Submission – Warragamba Dam Raising Project – SSI8441

Submitted by:

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In the role of Chair,
Regional Advisory Committee,
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The Regional Advisory Committee, NPWS Blue Mountains Branch objects to the proposal to raise the wall of Warragamba Dam for the temporary detention of flood water.

Status of group making the submission

Regional Advisory Committees (RACs) are appointed by the NSW Minister for the Environment under the *National Parks and Wildlife Act 1974* (NPW Act) to support the National Parks and Wildlife Service (NPWS). Members contribute their expert knowledge and experience to inform park management and achieve conservation outcomes across New South Wales. Members provide advice on policies and plans, activities and proposed activities, and have input into draft plans of management to help achieve the objectives of the NPA Act.

The Blue Mountains Branch of NPWS manages 58 national parks, conservation areas, historic sites and other reserves. A series of national parks protect much of the Blue Mountains between the Hunter Valley and the Southern Highlands. The value of this network of reserves has been recognised internationally through the declaration of the Greater Blue Mountains World Heritage Area.

Introduction

The RAC states its opposition to the proposal to raise the wall of Warragamba Dam for flood mitigation.

The committee considers that there are numerous and serious inadequacies in the process of assessing the impacts of the proposal. These will be considered below.

The committee also notes opposition to the proposal from a variety of sources beyond the expected response from the environmental sector.

The Select Committee on the Proposal to Raise the Warragamba Dam Wall produced its Interim report on October 21. The committee members, Mr Justin Field MLC (Independent) Chair, Hon Rod Roberts MLC (Pauline Hanson's One Nation) Deputy Chair, Hon Wes Fang MLC (The Nationals), Hon Shayne Mallard MLC (Liberal Party), Hon Taylor Martin MLC (Liberal Party), Hon Adam Searle MLC (Australian Labor Party), and Hon Penny Sharpe MLC (Australian Labor Party) unanimously called on the NSW government to look at alternatives to raising the dam wall, heightened scrutiny of the environmental impacts of the proposal and the consent of local Aboriginal people before any decision to proceed.

On 15 February 2021 the Chief Executive Officer of the Insurance Council of Australia, Mr Andrew Hall, wrote to the Chair of the Select Committee updating the ICA's position on the wall raising on the basis of meetings with Traditional Owners and concerns raised about the cultural heritage assessment stating: "…the position of the general insurance industry is now that without satisfactory environmental and cultural heritage impact assessments being completed and made public to allow for full and open assessment, the industry is unable to support the proposal as it currently stands".

Dr Chas Keys, former Deputy Commissioner of the NSW State Emergency Service gave evidence to the Select Committee that 'the raising of the dam wall will reduce the threat of flooding for the lesser, more frequent floods in these areas but will according to the government's own investigations achieve little mitigation in the bigger events. Dr Key's central concern was that this reduction in smaller and more frequent floods would lead to the so called "Levee Paradox" whereby flood mitigation efforts can drive a push for development on floodplains increasing overall risk.

Local Governments with a direct interest in the proposal have not been supportive. Blue Mountains and Wollondilly Councils are actively opposing the proposal while Penrith Council has voted not to support the proposal. Hawkesbury Council has previously voted down a motion to support the raising of the dam wall and the current situation is that council will review the EIS before finalising their position.

Specific Issues of Concern regarding the Environment Impact Statement

1. <u>Rejection of alternative management solutions to flooding in the Hawkesbury Valley</u>

   Professor Jamie Pittock from the Fenner Institute published a report on alternative flood management measures in September 2018. His recommendations were

a. Providing alternative flood storage by lowering the storage level of Warragamba Dam. This proposal has received support at various times from former Premier, Gladys Berejiklian, Emergency Services Minister for Police and Emergency Services, David Elliott, and John Barrilaro, former Deputy Premier.

