

Our ref: DOC22/1066267

Sender's ref: CSSI-8441

Mr Marcus Ray
Deputy Secretary Planning
Department of Planning and Environment
Locked Bag 5022
PARRAMATTA NSW 2124

16 December 2022

Subject: Request for agency advice – Warragamba Dam wall raising Critical State Significant Infrastructure (CSSI-8441) – Submissions Report and Preferred Infrastructure Report

Dear Mr Ray

I refer to the request from the Department of Planning and Environment – Planning Group on 21 November 2022 seeking advice from the Department of Planning and Environment – Environment and Heritage Group (EHG) on the Submissions Report and Preferred Infrastructure Strategy (PIR) for the Warragamba Dam wall raising project.

EHG's detailed advice is attached to this letter and a summary of the key issues is presented below. These comments follow a submission made by the former Environment, Energy and Science Group during the public exhibition of the environmental impact statement (EIS) for the project, dated 17 December 2021, noting that Heritage NSW made a separate submission. EHG, including the National Parks and Wildlife Service (NPWS) and Heritage NSW, has provided ongoing advice to WaterNSW regarding the issues and concerns raised in the EIS submission.

Based on the revised information provided in both the Submissions Report and the PIR, EHG maintains that the project will have a significant impact on biodiversity, Aboriginal cultural heritage sites and values, and protected land reserved under the *National Parks and Wildlife Act 1974*, including the values of the Greater Blue Mountains World Heritage Area.

Aboriginal Cultural Heritage

The project will result in impacts to highly significant interrelated tangible and intangible Aboriginal cultural heritage sites and values. If the project is approved, EHG recommends that WaterNSW continues to work with the Aboriginal community to develop a model for long-term protection, conservation and celebration of the significant values attributed to the cultural landscape of the Burratorang Valley. This should include additional survey and assessment of Aboriginal cultural sites, to appropriately identify and assess the complex values of the Burratorang Valley.

Biodiversity offsets

If the project is approved, the biodiversity impacts, and impacts to the protected land and World Heritage values must be offset. The offset strategy should include:

1. Upstream biodiversity offsets: biodiversity impacts within the impacted national park estate are to be offset by a program of on-park biodiversity management actions to be delivered by NPWS in the Greater Blue Mountains area.

2. Construction site and downstream biodiversity offsets: biodiversity impacts to be offset through retirement of biodiversity credits.
3. Protected land offsets: impacts to protected lands and World Heritage values to be offset by the addition of new lands into the national park estate and the provision of management funding for these lands.

Upstream biodiversity offsets

EHG supports upstream impacts to biodiversity values in protected lands being offset through a program of biodiversity management actions developed by NPWS. This program would be funded by WaterNSW and delivered by NPWS to achieve a significant uplift in impacted biodiversity values within the protected lands. The funding would be used to improve catchment health, strengthen ecosystems, deliver direct offset outcomes for all affected threatened species and communities, and ensure no net loss outcomes as a minimum, outside of the project upper impact area (i.e., the area to be impacted by temporary inundation).

This approach reflects the unique scale of impacts inside existing protected lands and the significant offset obligations, noting that EHG believes the number of credits required to offset the impacts to biodiversity values in the upstream impact area are not available. This approach is consistent with the offsets agreed with the approval of the Snowy 2.0 Main Works (SSI 9687).

EHG does not support WaterNSW's proposal that it retains the option to reduce offset obligations in the upstream impact area by undertaking further survey. This is because the existing approach used in the EIS to manage the complexities of different inundation events is already a pragmatic compromise. While it could be an overestimation of biodiversity loss for some species or communities in the Project Upper Impact Area, it may also be an underestimation of biodiversity loss outside of this area. If project approval is nevertheless granted with a condition which allows for further survey to determine the presence of certain species, the species and area to be surveyed, and the survey methodology must be agreed with EHG.

To ensure accountability, NPWS would develop and implement a detailed program for the allocation of funding to specific projects and monitor, evaluate and publicly report on the progress of the implementation of the detailed program and the effectiveness of the specific projects. This will provide a high level of certainty that the biodiversity impacts of the proposal are fully offset (as a minimum).

Construction site and downstream biodiversity offsets

EHG notes that the biodiversity impacts at the construction site are quantifiable and do not occur within protected lands. EHG does not agree to biodiversity impacts at the construction site or downstream being offset through the on-park management actions proposed for the upstream biodiversity offsets. These biodiversity impacts should be delivered through the retirement of biodiversity credits.

Department of Planning and Environment

Protected land offsets

The protected land offsets approach set out in the PIR is noted. In principle, if the project approval is granted and subject to a condition requiring sufficient resourcing for NPWS, EHG submits that the protected land offset actions are delivered by NPWS to acquire priority lands (as determined by NPWS and the Minister for Environment and Heritage) for reservation under the *National Parks and Wildlife Act 1974* to support the overall integrity of the national park system and to fully compensate for the area and values in the project upper impact area. Specific details of the protected lands offset program would be addressed in a delivery plan, prepared post-planning approval, and approved by the Coordinator General of EHG (or delegate). Conditions of approval should be specific to confirm:

- quantum of land to be acquired and financial resources to be allocated for this purpose
- upfront contribution of the required resources
- NPWS determines acquisition priorities and manages and delivers the program.

The PIR implies that impacts to Aboriginal cultural heritage and World Heritage values will be addressed by the land management funding component of the protected land offset program. EHG does not agree with this position. The management funding to be provided as part of the protected land offset program is required to manage the acquired lands in accordance with standard park management requirements including world heritage requirements, where applicable. However, the acquisition and routine management of land cannot address the loss of Aboriginal cultural heritage.

Limitations with the downstream ecological survey and assessment

EHG's submission on the EIS concluded that the ecological survey and assessment for downstream impacts associated with this project were limited and inconclusive. EHG maintains this view. For example, the response regarding impacts on *Eucalyptus benthamii* is inadequate. EHG previously raised concerns that inundation would affect regeneration, but no additional information or assessment has been provided relating to this matter.

