

# MDBA ANALYSIS OF THE HUME DAM AIRSPACE MANAGEMENT AND PRE-RELEASES SDL ADJUSTMENT PROPOSAL

## PROPOSANTS: VICTORIA/NEW SOUTH WALES

The MDBA's analysis of the Hume Dam Airspace Management and Pre-releases proposal 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 management arrangements - legal and regulatory requirements (4.11.2)

### Key points/summary

- The proposal appears to have good potential for a supply contribution. However, there are some issues that need to be resolved which would benefit from further discussion between the proponents and MDBA river operators. The MDBA is available to work with the proponents to refine the proposed operating regime, and identify ways to overcome the issues identified in this assessment.
- The operating regime described in the business case proposes a change to operations at Hume Dam which, in effect, differs from the benchmark, but closely reflects how the storage is currently operated. Current pre-release rules were adopted well before held environmental water was introduced and do not distinguish between irrigation and environmental demand. The MDBA has found that managing the storage according to these rules, with the environmental water demand that now occurs, can lead to Hume Reservoir being kept close to full for prolonged periods of time which may create risks to third parties. There may also be impacts on other water accounts which are subject to spill.
- It is the MDBA's view that the proposal could be refined so that the storage is managed in a way that minimises third party risks.
- River Murray operators have identified ways that the proposal could be modified to both improve outcomes and reduce risks. For example, the MDBA is actively investigating and pursuing better ways to manage airspace and large parcels of held environmental water to avoid increased flood risk, and the results of these investigations may assist the proponents to refine the proposal.

## 1 Eligibility (3.1)

The proposal meets the eligibility 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.

The business case notes that overall the proposal's effects on entitlement reliability are similar to those expected under the benchmark conditions. It indicates that modelling has shown some minor variations in a number of statistics associated with water availability compared to the baseline/benchmark conditions but overall notes no significant impacts on reliability at this stage. The business case states that the Victorian Department of Environment, Land, Water and Planning is to provide jurisdictions with detailed results and data from modelling to inform the business case assessment. This has not yet occurred.

### 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.

The proponent notes that changes in river flows from the operation of Hume Dam have affected environmental features downstream of the storage. A relatively limited description of the ecological values of the six key environmental assets in the Murray system affected by the proposal (e.g. Barmah-Millewa, Hattah) has been provided. As this is a rule change rather than a works proposal, this level of detail is considered adequate. It is noted that the important values of the sites are well known and have been extensively described in readily available documents (e.g. environmental water management plans for Living Murray Icon Sites, assessment of environmental water requirements for the proposed Basin Plan).

## 3 Ecological objectives and targets (4.3)

Generally the business case meets ecological objectives and target assessment criteria. It is noted that instead of ecological objectives and targets, Specific Flow Indicators (SFIs) from Basin Plan modelling are used as the targets to measure the effectiveness of the proposal. Given the SFIs were developed

to support ecological objectives and targets specified by the MDBA, there is an implicit and reasonable assumption in the proposal that those objectives and targets remain valid. These water requirements are supported by scientific evidence and are linked to the ecological values, objectives and targets of the sites.

The rule changes may reduce some of the smaller, in-channel flow events at certain times of the year. The business case does not contain any metrics to measure these flow alterations and it is therefore difficult to get a sense of whether the changes may be ecologically significant. This is further discussed in the section on potential adverse ecological impacts.

## 4 Anticipated ecological outcomes (4.4)

### 4.1 Anticipated ecological benefits (4.4.1)

The description of anticipated ecological benefits described in the business case generally meet assessment criteria. The supply measure modelling undertaken by the MDBA (*Interim advice on supply measures, June 2015*) has shown that the proposal will produce more frequent inundation of larger floodplain-wetland areas particularly in the Upper Murray reach. As a result environmental outcome scores increase above benchmark scores.

The benefits are described in terms of changes to SFIs frequency (including with reference to the Basin Plan limits of change) and maximum dry spells. As this is a rule change rather than a works proposal, this level of detail is considered adequate and the assumptions valid. The SFIs show a modest net improvement of 23 successful events across the Murray system. In addition, flow and salinity limits of change indicators for the Coorong, Lower Lakes and Murray Mouth indicators remain unchanged except for one indicator which decreases slightly (mouth openness indicator of average annual depth of 1.0 metre reduces from 94% to 93% of years).

The limits of change are satisfied (i.e. not breached) by the proposal. The increase in the number of successful events highlights the potential of this proposal to maximise the SDL adjustment potential through easing the limits of change. As they relate to overbank flow events. The maximum dry spells largely stay the same across the Murray system except for two SFIs in the reach containing Gunbower-Koondrook-Perricoota Forest where one maximum dry spell worsens and in another, it improves.

