

Enquiries: Jane O'Malley
Our Ref: 2020_10_20
File No.: CS_300_301



30 October 2020

Mr Dean Unsworth
Chief Executive Officer
Shire of Murray
PO Box 21
PINJARRA WA 6208
mailbag@murray.wa.gov.au

Dear Dean

Submission – TPS No 4 Proposed Amendment No 314 (Complex) Point Grey Marina – Support Scheme Amendment

The Peel Harvey Catchment Council (PHCC) applauds and supports the Shire's decision to initiate Scheme Amendment No 314 to remove discretion for planning approval of a marina, amend or remove other provisions relating to a marina and make other consequential changes to reflect this. The PHCC urges the WA Planning Commission and Minister for Planning to endorse Amendment 314, to protect the Peel-Harvey Estuary and all the values that it brings to its residents and visitors, and to remove the risk of future financial burden on community. Our justification for support of the Amendment is detailed below.

We have multiple concerns regarding the proposed Marina and Channel, summarised into the following themes:

1. Threats to ecological character of the Peel-Harvey Estuary (Environmental)
2. Financial risks of ongoing costs, future maintenance, environmental repair (Economic)
3. Social and economic– loss of jobs, threat to recreational values including fishing and crabbing (Social)

In addition, the PHCC has made several submissions and deputations to the Australian Government, Western Australian State Government and the Shire of Murray opposing the Point Grey Marina development. We have attached copies of the most recent and pertinent of these as appendices to this submission, as they are relevant to considerations in respect to the proposed Scheme Amendment (refer to list of enclosures at end). Therefore, please consider these as part of our submission.

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1. Threats to the ecological character of the Peel-Harvey Estuary

The Peel-Yalgorup Wetland System, of which the Peel-Harvey Estuary is a major component, is designated as a Wetland of International Importance under the Ramsar Convention. The wetlands, known as Ramsar Site 482, meet at least 6 of the 9 criteria for listing under this convention as an 'international wetland of importance' (Hale and Butcher 2007). These criteria relate to the ecological values of the estuary, including their global importance in hosting populations of critically endangered migratory shorebirds.

The Peel-Harvey Estuary also supports Matters of National Environmental Significance (MNES) which the Australian Government has responsibilities to protect under the EPBC Act (including Ramsar wetland, Threatened species and Threatened Ecological Communities).

The Peel-Harvey Estuary is an important nursery area for more than 50 species of fish, including blue swimmer crabs and sea-mullet, with the commercial and recreational fisheries for both of these species certified as sustainable by the Marine Stewardship Council (SGS Global 2016).

The Point Grey Marina development poses a serious threat to these environmental values.

The Peel-Harvey Estuary is already identified as an **at-risk estuary** by the State Government (DWER 2017) primarily due to nutrient enrichment of its waters and sediments.

The greatest threats to the environmental values of the Peel-Yalgorup Ramsar Site, and in particular the estuary, from the Point Grey Marina development are those associated with dredging activity to construct and maintain the proposed marina entrance channel and navigation channel, namely:

- Disturbance of sulfidic materials including Monosulfidic Black Ooze (MBOs, black muck) and pyrites during the dredging operations exacerbating the poor water and sediment quality in the Peel-Harvey Estuary.
- Creation of depositional sinks for formation and accumulation of these sulfidic materials in the channelized areas (Bush et al., 2012).
- Disposal of dredge spoil from the capital dredging and maintenance dredging programs (how, when and where).
- Removal or smothering of seagrass and reduced sediment quality for benthic (sediment or bottom dwelling) feeders, including blue swimmer crabs and sea mullet.
- Impacts throughout the entire estuarine food chain resulting from pollution and reduced habitat quality.

Decision makers absolutely must consider the **cumulative impacts** of the development on the values of the Peel-Yalgorup Ramsar Site and in particular the Peel-Harvey Estuary. Scientific research clearly shows that the estuary is already suffering under existing impacts and management issues. In particular, poor water and sediment quality, treatment and disposal of dredge spoil, declining groundwater quantity and quality, declining surface flows in streams and rivers, physical disturbance of birds, loss of aquatic and terrestrial flora, loss of habitat for birds and aquatic fauna, and pressures from recreational and commercial fishing (PHCC 2017 – see Appendix 1).

PHCC urges the WA Planning Commission to consider the cumulative impacts of these pressures that existing development has already applied to the health of the Ramsar Site in conjunction with the threats from the proposed development at Point Grey, and thereby support the Shire of Murray's Scheme Amendment 314.

Recent scientific investigations regarding the Impact of the Point Grey (Huang et al. 2020)

Since our most recent deputation 25 June 2020, additional information has become available from further scientific investigation of the likely impacts of the proposed development. Drawing on information from the Australian Research Council (ARC) Linkage Project LP150100451 'Balancing estuarine and societal health in a changing environment', completed in 2019 (Valesini et al. 2019), **Huang et al. (2020) assessed the potential impacts of the Point Grey Marina Development on the siltation rate near to the development, including the navigation channel and marina; changes in water quality; and the health and condition of biotic communities.**

Modelling Results:

This assessment involved adaptation of the Peel-Harvey Estuary Response Model, developed through the ARC-Linkage project to include the proposed navigation channel, entrance channel and marina to include new wave and sediment transport models. **Scenarios were investigated to simulate wet season, dry season, flood conditions and future climate change scenarios.** The main predictions from these scenarios are as follows:

- The rate of **sediment accretion** in the channel and marina will vary from **1200 m³/year to 2460 m³ /year**, with both ends of the proposed channel being the most impacted.
- Winter storms and wave action will **increase the siltation rate** in the south eastern part of the channel. Depending on the prevalence and intensity of the storms, **this rate may vary by as much as two-fold.**
- The marina itself will be relatively unaffected by siltation but it is likely that this will become an area where **macroalgal wrack accumulates.**
- The development will result in **changes in the salinity and residence time of water** in the proposed navigation channel, particularly at the south eastern (i.e. Point Grey) end where the salinity of bottom water is predicted to **increase by up to 8 practical salinity units** during spring and the **retention time of the water decrease by up to 20 days.**

Indicators of Ecological Health

A review of the information collected during the ARC-Linkage project regarding the **indicators of the ecological health of the estuary** (i.e. seagrass, benthic invertebrates and fish communities) revealed that that the proposed development is situated in an area of the estuary that provides high quality habitat relative to other areas of the estuary: **"there were few other areas in the estuary that consistently ranked this highly for these indicators."**

Implications for Ecological Health of the Estuary:

Considering these observations and the impacts predicted by the modelling, Huang et. al. (2020) drew the conclusion “**that the development will cause disruption to one of the most valuable areas currently within the estuary**” through:

- The **direct effects of seagrass removal on ecological communities** during dredging.
- **Increasing salinity and decreasing retention time of water** resulting in the ‘**marinisation**’ (i.e. **increasing the marine character**) of the **ecological communities** in the vicinity of the marina development. This has the potential to **impact on the diversity** of these communities which rely on subtle seasonal changes in salinity as biological cues (e.g. for breeding).
- Predictions from modelling of **future drying climate scenarios** indicate an **increase on the overall stress to the Peel-Harvey estuary system in general**, with projections of **reduced flushing, further ‘marinisation’ and continuing decline in water quality**.
- Although the **climate change effects are likely to have a relatively small impact** in the vicinity of the development due to its proximity to the Dawesville Channel, the **changes in water retention time and increasing salinity will continue to apply** under this scenario, with the attendant **negative impacts on water quality and nutrient retention**.
- Increased **deposition of sediment fines and probable macroalgal wrack accumulation** resulting in a **deterioration in sediment quality in the eastern channel and marina**, with **highly sulfidic sediments negatively impacting on local biota** and more generally **contributing to a decline in ecological health**.
- The Peel-Harvey Estuary System is already under stress and that new adaptation strategies are required to ensure ecological resilience. **(This development) “adds further risk to ecosystem health of the estuary and will limit the ability of the estuary to respond to future challenges being faced.”**

2. Financial risks – ongoing maintenance of the development

PHCC is aware of previous, similar projects that have resulted in negative environmental consequences and high financial costs. These costs have fallen on the local community, due to local and state governments needing to fund remediation and ongoing management works. Often, this is a result of the developer going into liquidation or the passage of time, meaning the developer is no longer bound by any agreement to fund works, regardless of efforts to remove risk in this area (i.e. approvals and conditions).

PHCC believes that the local, state and commonwealth governments can learn from these previous similar projects to determine why they have failed and why the communities are having to bear the **ongoing financial and environmental cost** of these marinas and channels. As a result, PHCC commissioned a report (PHCC 2019a) which identified **eight previous similar projects and the financial burdens they have placed on ratepayers and taxpayers, despite the approvals and conditions in place**. These case studies demonstrate lessons to guide decision making in the progression of the Point Grey Marina development.

The projects investigated were:

- **South Yunderup Canals** – Western Australia
- **Port Geographe Bay** – Western Australia
- **Ettalong Channel** – New South Wales
- **Two Great Barrier Reef projects** – Gladstone and Abbot Point – Queensland
- **Port Hinchinbrook** – Queensland
- **Toondah Harbour** – Queensland
- **Beadon Creek** – Western Australia

In summary, the following conclusions were drawn from these case studies:

I. Environmental outcomes are unpredictable.

In many cases, environmental experts have predicted minimal negative impact or, in the case of the South Yunderup Canals and the Port Geographe development, positive impacts will be the result of the development. However, these **predictions have been proven to be incorrect.**

II. The cost of developments that do not have the predicted results can be very high.

When the environmental outcomes are not as predicted, (i.e. ongoing costs, accumulation of nuisance odorous seagrass wrack, detriment to industry and recreation values), **local and state government are left to try to rectify impacts, using public funds to do so.** These developments can cause issues that impact on the health of the community, and the economic stability of the area through accessibility issues, impacts on tourism and businesses being able to operate and impacts on land prices. This is in addition to the negative impact on the flora and fauna. Rectifying these issues can be extremely costly, as has been seen in the Port Geographe case.

III. The cost of maintenance and management are unknown but will eventually fall on the government.

Whether it is the local or state government and whether it is in the short, medium or long term, it is inevitable that the **responsibility for these costs will eventually lie with government,** which means the tax and rate paying community are forced to fund the costs. Monitoring, maintenance dredging and other required works will be required in perpetuity and we are unable to find any examples where the commercial developer was appropriately held to account for that ongoing commitment. Even with statutorily binding commitments, it is likely they will inevitably fail as a business and the responsibility will still fall to government, as in the case of Port Hinchinbrook.

In regards to the Point Grey Development, the EPA (2012) have stated that,

“the question of whether **the proposed arrangements and quantum of contributions** from the proponent are adequate **is best left to the Shire of Murray and the Department of Transport to negotiate with the proponent** during the finalisation of the relevant agreements.”

IV. Clarity over which government agency will be responsible for ongoing costs is paramount.

Government (via the community) will be responsible for funding the maintenance of the Point Grey development at some point. Therefore, should the state not support the Amendment, it is integral that, there is a clear plan in place for which government will fund the works. As demonstrated **in the case of the Ettalong Channel, disagreements over responsibility** between the local and state government **result in further negative impacts to the community and the economy**. It is therefore important that this decision is made, in writing, prior to any development proceeding.