   While recognising that this would reduce the capacity of Sydney's Water supply, the Draft Greater Sydney Water Strategy released in September 2021 details the alternatives to ensure water security including desalination, conservation and water recycling (including to potable supply).

b. Stop placing more people at risk by rejecting future development on the floodplain.

c. Improving evacuation routes.
   Investigations into flood mitigation strategies have found that effective evacuation is the only measure that guarantees a reduced risk to life in the Hawkesbury-Nepean Valley. A $950 million program of upgrading roads to allow evacuation at higher flood levels was considered before being dismissed due to cost in the Government's 2017 strategy.

d. Relocate the most flood prone residents.
   A large number of people on the Hawkesbury-Nepean floodplain live in houses that are flooded regularly: 5,000 houses lie under the 1:100 year flood level, and a further 7,000 lie under the 1:500 year flood level (Infrastructure NSW 2017). Importantly, many of these residences can potentially be flooded by lower catchment tributary rivers that

are not regulated by Warragamba Dam.

Relocation of people at risk is common globally and was undertaken at Grantham in the Lockyer Valley, Queensland where, after a series of catastrophic floods the entire town was rebuilt in higher ground.

The Insurance Council has come out in support of this proposal.

They are not acting out of self interest as they would either refuse insurance to people at risk or offer premiums that would be unaffordable to the resident.

Raising the dam as a flood mitigation measure will induce a sense of complacency in floodplain residents as suggested by Dr Chas Keys, former Deputy Commissioner of the NSW State Emergency Service.

Residents at high risk from natural disasters cannot obtain or afford insurance. The US Government has become the Insurer of Last Resort for householders along the Mississippi River as they cannot obtain commercial insurance against flood damage. The Australian Government has announced a $10 billion reinsurance pool to reduce expensive premiums in cyclone prone north Queensland.

The NSW Government will be exposed to continued future liabilities to assist flood affected residents, particularly as those individuals will have the expectation that the raising of Warragamba Dam will provide security for their home against flooding.

2. <u>Inadequacy of assessment of impact to Aboriginal Heritage in areas impacted by the proposal.</u>

The RAC has Aboriginal representatives on the committee and they will be making a submission on behalf of their organisations. Hence, this will be a more general commentary on the assessment of impact on Aboriginal Cultural Heritage of the proposed dam wall raising.

There is an overemphasis on sites rather than cultural landscapes in the impact assessment. Sites are recorded in the AHIMS database managed by the NSW Government as prescribed in National Parks and Wildlife Act 1974. This is likely to significantly under represent sites in the Burragorang Valley due to the general exclusion of people from the drinking water catchment areas and an understandable reluctance of Aboriginal parties to disclose sensitive cultural information.

The region has been nominated to be declared an Aboriginal Place under the National Parks and Wildlife Act 1974 based on the significance of the cultural landscape throughout the Gundungurra creation Songline, the journey of Gurangatch and Mirrigan. The nomination sets out a robust set of cultural values for the area, including:

- the strong association of the Cox and Wollondilly rivers with the Songline story of the ancestral beings Gurangatch and Mirrigan, the Eel and the Quoll;
- as a place where Aboriginal families lived and maintained connection with Country into the twentieth century; and
- as a place Aboriginal people have continued to visit, maintain knowledge, teach and research.

These Culturally important landscape features are vulnerable to impact from siltation from intermittent flooding and deposition in quiet backwaters after inundation.

Less than 30% of the impact area was surveyed and the assessment relies heavily on the predictive model. This is a flawed methodology and is patently inadequate due to the potential hurt and loss of Cultural identity of Aboriginal people with connection to this landscape.

The flooding of the Burragorang Valley by the original construction of Warragamba Dam occurred at a time when there was no legislation to protect Aboriginal Cultural Heritage. Aboriginal people living in the Burragorang Valley were displaced from Country and countless sites and features of Cultural significance were lost.

This past injury to Aboriginal people demands that a higher level of governance by the proponent and NSW Government must be met, requiring access to the highest standard of assessment of impact on Aboriginal Cultural Heritage. As the process and the determinations of the EIS have been rejected by Aboriginal stakeholder groups, this is clearly not the case.

The Insurance Council of Australia has stated "..that without satisfactory environmental and cultural heritage impact assessments being completed and made public to allow for full and open assessment, the industry is unable to support the proposal as it currently stands".

A curious inclusion in the EIS is the assertion that raising the dam wall will protect downstream Aboriginal Heritage from flood impact. These sites have been exposed to flooding both before and during European occupation, a period spanning millennia and also impacted by European land use for more than 230 years and this proposition must be considered as a "red herring".

