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Environment and Communications References Committee

Algal blooms in South Australia.

18th August 2025

Submission from Yumbah Mussels Holdings
Mr Mark Andrews, General Manager.

Yumbah Mussels Holdings (YMH) is a subsidiary of Yumbah Aquaculture Ltd. It operates the growing, production, processing and sale of blue mussels in Australia. As General Manager of YMH, I bring more than 20 years' experience of successful mussel farming and processing in the waters of Proper Bay and Boston Bay off Port Lincoln. YMH is Australia's largest producer of farmed mussels with the Port Lincoln operation producing around 2,500 tonnes of mussels annually at a value of $15 million.

My submission addresses the following terms of reference:

a. Contributing environmental, land management or water quality factors
b. Ecological, economic and social impacts of algal blooms with particular reference to:
    iii. Marine biodiversity and ecosystem health.

I note the continuing ecological and economic impact of the algal bloom of the harmful dinoflagellate *Karenia mikimotoi* and the potential for similar devastation in the waters off Port Lincoln. In particular, YMH's mussel culture operation is threatened.

The process of mussel production undertaken by YMH is unique in Australia relying on natural spatfall from established offshore populations. The South Australian government has established a dedicated aquaculture zone to provide a safe, secure and clean environment for growers. Clean water, regular environmental monitoring, and nominal protection from harmful coastal development/pollution was influential in my choosing the waters of Proper and Boston Bays for aquaculture. Our enterprise has thrived and now employs around 75 people from the Port Lincoln community. Our brand is established in premium seafood markets nationally.

The dedicated aquaculture zone has been established and managed by the South Australian government over more than 30 years. Citing the South Australian government "*South Australia is in a prime position to contribute to aquaculture growth as a world leader in the ecologically sustainable development of aquaculture, with one of Australia's most comprehensive legislative frameworks in place to protect and manage the state's aquatic resources whilst encouraging investment, growth and social licence*"[1].

[1] Source: Zoning in: South Australian Aquaculture report 2022.

"*The protection of the aquatic environment through environmental monitoring, aquatic animal health programs and strict zoning requirements ensures South Australian seafood retains a high standard of environmental credentials while providing certainty and opportunity for Industry investment*."[2]

My main concern in this submission is the proposed siting of a desalination plant off Billy Lights Point adjacent to Proper and Boston Bays. The potential environmental impacts of the proposed desalination plant off Port Lincoln have been well documented and a matter of public record[3]. Accordingly, Yumbah Aquaculture continues to oppose this development. Likely serious risks include entrainment of mussel larvae in the seawater intake of the plant affecting natural spatfall, potentially toxic maintenance chemicals discharged into the near shore environment and, in relation to this submission, mobilisation of cysts of harmful algae. Despite, these risks, SA Water is proceeding with construction of the desalination plant with the intake and outfall adjacent to our mussel collection and growing sites. How is this development consistent with world leadership in sustainable development of aquaculture? How, by supporting an industrial scale desalination plant adjacent to a dedicated aquaculture zone, is the government protecting and managing the state's aquatic resources whilst encouraging investment, growth and social licence?

In relation to contributing environmental, land management or water quality factors, the operation of the desalination plant will potentially trigger a harmful algal bloom[4]. Cysts of harmful algae are present in sediments from Boston Bay[5] including *Karenia mikimotoi*[6]. The South Australian Shellfish Quality Assurance Program (SASQAP) monitors the water quality in shellfish harvesting areas of South Australia including the Port Lincoln dedicated aquaculture zone. This provides confidence to growers that their production is not endangered by toxic algae or harmful pollutants.

Mobilisation of harmful algal species was documented by the South Australian government (SARDI) as a potential impact of the Adelaide desalination plant off Port Stanvac "*It is possible that activities associated with the working plant, such as brine discharge and entrainment in the*

[2] Source: PIRSA (2016). Aquaculture investment in South Australia.
[3] Yumbah Aquaculture (2024). Submission to Select Committee on the Water Supply needs of Eyre Peninsula 12 April 2024. McShane (2024). Dr-Paul-McShane-Submission-to-the-Select-Committee-on-the-Water-Supply-Needs-of-Eyre-Peninsula-YMH.pdf McShane (2023). Desalination plant threatens high value aquaculture off Port Lincoln. Desalination plant threatens high value aquaculture off Port Lincoln ⋆ Global Marine Resource Management - Dr Paul McShane McShane (2021). Potential impacts of a desalination plant at Port Lincoln with particular reference to mussel farming. Threats-to-aquaculture-from-desalination-plant.pdf McShane (2022). Desalination-impact-on-the-mussel-industry.pdf
[4] Gomaa et al. (2018). Low diversity triggers harmful algae bloom (HAB) occurrence adjacent to desalination plants along the Red Sea. *Desalination and Water Treatment* 114, 1-12.
[5] Bolch, C.J.S. (1997). Dinoflagellate cysts in sediments from Port Lincoln, Boston Bay and surrounds. Report to Tuna Boat Owners Association December 1997.
[6] Wilkinson, C. (undated). Proposed desalination plant at Billy Light's Point Port Lincoln. See also Hallegraeff, G. M. and Bolch, C.J. (1992). Transport of diatom and dinoflagellate resting spores in ships ballast water: implications for plankton biogeography and aquaculture. *Journal of Plankton Research* 14, 1067-1084.

intake structure, will change the ecology of the plankton in the region, and may promote blooms of harmful/toxic algal species which have been identified as components of the plankton community off Port Stanvac."[7] The government is therefore well aware of the risks to coastal ecosystems presented by desalination plants particularly in sheltered waters where flushing rates are low (Proper Bay and Boston Bay).

The use of high-pressure dispersion jets to dilute hypersaline effluent discharged into near shore environments has the potential to disturb sediments[8] and release cysts of harmful algae including the species responsible for the current and continuing algal bloom. The relatively sheltered environment of Proper and Boston Bay, salinity/temperature/nutrient profile, and ambient light favour growth of *Karenia mikimotoi* [9] This is of serious concern to YMH given our dependence on clean water and compliance with SASQAP requirements.

These concerns extend to:

a. Ecological, economic and social impacts of algal blooms with particular reference to:

iii. Marine biodiversity and ecosystem health.

Clearly, if the scale and impact of the current bloom were replicated off Port Lincoln, there would be a devastating economic impact on our business, our clean green reputation and our established relationships with our customers. This economic impact through harm to the coastal ecosystems upon which our mussel aquaculture operation depends is measurable in millions of dollars with concomitant social impact on our employees and their dependents.

Given the extant risks of a further harmful algal bloom (among other potential impacts), I strongly urge the government to reconsider the location of the proposed desalination plant at Billy Lights Point so as to avoid potentially catastrophic ecological impact and severe economic losses for existing and viable aquaculture enterprises including YMH.

Thank you for considering my submission.

Mark Andrews 18th August 2025

General Manager
Yumbah Mussels Holdings

[7] Van Ruth, P. D. (2010). Adelaide desalination Project plankton characterisation study, prepared for Adelaide Aqua. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2010/000378-1. SARDI Research Report Series No. 487. 39 pp.

[8] Clark et al. (2018). First large-scale ecological impact study of desalination outfall reveals trade-offs in effects of hypersalinity and hydrodynamics. *Water Research* 145, 757-768.

[9] Modelling of growth and dispersal of *Karenia mikimotoi* by Jochen Kaempf (Flinders University Seminar series 15th August 2025 and manuscript under review.