V. Dredge spoil disposal locations will be an issue in the future.

The Yunderup Canals experience has shown that in-estuary disposal of spoil has negative environmental consequences. The Great Barrier Reef experience demonstrates the negative environmental impact from marine-based spoil disposal, to the extent that it has now been banned. However, land-based disposal options in the area of the Yunderup canals, and therefore in the area of the Point Grey development, are limited. Additionally, the Commonwealth environmental approval conditions prohibit in-estuary disposal of the Point Grey spoil. A key consideration for decision makers, should they not support the Scheme Amendment, must be **where and how the dredge spoil from the Point Grey development will be disposed of**, noting that it will be ongoing in perpetuity and needs to be considered in the context of the area already having large amounts of dredge spoil to dispose of, due to the Yunderup and other existing canal systems in the region.

VI. Conditions of Approval including Monitoring and Management Plans do not ensure success.

The EPA has approved the Point Grey Marina development with a number of conditions to limit and monitor the environmental impact. However, **once the marina and channel are constructed, no amount of monitoring or management plans can reverse the impacts this will cause**. The Port Geographe example clearly demonstrates that the imposition of conditions, requirements and monitoring plans does not stop the negative environmental and financial impacts of a development. Despite over 18 recommendations, this project still resulted in environmental and health issues and above expected ongoing maintenance costs, providing an ongoing burden to government and community.

Should the Scheme Amendment not be supported, the **Shire of Murray will be required to play an integral role** in coordinating and **implementing the state and commonwealth environmental approval conditions**, particularly with regard to monitoring the impacts and actioning remedial works should triggers be exceeded. It will **have significant resourcing implications for the Shire, especially when adverse consequences occur** as a result of the development.

Commonwealth conditions allow for the proponent to modify management plans throughout the life of the development and the proponent has already successfully influenced the Commonwealth to modify conditions, without consultation with the Shire of Murray or any other impacted stakeholder. These modifications significantly changed the proposal and the ability for due diligence around the construction of the Marina and Channel. The proponent has already breached conditions and has submitted management

plans to the state in direct contradiction to commonwealth conditions. The implications to resources at a local, state and commonwealth government will continue to be significant, and will provide increased pressure, should the Scheme Amendment not be supported.

3. Social and Economic values of the Peel-Harvey waterways:

Preserving the health of the waterways is central to local community values and will retain **significant economic benefits** currently supported by the waterways through local tourism, commercial and recreational fisheries and other recreational activities. The following economic values have been found to be **reliant on the condition of the waterways** (PHCC 2019b):

- \$217 million in annual expenditure on recreational fishing activities
- \$40 million in annual expenditure on boat maintenance and operations in the Peel Region
- \$1.8 million in annual revenue generated through storing boats in marinas
- Between \$0.9 million and \$1.7 million in annual catch of blue swimmer crabs and finfish from commercial fishing
- \$318.2 million in annual tourism expenditure spent in Mandurah
- \$3.15 million derived from the annual value of commercial fishing licenses

This represents a **total value of approximately \$580 million (per annum)**.

Note from the above that the current **combined revenue of all marinas** in the Peel-Harvey Estuary System represents **approximately 0.3 %** of the total economic value of the estuary system. Building the proposed additional marina at Point Grey effectively puts an asset with an estimated value of at least \$580 million at risk for the sake for a relatively minor contribution to overall economic value.

To further illustrate this economic risk and the social risk, **Remplan economic modelling** indicates that a **1% reduction to the value of key industries** that are reliant on the waterways (tourism, fishing and recreation) over 5 years would be significant, resulting in **the loss of 39 jobs, \$2.17 million in wages and a broader economic impact of -\$45.6 million** (PHCC 2019b).

Conclusion

The proposed Pt Grey Marina and Channel are not in the public interest. Rigorous and contemporary science demonstrates the risks to the Estuary and all the values it holds for our community and its visitors, should the proposed Pt Grey Marina and Channel be constructed. Case studies demonstrate the financial, social and environmental risks, despite approvals and conditions.

Our waterways are clearly and consistently recognised as our biggest economic asset and our community relies on and needs a healthy Estuary.

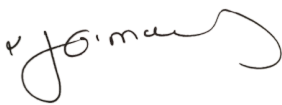
The risks of this marina and channel are too high, and they cannot be mitigated – no amount of monitoring can undo the damage this channel will cause. We need to learn from other projects, asking ourselves why they have failed and why community is wearing the ongoing costs.

This Scheme Amendment, if approved, will remove the cycle of defending applications and we hope, allow community to work with all levels of Government, and the proponent on a new vision for Pt Grey. A vision that celebrates and embraces the unique qualities of Pt Grey, without risking our Estuary in the process.

Thank you for listening to the science, economics and your community. We support the Shire's leadership and courage in this long and complex process and hope that you will endorse the Officer's recommendation to remove this significant risk to our Estuary.

Should you require further information, please do not hesitate to contact Jane O'Malley on (08) 6369 8800 or email admin@peel-harvey.org.au.

