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The Hon Daniel Mookhey, MLC  
Chair, Public Works Committee  
NSW Parliament

11 June 2021

## Re: Parliamentary Inquiry into the impact of the Western Harbour Tunnel and Beaches Link

Dear Mr Mookhey,

On behalf of the members of the Royal Zoological Society of NSW (RZS NSW), I am pleased to provide this submission to the NSW Legislative Council Parliamentary Inquiry (Public Works Committee) into the impact on the Western Harbour Tunnel and Beaches Link (WHT/BL).

The RZS NSW is Australia's oldest and largest zoological society, comprising approximately 500 members, including professional zoologists and ecologists and members of the broader community passionate about the conservation of Australia's unique animals. The Society and our members have approached our submission backed by a long history of interest in and involvement with the conservation of the fauna of NSW (including marine, freshwater and terrestrial environments), through research, development of legislation and management plans, and through academic inquiry and dissemination of information. The current RZS NSW Council includes researchers and practising ecological consultants who are involved in undertaking biodiversity assessments and study of NSW's marine fauna.

We provide the following comments with regard the terms of reference for the inquiry, in particular - Terms of Reference (i) whether the project is subject to the appropriate levels of transparency and accountability that would be expected of a project delivered by a public sector body and (ii) the impact on the environment, including marine ecosystems.

1. The WHT Environmental Impact Statement (EIS, January 2020) and subsequent Submissions Report (September 2020) does not adequately consider the impacts of tunnel construction to the marine environment and the natural resource assets of Sydney Harbour. We are particularly concerned about the resuspension and redistribution of contaminated sediments. The spread of toxicants dissolved in the water and the toxicity of these chemicals are of particular concern because of the potential for their redistribution through the food chain. Further, the EIS and the associated reports were not clear on the amount of sediment that will be disposed offshore and prevention and assurance that these sediments will not be contaminated. Over the past few decades, the water quality of Sydney Harbour has improved considerably and supports significant biodiversity as well as represents one of the most diverse harbours in the world - the proposed development is likely to reverse these improvements.
2. The Contaminants Report (Golder-Douglas 2017) with data on the contaminants in the sediment (e.g., dioxins, heavy metals, organic chemicals) was commercial in confidence. This report was not released until after the public submission period for the EIS closed. This meant that the data were not available for public scrutiny – this is critical, as the process must be transparent.
3. The Submissions Report showed that additional sediment analyses were undertaken in new locations due to the upstream shift of the tunnel alignment. No results of these new chemical analyses were provided in the Submissions Report, again limiting public comment.



4. As detailed in the Sydney Morning Herald (Feb, 2021 - <https://www.smh.com.au/national/nsw/harbour-sludge-to-be-dug-up-for-new-tunnel-contains-alarming-levels-of-toxins-20210212-p5721z.html>) very high levels of banned toxic chemicals (tributyltin - TBT, dioxins, arsenic, mercury) are in the sediments of the proposed Berrys Bay WHT construction support site. Due to the industrial legacy of Sydney, sediments in the harbour including around the WHT site have high levels of persistent (100s of years) and highly toxic chemical contaminants including the biocide antifoulant chemical TBT and carcinogenic dioxins. The proposed development will resuspend much of this contaminated sediment, which will then be available to be eaten by a wide variety of benthic organisms - These contaminants will be retained in their body tissues and these animals can then be eaten fish, prawns and wading birds, and thus be further spread throughout the harbour, posing a threat to human health by consumption of contaminated fish and crustaceans. The wading birds, many of which are migratory, can also spread these contaminants outside of the Sydney Harbour region.
5. Tunnel construction activities, dredging, piling and vessel movements have high potential to disturb contaminated sediments. Sediments on the east and west ends of the tunnel corridor where the cofferdams will be constructed, include highly contaminated samples. Tidal movements and currents in the harbour will redistribute contaminated sediments through the harbour as well as by the associated boat traffic associated with the development. Throughout the day, a large number of ferries traverse this region and will also redistribute the suspended sediments.
6. The risk of dredging contaminated sediments as a specific impact was not included in the Environmental Risk Analysis (Appendix A of the EIS). This analysis did not include the impacts of remobilisation and redistribution of toxic chemicals and heavy metals into the marine environment. The report completely failed to identify the impact of these toxicants on marine life which includes death, accumulation of contaminants in benthic animals and movement of toxics up the food chain and dispersal of contaminants through Sydney Harbour by fish and birds.
7. The Revised Environmental Measures (Part D) has management measures to address the risk of environmental poisoning. It is critical that the dissolution of chemicals in harbour waters via sediment pore water release is monitored continually and data made available immediately.
8. Shallow silt curtains as recommended in the EIS, will not contain the sediment plume as they are not firmly attached to the seafloor and the proposed site experiences high wave, current and wind activity.
9. The Environmental Risk Analysis and Revised Environmental Measures must be redone to include the risk of polluting the environment.