The revised Assessment of Significance for the project now identifies that there will be significant impacts on *Rhodamia rubescens* and *Pomaderris brunnea*. These species occur within protected lands (in proximity of Longneck Lagoon). Clarification is needed to confirm whether the impacts identified by the updated assessment will include significant impacts to these species on-park. If so, specific and additional offsets will need to be identified for these species.

Bilateral Assessment

EHG notes that this project is also being assessed under the Bilateral Assessment Agreement between the Australian and NSW governments. EHG considers that the assessment has been done in accordance with the requirements of the *Environment Protection and Biodiversity Conservation Act 1999*.

Department of Planning and Environment

Environmental management plan required under the Water NSW Act 2014

NPWS notes references in the PIR and Submissions Report to the Environmental Management Plan (EMP) required under the *Water NSW Act 2014*. There appears to be continued confusion about the role and status of the EMP.

The EMP to be prepared under the *Water NSW Act 2014* is a separate statutory document and subject to separate statutory approvals. It must be consistent with any planning approval for the project. It is the Minister for Environment and Heritage's role under the *Water NSW Act 2014* to determine the matters that are to be addressed by the EMP and the PIR (and planning approval) cannot pre-empt this requirement.

Non-Aboriginal Heritage

EHG does not agree that a Heritage Interpretation Strategy is sufficient to address the impacts to the State Heritage Listed Haviland Park. EHG recommends that a detailed Heritage Interpretation Plan be prepared.

Hydrology and Aquatic Ecology

The response provided does not address concerns raised by EHG in its submission on the EIS. The areas impacted by inundation have not been assessed, which means the extent and severity of direct and indirect impacts to the aquatic environment have not been fully articulated or understood.

Erosion

In the EIS submission, EHG disagreed with the assessment of the degree of likely impacts on bank erosion, displacement of habitats and impacts to wetlands and floodplain communities.

The Submission Report states that further information on these impacts is discussed in section 4.2.2, but this section only deals with groundwater, not bank erosion and other matters. It is noted Appendix G of the PIR concludes that there will be possible increases in localised bank failures and increases in bank erosion in one reach. EHG considers the impact assessment regarding these matters is likely an underestimate.

WaterNSW should clarify the following:

- whether any downstream erosion impacts are likely to impact lands protected under the *National Parks and Wildlife Act 1974*, including at Yellowmunde Regional Park
- whether erosion will impact Aboriginal cultural heritage, given the known values of Yellowmunde Regional Park, and other park values in general
- if such impacts are likely, any engagement that has occurred with the relevant Aboriginal communities
- measures proposed to mitigate, offset, or compensate for impacts to Aboriginal cultural heritage and park values.

Department of Planning and Environment

Floodplain Risk Management

EHG had previously identified many matters in the assessment of flood risk management that need further consideration, corrections, or additional information.

On review of the Submissions Report there is no further information required by EHG on floodplain risk management. Further assessment investigation will be required at the future detailed design stage should the project proceed.

Please note that EHG includes NPWS and Heritage NSW and the advice provided in this submission refers to both. In addition, a response on climate change risk, which was included in the EHG submission on the EIS, will now be provided by the Office of Energy and Climate Change in Treasury.

To achieve the best outcomes, EHG is available to work with the Planning Group and WaterNSW to address any outstanding matters and progress the offset strategies.

Should you have any queries regarding this advice, please contact Ms Louisa Clark, Director Greater Sydney Branch, Biodiversity and Conservation at louisa.clark@environment.nsw.gov.au or on 9585 6001.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Atticus Fleming".

Atticus Fleming

Acting Coordinator General
Environment and Heritage Group

Biodiversity Upstream

Plant Community Types (PCT) and species polygons

EHG's EIS submission noted several modifications needed to be made to the PCT mapping and species polygons.

These amendments have been generally implemented for both the upstream and construction site biodiversity assessment reports. EHG has met with WaterNSW's consultants to discuss some of the recommendations and agreement on changes, where appropriate. The recommendation to resurvey some vegetation plots was not implemented due to lack of access.

Offset Strategy

The biodiversity offsets approach set out in the PIR is noted. EHG recommends that the biodiversity offsets strategy is finalised in consultation with EHG prior to an approval decision.

Matters of National Environmental Significance

EHG's EIS submission noted that the assessment of listed threatened species and ecological communities in the exhibited EIS and BAR was generally in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* and the Secretary's Environmental Assessment Requirements (SEARs). However, it was noted that the remapping of PCTs and species polygons would likely be required following EHG's comments. This has been carried out satisfactorily.

Post-approval revisions

The PIR discusses future surveys to further define offsetting requirements for the project (page 81). The intention for these surveys is to confirm the presence or absence of species, and define species polygons accurately, rather than assume presence, with the expectation that credit requirements would be revised down significantly.

Earlier correspondence indicated that these surveys would be restricted to the project upstream impact area (PUIA). That proposal failed to recognise that the assumed 100 per cent loss in the PUIA was due to the inability of the Framework for Biodiversity Assessment (FBA) to calculate credit requirements for different levels of loss and different heights above full supply level (FSL). While the existing approach used in the EIS could result in an overestimation of biodiversity loss for some species or communities in the PUIA, it may also be an underestimation of biodiversity loss outside of this area.

As stated in other sections of this submission, EHG would not support the proposal by WaterNSW to retain an option to reduce offset obligations by undertaking further survey. If project approval is nevertheless granted with a condition which allows for further survey to determine the presence of certain species, the species and area to be surveyed, and the survey methodology must be agreed with EHG.

Biodiversity Downstream

Overall adequacy of assessment

EHG's EIS submission concluded that the ecological survey and assessment for downstream impacts associated with this project were limited and inconclusive. In reviewing the Submissions Report EHG maintains this view.