Yours sincerely



Jane O'Malley
Chief Executive Officer

Appendices:

Appendix 1: Comment regarding the change to condition to extend the time limit of authorisation for the Point Grey Marina Proposal. A submission to the Environmental Protection Authority, 26 September 2017. (A1_0123_2017_0921_PointGrey_Final&Attach_SF_JO)

Appendix 2: Deputation by the Peel-Harvey Catchment Council PO23/2019 – Proposed Stage One Earthworks – Point Grey Marina Lot 572 Carrabungup Road, Point Grey – Recommend Refusal 24 April 2019 (A2_2019_Point Grey DA_PHCC Deputation_Murray_24 April)

Appendix 3: Deputation by Jane O'Malley, CEO of Peel-Harvey Catchment Council, on behalf of the Peel-Harvey Catchment Council Inc. 11.4 - Application for Development Approval for Stage 1 Earthworks for the Point Grey Marina – Lot 672 Carrabungup Road, Point Grey (A3_2019_Marina Deputation_Shire Murray_Jane_27June2019_Final)

Appendix 4: Deputation by the Peel-Harvey Catchment Council 11.4 - Application for Development Approval for Stage 1 Earthworks for the Point Grey Marina – Lot 672 Carrabungup Road, Point Grey 27 June, 2019 Dr. Steve Fisher, Science Advisor & Program Manager, Science & Waterways (A4_2019_Marina Deputation_Shire Murray_Steve_27_June_Final)
Appendix 5: Expert witness statement of Dr Steven James Fisher to State Administrative Tribunal Matter No. DR 108 of 2019, 17 September 2019. (A5_Witness-Statement_Fisher-Final)

Appendix 6: Deputation by the Peel-Harvey Catchment Council 11.4 - Amendment to the Town Planning Scheme 4 to Remove Discretion for a Marina at Lot 1132 (745) Carrabungup Road, Point Grey, 25 June, 2020 Dr Steve Fisher, Science Advisor & Program Manager, Science & Waterways (A6_2020_Marina Deputation_Shire Murray_Steve_25_June_Final)

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PHCC 2017. Comment regarding the change to condition to extend the time limit of authorisation for the Point Grey Marina Proposal. A submission to the Environmental Protection Authority, 26 September 2017.

PHCC 2019a. Case Studies Relevant to the Proposed Point Grey Marina and Channel. A Report to Inform Decision Makers and Community, prepared by Whitney Consulting on behalf of the Peel-Harvey Catchment Council Inc., June 2019.

PHCC, 2019b. Business Case 2020, Peel Waterways Research Infrastructure Project

SCS Global 2016, Western Australia Peel-Harvey Estuarine Fishery MSC Full Assessment Final Report retrieved from <https://fisheries.msc.org/en/fisheries/peel-harvey-estuarine-fishery-recreational-and-commercial-blue-swimmer-crab-and-commercial-sea-mullet/@@assessments>

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Your Ref: DWERA-000183



26 September 2017

Dr Tom Hatton
Chairman
Environmental Protection Authority
Locked Bag 33, Cloisters Square
PERTH WA 6850

Dear Dr Hatton

Comment regarding the change to condition to extend the time limit of authorisation for the Point Grey Marina Proposal

The Peel-Harvey Catchment Council Inc. (PHCC) is opposed to the change to extend the Time Limit of Authorisation for substantial commencement for implementation of the Point Grey Marina proposal, including the proposed navigation channel across the northern end of the Harvey Estuary.

Here we present information regarding deterioration in the environmental condition of the Peel-Harvey Estuary and implications of implementation of the proposal to contribute to further deterioration in the condition of the estuary that have emerged since the proposal was previously considered by the WA Government Environmental Protection Authority in 2011. These are described in Attachments 1 to 4, but in summary we believe the key issues are:

- Research completed in 2012 by Bush et al. (ARC-Linkage Project LP0991658 *Hyper-accumulations of monosulfidic sediments: Exploring a biogeochemical extreme to resolve fundamental sulfur biomineralisation pathways*) and several publications by Morgan and others (Morgan 2012; Morgan, Burton and Rate 2012; Morgan, Rate, Burton and Smirk 2012 and Morgan Rate and Burton 2012) revealed that sediments in the Peel-Harvey Estuary contain high concentrations of acid volatile sulfides (AVS). These are indicative of monosulfidic black ooze (MBOs), which release nutrients into, and lead to localized deoxygenation of, the water column, especially upon disturbance. **This new information showed that AVS is widespread throughout the estuary, including in the Harvey Estuary, and present in concentrations several times that observed in estuaries elsewhere.**
- The ARC-Linkage project LP0991658 (Bush et al. 2012) also gave new insights into MBOs, linking their formation to fine-grained sediment, and observing their reactivity on disturbance, releasing nutrients and potentially toxic sulfides into the water column. This work identified several management implications of disturbance of these sediments through dredging operations, including ***“The mobilization of fine sediments as a result of dredging will cause MBOs materials to oxidise and release associated contaminants. Current hazards associated with the mobilization of these sediments are poorly defined. A clear understanding of these hazards will improve the environmental assessment and management of MBOs in areas of dredging and dredge disposal.”***