3. <u>Calculation of area of impact</u>

There was commentary after the draft EIS was produced that biodiversity offsets could cost up to $2.88 billion (ABC, 23 March 2021).

The current EIS is clearly trying to reduce the exposure of the proponent to these high offsetting costs.

The EIS defines:
The *Biodiversity Study Area* to be between the FSL (Full Storage Level) and PMF (Probable Maximum Flood) covering 5280 ha.
The *Field Survey Area* as that affected by a 1 in 100 flood, ie 3740 ha.
The *Upstream Impact Area* as the "likely inundation area", defined as the area inundated at 2.78 to 10.25m above the FSL. The area of the upstream impact area is about 1400 hectares with 304 hectares occurring within the GBMWHA

The EIS states "since the construction of Warragamba Dam, the "likely inundation area" is the maximum level achieved". However, this is

- A short time period on which to base an assessment as 60 years is insignificant in geological time
- The EIS elsewhere considers risk of significantly higher rainfall due to climate change.

- The auxiliary spillway was built based on the risk of a 1 in 1000 flood.

This is creative accounting to minimise the impact area to reduce the cost of biodiversity offsets.

Conducting 20,000 Monte Carlo simulated events may sound rigorous, but it is of limited value because it is based on the single arbitrary assumption that the impact is related only to the increase in flooding associated with average maximum floods in 20-year periods.

While 20-year flood maxima may be relevant to matters (say) of plant death and regeneration, flood maxima associated with longer periods are also relevant. Periods of perhaps 100 years are required for old growth habitat to develop, and the effects of prolonged deep submersion of the various *Eucalypt* and *Corymbia* species which provide such habitat are unknown. Hence, 100-year flood maxima may be just as relevant to the longer term impact on total ecosystem health as 20-year maxima.

If 20,000 Monte Carlo events were simulated to determine the increase in average maximum inundation in 100-year periods, a different impact area would be derived. Although there would be overlap, it would cover an area beyond the 1400 hectares derived from the 20-year analysis.

Realistically, the impact area should be calculated on the area inundated by the water level at the "full" level when the wall is raised 14m. This is expected as the wall is not being raised 10.25 m (the "likely" event described) but 14 m with the provision for an additional 3 m for future contingencies.

In addition, the EIS discounts the impact zone by stating there are already areas inundated when the dam exceeds 100% capacity. This is used to exclude the FSL to 2.78 m above the current dam wall height from the impact area.

This should cut both ways.

If the area currently intermittently flooded when the dam exceeds 100% capacity is removed from the calculations, there should be an additional area of impact added above the FSL of the additional 14 m of detention for events that exceed FSL. This is clearly anticipated by the fact that the construction will include the abutments so that an additional 3 m of detention can be added.

4. <u>Biodiversity impacts.</u>

The EIS falls short in its assessment of biodiversity impacts.

a. Selective editing of consultants reports.

The expert advice provided by consultants contracted by SMEC in preparing the biodiversity impact assessment has been altered to "water down the envisaged impacts of the proposed development" (Dr Ross Crates, postdoctoral research fellow at the Fenner School in evidence to the Select Committee).

Ross Crates and ecologist Rachel Musgrave, who also worked for SMEC, indicated to the Select Committee similar accounts of the wording in their reports being altered to downgrade the environmental impacts of raising the dam's wall by at least 14 metres.

b. Offset Strategy

Ecologist, Steve Douglas, in evidence to the Select Committee, stated "he was not aware of any occurrences on private land that might be purchased and secured as a biobanking style of offset site. If that is the case, and the best available information to date is that that is accurate, those offsets simply cannot be achieved and there does not appear to be any measure to deal with those circumstances".

c. Incomplete seasonal data in surveys

The time period of assessment was
Flora: 11 October 2017 to April 2018, 95 plots and transects
Fauna: October 17 to April 18.
This suggests that only fauna present from late Spring to late Autumn were recorded, resulting in a lack of seasonal data on transitory species outside the survey period.

d. Impact on Critically Endangered Regent Honeyeater (RHE)

The EIS recognises that RHE habitat will be impacted.

