ARRC Australian River Restoration Centre

Major Projects Team
Warragamba Dam Raising Proposal
Department of Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Dear Sir/Madam,

Objection to the proposed raising of the Warragamba Dam wall (SSI-8441)

At the Australian River Restoration Centre, we believe that rivers and people need each other to thrive. Since our establishment in 2008, we have been raising awareness about the need to protect and restore Australia's rivers, creeks, wetlands and billabongs. We do this by providing landholders with access to the science and practical expertise needed to restore degraded rivers. We find the proposal to raise the Warragamba Dam wall deeply worrying and, along with others in our river community, we are very concerned that the New South Wales Government could consider such an action, particularly when it is in direct contravention of International and National agreements.

This is not the first proposal to raise the dam wall. In 1992, a proposal to raise the Warragamba Dam wall was rejected due to the extensive environmental impacts it would have caused. Thirty years later, we have an even better understanding of the consequences of dams, and the raising of dam walls, on habitats and ecosystems. The Warragamba Dam wall Environmental Impact Statement (EIS) presents these impacts in great detail, with 90% of the document outlining all the species, habitats and threatened ecosystems that will be negatively impacted. The fact that less than 10% of the EIS has any mention of mitigation measures is testament to the inadequacies of the proposal. In addition, the very premise that the dam wall will protect people living downstream from major flooding is flawed, and we have no confidence that the EIS has addressed this fundamental error.

We are at a loss to understand why the proposal to raise the Warragamba Dam wall is being considered at all, given that this world class National Park is inscribed on UNESCO's World Heritage list, and is home to some of the most stunning rivers in New South Wales. At its heart, the proposal is not simply about securing the ability to store more water and, in turn, seemingly deliver flood-resilient land to developers. Rather, it is about carelessly experimenting with environmental tipping points in areas that Australians, through our Federal and New South Wales Governments, have accepted custodianship for protecting. It is a source of shame and embarrassment that the New South Wales Government is ignoring International and National agreements to potentially desecrate an area recognised as having Outstanding Universal Value for the whole of mankind.

We have reviewed the EIS and find the following gaps and omissions:

1. **World Heritage Area:**

Flooding this (or any) World Heritage Area is in direct contradiction of International, National and State policies and agreements. The Greater Blue Mountains World Heritage Area Strategic Plan provides broad principles for the integrated management, protection, interpretation and monitoring of the parks and reserves that make up this World Heritage Area. Although the EIS notes that the proposed raising of the dam wall will inundate World Heritage Areas, little is made of the fact that **any environmental impact** will violate International and National Agreements the Commonwealth and New South Wales Government have signed.

Chapter 12, Matters of National Environmental Significance (page 57) notes that the presence of unique Scleromorphic species in the area around the Warragamba Dam is a key reason for its World Heritage listing and Universal values. The EIS concludes that it is impossible to precisely predict the effect of the dam raising on this species of trees, stating that "there would be a total loss of biodiversity value within the upstream impact area" and that the region would lose some of its value as a World Heritage Area.

Other unique tree species that "have limited tolerance to flood stress" (Chapter 12 Matters of National Environmental Significance, page 60) as a result of the dam wall raising include threatened species such as the Kanangra Wattle (*Acacia clunies-rossiae),* Bynoe's Wattle (*Acacia bynoeana*), Flockton's Wattle (*Acacia flocktoniae*), Gordon's Wattle (*Acacia gordonii*), and Downy Wattle (*Acacia pubescens*). These populations could be lost forever from the region that will be inundated if the dam wall is raised.

The Commonwealth and NSW Governments made a commitment to future generations to protect the Greater Blue Mountains World Heritage Area forever. How is it possible for this proposal to be considered when the Blue Mountains World Heritage National Parks have been given the highest possible International status and protection in recognition of the area's extraordinary biodiversity and ecological integrity? This was a question we asked Bob Debus and he shared his concerns about the worrying policy and legislative precedent that will be set if the dam wall proposal goes ahead:

Take me to the River Podcast - Why raising the Warragamba Dam wall raises serious concerns.

As pointed out previously, the EIS states that the region would lose some of its value as a World Heritage Area.

It is unsupportable.

2. **Assessment of impacts inadequate and perfunctory:**

The EIS is a voluminous document that seems designed to baffle rather than clarify. In our review we have been struck by the pages upon pages (see Chapter 8, Biodiversity Upstream) that list species and habitats endemic to this region, including threatened and critically endangered ecological communities. Given the amount of time spent in the document listing these communities, it was shocking to see the responses (outlined in the red boxes Table 8-27) which basically acknowledge that raising the dam wall will decimate these populations and habitats, and that nothing can be done to save them.

