

**Public Works Committee**

**Inquiry into the Impacts of the Western Harbour Tunnel and Beaches Link**

**Hearing 17 September 2021, Supplementary questions**

**Questions for Australian Marine Sciences Association**

1. *The Metro Southwest Business Case summary documents show that the project team chose not to use an immersed tube due to the risks to the environment being too high in a location very close by, but further East. To what extent are the Harbour problems you've identified caused by the choice to use an immersed tube method to cross the Harbour and Middle Harbour?*

We can say with certainty that the choice to use an immersed tube method for the two crossings is far more damaging to the marine environment than a bore tunnel due to disturbance of the sediments (contaminated and uncontaminated) by dredging, boating, pile driving, and other activities associated with construction. Certainly, the use of shallow silt curtains during construction which are not anchored to the seafloor will not prevent sediments from dispersing widely.

2. *You mentioned that there was insufficient data for you to comment on Middle Harbour. Is the quantity and quality of the data in relation to Middle Harbour acceptable at this stage of the project?*

With regards to the EIS (Appendix M, Contamination, Jacobs Group) and the number of sediment cores analysed in the Golder Douglas (2017) Contaminants Report, specifically for both immersion tube tunnels (ITT), it is clear that insufficient samples of marine sediments were taken, and so insufficient analyses were done.

As AMSA mentioned in our submission, the proponents of the WHT/BL project did not consult the wealth of project-independent data in many scientific publications on the sediments and environments of Sydney Harbour. In addition to the publications attached to our submission, we attach Birch et al. (2013) which has data on the sediments of Middle Harbour. Chromium contamination was found at 50 cm depth in sediment cores and were dated to 1935, the source being legacy industry. This layer of contaminants is well buried and will be mobilised by the ITT project. Storm water runoff from Flat Rock Creek is a source of contaminants. This area has been modified by an incinerator and landfill with groundwater leachate contaminating the creek.

Appendix M of the EIS states that contaminated sediments associated with the historical industrial use of the harbour and polluted stormwater runoff have been identified within Middle Harbour and The Spit and that these potentially pose a high contamination risk to construction. Examination of data for Middle Harbour sediment cores (Golder Douglas, 2017; Table A1) shows that some samples had contaminants at or approaching sediment quality guideline values (e.g., hydrocarbons, tributyltin). While these are of concern, contaminants in the Middle Harbour sediment are much lower than found in highly contaminated sites

associated with the WHT/BL project (e.g., Berrys Bay). No detailed studies were carried out on water movements as to how these disturbed sediments and associated pollutants will move up and down Sydney Harbour.

As we stated in our submission, with respect to the marine environment, sediment core analyses are the most inadequate aspects of the EIS and of most concern. The quality of the sediment analysis data, in relation to the WHT/BL project is not acceptable at this stage of the project. Based on the poor information on contaminated sediments and disturbance risk the EIS should be redone.

With respect to marine animals – a search of the archives and records at the Australian Museum shows that the Middle Harbour area is poorly studied.

3. *We have heard that two catchments are being disturbed and are contaminated (Willoughby Creek and Flat Rock Creek catchments) that feed into Middle Harbour. Do you have concerns about this?*

AMSA's scope of expertise is the marine environment. Willoughby Creek and Flat Rock Creek catchments are land-based habitats. Contamination from storm water runoff from these sites is a concern (Birch et al., 2013). Flat Rock Creek, a waterfall-gully system, was an unregulated tip and incinerator site for industrial and domestic waste from 1940-1985 and had industries nearby (refrigerator factory). The results of Birch et al., (2013) indicate that this history impacts the flow of contaminants into Middle Harbour. As this area is proposed to be a construction support site this is of concern as high risk to contaminate the marine environment. It is sensible to avoid disturbance of any industrial tip site where there is no record of what was dumped there.

Due to limited sampling and lack of rigour in the approach to replication and analysis, the data are insufficient to assess this risk.

4. *In your experience do contaminants in catchment areas have a risk of mobilisation into waterways if disturbed?*

With respect to mobilisation of contaminants from disturbed sediments, this is almost certain and is well-documented in the scientific literature.

- a. *How would you classify that risk?*

High

- b. *Would you say contamination in large catchment areas is easy and therefore inexpensive to mitigate or difficult and therefore expensive?*

We do not know what "easy" means in this question. What we can say is that contamination of a large area of Sydney Harbour from the ITT constructions is highly likely and that as some contaminants are persistent pollutants that will remain toxic for 100's of years. Thus, some chemicals cannot be mitigated and so would have to be removed and treated on land as done for sediments around the Homebush Olympic site. We believe that this is a costly undertaking.

5. *Do you think a known industrial tip site within a major catchment to Middle Harbour should be used as a dive site?*

The tip site at Flat Rock Creek is registered as contaminated land. As detailed above we suggest that disturbance of this site should be avoided.

- a. *Would it be more cost effective to avoid the use of this site?*

As we are not construction engineers, we cannot answer this question.

6. *We have heard that Middle Harbour is well recognised as a sensitive area and a nursery for Sydney Harbour in terms of wildlife – can you expand on how Middle Harbour supports Sydney Harbour and its importance to the overall ecosystem health of the Harbour?*

AMSA's brief is the marine environment and so our response is in relation to marine wildlife (birds and mammals). We are not aware that Middle Harbour is well recognised as a sensitive area and a nursery for Sydney Harbour in terms of marine wildlife, although upstream of the site there are extensive mangroves which are known to be important nursery grounds. As mentioned above, this area is poorly studied in the scientific literature. According to the WEPA submission Little Blue Penguins are common in the area and this seems likely as this area is close to the rookery at Collins Flat, Manly.

