

**Submission
No 343**

**INQUIRY INTO PROPOSAL TO RAISE THE
WARRAGAMBA DAM WALL**

Name: Dr Neil Perry
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10th September 2019

Mr Justin Field
Committee Chair
Legislative Council Select Committee on the Proposal to Raise the Warragamba Dam Wall
Parliament House,
Macquarie St, Sydney, NSW 2000

Dear Mr Field,

I am an Environmental and Natural Resource Economist at Western Sydney University and I provide a submission to the Select Committee on the Proposal to Raise the Warragamba Dam Wall. In particular, I would like to suggest that at this stage there is no proof that the proposal meets the cost benefit test. Thus, I speak to items 1d), 1e) and 1g) of the terms of reference. I am happy to give evidence to the Committee in the future and would be grateful to receive the full cost-benefit analysis of the proposal because I have been unable to locate it in the public realm. It should be noted that I do not speak on behalf of my University but as an independent researcher and teacher employed at the University.

I have qualifications in cost-benefit analysis from the Institute for Public Administration Australia and I teach cost benefit analysis at Western Sydney University. I have been teaching and researching in the area of environmental and natural resource economics, and ecological economics, for over twenty years in Australia and in the USA and I have published scholarly articles in international journals using the framework of cost benefit analysis. My profile is available at: https://www.westernsydney.edu.au/staff_profiles/uws_profiles/doctor_neil_perry.

In particular, my research concerns the recognition of ecological values in economics. However, fundamentally, cost benefit analysis already requires a recognition of ecological values in so far as they affect human wellbeing. Cost benefit analysis concerns social wellbeing and weighs up the impacts of policy and proposals on human utility, both positive and negative. The cost of new government policies and projects such as raising the Warragamba Dam should include, (along with construction costs), pollution, the impact on endangered species, carbon emissions, impacts on water quality and wetlands, and other non-market impacts that can theoretically be priced or valued. Similarly, non-market benefits should be included in addition to the market benefits of a proposal.

I have not been privy to the full cost benefit analysis conducted for the proposal to raise the Warragamba Dam but I have seen a summary of an earlier cost benefit analysis or 'economic assessment' in section 6.2.4 (page 137-9) of Infrastructure NSW's (2019) "Hawkesbury-Nepean Valley Flood Risk Management Strategy: Taskforce Options Assessment Report". As acknowledged in that document on page 138, the environmental and social impacts of the proposal to raise the Warragamba Dam have not been assessed. However, the environmental and social impacts are potentially substantial.

As outlined in Greater Blue Mountains World Heritage Area Committee (GBMWHAC) (2018) and other submissions to the Inquiry into Water NSW Amendment (Warragamba Dam) Bill 2018, as well as submissions to the current inquiry, such as Blue Mountains Conservation Society Inc (BMCSI) (2019), the social and ecological impacts include the following:

- There will be negative impacts on biodiversity including populations of national threatened and endangered species such as *Eucalyptus benthamii*, *Hakea dohertyi*, and *Macquaria australasica* (Macquarie Perch). GBMWHC (2018) also identify potential impacts on populations of the Critically Endangered Regent honeyeater (*Anthochaera phrygia*). In addition, the BMCSI (2019) identify threats to a critically endangered ecological community – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
- Siltation of currently undisturbed native forest will cause an inundation of weed species that will further compromise biodiversity in the area of the Greater Blue Mountains World Heritage Area.
- Wilderness and wild river values will also be compromised with areas of the Kanangra and Nattai wilderness areas and Kowmung river affected by silt.
- Aboriginal cultural heritage will be adversely and irreplaceably affected as explained in Dr Jim Smith's (2019) submission to the inquiry.
- Aesthetic values will be compromised which negatively impacts on the assessment of the Greater Blue Mountains World Heritage Area as an area of scenic beauty for its aesthetic values under the National Heritage List (GBMWHAC 2018).