Table 8-27. Avoidance of impacts on biodiversity values

FBA section	FBA criterion	Avoidance mechanism proposed
8.3.1.3 (a)	*Impacts to endangered ecological communities (EECs) and critically endangered ecological communities (CEECs)*	The Project allows for the provision of a 14 metre dam raising, which provides an optimum balance between effective downstream flood mitigation and minimising, as much as possible, impacts associated with upstream temporary inundation. The scale and nature of the Project means that options to avoid impacts to EECs and CEECs are limited.
8.3.1.3 (b)	*Impacts to PCTs that contain threatened species habitat*	The Project allows for the provision of a 14 metre dam raising, which provides an optimum balance between effective downstream flood mitigation and minimising, as much as possible, impacts associated with upstream temporary inundation. The scale and nature of the Project means that options to avoid impacts to PCTs that contain threatened species habitat are limited
8.3.1.3 (c)	*Impacts to areas that contain habitat for vulnerable, endangered or critically endangered threatened species or populations*	The Project allows for the provision of a 14 metre dam raising, which provides an optimum balance between effective downstream flood mitigation and minimising, as much as possible, impacts associated with upstream temporary inundation. The scale and nature of the development type means that options to avoid impacts to areas which contain habitat for vulnerable, endangered or critically endangered threatened species or populations are limited.

The EIS Assessment limitations are striking in that they baldly state there is insufficient information upon which to base much of their analysis. See Chapter 8.8.4 (Biodiversity Upstream) where it is says:

- Biodiversity information within the study area and the broader locality – Up until the biodiversity surveys undertaken for the Project, there was very little ground-truthed vegetation mapping and other biodiversity information available for the study area and surrounding area. While the biodiversity survey works included a substantial portion of the study area, not all the study area was able to be visited due to its size and access constraints. Very few areas outside the study area were surveyed and therefore it was difficult to provide a context for some of the impacts with the regional presence of PCTs, flora and fauna.

This is an inadequate response given the EECs and CEECs threatened by the raising of the dam wall. Field work and further analysis of impacts to these communities in simulated flooding conditions is required to gain a true understanding of what will happen to biodiversity upstream of the dam. Instead Table 8-31 (page 8-81) repeats this sentence over and over again:

'Temporary inundation resulting from the Project may adversely impact this species'

Furthermore, the summary risk assessment of upstream biodiversity if the proposal goes ahead, reveals damages not only to the environment, but also legal, socio-economic and health consequences (Chapter 8, page 121, table 8-48, highlighted in red). The level of risk is assessed as 24/25 on the EIS report's risk matrix without any mitigation measures, and 20/25 even with mitigation measures. The consequences are significant, with both outcomes resulting in a range of impacts on biodiversity, such as ecosystem and habitat degradation, and widespread long-term impacts on habitat and species. This shows the impacts of the project are well understood by the authors of the EIS, yet are continually downplayed or overlooked.

Figure 8-17. Risk matrix

		Consequence				
		Negligible	Minor	Medium	Major	Extreme
	LEGAL	No legal consequences	No legal consequences	Incident potentially causing breach of licence conditions	Breach of licence conditions	Breach of licence conditions resulting in shutdown of Project operations.
	SOCIO-ECONOMIC	Impacts that are practically indistinguishable from the social baseline or consist of solely localised or temporary/short-term effects with no consequences on livelihoods and quality of life.	Short-term or temporary impacts with limited consequences on livelihoods and quality of life. Those affected will be able to adapt to the changes with relative ease and regain their pre-impact livelihoods and quality of life.	Primary and secondary impacts with moderate effects on livelihoods and quality of life. Will be able to adapt to the changes with some difficulty and regain their pre-impact livelihoods and quality of life.	Widespread and diverse primary and secondary impacts with significant long-term effects on livelihoods and quality of life. Those affected may be able to adapt to changes with a degree of difficulty and regain their pre-impact livelihoods and quality of life.	Widespread and diverse primary and secondary impacts with irreparable impacts on livelihoods and quality of life and no possibility to restore livelihoods.
	HEALTH	No health consequences	Accident or illness with little or no impact on ability to function. Medical treatment required is limited or unnecessary.	Accident or illness leading to mild to moderate functional impairment requiring medical treatment.	Accident or illness leading to permanent disability or requiring a high level of medical treatment or management.	Accident, serious illness or chronic exposure resulting in fatality.
	ENVIRONMENT	Localised (on-site), short-term impact on habitat, species or environmental media	Localised or widespread medium-term impact to habitat, species or environmental media	Localised degradation of sensitive habitat or widespread long-term impacts on habitat, species or environmental media. Possible contribution to cumulative impacts.	Widespread and long-term changes to sensitive habitat, species diversity or abundance or environmental media. Temporary loss of ecosystem function at landscape scale. Moderate contribution to cumulative impacts.	Loss of a nationally or internationally recognised threatened species or vegetation community. Permanent loss of ecosystem function on a landscape scale. Major contribution to cumulative effects
		A - negligible	B - minor	C - medium	D - major	E - extreme
Expected to occur during the Project or beyond the Project	a - expected	13	14	20	24	25
May occur during the Project or beyond the Project	b - may	8	12	19	22	23
Possible under exceptional circumstances	c - possible	6	7	11	18	21
Unlikely to occur during the Project	d - unlikely	4	5	10	16	17
Rare or previously unknown to occur	e - rare	1	2	3	9	15
		Risk Definition (see Table 8-47)	Low	Medium	High	Extreme

