

MDBA ANALYSIS OF THE NIMMIE-CAIRA INFRASTRUCTURE

MODIFICATIONS 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)

Business case assessments by the Department of Agriculture and Water Resources will include advice from the MDBA on the technical feasibility and fitness for purpose of proposals as per section 4.8 of the Guidelines.

Key points/summary

- The proposal meets the Basin Plan supply measure definition.
- The proponent should reconsider the ecological objectives and targets identified in the business case and develop quantitative targets specific to the Nimmie-Caira system.
- The business case doesn't include an assessment of improvements in SFIs for the lower Murrumbidgee River floodplain, presumably because of issues raised by the proponent with the appropriateness of the SFIs for Nimmie-Caira. These issues will need to be resolved between the proponent and MDBA.
- The business case requires an analysis of the potential to achieve the environmental water demands relative to the benchmark. The proponent should confirm if this will be provided once the integrated modelling of all supply measures in the Murrumbidgee has been completed and benchmark modelling issues resolved.
- The business case states an intention to use the environmental assets (and their spatial distribution) identified by Biosis in the equivalence testing. The proponent should demonstrate that these provide a better basis for the test than the datasets (and their spatial distribution) currently identified. The proponent should further indicate when the investigation and alignment

work referred to will be available. This will include considerations of issues raised in the business case regarding delineation of inundation extents.

- Modelling undertaken by the proponent has been supplied as part of the revised Murrumbidgee benchmark model provided to the MDBA. However, the MDBA is currently working with NSW on the revised model to enable a reasonable representation of overbank flows, without which an assessment of the environmental benefits from the project cannot be properly assessed.
- The business case raises issues with regards to the appropriateness of the SFIs for the Nimmie-Caira which is subject to further discussion between the proponent and MDBA.

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.

Please note 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/environmental values and features of Nimmie-Caira is provided (Business Case, various Biosis reports) notwithstanding the limitations of the ecological assessment results. Biosis (2014) notes that their study attempted to document ecological values of a large, complex and highly modified floodplain environment at one point in time when much of the floodplain was dry or in a drying phase. Furthermore, there are locations on the floodplain and habitat types that are considered under-sampled due to timeframe and budget limitations. Assessments are therefore considered indicative of species diversity and habitat conditions.

It is noted that the Nimmie-Caira contains:

- key flood-dependent vegetation communities (lignum, red gum, black box);
- important areas for waterbirds including breeding of colonial nesting waterbirds;
- habitat for a range of species and communities listed as threatened under both Commonwealth and state legislation including the EPBC threatened Southern Bell Frog; and
- fish communities with relatively low species diversity dominated by alien species with large bodied fish largely absent (two Golden Perch collected in recent surveys) and no threatened species detected in recent surveys.

It is further noted that the extent of regular inundation of the estimated 350,000 ha floodplain has been reduced through flow regulation, water use and floodplain developments. The Nimmie-Caira system has a long history of agricultural production with grazing and more recently irrigation and the proposed future management includes continued productive land use. Subsequently, non-flow related threats to values (grazing, pest plants and animals) will need to be managed. Given Biosis (2015) identifies that grazing impacts cannot be excluded from wetlands and important habitat areas due to a lack of fencing, MDBA supports that the development of a land management plan with fencing and grazing strategy is a priority foundational activity.

3. Ecological objectives and targets (4.3)

The business case cites Lower Murrumbidgee environmental objectives and targets from the *Guide to the Proposed Basin Plan* (MDBA 2010). This work has been superseded and should be replaced with the final set of objectives and targets as described in the '*Assessment of environmental water requirements for the proposed Basin Plan: Lower Murrumbidgee River Floodplain, MDBA 2012 page 11*'.

The MDBA objectives and targets relate to the broader Lowbidgee area. The business case proposes a set of ecological objectives and targets that are specific to the Nimmie-Caira system. These are generally consistent with the assessment criteria, although quantitative targets were not provided. The proponent is requested to give further consideration to the development of quantitative targets which are supported by evidence. The proponent may also want to consider including objectives concerning ecosystem functions as per the MDBA objectives/targets.

4. Anticipated ecological outcomes (4.4)

4.1 Anticipated ecological benefits (4.4.1)

Anticipated ecological benefits/outcomes for Nimmie-Caira are described in the business case and are generally consistent with the assessment criteria. These are predominantly qualitative descriptions of expected improvements for a range of biota (e.g. frogs, waterbirds, vegetation, fish). The business case doesn't include an assessment of improvements in SFIs for the lower Murrumbidgee River floodplain, presumably because of issues raised by the proponent with the appropriateness of the SFIs for Nimmie-Caira. As noted below, these issues will need to be resolved collaboratively by the proponent and MDBA as the SFIs will remain the foundational hydrology upon which the environmental equivalence test will be based.