The RZS also fully supports the submission prepared by the Australian Marine Sciences Association. We have provided a list of relevant scientific literature below, which we encourage the Committee to consider.

The RZS NSW would be happy to provide further information and comment.

Kind regards,

Dr Pat Hutchings  
President Royal Zoological Society of NSW  
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## Scientific literature pertinent to Sydney Harbour and dredging

- Anim et al. (2020) Occurrence and distribution of pharmaceuticals, personal care products, food additive and pesticides in surface waters from three Australian east coast estuaries, *Mar Poll Bull* 153 111014
- Birch & Taylor (2002) Application of sediment quality guidelines in the assessment and management of contaminated surficial sediments in Port Jackson (Sydney Harbour), Australia. *Env Mgt* 29:660-670.
- Birch et al., (2007) The source and distribution of polychlorinated dibenzo-p-dioxin and polychlorinated dibenzofurans in sediments of Port Jackson, Australia. *Mar Poll Bull* 54: 295-308.
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- Birch et al., (2008) Contaminant chemistry and toxicity of sediments in Sydney Harbour, Australia: spatial extent and chemistry-toxicity relationships. *Mar Ecol Prog Ser* 363: 71-87;
- Birch (2017) Assessment of human-induced change and biological risk posed by contaminants in estuarine/Harbour sediments: Sydney Harbour/estuary (Australia). *Mar Poll Bull* 116: 234-248.
- Birch & Lee (2018) Baseline physico-chemical characteristics of Sydney estuary water under quiescent conditions. *Mar Poll Bull* 137: 370-381.
- Birch et al. (2018) Complex relationships between shallow muddy benthic assemblages, sediment chemistry and toxicity in estuaries in southern New South Wales, Australia. *Mar Poll Bull* 129/2: 573-591.
- Birch et al. (2018). The relationship between metal concentrations in seagrass (*Zostera capricorni*) tissue and ambient fine sediment in modified and near-pristine estuaries (Sydney estuaries, Australia). *Mar Poll Bull* 128: 72-81.
- Birch et al. (2018) Metal concentrations in seagrass (*Halophila ovalis*) tissue and ambient sediment in a highly modified estuarine environment (Sydney estuary, Australia). *Mar Poll Bull* 131: 130-141.
- Birch G. F. & Lee S. B. (2018) Baseline physio-chemical characteristics of Sydney estuary water under quiescent conditions. *Mar. Poll. Bull.*, 137: 270-381.
- Birch et al. (2019) Metal concentrations in Sydney Cockle (*Anadara trapezia*) tissue and ambient sediment in a highly modified estuary (Sydney estuary, Australia). *Mar Poll Bull* 144: 299-308.
- Birch et al. 2020. Sediment metal enrichment and ecological risk assessment of ten ports and estuaries in the World Harbour Project, *Mar Poll Bull* doi:10/1016/j.maepolbul.2020.111129
- Drage et al. (2015) Historical trends of PBDEs and HBCDs in sediment cores from Sydney estuary, Australia. *Sci Tot Env* 512-513: 177-184
- Fraser et al. (2017). Effects of dredging on critical ecological processes for marine invertebrates, seagrasses and macroalgae, and the potential for management using environmental windows. *Ecol Indicators* 78: 229-242.
- Hutchings et al., (2013) Sydney Harbour: its diverse biodiversity. *Aust Zool* 36: 255-320
- Johnston et al. (2015). Sydney Harbour: what we do and do not know about this highly diverse estuary. *Mar Freshw Res* 66: 1073–1087.
- McCready et al., (2000) The distribution of polycyclic aromatic hydrocarbons in surficial sediments of Sydney Harbour, Australia. *Mar Poll Bull* 40: 999-1006;
- McCready et al., (2006) Relationship between toxicity and concentrations of chemical contaminants in sediments from Sydney Harbour, Australia, and vicinity. *Env Mon Ass* 120: 187-220;
- MEMA Sydney Harbour Background Report (2014) Sydney Institute of Marine Science prepared for NSW Department of Primary Industries
- Montoya (2015) Pollution in Sydney Harbour: sewage, toxic chemicals and microplastics. NSW Parliamentary Research Service Briefing paper 03/2015
- Mortimer (2004) Tributyltin (TBT) Analysis Protocol Development and Current Contamination Assessment. A Report from Natural Heritage Trust (Coast and Clean Seas) Project No 25425, Australian Government