Submission on the Warragamba Dam Wall Raising

To : The NSW State Government

Having read the Environmental Impact Statement (EIS) on the Warragamba Dam Wall Raising (WDWR), I make this submission to object to the insufficiency of this EIS and to the proposed destruction of priceless NSW ecological and Aboriginal heritage that this EIS, if it were approved, would permit, and to urge the NSW State Government to reject the WDWR EIS and completely abandon the high risk, potentially destructive WDWR project.

The WDWR EIS omits essential engineering and post-construction dam maintenance considerations. This means that the estimated price of A$1 Billion is a gross under estimation. Even if this proposed project goes ahead, the construction period would in all likelihood exceed 10 years and cost at least $20 billion dollars. The underestimated cost also masks the availability of less costly, alternative options, which are omitted from the WDWR EIS.

In the opinion of several well qualified engineering professionals and geologists, the WDWR project and the WDWR EIS that would permit it, present unacceptably high risks to the Greater Sydney community, because endorsing the WDWR via the WDWR EIS, exponentially increases the risk of total dam failure, massive flooding of the Greater Sydney Basin, and the total loss of Sydney's primary water supply.

In the WDWR EIS, no consideration has been given to crucial matters such as whether it is physically possible or even safe to raise the Warragamba Dam Wall, and it contains no assessment of what risks would be incurred during and after construction, or whether these risks could be mitigated, or of the progressive costs of each construction stage, or of who would be expected to bear the cost of this project, or of how the funds for such a high risk, uninsurable project could be raised, approved and allocated.

On further researching the WDWR EIS and the associated WDWR project, I found and verified the following facts, cited by qualified engineers and geologists, botanists, ecological researchers, and accredited Aboriginal Elders, that should be read, understood, and taken into account before elected Government Members or staff vote or act on any legislation authorising or facilitating this project proposal, before discussing or passing associated motions, before any work tenders are invited, and before any associated Memoranda of Understanding or Planning contracts are prematurely signed by government officials or any associated parties.

These are the relevant facts reported to me by Paul Matthews and other informed people.

1. The WDWR EIS contains no comprehensive feasibility or geological studies, and no Aboriginal heritage and culture studies, or botanical or ecological impact assessments, have been conducted or submitted for public scrutiny in relation to this project.

2. Many Aboriginal Elders resident in Greater Sydney advise against the destruction of Aboriginal sacred and community sites and heritage that would certainly be incurred by approval of this incomplete, insufficient WDWR EIS. The NSW Government would

render itself liable for any heritage damage or loss resulting from this high risk project, as well as potential flood damage, therefore the WDWR EIS should not be approved.

3. NSW botanists and ecological experts affirm that the area around the dam, that would be flooded by the implementation of the Warragamba Dam Wall Raising proposal, contains many priceless, rare plants and native animal species, many Aboriginal sacred sites, and irreplaceable Aboriginal heritage, that would all be lost if the Warragamba Dam Wall Raising project EIS is approved, and the project goes ahead. This is unacceptable to the Aboriginal Elders of Greater Sydney, including the Dharug Aboriginal community, whose advice is endorsed by thousands of Local Reconciliation Group members, and the vast majority of Greater Sydney residents.

4. The WDWR EIS cost estimate is merely an approximation, unsupported by evidence, and since the scientific basis of the construction work has not been properly researched, the construction stages and risks have not been adequately defined or assessed, and the job schedule is unplanned, limiting the foreseeable project costs to $1 billion is completely unrealistic.

5. Referring to WDWR EIS Appendix N2: The WDWR EIS does not include a geological engineering statement outlining the capability of the surrounding area to withstand the additional forces created around and under the existing dam when the dam capacity is increased. Questions associated with groundwater hydrology on pages 18 and 19 of Appendix N2 have been deliberately blanked out, with this document completely skirting over this critical issue. Appendix N2 only describes inflows and outflows of the reservoir, not the geological stability of the dam itself or the surrounding rock faces and foundation. No other information is provided in the EIS about the effect of the project on the water table and rock underneath and immediately surrounding the dam.

6. To remain accountable to the electorate the NSW Government must serve responsibly, the WDWR EIS and the WDWR Proposal should include a comprehensive risk assessment in regard to potential dam failure or surrounding geological support failure leading to potentially total devastation of the Sydney basin. If dam failure occurs, potentially millions of lives would be lost. None of the WDWR EIS documents state or analyse the very high risks associated with geological fault pressure, or the risk of dam wall failure, although these are primary risks associated with this project.

7. The WDWR EIS does not include any tabulation of how the existing dam has performed and moved and continues to move since it was constructed in the 1950s, nor any explanation of how the proposed additions may affect this movement or the ground water penetration underneath the dam foundations. Warragamba Dam has moved and continued to move and leak since its earliest days of construction. The current EIS should tabulate all movements and leaks suffered by the dam in it's life span so far, and detail how these have been handled, drawing conclusions as to how the proposed structure is likely to change these.

8. The WDWR EIS contains no explanation of or cost estimate for costly, ongoing survey and maintenance requirements, which would be required to sustain the modified structure and surrounding rock faces.