It is unacceptable.

3. Blue Mountains Perch will be placed under further threat:

The International Union for Conservation of Nature Red List of Threatened Species, founded in 1964, is the world's most comprehensive inventory of the global conservation status of biological species. It uses a set of precise criteria to evaluate the extinction risk of thousands of species and subspecies. The Blue Mountains Perch (*Macquaria sp. nov. 'Hawkesbury'*) is only found in this region and it will be threatened if the proposal to raise the Warragamba Dam wall is accepted. The EIS fails to appropriately note the impact on this species if the project goes ahead.

This species was previously considered part of *Macquaria australasica,* but since 1986 has been accepted as a separate taxon and is now recognised as a separate species. This species is assessed as Vulnerable based on its restricted distribution in the Hawkesbury-Nepean catchment. The area of occupancy of this species is estimated as 788 km2 (ranging between 172- 2,096 km2).

The species has already disappeared from parts of its historical range including the upper Kowmung River, Wollondilly River, and approximately 80 km of the Nepean River between the Bargo River junction and Penrith weir. The area of occupancy, extent of occurrence (EOO), habitat and number of locations are projected to decline with recent expansion of Redfin Perch distribution, and projected to decline further with increased water extraction for Sydney water supply, climate change impacts, and if the proposed raising of Warragamba Dam wall occurs. The population is severely fragmented, and these threats have increased the degree of fragmentation. Yet, the Blue Mountains Perch does not appear on the list of 'threatened fauna likely to be significantly impacted' by the dam wall being raised (Chapter 12 Matters of National Environmental Significance, table 12-33, page 83). This is an omission that needs to

be rectified and mitigation measures provided to ensure that the Blue Mountains Perch is protected.

It is inexcusable.

4. Understanding of floodplain hydrology is flawed:

The project rationale is deeply flawed, with nearly half the floodwaters that have historically impacted the floodplain coming from rivers outside the Warragamba catchment. On average, 45% of floodwaters are derived from areas outside of the upstream Warragamba Dam catchment. This means that no matter how high the dam wall is constructed, it will not be able to prevent flooding in the Hawkesbury-Nepean Valley downstream.

There are many alternative options to raising the Warragamba Dam wall that would protect existing floodplain communities. A combined approach of multiple options has been recommended as the most cost-effective means of flood risk mitigation. Alternative options were not comprehensively assessed in the EIS. Any assessment of alternatives does not take into account the economic benefits that would offset the initial cost of implementation.

We feel that the EIS is minimising the ~$2.8 Billion offset cost by claiming that the upstream habitat that will be destroyed is only the land in the 1:20 year inundation zone, rather than 1:100 year flood area. The 1:100 year flood zone area will be affected by the dam wall being raised and needs to be included in the biodiversity offset actions. In addition, the EIS Biodiversity Offset Plan for the project (Chapter 13 Biodiversity Offset Strategy and Appendix F6) is insufficient and does not adequately apply the principles of the Environment Protection and Biodiversity Act 1999. The offset actions in the EIS are unclear, often avoiding to mention that the actual and proposed actions listed to minimise harm, are not enough to protect the large array of native flora and fauna in the surrounding area.

We asked Professor Jamie Pittock about the rationale for the proposal to raise the dam wall, and his explanation clearly highlights the flawed assumptions and lack of hydrologic understanding underpinning the approach. Listen to the podcast for more details.

Take me to the River: Is raising dam walls an effective strategy to manage climate change impacts?