These and other impacts, such as the impact on downstream wetlands that rely on periodic flooding, affect human wellbeing with the appropriate measurement in cost benefit analysis being the willingness to pay to avoid the impacts or willingness to accept compensation for the impacts. If measured, it is highly unlikely that the cost benefit analysis summarised in Infrastructure NSW (2019) will be favourable. Without measuring these social and ecological values, nor the potential impact on tourism in the Greater Blue Mountains World Heritage Area, the cost-benefit analysis for raising the wall by 14 metres comes in at a cost of \$603m and a benefit of \$768m (Infrastructure NSW 2019, pp. 137-8). This means that if the 2.6 million households in NSW value the social and ecological impacts of the dam raising at a mere \$5 per household per year, the cost benefit analysis turns out to be negative. Using a time period of 30 years and real discount rate of 7%, as stipulated in the NSW Guidelines to Cost Benefit Analysis (NSW Treasury 2017), and conservatively assuming no growth in household numbers, the discounted flow of social and ecological costs is \$174m. The benefit minus cost calculation would then be negative \$9m with a benefit cost ratio of less than 1. In this case, the proposal would not be economically efficient.

The assumption of \$5 per household per year is surely a very conservative estimate of the willingness to pay to avoid the social and ecological impacts, and the potential impact on tourism is substantial and currently unaccounted for. It is recognised that I do not have access to the full cost benefit analysis and that the figures reported in the Infrastructure NSW (2019) document may not be up to date. This supports my request for the up-to-date cost benefit analysis so that I can provide further evidence to the Committee. However, at this stage, it should be noted that it is incumbent upon the proposer to prove that the benefits outweigh the costs and at this stage this proof is non-existent.

I would also like to make the point that even if the ecological costs are 'compensated' through the use of environmental offsets, this does not absolve the proposer of the need to assess the ecological damages. It is common in cost benefit analyses performed for mining proposals to include the costs

of environmental offsets in the costs column of a cost benefit analysis and assume that this completely compensates for the environmental damages (Perry 2015). Environmental offsets are a relatively new phenomenon and such an approach has never been established as the correct theoretical approach in cost benefit analysis. Instead, as a practitioner, teacher and researcher in cost benefit analysis, I assert that the correct approach would be to (Perry 2015): 1) include the monetary costs of offsets in the cost column of the cost benefit analysis (noting that this would again likely lead to the rejection of the 14m dam raising); and 2) include as an additional cost the societal willingness to pay to avoid the removal of biodiversity in one area and improvement in another.

The additional calculation in item 2) recognises that offsets are not the same as the original area. In economic theory the offset area and the original disturbed area can be identical but economic theory cannot account for the complexity of nature (Perry and Primrose 2015). Thus, there is a net ecological and therefore economic cost to degrading one area and offsetting the impact by improving another area which must be included in the cost benefit analysis. Of course, if offsets are very large it is conceivable that the item in 2) could be a net benefit which would also need to be included. This might occur when the offsets are so substantial that they truly improve biodiversity values (of course the monetary cost of the offsets would also be very large). In either case, the willingness to pay for the net ecological cost (or benefit) of the degradation of biodiversity and improvement at the offset site should be calculated; or if calculation is impossible, the net impact should be acknowledged in the intangibles section of a cost benefit analysis.

In summary, the economic argument for raising the Warragamba Dam has to date not been determined and given the available figures the costs are likely to outweigh the benefits. I would value the opportunity to provide evidence to the Committee and to assess and evaluate the full cost-benefit analysis.

Thank you for your time and energy with this Inquiry,

Dr Neil Perry
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References:

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Perry, N. 2015. *Russell Vale Colliery Underground Expansion Project – Submission to the Planning Assessment Commission Public Hearing*. December. (Available at: <https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/projects/2015/10/russell-vale-colliery-underground-expansion-project--second-review/submissions/neilperryeconomicsedopdf.pdf>).

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