions and greater than 9,000 ML/day on 76 occasions, with the majority of occurrences during the period August to November. If the proposal had been operating during this period, and the maximum flow rate into Frenchmans Creek is 10,000 ML/day, delivery to CCB would have been limited to below the 2,000 ML/day target on these occasions.

Running Frenchmans Creek at channel capacity for extended periods may result in erosion issues, however, this is not addressed in the business case.

Flow measurement through the CCB creek system has not been included, and confirmation from SA Water should be sought that this is not an issue when managing flows into South Australia.

SA Water have advised that any proposal to raise Lock 9 from 20-30cm above FSL to 50 cm above FSL will require significantly more levee banks, at a cost not factored into the proposal.

The proponent has not provided the required assessment of any potential adverse water quality impacts in line with Chapter 9, Divisions 2 and 3 of the Basin Plan. Mitigation measures should be developed where water quality risk is found to be significant.

8. Complementary actions and interdependencies (4.9)

The business case articulates the potential interaction with other supply measures, stating that the proposed weir pool manipulation strategy will be developed in conjunction with Mulcra Island TLM watering and the proposed Wallpolla Island supply measure works put forward by the Victorian Government in 2014. However, as noted above, the operating rules appear to have been developed without considering the influence on nearby sites.

9. Project governance and project management arrangements (4.11)

9.1 Legal and regulatory requirements (4.11.2)

The proposal does not appear to impact any transitional or interim plans. However, if any actions in the project result in an amendment to a transitional or interim water resource plan we would expect that the Basin State would seek accreditation of any such amendment in the normal way.