Supplementary ecological assessment

The PIR states that the Longneck Lagoon study, conducted by Stantec dated 6 September 2022, demonstrates changes to vegetation composition and integrity from inundation are subtle. However, the Longneck Lagoon study shows there are significant differences in relation to some measures when comparing affected and unaffected areas. EHG disagrees that the study shows that changes are subtle but acknowledges that longer term studies are required.

EHG considers the response to impacts on *Eucalyptus benthamii* is inadequate. EHG previously raised concerns that inundation would affect regeneration, but there is no additional information or assessment relating to this matter. Additionally, the PIR is inconsistent in its assessment of impacts to this species. The PIR states that the impact on this species has been recalculated by assuming total loss in the impact area. However, Table 6-7 of the PIR states the Kedumba Valley subpopulation is unlikely to be impacted.

EHG considers a total loss of the subpopulation is likely to have a significant impact on the species.

EHG notes that the PIR now considers the project will result in significant impacts on two threatened flora species, scrub turpentine (*Rhodamnia rubescens*) and brown pomaderris (*Pomaderris brunnea*). EHG notes that the PIR lists several proposed management actions for these species but does not state which agency will be responsible for implementing these actions. EHG considers that a commitment by WaterNSW to undertake actions for these species should be in place.

In the EIS submission, EHG disagreed with the assessment of the degree of likely impacts on bank erosion, displacement of habitats and impacts to wetlands and floodplain communities.

The Submission Report states that further information on these impacts is discussed in section 4.2.2, but this section only deals with groundwater, not bank erosion and other matters. It is noted Appendix G of the PIR concludes that there will be possible increases in localised bank failures and increases in bank erosion in one reach. EHG considers the impact assessment regarding these matters is likely an underestimate.

The PIR states that no mitigation measures are required to manage downstream biodiversity given the information provided in Appendices E and G. However, Appendix G recommends mitigation measures are undertaken. EHG maintains the view that

mitigation measures are required. If the proposal is to be approved, mitigation measures should be developed in consultation with EHG.

Biodiversity Offsets

There are no offsets proposed for downstream impacts. However, EHG notes that the PIR now identifies that several protected species are likely to be significantly impacted because of developing and operating the project. These species, and any other protected entity found to be impacted by the project, must be incorporated and represented in the biodiversity offset strategy currently being prepared by WaterNSW. This must include the retirement of a suitable quantity of offset credits where an impact has occurred outside of the national park estate.

Matters of National Environmental Significance

EHG's EIS submission noted that the assessment of listed threatened species and ecological communities in the exhibited EIS was generally in accordance with *Environment Protection and Biodiversity Conservation Act 1999* and the SEARs.

Biodiversity – Construction Site

EHG's EIS submission noted several modifications and amendments to the PCT mapping and species polygon. EHG considers that these amendments have been generally implemented for the upstream and construction site biodiversity assessment reports.

Biodiversity Offsets

The biodiversity offsets approach set out in the PIR is noted. The Submission Report states that on-park management could be utilised to offset impacts associated with the construction area. EHG does not consider that this was an agreed outcome for the offset strategy. EHG recommends that the conditions of consent include a requirement that appropriate credits are retired.

Matters of National Environmental Significance

EHG's EIS submission noted that the assessment of listed threatened species and ecological communities in the exhibited EIS was generally in accordance with *Environment Protection and Biodiversity Conservation Act 1999* and the SEARs.

Hydrological Assessment and Aquatic Ecology

The Submissions Report provided does not adequately address concerns raised by EHG in its submission on the EIS.

In responding to the EIS, EHG recommended that additional studies and analysis would be required before specific issues raised can be responded to adequately, particularly in relation to the calibration and validation processes undertaken as part of the development of the hydrological model for upstream areas.

An overarching concern is that the areas of inundation impact identified within the EIS have not been adequately assessed. The lack of assessment in these areas means the extent and severity of direct and indirect impacts to the aquatic environment are not fully articulated or understood.

The EIS identified inundation areas present a substantial impact to a pristine waterway environment. Raising the Warragamba Dam wall is highly likely to extend existing environmental impacts experienced at current full supply level across a broader footprint.

The inundation areas identified in the EIS are based on modelled estimates, relying heavily on the accuracy of the applied modelling and the assumptions incorporated into the modelled output. The assumptions have not been adequately articulated. The calibration and validation of the developed models is unclear and requires further clarification to demonstrate the reliability and accuracy in identifying areas of potential impact.

Given the magnitude of changes likely to occur from raising the Warragamba Dam wall, additional assessment of hydrological and ecosystem impact is recommended. It is also strongly recommended that further assessments include peer reviewed assessments and the provision of additional model calibration and validation results.

Floodplain Risk Management

No further information is required by EHG on floodplain risk management at this stage of the assessment process. Should the project proceed, further assessment investigation will be required at the detailed design stage.

Unless discussed below, EHG notes the response to issues raised in the EIS submission and considers these matters suitably addressed.

4.1.8.3 Flooding and Hydrology (Chapter 15)

Issue 10

The EIS showed that there is an increase in the closure duration for most affected bridges. WaterNSW indicates that these calculations were based on assumed levels prepared in 2019 and work is currently underway to update these figures based on the experience of flooding in 2021 and 2022.

EHG acknowledges the work undertaken by WaterNSW to date but highlights that it is prudent to assess any potential increases in the closure duration of affected bridges in the economic assessment.

WaterNSW refers to Table 21-15 in Chapter 21 of the EIS as the section that includes information on the bridge closure. However, this table does not provide the required additional information on bridge closures or the duration of traffic interruption at road bridges for prolonged release of the floodwater from the flood mitigation zone (FMZ).

EHG considers that this can be investigated as part of the detailed design stage of the project.

Issue 14

WaterNSW's response states "Flood property damages are predominantly flood peak related and not driven by flood duration". This is not technically correct.

The duration of flooding (particularly greater than 72 hours) is a key parameter for property damage as identified in the Department's guideline (DECC 2007). Increasing the duration of inundation from 100 hours to 200 hours would have an adverse impact on the extent of property damage.

EHG considers this additional information can be provided in the detailed design stage of the project.