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- Bush et al. (2012) and later Choppala et al. 2017 observed that the estuarine sediments also contain high concentrations of iron pyrite (FeS₂) which are unusually highly reactive upon disturbance, are implicated in nutrient release into the water column and also contribute to the deterioration of the environment through smothering biological surfaces, deteriorating food sources and the quality of benthic habitats through formation of iron (III). **Disturbance of these sulfidic materials through construction, operation and maintenance of the marina development therefore present a threat to the marine environment that was not previously considered in the original assessment.**
- Estuarine water quality over the period 2012-2016, in particular concentrations of dissolved nitrogen and dissolved oxygen and salinity, does not meet the Limits of Acceptable Change (LACs) as described by Hale and Butcher (2007) for the Peel-Harvey Estuary. **The new understanding of the threat of nutrient release from disturbance of sulfidic material during construction and maintenance of the proposed marina indicates that implementation of the proposal is likely to exacerbate the poor water quality.**
- The concentrations of total phosphorus and (dissolved) phosphate in the estuarine portions of the Murray and Serpentine Rivers also do not meet the LACs for the estuary.
- New data collected since the initial assessment of the proposal in 2011 shows that three of the LACs were not met for waterbirds in the Peel-Yalgorup System (PYS) Ramsar Site. Further, since 2012, the list of vulnerable, endangered and critically endangered species has expanded to include six species for which the PYS provides critical habitat. An assessment of the 11 species against which the Site met Criterion 6 for Ramsar listing shows that in the past five years only one species has reached the population threshold every year and four of the 11 species have not reached the threshold in any year. **Implementation of the proposed marina is an additional disturbance to bird habitat, foraging and reproductive behavior and thereby poses a threat to the international recognition of the PYS as a Ramsar site.**
- In 2016, the Peel-Harvey Estuarine Fishery was certified as sustainable by the Marine Stewardship Council (MSC). This certification involved development and adoption of Harvest Strategies for the target species of blue swimmer crabs and sea mullet, based on catch data from the period 2000/01 to 2011/12 inclusive. Implementation of the Point Grey proposal poses a risk to the condition of the Peel-Harvey Estuary through declining sediment and water quality. **The effect of this potential habitat degradation on catches of benthic feeders such as blue swimmer crabs and sea mullet has not been considered in setting the sustainable catch through the respective harvest strategies. Any change in the benthic environment likely to affect the abundance and distribution of these species and their prey, including the dredging operations and accumulation of MBOs through implementation of the proposed marina, may have serious implications on the MSC certification and the sustainability of the commercial and recreational fishery. Implementation of the proposal thereby has the potential to cause the closure of the recreational and/or commercial fishery due to factors other than fishing pressure, or alternatively places the MSC certification of the fishery at risk.**
- In 2013, the Commonwealth Government Minister for Environment, Heritage and Water listed the *Subtropical and Temperate Coastal Salt Marsh Ecological Community* as a threatened ecological community (TEC) in the vulnerable category. These marshes occur as fringing vegetation to the Peel-Harvey Estuary, including in the embayments of the Peel-Harvey estuary in

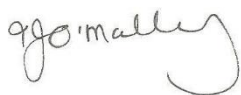
the vicinity of the proposed marina. The *Conservation Advice* notes that “population growth and development in the coastal zone ... continue to exacerbate all threats to the ecological community”. The proposed marina represents a coastal development, identified as a factor in exacerbating the threats to the TEC according to the Conservation Advice accompanying the listing. Dispersal of sulfidic materials (MBOs and pyrite) disturbed during construction, operation and maintenance of the proposed marina and navigation channel also present a threat to the samphire TEC. **The listing of this community as vulnerable since the initial assessment of the Point Grey Marina in 2011, and its occurrence in fringing vegetation near to the proposed site must be considered in a reassessment of the proposal. Samphire is also an important habitat for shorebirds for food and shelter.**

- The Tuart woodlands (*Eucalyptus gomphocephala*) are currently being considered for listing under the EPBC Act as a Threatened Ecological Community by the Threatened Species Scientific Committee. Ministerial advice is expected in late 2017 or early 2018. There are 82 tuart trees that will be destroyed through the development of the marina. **In January 2016 the Waroona/Yarloop bushfire destroyed a large portion of tuart habitat across private land, State Forest and Yalgorup National Park. The endangered Carnaby’s Cockatoos are known to nest in Tuart woodlands and so with the loss of trees due to the bushfires, it is likely that the importance of the tuart trees at Point Grey for foraging and nesting has increased significantly since the initial assessment.** Implementation of the marina proposal will in turn enable the terrestrial subdivision of the remainder of Point Grey. **This will mean the loss of a significantly larger number of tuart trees than the 82 that will be destroyed by the marina.**
- The Precautionary Principle should be applied to this assessment of the environmental condition of the estuary with respect to the Point Grey Marina proposal. The absence of new information regarding some indicators of the current condition of the estuary should not be interpreted to mean that environmental conditions have not deteriorated since the initial assessment of the proposal.

Based on this information, we reiterate our recommendation that the Time Limit of Authorisation for substantial commencement of the proposal is not extended.

Should you require further information, please do not hesitate to contact Jane O’Malley on (08) 6369 8800 or email admin@peel-harvey.org.au.

Yours sincerely



Jane O’Malley
Chief Executive Officer

Enclosed:

Attach 1: Evidence of potential decline in environmental health of the Peel-Harvey estuary since 2011
Attach 2: ARC-Linkage Project Update May 2012 (LP0991658 – Bush et al. 2012)

Attach 3: Water quality and phytoplankton data collected from the Peel-Harvey Estuary 2012-2016 (DoW, 2017) compared against Limits of Acceptable Change (LACs) for the Peel-Yalgorup System (Hale and Butcher 2007) and trigger values from the ANZECC and ARMCANZ Guidelines (2000).

Attach 4: Shorebird data collected from the Peel-Yalgorup System 2008-2016 compared with Limits of Acceptable Change (Hale and Butcher 2007)

Attachment 1: Evidence of potential decline in environmental health of the Peel-Harvey estuary since 2011

In applying the *Statement of Environmental Principles, Factors and Objectives (EPA 2016)*, the EPA has identified the following key environmental factors relevant to the proposal:

- Marine Environmental Quality;
- Marine Fauna;
- Flora and vegetation;
- Terrestrial fauna.

In the following, we present evidence showing a potential decline in the environmental health of the estuary since 2012 according to these factors and the implications of this new information for implementing the Point Grey Marina proposal.

Marine Environmental Quality

Sediment Quality

Data/Findings

The sediments of the Peel-Harvey estuary contain high concentrations of monosulfidic black oozes (MBOs) which have the potential for degradation of benthic habitat and water quality. Photographs showing examples of accumulations of these MBOs in the Peel-Harvey Estuary System (PHES) are shown in Figure 1.