Dr Crates, in evidence to the Select Committee stated "that with a critically endangered species that is already extremely habitat limited it simply will not be possible to offset this and the impacts by recreating habitat in other areas within a time frame that would be beneficial to the regent honeyeater, given the rate already of their decline". During a survey, he found 21 RHE and seven nests.

Dr Crates further stated that "there are probably less than 300 birds left in the world and there may be less than 150 to 200 birds occurring within the Greater Blue Mountains. So 21 birds and seven nests represents somewhere between 5 and 7 per cent of the global population detected breeding within a single round of survey visits. It is also worth noting that the survey effort only encompassed a very small proportion of the potential inundation zone".

The Chair of the Blue Mountains NPWS RAC has been involved in the BirdLife Australia Regent Honeyeater Recovery Program in the Capertee Valley since 1998. The idea of compensatory habitat is not really valid for this species in the short term. They nest in unpredictable ways and any existing breeding site is critical for any chance of survival of the species in the wild. Former project coordinator, David Geering , mentioned how the Victorian government declared a new reserve with suitable RHE habitat and a known local population to provide a secure area for breeding. Despite this being available, the birds nested in street trees in a nearby residential development.

The EIS notes that mature trees suitable for nesting of RHE will be unlikely to be impacted by intermittent flooding. This shows a lack of appreciation for the requirements of the species. Inundation is much more likely to cause loss of understorey plants which favours the exploitation of the habitat by noisy miners. This aggressive, territorial species displaces RHE in degraded habitat.

e. Re: Case study: Eucalyptus benthamii (Camden White Gums)

The Executive Summary, at page 31, presents an information box describing the CSIRIO study on the flooding of Eucalyptus benthamii. The findings of the study are summarised, without the qualification that the experimental conditions did not address the range of real world conditions that are expected.

Within the EIS the following statements can be found concerning the CSIRO study:

- [T]he depth of inundation is expected to be more variable and potentially much greater than 30 centimetres. Under these circumstances the impacts on Eucalyptus benthamii may be greater than identified in the controlled study. [Appendix F1)
- The assessment also noted that inundation to depths greater than 30 centimetres may result in mortality to affected individuals including soil-stored seed bank through flood stress. [Chapter 15)

The fact that the CSIRO study is displayed so prominently in the Executive Summary without any such qualifications is deceptive, to say the least.

More work needs to be done on how these controlled experiments relate to the distribution and condition of the species in nature.

Ecologist, Peter Ridgeway has been involved in the conservation management of Camden White Gum for many years. In a personal communication, he suggested that this species is largely absent from the flood zone, both on the Nepean and on the shores of Lake Burragorang.

Distribution mapping should be carried out to evaluate how well this species survives in the zone of intermittent inundation to evaluate the impact of an increased area of temporary flooding.

5. <u>Impact on the Outstanding Universal Values of the Greater Blue Mountains World Heritage Area.</u>

In 2019, at the 43rd session of the World Heritage Committee, it was noted with concern that the inundation of areas within the property, resulting from the raising of the dam wall, are likely to have an impact on the Outstanding Universal Value (OUV) of the property.

The selection of attributes contributing to the OUV of the GBMWHA for the 2021 Periodic Report produced the list

- Scleromorphic and Gondwanan flora
- Conservation significant flora and fauna
- Indigenous custodial relationships
- Geodiversity, water systems and natural beauty
- Boundary integrity; size and connectivity; wilderness and adjacent reserves

The EIS calculates the area of "likely impact area" to be about 1400 ha with 304 ha occurring within the GBMWHA (0.03%). The inadequacies of the use of the "likely impact area" have already been discussed.

It must be recognised that the reserve outside the boundary of the WHA also contributes to the OUV. The World Heritage Area is reviewed periodically and boundaries may change based on the current assessments.

The Australian Government has recognised this in funding to protect the values of the GBMWHA provided through the Natural Heritage Trust, Caring for Our Country and the National Landcare Program. This was applied to threatened eucalypt communities on shale based soils outside the World Heritage Area and National Park system as these were not well represented on the reserve and they contributed to the diversity of eucalypt flora, a key factor in the declaration of the WHA.