Issues 19 and 20

The response to Issue 19 states "In the event of a second forecast significant flood inflow, it would be possible to empty the whole of the FMZ within **10 days**. This would allow FMZ capacity to mitigate further downstream flooding".

This is inconsistent with section 15.8.5.1/page 15-109, which states, "In the event of a second forecast significant flood inflow, it would be possible to empty the whole of the

FMZ with piggy-backing within **3-4 days**. This would allow FMZ capacity to mitigate further downstream flooding.”

Clarification on the timing for release is needed as part of the detailed design stage of the project.

4.1.8.4 Flooding and Hydrology Assessment Report (Appendix H1)

Issue 3 and 4

EHG’s comments related to the inconsistencies of Table 3-12 Appendix H1 with the data in Table 8-15 and of Table 3-15 Appendix H1 with data in Table 8-18 in Appendix M. These inconsistencies, respectively, relate to impacted residential properties and the number of people requiring evacuation during different flood intensities. While the Submission Report did not address these inconsistencies, WaterNSW has confirmed that the values presented in Chapter 21 and Appendix M of the EIS are correct.

EHG notes the difference is minimal and clarification on this inconsistency can be provided during the detailed design stage.

4.1.8.5 Socio-economic, land use, and property (Chapter 21)

The response is limited to highlighting the benefits of the project. It would be prudent to adequately address the adverse impacts on the low-lying area.

More information on the adverse impacts on the low-lying area should be including as part of the detailed design stage of the project.

4.1.8.6 Socio-economic, Land Use, and Property Assessment Report (Appendix M)

Issues 5 and 6

WaterNSW’s responses state that a state environmental planning policy (SEPP) is an example of a suggested instrument. It also states, “The final details of a SEPP and its application, if such an instrument is adopted, are yet to be concluded. The making of any such SEPP in relation to flood controls for the downstream area is outside of the scope of the Project.”

EHG agrees that all reference to a SEPP, other environmental planning instruments, or land use controls are outside the scope of this project. Accordingly, WaterNSW should not include suggested planning instruments or flood related land use controls in the detailed design stage of the project.

The following matters are considered to have been adequately addressed by the Response to Submission or do not requiring any further comment:

- Consideration of the effects of climate change including sea level rise (4.1.8.1 Issues 1 and 2 and 4.1.8.3 Issue 15). WaterNSW states the climate change assessment considered a broad range of increased rainfall scenarios based on dynamic down scaling and temperate scaling. The range covers the projections from the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report.
- WaterNSW agrees that the detailed design stage of the project will use the latest available climate change projections from the IPCC.

Protected Areas

The following comments are provided based on existing available information about the expected scope of temporary inundation associated with the project, as set out in the EIS and the PIR.

Should additional analysis or information produce new conclusions or clarification regarding the extent and duration of inundation events, and/or environmental impacts arising, National Parks and Wildlife Services (NPWS) may need to reconsider the feedback provided here and/or provide additional or revised comments.

Except where specifically indicated, these comments are focused on the upstream impacts of the project.

Impacts to national park estate and values

The EIS, PIR and Submissions Report confirm that the project will result in adverse environmental impacts to lands that are reserved and subject to the highest levels of statutory, in-perpetuity protection under the *National Parks and Wildlife Act 1974* (NPW Act), including lands that are World Heritage listed.

The values within the national parks estate that will be adversely impacted are significant and broad. They include:

- biodiversity, including threatened species and endangered ecological communities, which are also part of the outstanding universal values (OUV)
- non-Aboriginal and Aboriginal cultural heritage (also OUV)
- World and National Heritage values, noting:
 - there is likely to be loss of Aboriginal cultural heritage sites and not merely “diminution” of values (PIR, page 77)
 - there will be cumulative harm to intangible values resulting in “irreversible harm to the cultural and spiritual connection” of Aboriginal people to Country (PIR, page 39)
 - degradation and damage to biodiversity, including significant flora and fauna, will result in alteration, modification, obscuring or diminishment of these elements of the OUV
 - upstream lands that will be impacted by the project are currently the subject of an assessment for National Heritage listing, which may be a precursor for potential World Heritage nomination and listing
- wild rivers and wilderness (also OUV)
- recreation
- park management assets
- values arising from the inclusion of the relevant land as part of the NSW, Australia and global protected area system.

NPWS considers that the project impacts will be:

- detrimental to these values in the short-term, long-term and ongoing
- inconsistent with the purpose of reserving these lands as part of the national parks system
- inconsistent with the protection and maintenance of the OUV of the GBMWSA.

As a general principle, NPWS's preference from a conservation and park management perspective is that these impacts **do not occur**. However, NPWS recognises that the NSW Government may need to decide between competing priorities – the conservation of national park and World Heritage values and flood mitigation objectives. It is not the responsibility of NPWS to comment on this decision or the relative merits of the competing objectives.

Offsets

If the project is approved, then substantial and clear offset and compensation arrangements must be included as enforceable conditions.

This is essential to fully compensate for the impacts to the values of the national parks and reserves e.g., to ensure that there is no net loss of biodiversity from the national park estate and to ensure the effective replacement of any areas that is, in effect, lost from the national park estate and World Heritage area. Such compensation and offsets measures must:

- ensure the overall integrity of the national parks estate and World Heritage area is maintained
- be secured under transparent, ongoing arrangements.

Biodiversity offsets for the upstream impact area

The biodiversity offsets approach set out in the PIR is noted.

The following comments primarily address biodiversity offset matters arising from the impacts upstream and on-park (within the Project Upstream Impact Area (PUIA)). NPWS has no specific comments to make in this section on offsets that may be required for the construction footprint of the project; this is addressed in the 'Biodiversity – Construction Site' section of the EHG submission. Brief comments on specific downstream biodiversity impacts and offset matters are provided in other general matters below.