The business case also doesn't present any analysis of the potential to achieve the environmental water demands presented in Table 6 (pg. 36 of the business case) relative to benchmark. The proponent should confirm if this will be provided once the integrated modelling of all supply measures in the Murrumbidgee has been completed and benchmark modelling issues resolved. This analysis will be important to provide a quantitative assessment of the anticipated ecological benefits. The business case highlights issues with the benchmark model, whereby it shows negligible inundation of red gum and black box communities within the Lower Murrumbidgee floodplain. This issue appears to stem from the benchmark model configuration preventing the additional environmental water targeted for the Lower Murrumbidgee floodplain from being diverted to the floodplain for environmental purposes. As a consequence, as noted by the proponent, less water enters the Lower Murrumbidgee River under benchmark conditions than the baseline scenario with the majority of increased flows retained in-channel and flowing through to the Murray River. MDBA will continue to work with the proponent to ensure the benchmark model represents a more realistic Lower Murrumbidgee floodplain watering regime so that the marginal benefit from the Nimmie-Caira proposal can be assessed. Proposed changes to benchmark environmental outcomes in the Murrumbidgee are yet to be agreed by TWG and will need to be appropriately justified with the updated modelling being provided to the MDBA in sufficient time to allow its validation before subsequent use to assess the notified package of measures.

With respect to the established assessment framework, the ecological benefits of increased inundation will contribute to an SDL adjustment. However it should be noted that not all aspects of the proposal will contribute to the calculation of the supply contribution. This particularly relates to the preferred optional arrangement to water priority lignum and floodplain wetland areas for rehabilitation. The method is designed to assess the change in condition of Ecological Elements that are currently mapped, not the potential to change the Ecological Element(s) extent.

Similarly, whilst the Southern Bell Frog is a recognised value of the site which the proposal seeks to enhance outcomes, frogs are also not explicitly considered by the method. While these ecosystem components are not scored through the SDL adjustment process, the targeting of flows to them can be pursued through the broader Nimmie-Caira System Enhanced Environmental Water Delivery Project.

The business case states that the spatial and type accuracy of ecological elements from the Lowbidgee benchmark scenario will require further investigation and alignment with the environmental assets identified by Biosis prior to an equivalence test for any supply measures. This statement indicates an intention to use the environmental assets (and their spatial distribution) identified by Biosis in the equivalence testing. For this to occur, the proponent should demonstrate that the Biosis work provides a better basis for the test than the datasets (and their spatial distribution) currently identified. The proponent indicated that following discussion with MDBA further advice would be provided in November 2015. This advice has not been received so the proponent is requested to provide evidence to demonstrate it provides a better basis and indicate when the investigation and alignment work referred to will be available. This will include considerations of issues raised in the business case regarding delineation of inundation extents.

Further information is sought regarding the basis of the statement that it is not proposed to pass any significant volumes of water through the Nimmie-Caira area specifically to target increased flows to

the Murray River as this is likely to significantly reduce environmental outcomes locally, and only produce minor improvement for environmental outcomes in the Murray valley. Is this related to the intention to provide environmental flows to Yanga National Park via the Nimmie-Caira system?

The business case notes that monitoring data is required to monitor the supply of water and the ecological outcomes from that watering, to manage risks and to refine ecological objectives. Given that monitoring and evaluation is integral to the successful implementation of the proposed measure, there should be a clear indication that funding is available and identification of how this will be funded.

4.2 Potential adverse ecological impacts (4.4.2)

The business case highlights a number of potential adverse ecological impacts, including changes to watering regimes of various parts of the Lower Murrumbidgee floodplain.

The business case does not identify pest plant and animal control or the re-establishment of agricultural production within Nimmie-Caira as having potentially adverse ecological impacts. The development of a land management plan with fencing and grazing strategy will be important to mitigate against these risks. Similarly, supporting material provided (Biosis 2015) documents risk assessment outcomes, however, this information is not presented in the business case. The proponent is requested to clarify why the outcomes of these risk assessments are not presented in the business case as they identify some critical risks which do not appear to be captured. For example, the Biosis (2015) risk assessment identifies that “the majority of ecological assets of the Nimmie-Caira project area at high to extreme risk from a range of failure modes”. The proponent should clarify whether this refers to existing arrangements or with the proposal in place? MDBAs understanding is that the assessment is the former i.e. existing arrangements.