Since the consideration of the Point Grey Marina proposal in 2011, Morgan (2012) has published her Ph.D. thesis investigating the formation of MBOs in the PHES. In Chapter Two of this thesis (also published as Morgan, Burton and Rate 2012), concentrations of acid volatile sulfide (AVS) ranging from 34 to 335 $\mu\text{mol/g}$ were reported in sediments collected from six sites in and around the South Yunderup channel, a frequently dredged boating entrance to the South Yunderup residential canals. AVS concentration is a measure of, and a proxy for, iron monosulfides in the sediment, a major component of MBOs. Morgan (2012, p 26) noted that these concentrations were anomalously high compared with other studies of estuarine systems which are generally present at less than 100 $\mu\text{mol/g}$ AVS.

Chapter 3 of Morgan 2012 (also published as Morgan et al. 2012) presents AVS concentrations from sediment samples collected from 20 sites at various locations around the Peel-Harvey Estuary and estuarine portions of the Murray and Serpentine Rivers (i.e. the PHES). Median concentrations of replicates from each site ranged from 16 $\mu\text{mol/g}$ to 614 $\mu\text{mol/g}$, indicating that the MBOs are widespread across the PHES.

Results from a laboratory trial (Chapter 5) show that as macroalgae decompose, the nutrients ammonium (NH_4^+) and phosphate (PO_4^{3-}) are released back into monosulfide-rich PHES sediments. This cycling and subsequent release of nutrients from the sediment leads to the stimulation of further algal growth. Thus, the sulfide rich sediments of the PHES drive an internal regeneration of macroalgae. **Morgan (2012) concluded that this may be a greater environmental concern than the release of metals and deoxygenation which occurs upon disturbance of these sediments.**



Figure 1: Photographs showing monosulfidic black ooze in the Peel-Harvey Estuary System. Note the depth of the ooze in the upper photograph (Photographs courtesy R.Bush 2013).

Chapter 6 of Morgan (2012) (also published as Morgan, Rate and Burton (2012)), reports on the water chemistry and nutrient release during the resuspension of MBOs collected from the PHES in the laboratory and in-situ in the estuary during dredging operations. In summary, the resuspension of MBOs resulted in:

- rapid deoxygenation of the water column in the laboratory which was not observed during dredging
- a decrease in (water) pH in the laboratory, not observed during dredging operations presumably due to the buffering capacity of the estuary
- releases of dissolved ammonium (NH_4^+) and phosphate (PO_4^{3-}) in both the laboratory and field

The high concentrations of MBOs and nutrient cycling behavior of sediments from the PHES were also observed in the ARC-Linkage Project LP0991658 *Hyper-accumulations of monosulfidic sediments: Exploring a biogeochemical extreme to resolve fundamental sulfur biomineralisation pathways* led by Dr Richard Bush from Southern Cross University from 2009-2012. Relevant peer-reviewed publications from this study include Kraal, Burton and Bush (2013), Kraal et al. (2013), Kraal et al, (2015) and Lockhart et al (2013).

The key findings of this study and the management implications are summarized in the project update from May 2012 shown in Attachment 2. In particular, Findings 1 to 4 inclusive and Findings 6 to 9 inclusive and the associated management implications highlight:

- that favourable conditions for MBO formation and accumulation exist in the Peel-Harvey Estuary system, especially around deeper sinkholes and troughs (e.g. navigation channels)
- that MBOS are prone to scouring and resuspension
- the mobilization of fine sediments from dredging activities will cause MBO materials to oxidise and release associated contaminants
- that activities that change the benthic sediment chemistry will have a direct impact on nutrient supply and the potential to trigger cycles of algal blooms
- MBOs are impacting water quality continually as a result of minor disturbances, such as recreational boating.

Finding 5 states that the coarser sediments with lower monosulfide content have high concentrations of pyrite (FeS_2), another major potential source of acidity and water column deoxygenation. These materials should be a key aspect of environmental impact assessments for developments involving benthic disturbance.

In a more recent study, Choppala et al. (2017) reported that in addition to the very rapid oxidation of monosulfides, unusually high rates of pyrite oxidation were also observed upon disturbance of sediments from the Peel-Harvey Estuary System, most likely due to the presence of very fine nanocrystals of FeS_2 . The investigators also concluded that *“No significant release of trace metals was observed during resuspension of sulfidic sediments. However, disturbance to these estuarine sediments increases Fe(III) formation and further deteriorates the environment through smothering biological surfaces, deteriorating food sources and the quality of benthic habitats.”*

These findings were not considered during the initial assessment of this proposal.

Implications

The very high concentrations of MBOs (and pyrite), the greater extent of their occurrence in the PHES and the improved understanding of their tendency to rapidly form and accumulate, especially in channelized areas of the PHES are now acknowledged in the peer reviewed literature. Recent studies showing the unusually reactivity of pyrite and the potential for degradation of the benthic environment on disturbance also add to the understanding of the consequences of disturbing sediments in the PHES. With this greater understanding, it is apparent that the construction and maintenance of the proposed marina poses greater risks to the quality of the marine environment than when the proposal was considered in 2011.

It is clear that the disposal of dredge spoil from the initial construction of the proposed marina and navigation channel and the on-going maintenance dredging of the channel poses a greater management problem for the managers of the estuary than considered in the initial assessment.

It is also likely that the tidal current associated with the Dawesville Channel (up to 12 knots) will cause the mobilisation of accumulated MBOs from within the proposed new navigation channel leading to oxidisation and the release of associated contaminants. Current hazards associated with the mobilisation of these sediment are not understood.

Both on shore and in-estuary disposal of dredge spoil involve a significant footprint for treatment and disposal of the MBOs. In-estuary disposal involves covering of the estuary floor elsewhere and even with careful site selection and monitoring the risk of smothering of the benthic flora and fauna remains. Relocating the spoil and associated MBOs elsewhere in the estuary does not reduce the risk of future resuspension and mobilization. On-shore treatment and disposal needs to be carefully managed to reduce the risk of acid sulfate drainage on aquatic and terrestrial environments.