If project approval is granted, NPWS **submits that the following arrangements must be implemented to fully compensate/offset relevant impacts on biodiversity:**

- biodiversity offset actions to be delivered by an on-park program of management actions that achieve a significant uplift in values, above the outcomes expected from "business as usual" park operations
- the program to be managed by NPWS
- the program must deliver biodiversity benefits on-park that are at least equivalent to the assumed loss in the PUIA, to ensure a no net loss of biodiversity outcome as a minimum

- the delivery area of such a program to include **existing lands** that are reserved or acquired under the NPW Act within the GBMWA, or in adjacent or proximate national parks or reserves
- funding for the program being delivered up-front, prior to or concurrent with the commencement of construction.

NPWS notes that provision may need to be made for selected on park biodiversity offsets to be delivered off-park, where it is not feasible to deliver the required managements actions on-park, noting that upstream off park biodiversity impacts may also be offset by actions off park.

NPWS also acknowledges that there may be some limited, potential scope for biodiversity offset actions to be delivered on **lands to be acquired** as part of the protected land offsets program (see below), but **only** if such actions are similarly beyond “business as usual” park management and would deliver an appropriate uplift in biodiversity values. NPWS notes this option would add complexity to any planning approval and will require further consideration to ensure there is sufficient clarity in any conditions of approval about the circumstances when it may apply. This may include trigger points for detailed action plans and additional resourcing to be provided to enable an uplift of biodiversity values on land acquired as part of the protected land offsets program.

NPWS **would not support** the proposal by WaterNSW in the PIR to retain an option to reduce offset obligations by undertaking further survey (PIR, page 81). This is because the existing approach used in the EIS to manage the complexities of different inundation events, which assumed 100 per cent loss of biodiversity in the PUIA, is already a pragmatic compromise. In other words, while it could be an overestimation of biodiversity loss in the PUIA, it may also be an underestimation of biodiversity loss in the area outside the PUIA. If project approval is nevertheless granted with a condition which allows for further survey to determine the presence of certain species, the species and area to be surveyed, and the survey methodology **must be agreed with EHG**.

NPWS **would not support** any proposal for WaterNSW to lead the delivery of on-park biodiversity offset actions (Submissions Report, page 145). The relevant actions must be integrated with core national park management noting the additionality requirement. Accordingly, it must be delivered by NPWS to ensure success and efficient and cost-effective delivery, and to avoid duplication. Arguably it is required by law to be implemented by NPWS, which is vested with the statutory authority to manage national parks. Furthermore, there is no evidence that WaterNSW has the relevant experience, capability, or expertise to deliver the required science and land management programs on park.

The specific details of the on-park program would need to be addressed in a biodiversity offset plan, prepared post-planning approval, and approved by the Coordinator General of EHG or delegate. This is like the approach adopted in the planning approval for Snowy 2.0 – Main Works.

If approval is recommended and subsequently granted, it should be subject to conditions that are sufficiently specific to confirm:

- the level of biodiversity offset to be delivered including the relevant species and communities
- the quantum of resources to be allocated to deliver the on-park biodiversity offset program
- the timing of delivery of resources, which should be upfront (prior to or concurrent with construction commencement) to:
 - provide certainty and public confidence in planning and delivery of the offset program
 - enable immediate commencement of some actions, such as genomic salvage of species from the impacted area (e.g., collection of plant and seed materials from the lands to be inundated)
- purposes for which the resources are to be used for, including staffing and modest administrative costs
- area subject to the program
- primary role of NPWS in design, management and delivery.

Protected land offsets

The protected lands offsets approach set out in the PIR is noted.

In principle, if project approval is granted and sufficient resourcing provided, NPWS **submits that the following arrangement must be implemented:**

- protected land offset actions to be delivered by NPWS to acquire priority lands (as determined by NPWS and the Minister for Environment and Heritage) for reservation under the NPW Act to support the overall integrity of the national parks system and to fully compensate for the area and values in the PUJA
- priorities for acquisition to be:
 - lands with appropriate biodiversity, cultural heritage, landscape, and other values consistent as far as possible with the values of the land impacted in the PUJA
 - lands with attributes that approximate or are potentially comparable with the OUV of the GBMWA
 - as a last resort, land that is needed to support efficient land management, such as for secure legal access, boundary management and bushfire operations and the like
- the program must cover costs associated with acquisition of the priority lands and management for 20 years, with funding for elements delivered upfront, prior to or concurrent with construction commencement
 - this includes NPWS staffing and modest administrative costs
- the quantum of lands to be acquired must be greater than the area of national park estate impacted, including a premium (additional multiplier) to reflect the World Heritage status of part of the impacted area.

The specific details of the protected lands offset program would need to be addressed in a delivery plan, prepared post-planning approval, and approved by the Coordinator General of EHG or delegate.

If approval is recommended and subsequently granted, approval should be subject to conditions that are sufficiently specific to confirm:

- area of land to be acquired and financial resources to be allocated for this purpose
- upfront contribution of the required resources
- NPWS determines acquisitions priorities and manages and delivers the program.

Out of scope matters proposed to be addressed by protected land offset program

NPWS notes that the PIR implies that impacts of the proposal to Aboriginal cultural heritage (page 75) and World Heritage values (page 78) would be addressed by the land management funding component of the protected land offset program.

NPWS **does not agree** with this position.

The management funding to be provided as part of the protected land offset program is required to manage the acquired lands in accordance with standard park management requirements (i.e., business as usual), including World Heritage requirements, where applicable. However, the acquisition and routine management of land cannot address the loss of Aboriginal cultural heritage.

Heritage NSW are best placed to advise on impacts to Aboriginal cultural heritage (should the project proceed). See further comments below about proposed on-park actions by WaterNSW.

Environmental management plan

NPWS notes references in the PIR and Submissions Report to the EMP required under the *Water NSW Act 2014*. There appears to be continued confusion about the role and status of that future EMP.

As stated in the EES submission to the EIS, “The EMP is not the mechanism – either in part or wholly – for determining offsets for the Project impacts on protected area values. The Warragamba Offset Program must address offsets for impacts on protected area values”.