7. *Middle Harbour is due to be dredged at a point where contaminants have been identified (including PFAS) and contaminated sediment will be barged out under the Spit Bridge into the main Harbour. Are you concerned about the dredging and potential of spill in Middle Harbour and near the Northern Beaches?*

Damage to the marine environment through dispersal of contaminated sediment is of great concern. During barge transport of contaminated sediments there is a risk for spill. This is a major concern for the WHT/BL project. We do not have data to assess particular risk to the Northern Beaches.

8. *The EIS states that contaminated sediment will need to be dried out at an unknown location. Are there risks associated with drying out contaminated sediment to surrounding ecosystems and residents?*

Yes – dried contaminated sediments can be readily transported as aerosols with high risk to surrounding ecosystems and residents. This is particularly the case for the WHT/BL project as carcinogenic and poisonous contaminants occur in sediments at both the ITT sites and construction support sites (e.g., dioxins, tributyltin, chrome, arsenic, mercury). Humans breathing in these toxics would have adverse health impacts. These chemicals and their mixtures are highly damaging to the marine environment.

9. *A large amount of waste has been earmarked as suitable for “offshore disposal” (in total, 1,450,000 tonnes). Do you have concerns about this?*

Yes, absolutely. The EIS did not sufficiently document the location and depth of the contaminants – the number of samples taken was highly inadequate. We do not have a sufficient understanding of where the contaminants are. As Dr Ryall stated in his submission there are 18 sites that are likely to be contaminated for which there are no samples analysed.

The WHT the corridor was moved to the north, but only a few extra sediment cores were analysed. The proponents were required to analyse more sediment samples for the Commonwealth in the context of offshore disposal, as stated in the submission report, but these data are not available. For the marine environment offshore disposal is one of the most hazardous and uncertain issues of the WHT/BL project and needs urgent attention. Dr Ryall's submission indicated that the EIS overestimated the amount of contaminated spoil. This aspect of the EIS should be revisited in detail.

10. *Are you aware of the decline of Little Penguins in the Harbour?*

Yes, prevailing evidence suggests that this is largely due to disturbance of the burrows by domestic dogs.

a. *How do you think the increased marine traffic required to support the immersed tube works could affect them and the other 21 threatened or endangered marine species identified in the EIS?*

We are not clear on the 21 species. The appendices in the EIS Biodiversity chapter (Chapter 19, Cardo Consultants) name 23 (Appendix A Threatened Species) and 30 (Appendix C Protected Species) species. However, many of the species named in the appendices are rarely/never seen in Sydney Harbour and so these appendices are off base (e.g., Tropical species: Hawksbill Turtle, Leatherback Turtle, Green Turtle, Loggerhead Turtle, sea snake, Dugong, Offshore/Oceanic species: Southern Right Whale, Humpback Whale, Blue Whale, Whale Shark).

It would have been expected for the EIS to focus on marine species that are of concern in Sydney Harbour and thus have a high risk of being affected by the WHT/BL project. These include Whites Sea Horse, *Posidonia* sea grass, New Zealand Fur Seal, Little Blue Penguin and several pipefish species. We note that the endangered soft coral *Dendronephthya australis* is not mentioned.

What is missing from the EIS is a considered and robust risk assessment for the vulnerable species that we know use Sydney Harbour as a key habitat.

11. *Do you think that safe swimming at Dawn Fraser Baths, Greenwich Baths, MacCallum Pool, Cremorne, Northbridge Baths, Clontarf Baths and Manly Dam will be able to be guaranteed during the 8 year construction program?*

The corridor of the WHT is a highly hydrodynamic crossing and so there is a high risk that sediment and contaminant dispersal will be a risk to safe swimming at Dawn Fraser Baths and Greenwich Baths cannot be guaranteed. The WHT ITT has very a high potential to release toxic chemical mixtures into the water. The EIS did not provide sufficient data on water circulation for AMSA to understand the transport of contaminants to all of these swimming facilities.

12. *What type of monitoring would be needed to alert the community to dangerous levels of contamination including heavy metals, PFAS and other contaminants?*

With respect to risk to human and environmental health water samples would have to be collected daily for analysis of contaminants. As some contaminants are toxic at very low concentrations toxicity is determined using standard marine ecotoxicology testing.

- a. *Does such detailed, real time monitoring exist?*

Yes – in these monitoring programs water samples are delivered to accredited laboratories (e.g., Australian Government Analytical Labs, Ecotoxicology Labs) promptly after collection for rapid testing and reporting as done for water sample analysis during the remediation of areas around Homebush for the Sydney Olympics.

13. *What are the climate associated impacts of destroying or damaging mangrove and sea kelp areas?*

Mangroves and kelp are very important as a source of blue carbon – major sinks for CO<sub>2</sub>. For the same reason that deforestation is a concern on the land destruction of mangrove and kelp has climate change impacts with regard to CO<sub>2</sub> sequestration. Another important, but less appreciated service that mangrove and kelp provide is buffering the environment from ocean acidification. By taking up CO<sub>2</sub> and releasing the products of photosynthesis (e.g., oxygen) these plants protect marine species, in particular species such as oysters that make a shell.

**Reference:** Birch et al. (2013) The use of vintage surficial sediment data and sedimentary cores to determine past and future trends in estuarine metal concentrations (Sydney estuary, Australia). *Science of the Total Environment* 454-455: 542-561.