Biosis (2015) also suggests that the risk assessment tool can be re-run and risk ratings adjusted once management interventions are formalised and implemented. Can the proponent clarify if and when they intend to re-run the risk assessment if it does only consider existing arrangements? To further understand issues around the risk assessments, please provide the relevant report (Biosis 2015. Nimmie-Caira Ecological Risk Assessment, Stage 2, Phase 4 report)

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 business case and supplementary information provide sufficient information to explain the project’s current hydrology and changes associated with the proposal. To assist the proposal’s integration into the MDBA’s model-based assessment framework further clarification and refinements are likely to be required.

- The hydrology and hydraulic relationships at the site are described in the business case. The model to support these estimates and for inclusion in the IQQM and MSM-BIGMOD for assessing SDL offset has been provided and NSW and the MDBA. However, the MDBA is currently working with NSW on the revised Murrumbidgee benchmark model to enable a reasonable representation of overbank flows, without which an assessment of the environmental benefits from the project cannot be properly assessed.

The volume of water to be used at the site is mentioned in the business case. Details of how this has been derived and how it will vary between wet and dry years and how much of it would get supplied by overbank flows during floods is not quantified. Once the model with the business case representation is received, it would be possible to quantify how much of 46-67 GL/y is to be supplied through recovered water and possible SDL offset.

None of the environmental water supplied is proposed to be returned to the river. This assumption, and not enhancing the capacity to channel 3000 ML/d through Nimmie-Caira system and bypassing Chaston cutting capacity constraint as proposed in the Nimmie-Caira Bridging the Gap proposal, has the implication of reducing the estimated volume of water recovered for Bridging the Gap.

The details of changes in the flow that result from the proposal is not supplied with the business case and should be provided by the proponent.

Modelling undertaken by the proponent is yet to be supplied. It is therefore not possible to comment whether modelling and assumptions used to represent the business case in the model are fit-for-purpose or not.

It is not possible to comment on model calibration as hydraulic models, IQQM models and associated reports are yet to be supplied.

5.2 Environmental water requirements (4.5.2)

Information on environmental water requirements has been provided to the appropriate level of detail to meet Guidelines criteria.

Environmental water demands for different hydrological features are provided in the business case (Table 6) to define the preferred flow regime. The source material provided illustrate that these demands are supported by scientific evidence (Roberts and Marston 2011, Rogers and Ralph 2011). The environmental water demands in Table 6 are categorised by hydrological feature and are based on Table 4 of the Biosis ecological assessment report (business case Appendix A2). Two key feature types are missing from Table 6, namely 'Marshes and Sedgeland' and 'Natural Lakes'. Both these types are also reflected in the ANAE dataset (Palustrine and Lacustrine types). The proponent should explain the reasons for their exclusion, and if appropriate, include them in the environmental demands table. More explanation is required regarding how the environmental water demands relate to the watering regime / proposed operating regime (Table 11). In a number of instances it is not apparent how these align directly e.g. how does the proposed watering regime satisfy the duration of inundation required for river red gum forests?

The proposed watering regime is much shorter than the 5-7 months environmental water demand identified. The MDBA therefore assume that water will be retained on the floodplain to achieve the desired duration. The proponent should confirm this assumption.

In the event that further consideration is given to environmental water demands for the biota in 'Marshes and Sedgeland' and 'Natural Lakes' (as above), the proponent should consider whether they have unique requirements that should be included in the environmental watering regime at Table 11.

The proposal also refers to the environmental water requirements (SFIs) developed as part of the Basin Plan for the lower Murrumbidgee River floodplain. These water requirements are supported by scientific evidence and are linked to the ecological values, objectives and targets of the sites. However, the business case raises issues with regards to the appropriateness of the SFIs for the Nimmie-Caira which is subject to further discussion between the proponent and MDBA.

6. Operating regime (4.6)

MDBA River Operations has indicated it has no comment.

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

Insufficient information has been provided to enable an assessment of the potential adverse water quality impacts in line with Chapter 9 Division 2 & 3 of the Basin Plan. Mitigation measures should be provided in case water quality risk has been found to be significant. These assessments are currently lacking in the proposal.

8. Complementary actions and interdependencies (4.9)

The proponent has provided this information since the business case was submitted.

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.