The EMP to be prepared under the *Water NSW Act 2014* is a separate statutory document and subject to separate statutory approvals. It must be consistent with any planning approval for the project. The PIR (and planning approval) cannot pre-empt the requirement under the Act for the Minister for Environment and Heritage to determine the matters that are to be addressed by the EMP.

NPWS recommends that any planning approval and conditions of approval clarify that any mitigation, offset or project implementation requirements are a part of the planning decision, and should not rely on or assume the content of the future EMP to be prepared under the *Water NSW Act 2014*.

Other general matters

Impact to park assets

The Submissions Report (sections 4.1.9.3 to 4.1.9.7) downplays the risks and potential impacts of future inundation to:

- pest, weed and erosion/sedimentation impacts on-park that arise from inundation events caused by the project, all of which will pose risks to the condition and ongoing survival of existing biodiversity values
- existing visitor facilities, historic items and park assets (such as culverts and management trails), which will require additional ongoing maintenance and upkeep actions in response to inundation caused by the project.

If approved, conditions should be applied to require:

- independent preparation and regular updating of pre-inundation asset condition reports covering the above matters
- independent post-inundation assessments of asset condition to determine impacts caused by inundation
- WaterNSW to undertake actions or works to restore the condition of assets to pre-inundation standard (or provision of funding to NPWS to implement such works)
- all actions and works to be completed to the satisfaction of the Coordinator General of EHG or delegate.

See further comments below about proposed on-park actions by WaterNSW.

Non-Aboriginal and Aboriginal cultural heritage actions on-park

The PIR package includes statements indicating that WaterNSW will undertake various actions within lands that are part of the national parks estate. These include:

- archival recording of historic heritage structures, inspections post-flood events, preparation of management plans, and condition assessments and works (Appendix G – Non-Aboriginal Heritage Supplementary Report – pages iv and 83 mitigation measures)
- develop and implement a policy to improve access to Country and facilitate visits to Country (Appendix ACH 22 and ACH 23).

As indicated above, NPWS would support actions being taken to independently assess the pre-inundation condition of park assets and then implement post-inundation remediation.

NPWS would also support the following actions, to be led by NPWS, to facilitate Aboriginal community access and engagement in the management of Country:

- Aboriginal stakeholders to deliver on-park conservation and cultural initiatives
- WaterNSW working with NPWS and Aboriginal stakeholders to assess and document Aboriginal cultural heritage values and resource management programs to enhance these and facilitate access to Country.

However, NPWS has primary statutory responsibility for the management of lands reserved under the NPW Act. As such:

- as a first preference, any such proposed actions (and others) within the national parks estate would be determined and led by NPWS (with resourcing provided by WaterNSW)
- if such works are proposed to be undertaken by WaterNSW or others then this must only occur with prior consultation, agreement, and approval of NPWS, and works completed to the satisfaction of the Coordinator General of EHG or delegate – in effect, reflecting the statutory responsibilities of NPWS, this option would involve WaterNSW acting under the direction and authority of NPWS
- this should be reflected in any conditions of approval.

Property access - Yerranderie

The Submissions report (SE36) proposes to engage with communities via a community and stakeholder and engagement plan, and to consult NPWS and other parties about impacts and mitigation measures to affected properties.

Consultation and stakeholder engagement is not an appropriate mitigation measure. Any planning approval should set specific mitigation actions in the conditions of approval, or require these to be identified, approved and then implemented by WaterNSW during project implementation.

Project justification

The PIR states that the World and National Heritage listings that occurred after construction of the existing dam “implicitly accept the risk of temporary inundation associated with the dam” (see for example, page 108).

This is a misrepresentation. It is particularly noted that prior to recent amendments to the *Water NSW Act 2014* to enable the project to proceed, inundation of national park lands now proposed by the project was prohibited by the *National Parks and Wildlife Act 1974*.

NPWS is therefore of the view that unfounded assumptions about the scope or context for World and National heritage listings are not a valid consideration in terms of the planning assessment and decision-making process. Such statements should not be afforded any specific weight.

Downstream Impacts

Threatened species

The revised Assessment of Significance for the project now identifies that there will likely be significant impacts on *Rhodamia rubescens* and *Pomaderris brunnea*. These species occur within the national parks estate (in proximity of Longneck Lagoon).

Clarification is needed to confirm whether the impacts identified by the updated assessment will include significant impacts to these species on-park. If that is the case, then specific and additional offsets will need to be identified for these species.

Erosion

The PIR (7.3, Key benefits and impacts) states that, among others, a principal impact of the project is, “Potential increased bank erosion downstream associated with discharge of the [flood mitigation zone] FMZ, however, the additional analysis carried out during preparation of the Submissions report and PIR has identified that this risk would not be as widespread or uniform as assumed in the EIS, with some reaches being at a lower risk while others would have a relatively higher risk.”

The Submissions Report (Appendix G Supplementary geomorphology assessment, Attachment C) then lists two sites in or close to Yellowmundee Regional Park where the potential effect on bank erosion includes a “probable increase in erosion”; being site CATTAIK3 for ARI 50 and 100; and site HOPEFARM1 for ARI 20 and 50.

Yellowmundee Regional Park includes known areas of Aboriginal cultural heritage value of very high significance to the Aboriginal community. That includes the declared Shaws Creek Aboriginal Place, which is afforded additional protection under the *National Parks and Wildlife Act 1974*.

WaterNSW should provide clarification on the following:

- whether any downstream erosion impacts are likely to impact lands protected under the *National Parks and Wildlife Act 1974*, including at Yellowmundee Regional Park
- whether any such erosion will impact Aboriginal cultural heritage, given the known values of Yellowmundee Regional Park, and other park values in general
- if such impacts are likely, any engagement that has occurred with the relevant Aboriginal communities
- measures proposed to mitigate, offset or compensate for impacts to Aboriginal cultural heritage and park values.

NPWS comments above on impacts to park assets are also relevant here.

Bushfire and emergency access

Access is currently available across the top of the existing dam for bushfire and emergency access purposes. This is essential for actions by NPWS and NSW Rural Fire Service (RFS) in the Erskine Range and Blue Labyrinth areas.