Thus, the impact of raising the dam wall is far greater than acknowledged in the EIS, as a result of underreporting the area of impact and the impact on reserved areas outside the WHA boundary that contribute to the OUV of the GBMWHA.

6. Assessment of climate change risk.

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a. The SEAR indicates that
   - The Proponent must assess the risk and vulnerability of the project to climate change in accordance with the current guidelines.
   - The Proponent must quantify specific climate change risks with reference to the NSW Government's climate projections at 10km resolution (or lesser resolution if 10km projections are not available) and incorporate specific adaptation actions in the design.

   The following table indicates the rainfall projections used in the EIS and the NSW Government's climate projections at 10km resolution (NARCliM) taken from the Regional Snapshots for the areas that contribute to the Warragamba catchment.

2030 Rainfall

	EIS	NARCliM Sydney	NARCliM Central West	NARCliM SE /Tablelands
	% change	% change	% change	% change
Season				
Summer	0 to +5	-14 to +15	-15 to +16	-18 to +20
Autumn	+5 to +10	-22 to +43	-11 to +42	-12 to +38
Winter	-5 to +5	-19 to +23	-12 to +3	-12 to +10
Spring	-5 to 0	-27 to +17	-25 to +11	-1 to -17
Mean		-13 to +18	-12 to +11	-10 to + 6

2070 Rainfall

	EIS	NARCliM Sydney	NARCliM Central West	NARCliM SE /Tablelands
	% change	% change	% change	% change
Season				
Summer	+10 to +20	-7 to +28	-10 to +26	-8 to +33
Autumn	+10 to +20	-15 to +42	-9 to +45	-6 to +45
Winter	0 to +10	-38 to +38	-25 to +34	-20 to +11
Spring	0 to +10	-14 to +37	-25 to +17	-2 to -19
Mean		-9 to +24	-10 to +22	-6 to +10

There appears to be no correlation between the EIS rainfall projections and the NARCliM data.

b. The EIS Summarises unmitigated high and extreme climate risks to the Project

Only two of the risks relate to the operation of the dam.

The remainder discuss climate risk during the construction phase. These should be considered as Weather Risks as the construction phase will be short term (five years) in what is our prevailing climate. Though there may be some small influence by the Near Term Climate Scenario (2030), the Far Term Climate Scenario (2070) is irrelevant

c. The influence of East Coast Lows

The EIS includes the statement
"As discussed earlier, storms and floods in NSW are often associated with ECLs. The patters (sic) of historical ECLs are yet to be fully understood, and as such, there is significant uncertainty in model outputs. However, there is consensus that while the frequency of ECLs may remain neutral or show a decline, the frequency of more intense ECLs events will increase."

In the past few years, there has been significant research on ECLs, which is available on the AdaptNSW website, under Research Findings

"ECL activity may change in the future and this should be considered by coastal and water managers
Climate modelling projects a decrease in the number of small to moderate ECLs in the cool season with little change in these storms during the warm season. However extreme ECLs in the warmer months may increase in number but extreme ECLs in cool seasons may not change.
Projected changes in ECLs into the future are smaller than the natural variability we see in ECLs from the historical record. This means that 'planning for the past' in addition to the future will enhance risk management by accounting for the broader range of ECL variability and associated risk. Risk analysis should consider the storminess of the 1600-1900 period".

This suggests that the EIS consultants are not using the most up-to-date research.

d. The EIS is negligent in assessment of risk to biodiversity in respect to climate change.

   The EIS identifies that increased upstream inundation frequency may lead to impacts related to environment due to potential loss of biodiversity and changes in water quality.

   Potential risks are not limited to frequency of inundation. Climate change is likely to cause synergistic impacts such as higher temperatures and increased frequency of heatwaves reducing the resilience of individual species to other impacts such as inundation and/or fire (see research undertaken by the Hawkesbury Institute of the Environment).

e. General Comment on Risk Assessment in the EIS

   The consultants have used the Likelihood/Consequence Matrix for risk assessments. While this is recognised under the Australian Standards, it is qualitative in its methodology. The International Standards Organisation have developed more robust, quantitative assessment methodologies that are more appropriate to a major infrastructure project such as this.