The lack of support for the raising of the dam wall by the Insurance Council of Australia, highlights the flaws in the project rationale. If the raising of the dam wall goes ahead people building their homes and living on the floodplain will be placed at risk, duped into believing their lives and assets are safe.

It is indefensible

5. ‘Wild River’ status of the Kowmung

The Kanangra-Boyd wilderness is the second largest wilderness in NSW, and yet the EIS Executive Summary for this proposal does not once mention ‘wilderness’. We believe this is a

significant omission as the Kowmung River is a declared 'Wild River' and is protected for its pristine condition under the National Parks and Wildlife Act 1974. Wild rivers are those rivers of which the biology, geomorphology and hydrology are in a substantially unmodified condition. Wild rivers are declared within areas currently reserved and managed for nature conservation purposes, to ensure that the high conservation values of these rivers are maintained.

The Kowmung River is located in the Hawkesbury Nepean catchment. The majority of the 80-kilometre stretch of the Kowmung River lies within Kanangra-Boyd National Park. The lower reaches of the river lie within Blue Mountains National Park. The Kowmung River has been assessed in terms of its biological, geomorphic and hydrological condition, and although there has been some disturbance as a result of land use activities, overall, the river is considered to be sufficiently hydrologically natural to be declared a wild river. The biological condition of the river is very good; the results of an analysis of invertebrates in the river were consistent with results from some of the most pristine waterways in the region. The river is a protected habitat for the Blue Mountains Perch, a threatened fish (see point 4 above). Combined, these expert assessments resulted in the Kowmung River being declared a 'Wild River'.

The EIS acknowledges the importance of the Wild River declaration, especially in Chapters 8 (Biodiversity Upstream) and 12 (Matter of National Environmental Significance). The EIS explains in Chapter 8 Biodiversity Upstream that "all upstream reaches within the study area are within a protected area. A section of the Kowmung River within the study area was declared as a Wild River, in near-pristine condition and free from unnatural rates of siltation and bank erosion and has high conservation value". Further on, the report states "consequently, the project would be impacting upon a state significant biodiversity link". Following this recognition of the values of this region the EIS goes on to say: "any impacts to the riparian buffer zones cannot be avoided" (Chapter 8 Biodiversity Upstream, page 69) and "conservation areas both upstream and downstream may be impacted by changes in temporary inundation and flooding due to operation of the Project" (Chapter 20, Protected Lands, page 5).

Raising the dam wall would threaten the near-pristine condition of the Kowmung and its surrounding tributaries - this could mean that the river's biodiversity value and classification as a Wild River could be revoked. The EIS in Chapter 11 Aquatic Ecology also further explains the importance of the Wild River classification where, on page 5, it states that Wild Rivers are managed to ensure "restoration and maintenance of the natural biological, hydrological and geomorphological process associated with wild river catchments". So the EIS recognises the value of Wild Rivers but offers no measures to protect or conserve those values.

Table 8-27. Avoidance of impacts on biodiversity values. *(Chapter 8 Biodiversity Upstream, page 68).*

8.3.1.3 (e)	*Impacts to the riparian areas of 4th order or higher streams and rivers, important wetlands and estuaries*	The Project is situated at Warragamba Dam with operational impacts occurring on land surrounding Lake Burragorang, which is a 9th order stream at points along its extent. As such, any impacts to the riparian buffers of a 4th order stream or higher cannot be avoided.
8.3.1.3 (f)	*Impacts to state significant biodiversity links*	The Project is situated at Warragamba Dam with operational impacts occurring on land surrounding Lake Burragorang, which is a 9th order stream at points along its extent. As such, any impacts to the riparian buffers of a 4th order stream or higher cannot be avoided.

Once a Wild River is declared, it must be managed in a manner that is consistent with the maintenance and restoration (if necessary) of their Wild River values. The EIS states that there would be "no material difference between the existing situation and with the Project for all flood events up to the 1 in 100 chance in a year even… In real world terms, the Project would not impact on the declared wild river section of the Kowmung River" (Chapter 20, page 18). We totally reject this assertion because it is not consistent with the principles of managing and restoring Wild Rivers, and fails to account for the 1 in 20 chance in a year flood event. By minimising the impacts and risks of the flood events on the Kowmung River's Wild River section, the EIS also minimises any potential mitigation measures. It is difficult to see how the project would not impact on the pristine nature of the wild river section of the Kowmung when it will have significant impacts on its riparian buffer zone, and will alter its natural state.

It is illogical.