If project approval is granted, conditions should be included to address the following matters:

- **Pre-construction** – final designs must incorporate requirements for emergency services access across the dam wall, including by heavy plant and equipment
- **During construction** – as no access will be available across the dam wall during this period, alternative fire management strategies will need to be identified and implemented and funded by WaterNSW in consultation with NPWS and RFS
- **Post-construction** – ongoing access arrangements across the new dam wall must be implemented in consultation with NPWS, RFS and relevant emergency services agencies.

ABORIGINAL CULTURAL HERITAGE

Subsurface Testing and Potential Archaeological Deposits (PADs)

Heritage NSW welcomes the additional exploration presented in the PIR - Appendix F - Supplementary assessment to Aboriginal cultural heritage assessment report (Supplementary Assessment) of site records from the Aboriginal Cultural Heritage Assessment Report (ACHAR), to clarify whether a site was or should be associated with PADs. Heritage NSW notes that the potential number of open camp sites/isolated artefacts now assessed to be associated with PAD has increased to 32.

Heritage NSW welcomes the Supplementary Assessment's inclusion of a revised consideration of archaeological potential based on soil landscape characteristics and slope inclination. While a map has been provided, the broad scale reduces its ability to be adequately interrogated. The limitations of this approach, with reference to closed sites (those shelters with potential archaeological deposits within the shelter, spilling from a shelter and/or the art on the rock shelter itself), are recognised in the Supplementary Assessment, however, they are not corrected. No further reference is made to how this information is used to quantify impacts or identify mitigation requirements other than at specific sites.

The Supplementary Assessment reiterates that no archaeological test excavations were conducted within the project area, based on the wishes of the registered Aboriginal parties (RAPs). However, consultation records indicate test excavation was not opposed by all parties. Heritage NSW recommends that archaeological testing of the 32 PADs be undertaken prior to the commencement of work to determine the nature and extent of impacts, so that mitigation measures can be appropriately designed and implemented. This should be a condition of consent.

Heritage NSW notes the positive attempt to additionally provide a local case study on the impacts of flooding on open site contexts. Heritage NSW agrees that the presentation of data from Longneck Lagoon does support information gleaned from other studies, which demonstrate that effects of inundation will be variable, based on location and nature of flooding (backwater flooding as compared to stream flow).

Heritage NSW notes, however, that the context of the lagoon is different to the dam, being natural rather than artificial. The study was also conducted under conditions where vegetation growth is high, with increased vegetation growth potentially masking the impacts of erosion that may be seen under less optimal conditions.

Survey Results

Heritage NSW welcomes the additional response (Section 6.2 of the Supplementary Assessment) to its principal concerns on the rationale for survey coverage and methodology. Heritage NSW notes the references to inclusion of targeted survey locations in response to feedback from the RAPs.

The Supplementary Assessment clarifies that the survey results in the original ACHAR related to survey effort within the PUIA (total area of 1401 hectares) and involved pedestrian survey of a sample of 464 hectares. Heritage NSW notes that Table 49 of the Supplementary Assessment includes the additional survey results from the existing upstream impact area and above the PUIA, presenting data for a total area of 2105 hectares (excluding water). The reported levels of visibility and exposure in Table 49 seem unusually high, which elevates the effective coverage levels.

However, Figure 10 of the Supplementary Assessment shows that there are still substantial portions of the upstream study area that were not subject to survey, including whole sections of specific stream catchments. The figure allows for basic understanding of areas surveyed, however it is a single A4 map for a large and dispersed area. Provision of maps at suitable scale and/or access to GIS files or layers containing relevant information is required to allow sufficient review of the information presented.

More sites identified at risk

Heritage NSW sought additional ground-truthing of sites but notes that no further surveys were conducted to inform the Supplementary Assessment and PIR. As discussed below, based on revised predictive modelling, the Supplementary Assessment acknowledges the higher likelihood of sites with rock art and grinding grooves being present within specified sections of the unsurveyed area. No attempt has been made to conduct additional survey of these areas.

Predictive model

Heritage NSW acknowledges that mapping (predictive modelling, survey coverage and survey outcomes) is of improved quality. However, it remains of insufficient resolution or scale in the Supplementary Assessment to allow for professional and public interrogation. Given the size and distribution of the area, it would have been advantageous to have linked PDFs or access to GIS files or layers containing relevant information to allow for readers to review at suitable resolution and details.

The Supplementary Assessment uses the Department of Planning Aboriginal Sites Decision Support Tool (ASDST) as a tool for revised predictive modelling to map the likelihood of specific site types occurring across the project area. However, due to the scale of the mapping and the fact that there is no overlay of survey locations on the maps, it is difficult to determine the relationship between areas with higher likelihood of site types and the extent of survey effort in these areas. It should also be acknowledged that the survey methodology was not developed using the ASDST data and so was not designed to target these identified high likelihood areas.

Based on the adjusted predictive modelling, the potential for sites containing rock art and grinding grooves to be present within specific portions of the unsurveyed project area is noted, while the potential for scarred trees and sites containing stone artefacts is referenced more generally across the entirety of the unsurveyed area. Rock shelters are not included in the predictions.

The predictive modelling based on ethnographic information references the potential for contact and historical archaeology associated with Aboriginal people living in the valley in the historical period. There is no subsequent discussion of this with reference to how these sites should be managed, including any provision for mitigation works.

Despite the refined predictive modelling, the Supplementary Assessment presents the same information included in the ACHAR in relation to the number of sites (including known and predicted sites) within the project area. That is, the refined predictive modelling has not been used to refine the quantification of sites within the project area. This is a limitation.

Site Analysis

The Supplementary Assessment includes an additional review of rock art within the project area with reference to the broader regional context. It is understood that there is a limited number of grinding groove sites and that key attributes for these have been recorded. From an archaeological perspective, it is understood that further analysis of the grinding groove sites at this stage may not provide further information regarding significance.