### 4.2 Potential adverse ecological impacts (4.4.2)

The potential adverse ecological impacts are described in terms of changes to SFIs and some of the limits of change. While two flow indicators decline marginally, overall there is a net increase in successful events (and ecological outcome score) and therefore these impacts are not considered material.

The proposed reduction in pre-release volumes will occur between the months of February and September (Figure 7 in the business case). It appears likely that this will mainly affect in-channel flows through reductions in small flow events. Therefore, in-channel flows may decline under the proposal at certain times of the year. This means that there may be some negative impacts on baseflow/freshes which will need to be managed however in the assessment framework impacts on the flow regime other than SFIs are not explicitly assessed. The business case should present a preliminary analysis of all limits of change and in-channel flows (baseflows and freshes), given that it is anticipated there may be some impacts on these from the proposed rule change. It should be noted that interaction with

other supply measure proposals may at least partially offset these negative impacts this suggest further investigation may be required when this proposal is modelled as part of the final package.

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

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

The proposed changes to the hydrology are based on the assumption that river operators treat environmental demands in the same manner as irrigation demands in the airspace target calculation at Hume Dam. This would mean that river operators would significantly reduce or cease pre-releases from Hume Reservoir when environmental demands are expected. This is likely to be positive for environmental outcomes but there are associated potential negative impacts in terms of third party risk and equity, discussed further below.

### 5.2 Environmental water requirements (4.5.2)

The environmental water requirements (SFIs) developed by the MDBA to inform the Basin Plan are used as the basis of the proposal. These water requirements are supported by scientific evidence and are linked to the ecological values, objectives and targets of the sites.

The proposal uses assumptions from early Basin Plan proof-of-concept work done by the MDBA to demonstrate a relationship between environmental demands and unregulated flows. The business case flags that these assumptions will be updated and revised and clarification is sought on when this work will be done, by whom and the consultation process, to ensure the latest understanding of likely environmental demands is represented.

The business case states that current higher pre-releases and spills in the March to May period do not coincide with the timing required to achieve environmental outcomes targeted in the Basin Plan and therefore were unlikely to be providing environmental benefits which is only partially correct. No evidence is provided to support this statement other than the start and end months of SFIs listed in Table 9 of the business case. Whilst a number of SFIs have a specified timing of winter-spring (June – November/December), a large number do not have a specified timing, therefore flows in March and May in certain years are potentially important for achieving SFIs targeted in the Basin Plan. To illustrate this further, 16 of the 35 SFIs presented in Table 9 have an all-year timing for which pre-releases and spills in particular may be contributing to targeted outcomes. Modelling undertaken to date of SFI success indicates that there may be a negligible negative impact from the proposed change, however the proponent should provide supporting evidence with regard to this for both in-channel and floodplain ecological assets.

## 6 Operating regime (4.6)

Further discussion between the proponents and the MDBA on possible options would be beneficial to improve the prospects of the proposal and minimise risks, discussed at section 7. The operating regime described in the proposal purports a change to operations at Hume but in reality reflects how the storage is currently operated.

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

The MDBA manages storages, including Hume Reservoir, in order to:

- firstly, protect the security of the storage;
- secondly, to maximise the available water; and then
- thirdly, subject to the foregoing items, limit flood damage to downstream communities and increase benefits to the environment and public amenity.

Although the MDBA currently operates Hume Reservoir as proposed in this supply measure, current pre-release rules were adopted well before held environmental water was introduced and do not distinguish between irrigation and environmental demand. The MDBA has found that under the current operational rules the relatively unpredictable environmental water demand that now occurs, combined with the need to maximise the available water, results in Hume Dam being held close to full supply level for prolonged periods of time and could reduce the ability of the MDBA to mitigate against floods. The proposal would therefore lock in an operating regime which may create risks for third parties.

River Murray operators have identified ways that the proposal could be modified to both improve outcomes and reduce risks. For example, the MDBA is actively investigating and pursuing better ways to manage airspace and large parcels of held environmental water to avoid increased flood risk, and the results of these investigations may assist the proponents to refine the proposal.

## 8 Complementary actions and interdependencies (4.9)

The operation of Hume Dam has important interactions and dependencies with the river more broadly. The proposal will provide more natural variability of flows below Hume Dam to help meet environmental flow targets at Barmah-Millewa Forest. Although there is also significant potential for the proposal to interact with constraints measures as noted in the MDBA's interim advice on supply measures (June 2015) it should be noted that pre-release is a spill which is not subject to flow limits that apply for regulated releases.

The business case does not identify specific interactions with other proposals but notes that linkages and inter-dependencies with the measure (including with constraints measures) will become better understood once the full SDL package is finalised and modelled.

## 9 Project governance and project management arrangements (4.11.2)

### 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 it is expected that the Basin State would seek the required accreditation of any such amendment.