6. Desecration of Aboriginal sites

The Commonwealth Department of Environment and the International Council on Monuments and Sites have both pointed out very serious failings in the assessment of the impact on the cultural heritage of the Gundungurra traditional owners. The EIS spends 81 pages in Chapter 18 on Aboriginal Heritage in the region and states that "the landscape surrounding Warragamba Dam holds deep cultural values for the Aboriginal people" (Chapter 18 Aboriginal Heritage, page 21) and has been occupied for at least 12,000 years, with archaeological evidence demonstrating this. The area that could be inundated is home to many of these archaeological and culturally significant sites; the EIS found that the most common Aboriginal site types are open camp sites, scarred trees and artefacts which will see a "total loss of value" (Chapter 18 Aboriginal Heritage, page 56) once inundated.

Most concerningly, Chapter 18 Aboriginal Heritage includes a section on comments received from Registered Aboriginal Parties (RAPs) (page 20) where "most RAPs declined [to be involved]… as they did not trust the intent of the Proponent or the assessment process". The EIS acknowledges that the RAPs "expressed a high level of concern regarding the potential impacts of the Project". Only 3 RAPs were involved in the consultation process out of the 22 present in the region. This demonstrates that the consultation process was insufficient and is not representative of the perspectives and knowledge of different Registered Aboriginal Parties.

In our podcast with Kazan Brown, a member of the Gundungurra community, she talks about her experience with the Warragamba Dam being built and the ongoing impact this has had on her community. Raising the dam wall will desecrate sacred Aboriginal sites and further traumatise an already disenfranchised community.

Take me to the River: How raising the Warragamba Dam wall will erase Indigenous heritage.

At a time when Australians are trying to move beyond the rhetoric of reconciliation to genuine, tangible rights and actions to support Aboriginal and Torres Strait Islander peoples, the process by which this proposal has been developed is disgraceful.

It is shameful.

7. Impacts on flora and fauna are disregarded

The devastating impacts on flora and fauna from the Warragamba Dam wall being raised are well understood in the EIS, but are largely dismissed. The EIS outlines exactly why the area should be protected from inundation as it has "some of the highest species-richness values in the world… related to the low nutrient soil, the open vegetation structure and disturbance by fire" (Chapter 12.7.5 Matter of National Environmental Significance). This will be lost if the project goes ahead and floods these areas. Chapter 8 Biodiversity Upstream, in particular, demonstrates this by stating "it is unlikely that the vegetation within the study area possesses adaptive or acclimatised growth to withstand the physical forces of inundation. Consequently, the vegetation within the study area may be susceptible to physical damage from the increased temporary inundation associated with the Project" (Chapter 8 Biodiversity Upstream, page 75).

In addition, throughout the assessment of the Project's impacts, after outlining exactly how a particular species or ecosystem will be affected, it often repeats the phrase "it is unlikely to have an impact" but the EIS and its biodiversity offset plan still account for, in most cases, a "total loss of biodiversity". Surely it is unnecessary to offset a total loss of biodiversity if it is "unlikely to have an impact". This is another of the many contradictions which characterise the EIS.

Chapter 8 Biodiversity Upstream (page 75) explains briefly the impact the project will have on fauna, with just four sentences provided. This is totally insufficient when the potential impacts on native threatened fauna and their habitats will be significant.

"The main potential impacts of the Project are on loss and modification of vegetation and the impacts of that on the habitat of threatened flora and fauna. Fauna mortality may also occur directly due to animals killed through injury or stress during flood events, particularly should the flood events occur during breeding periods where juveniles may have limited ability to flee flood water and can be sensitive to disturbance".

These four lines baldly state that impact include loss and modification of the very habitats upon which threatened fauna rely. How can this proposal be allowed to go ahead when so much will be lost and the surety of flood mitigation is a false hope.

It is unconscionable.

Conclusion

This proposal to raise the Warragamba Dam wall and inundate a World Heritage Area is flawed and will breach International, National and State agreements and legislation. Thirty years ago the proposal was rejected, and it should be so again, given the flawed rationale upon which it is based. The EIS is inadequate and fails to provide any genuine measures to protect and conserve the species, habitats and rivers that make up this stunning part of Australia. Rivers and the diverse biota that rely on them for habitat, food and shelter are unique, living, breathing entities, connecting our landscapes and containing deep cultural, environmental and social significance. If this threshold is crossed, we will leave a dire legacy to our children and grandchildren - the people of Australia and New South Wales - that no financial amount could compensate. We wholeheartedly reject the proposal to raise the

Warragamba Dam wall and have no confidence in the EIS that has been developed to justify the proposal.

Yours sincerely,

Dr Siwan Lovett (on behalf of the ARRC Team)

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