Significance Assessment

Heritage NSW acknowledges the additional PAD sensitivity modelling in the Supplementary Assessment, which identifies additional sites as containing PAD. The report provides an updated assessment of scientific significance for some of these sites with PAD (noting that some had already been assessed with reference to potential despite it not being specifically referenced) and were assessed to be of at least moderate significance based on research potential. The significance assessment for 21 rock shelters was also revised based on the presence of PAD within the shelter.

The additional information improves the understanding of individual site heritage significance levels. Scientific significance was updated for 43 sites, noting 297 sites did not have a re-assessed archaeological significance. No assessment of scientific significance for potential post-contact sites is provided.

The statement of significance references the very high social and cultural significance and high scientific significance of the project area, noting that this is not only due to the individual sites/places/features it contains but based on its values as a cultural landscape.

Further information on cultural values is provided, however this is provided from a desktop perspective only and is not primarily based on direct input from the registered Aboriginal parties.

Rock shelters

As discussed above, the Supplementary Assessment includes a re-evaluation of the significance of 21 rock shelters due to the likely presence of PAD within the shelters.

However, this was based on desktop review only. No test excavation was completed so the significance of rock shelters is on potential only, with no datable evidence obtained.

Ecologically sustainable development

Section 8.7 of the Supplementary Assessment provides responses in relation to ecologically sustainable development. It acknowledges the impacts to the overall cultural landscape, however it does not include any specific commentary on impacts to predicted sites.

Impact Assessment

Heritage NSW acknowledges that WaterNSW has undertaken a significant amount of additional assessment and has provided revised information in relation to Aboriginal cultural heritage.

Based on the review of the Supplementary Assessment, Heritage NSW makes the following comments and recommendations:

- if approved, the project will result in impacts to highly significant interrelated tangible and intangible Aboriginal cultural heritage sites and values
- the presence and clear expression of dreaming stories and song lines in the archaeological record of the Burratorang Valley is unique and by its very nature cannot occur elsewhere in NSW. The intangible values are specific to the Burratorang Valley and even if comparable sites, related to other intangible values, were to exist elsewhere, these will not offset the impact to the stories specific to this area
- that WaterNSW continue to work with the Aboriginal community to develop a model for long term protection, conservation and celebration of the significant values attributed to the cultural landscape of the Burratorang Valley
- that WaterNSW continue to survey and assess Aboriginal cultural heritage sites to identify and understand the complex values of the Burratorang Valley.

Environmental Heritage

The following comments are provided to address the applicant's response to the heritage issues previously raised.

Additional assessment of potential impacts

The Non-Aboriginal Heritage Supplementary Assessment has focused on providing additional assessment of four items included on NPWS Section 170 Heritage and Conservation Register in the upstream project area, and the State Heritage Register (SHR) item Megarrity's Bridge (SHR 01367). This document meets the intention of the recommendation.

Detailed assessment of significance of the archaeological potential within the construction area

This is addressed in Appendix H of the PIR (*Warragamba Dam Raising Non-Aboriginal Archaeological Research Design*). This document meets the intention of the recommendation.

Further detail on Jooriland Homestead, including mitigation measures

This is addressed in the Non-Aboriginal Heritage Supplementary Assessment.

It is noted that the Conservation Management Plan for the site, quoted in the Supplementary Assessment, assessed as State Significant under two criteria, however this has not been reconsidered or reassessed (p.61 Non-Aboriginal Heritage Supplementary Assessment).

A detailed heritage assessment should be undertaken to accurately determine the site's level of significance.

Clear mapping of heritage items within the study area

Additional mapping is provided within the Non-Aboriginal Heritage Supplementary Assessment. This documentation meets the intention of the recommendation.

Additional detail of impacts to SHR and NSW Maritime Heritage Database items downstream

The response to this recommendation states that the modeling predicts a reduction in the potential impacts to any downstream heritage items resulting from the proposal. This response is accepted.

Sensitivity mapping for upstream and downstream heritage items

Additional mapping is provided within the Non-Aboriginal Heritage Supplementary Assessment. This documentation meets the intention of the recommendation.

Recommendations for next steps for heritage items

The response states “as no significant impacts are identified within the upstream or downstream areas, no next steps are recommended.”

This is accepted, however the Supplementary Assessment includes various mitigation measures relating to the upstream sites (Section 7.2, p.83). These should be adopted and actioned by the proponent, should approval be granted.

The response states “the mitigation measures identified in the EIS apply to the construction area.” Regarding the Mitigation Measures for the construction area, particularly regarding the mitigation of impacts on SHR listed items such as Haviland Park, the proponent is encouraged to prepare a Heritage Management Sub-Plan, to be implemented as a part of the Construction Environmental Management Plan.

Updating Cumulative Impact Assessment

The response states that given the Supplementary Assessment has identified that significant impacts are unlikely, it is unnecessary to change the conclusions of the cumulative impact assessment. This response is accepted.

Prepare a Heritage Interpretation Plan

The response states that the proposed Heritage Interpretation Strategy (HIS) is sufficient to address this matter. This is **not supported**.

Given the level of impact to SHR listed Haviland Park (“High direct (physical) impact”), including the removal of all trees and vegetation, as well as impacts to other components within the construction area, interpretation is going to be imperative for understanding the place post construction phase.

A HIS is a high-level document containing overarching strategies. In this instance, a HIS will contain insufficient detail to provide concrete and practical recommendations as to how best communicate the heritage significance of the various components of the project area.

Heritage NSW reiterates the recommendation that a detailed Heritage Interpretation Plan be prepared. This should be undertaken early in the project timeframe, so its recommendations can be easily incorporated into design and post-construction remediation phases.

Specifics of Heritage Interpretation Plan

There is an opportunity for the Proponent to provide interpretation, which will allow the communication of the story of the Cultural Landscape, Aboriginal connections to Country, the dam construction and associated heritage places and stories.

This is considered a significant mitigation measure, particularly given the potential inundation impacts (particularly to Aboriginal and environmental elements) upstream.