Based on this new information, implementation of the proposal will exacerbate the poor sediment quality and lead to a deterioration in water quality in the PHES. We therefore recommend that the Time Limit of Authorisation for substantial commencement of the proposal is not be extended.

Water Quality

Consistent with the obligations under the Ramsar Convention, the Ecological Character of the Peel-Yalgorup System was described by Hale and Butcher (2007) as part of the process of developing the Management Plan (PHCC 2009) for the Ramsar-listed Peel-Yalgorup System (PYS), a wetland of international importance. Based on the Ecological Character Description (Hale and Butcher 2007), and given the limited resources generally made available for monitoring, a monitoring and evaluation program was developed (Hale 2008) for the Ramsar Site Management Plan, to set a baseline for the critical components and processes of the system against which changes in the character of the system may be assessed. Limits of Acceptable Change (LACs) were identified and threshold values set (in some cases upper and lower). A LAC is defined as “a variation that is considered acceptable in a particular component or process of the ecological character of the wetland without indicating change in ecological character which may lead to a reduction or loss of the criteria for which the site was Ramsar listed’ (Hale and Butcher 2007, p.10). To date a lack of resources have meant only certain elements of the 12-program monitoring guide have been implemented. A precautionary approach

needs to be taken as direct and cumulative impacts on the Ecological Character are not been monitored.

In March 2017 the Peel-Yalgorup System Ramsar Technical Advisory Group (TAG) met to consider information and monitoring data gathered regarding the current status of the system according to the monitoring guide and the LACs. These considerations form an initial framework for the assessment of the condition of the PYS Ramsar site (see Attachments 3 and 4).

Estuarine water quality and phytoplankton are two components for which sufficient data existed to enable LACs to be set in 2007. The results of the 2017 comparison with the LACs are summarised in Attachment 3, with a precis and discussion of the relevance to the Point Grey Marina proposal presented below.

Water Quality A & Phytoplankton: Peel-Harvey Estuary

Data / Findings

The (then) Department of Water monitors estuarine water quality and phytoplankton through water sampling and analysis. Phytoplankton and in-situ measurements of physical variables (e.g. pH, dissolved oxygen, electrical conductivity) are measured fortnightly. Nutrient concentrations were not monitored in the Peel-Harvey Estuary between September 2013 and June 2016, due to a lack of resources, but are now monitored monthly. Some monitoring sites are located outside of the PYS Ramsar site boundaries but within the estuarine portions of the Murray River and Serpentine River that drain into the estuary. Water quality parameters provided by the Department of Water for the period 2012-2016 were compared against both the LACs and trigger values from the ANZECC and ARMCANZ (2000) Guidelines (i.e. the ANZECC Guidelines) where available.

For the period 2012 to 2016 inclusive, the LACs were NOT MET for:

- ammonium and oxidized nitrogen concentrations in the estuary and estuarine portions of the Serpentine River and Murray River
- total phosphorus and phosphate concentrations in surface and bottom waters of the estuarine portion of the Serpentine and Murray Rivers, although the LACs were met for the Peel Inlet and Harvey Estuary.
- salinity at the mouth of the Harvey Estuary during winter
- salinity in the Peel Inlet and Harvey estuary in 2012, 2013 and 2015
- chlorophyll a in the Serpentine River during autumn
- dissolved oxygen in bottom waters of the Murray River

Implications

These exceedances of LACs indicate that the system is currently under significant stress. As described in the section on sediment quality above, nutrient release (in particular ammonium and oxidised nitrogen) and depletion of dissolved oxygen are associated with disturbance of MBOs during dredging operations, in-estuary disposal of dredge spoil and disturbance by boating activities associated with the construction and use of the proposed marina and channel. These activities are likely to exacerbate the current poor condition of the estuary.

The proposed navigation channel is also likely to affect the hydrodynamics of the estuary. It is not known what impact this would have on salinity which fails to meet the LAC for the Ramsar site. A current ARC-Linkage Project (LP150100451 *Balancing estuarine and societal health in a changing environment*) led by Murdoch University is developing a hydrodynamic model of the PHES which could be used to investigate the impact. This model might also be used to predict sediment dispersal and the effect of climate change on estuarine water quality and hydrodynamics in the context of the proposed marina and navigation channel.

To our knowledge, the comparison of measured water quality and phytoplankton against the LACS shown in Attachment 3 has not been made previously and so was not considered at the time of the initial approval. Based on this new information, implementation of the proposal will exacerbate the poor water quality in the PHES. We therefore recommend that the Time Limit of Authorisation for substantial commencement of the proposal is not extended.

Marine Fauna

Waterbirds

Comparison with LACs

In addition to considering water quality, in March 2017 the PYS Ramsar TAG also considered observed data for shorebirds. The annual Shorebird 2020 count is held in early February each year. A summary of observations by PHCC of various shorebirds drawn from this dataset 2008-2016 inclusive compared with the LACs for the system is shown in Attachment 3.

Three of the indicators were outside the range of the LACs indicating the system is under stress:

- Sharp-tailed Sandpipers only exceeded 1% threshold of the Flyway populations based on the 5th Edition of the World Population Estimates (Wetlands International, 2012) in 2009, 2010 and 2014 i.e. three out of nine years rather than the minimum of three years out of five years.
- The nests of Little Black and Little Pied Cormorants declined during the period 2008-2016
- The number of Little Pied Cormorant eggs had declined from a low base level.