9. As Paul Matthews notes in his WDWR EIS Submission, the WDWR EIS contains no explanation as to the geological risk of the dam becoming undermined as a result of

"gravity dam rotation effect"."Gravity Dam Rotation" takes place as a result of a dam being made too steep in reference to its base. The downstream base of the dam acts as a rotation point, around which the dam is somewhat free to rotate upwards when the average position of additional force is applied to the top of the dam by increasing the storage capacity. The Sydney sandstone upon which Warragamba Dam sits, is porous to water and acts somewhat as a sponge to water under high pressure. The downward pressure imposed on the sandstone by the heavy gravity dam, works to create pressure within the rock which is greater than the pressure of the water, ensuring water cannot enter the sandstone and sustaining the dam foundations, preventing ingress of moisture. However if Warragamba dam is raised in capacity without the addition of substantial upstream deep foundations and mass, the dam will tend to be "pushed back" when full. This creates a "rotation effect" on the dam whereby more pressure is placed downward at the downstream base causing a reduction of pressure at the upstream base, in effect "tipping the dam over". While admittedly it is unlikely the dam would ever be "pushed over", the action of repeated application and removal of pressure (as the dam is suddenly filled by a flood and then allowed to quickly empty back to supply level) will tend to reduce pressure at the upstream base and allow water to penetrate the existing dam foundations and surrounding rock at each end. Without adequate engineering treatment, such as a drastic increase of the dam mass at the upstream base and increased foundation treatments, the flow of water under the dam through the rock will create cracks and eventually water filled caves through the soft sandstone. Sediment would then be washed away into the water table surrounding the dam, eventually finding its way to lower pressure outlets further downstream. Left to itself, this action would eventually undermine the dam. It would cause dam failure as water attempts to find its way downstream under and around the dam, through the soft sandstone rock fissures that exist. The failure would likely not happen straight away, rather it would happen many decades after the project is complete, and after many flood events have systematically placed and then removed rotational pressure on the dam. Each each flood event will cause a small, invisible amount of movement upwards and subsequent damage in the rock foundations under and surrounding the dam. Once the damage is discovered it will be too late to do anything about it without draining the reservoir completely. If the damage remains hidden and undetected, total dam failure will become possible. This would likely happen at the worst possible time i.e. during a record flood event when the water table below the dam is already high and the downstream communities and catchments are already flooded and saturated. The only way the Warragamba dam can be sufficiently extended and reinforced at its upstream base will be to completely drain the reservoir and provide a bypass tunnel around the dam for the Warragamba River – as was originally carried out for the initial construction of the dam in the 1950s. The cost of this activity, both in dollar terms and in terms of the loss of Sydney's water supply for several years, would be immense.

10. I have verified that there is no worldwide precedent for creation of a flood mitigation dam on top of an existing working water supply dam for which foundations have already been completed many decades beforehand. The WDWR EIS should provide a section detailing similar projects overseas, the risks created and how these risks were controlled, but no such information is provided. The section "Environmental risk assessment procedure" doesn't mention the engineering and geological risks associated with raising the dam wall, so these risks are not considered or assessed as part of the construction procedure, so this renders the WDWR EIS incomplete, and this negligence would render the WDWR project uninsurable.

11. The WDWR EIS contains no explanation of how existing dam foundations will be changed by addition of new dam mass on the top and downstream side of the dam. Indeed the “Project Description” document merely suggests that the new work is to be literally placed on top of the existing dam wall like a jacket (on the downstream side only) with no changes or improvements to the existing foundations or the upstream face of the dam.

12. The WDWR EIS contains no explanation of how Sydney’s principal water supply will be protected during construction, and most importantly, how the structure may behave during this phase, or how risks may be controlled in the event that an extreme weather event takes place during construction.

13. The WDWR EIS contains no adequate explanation and costing of the practical alternatives, especially provision of sufficient flood escape routes or of widening / altering the course of the Hawkesbury River at Sackville. The grossly underestimated cost of the Warragamba Dam Wall Raising project masks the effectiveness and worthiness of alternative community based projects which would much more effectively mitigate flood risk.

Summary

I consider the WDWR EIS for the proposed Warragamba Dam Wall Raising insufficient to justify the high risk, expensive WDWR project, which is impractical when total cost is compared with viable alternatives, both in the short and long term. The potential benefits of the WDWR project are completely nullified by the high flood risks identified by experts, and the certainty of extensive environmental and heritage damage identified by Aboriginal Elders and environmental experts. The WDWR EIS does not address significant flooding risks associated with the proposed WDWR project, in particular the high risk of long term possible geological failure of the dam and / or surrounding rock faces and subterranean fissures leading to potential severe disaster of a total dam failure. Due to these high risks, if the WDWR EIS were approved and the WDWD project went ahead, the NSW Government could not guarantee community safety and promote flood mitigation in Greater Sydney, as it should wish to. In addition, the certainty that the WDWR project would, if implemented, incur massive destruction of plant and animal species and destruction of irreplaceable Aboriginal cultural heritage, rules out approving the WDWR EIS. Therefore I consider that this WDWR EIS should be rejected, and that the WDWR proposal it endorses, should also be rejected and discarded. I urge all NSW State Government representatives and employees to vote against and reject all proposed correspondence tenders, contracts, MOUs, legislation and regulations designed to facilitate the WDWR EIS and the WDWR project.

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