Performance against Ramsar Criterion 6

Table 1 shows the abundances of the 11 species of shorebird for which the Peel-Harvey Estuary portion of the Ramsar site meets Criterion 6 for Ramsar listing i.e. that "A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird". When compared with the 1% of the World Population Estimate, only one of these species met Criterion 6 in each year 2012-2017. Of the other 10 species, four did not meet Criterion 6 in any year and another three in only one year 2012-2017.

Table 1: Abundances of 11 shorebird species observed from the annual Shorebird 2020 Count in the Peel-Yalgorup Ramsar System from 2012 to 2017 inclusive compared with the 1% of the World Population Estimate (1% of WPE, 2012) for each. Note the 1% WPE data was sourced from [Wetlands International \(2017\)](#) and abundance data sourced from PHCC's analysis of the Peel-Yalgorup System's annual Shorebird 2020 Counts undertaken in partnership with Birdlife Australia each February.

Note that the 11 species are those that met Criterion 6 for Ramsar listing of the Peel-Harvey Estuarine portion of the wetland system. Cells highlighted in red indicate instances where the observed number fails to exceed the 1% threshold.

Species	Abundance for Peel-Yalgorup System (Shorebird 2020 Count)						1% WPE (2012)
	2012	2013	2014	2015	2016	2017	
Australasian Shoveler	0	50	484	1	0	2	250
Banded Stilts	1	39202	856	7468	462	200	3700
Curlew Sandpiper	0	12	31	20	6	11	1400
Eurasian Coot	28	109	127	35	27	3	10000
Fairy Tern	105	51	243	307	181	45	120
Grey Teal	1335	9403	6103	4179	112	627	20000
Musk Duck	13	318	186	134	31	9	250
Red-Capped Plover	659	1452	1238	1224	1067	812	950
Red-necked Avocets	36	316	590	428	2	197	1100
Red-necked Stint	4511	4330	4344	5077	4468	5974	3200
Sharp-tailed Sandpiper	257	1583	3550	1365	1390	721	1600

New EPBC Act listings

In May 2015 both the Eastern Curlew (*Numenius madagascariensis*) and the Curlew Sandpiper, (*Calidris ferruginea*) were listed under the Australian Government EPBC Act as Critically Endangered. The Peel Inlet and Harvey Estuary provide habitat to both these species of migratory birds. The Curlew Sandpiper is one of the 14 species of birds through which the PYS meets Ramsar listing Criterion 6 for Waterbirds. The 1% population threshold for Curlew Sandpipers has been set at 1800 for the Peel-Harvey Estuary.

Since the initial assessment in 2011 the following four species of migratory shorebirds have been listed (on 5th May 2016) as threatened species that should be observed in the PYS Ramsar site (S. Vine (Birdlife Australia) 2017, personal communication, 31 August).

- *Calidris tenuirostris* (Great Knot) Critically Endangered
- *Calidris canutus* (Red Knot) Endangered
- *Charadrius leschenaultii* (Greater Sand Plover), Vulnerable
- *Limosa lapponica menzbieri* (Bar-tailed Godwit (northern Siberian)), Critically Endangered

Further to the Fairy Tern being placed on the IUCN Red List in March 2011, these 2015 and 2016 listings of vulnerable, endangered and critically endangered bird species mean that the Ramsar site now qualifies against Ramsar Criterion 2, "that a wetland should be considered internationally important if it supports vulnerable, endangered or critically endangered species (or threatened ecological communities)".

Implications

The PYS is recognised by the Ramsar Convention as a wetland of international importance. Three of the seven criteria on which this listing is based relate directly to the Peel-Harvey Estuary and are dependent on the wetland sustaining populations (Criterion 5: >20,000 in total annually; and Criterion 6: at least 1% of the world's population of 11 species) of various species of migratory birds and shorebirds at critical times in their life cycles (Criterion 4).

New data collected since the initial assessment of the proposal in 2011 shows that three of the LACs were not met for waterbirds in the PYS. Further, since 2012, the list of vulnerable, endangered and critically endangered species has expanded to include six species for which PYS provides critical habitat. An assessment of the 11 species against which the Site meet Criterion 6 shows that in the past five years only one species has reached the population threshold every year and four of the 11 species have not reached the threshold in any year.

Implementation of the proposed marina is an additional disturbance to bird habitat, foraging and reproductive behavior and thereby poses a threat to the international recognition of the PYS as a Ramsar site. During construction, maintenance (dredging) and on-going use of the proposed marina facilities (and the terrestrial development that the marina will enable), there is a high risk of boats and humans disturbing bird behavior and preventing them from feeding, disturbance and loss of habitat (e.g. samphire and mudflats) as well as loss of habitat for benthic fauna upon which some birds prey. This is particularly important for migratory birds, including the six species recently placed on the EPBC threatened migratory species list, to re-fuel for their return journey to the northern hemisphere.

We therefore recommend that the Time Limit of Authorisation for substantial commencement of the proposal is not extended.

Benthic invertebrates

Data

In a study of benthic macroinvertebrate fauna, Wildsmith et al. (2009), investigated four sites in the PHES, including one at Point Grey. This study showed pronounced declines in benthic invertebrate fauna from the mid-1980s to mid-2000s in the PHES, with major reductions in diversity and density. Crustacea, the most sensitive of the taxa to environmental stress has become proportionally less abundant and represented by fewer species leading Wildsmith to conclude that the benthos of the Peel-Harvey Estuary is apparently more stressed than previously, probably due to the effects of a greater increase in system use. Although this paper predates the initial assessment, we believe that the original assessment did not adequately consider the risk to benthic fauna and the benthic flora.

Similar rigorous studies of the benthic fauna of the Peel-Harvey Estuary System have not been undertaken since the work of Wildsmith (2009), however the above-mentioned ARC-Linkage Project (LP150100451 *Balancing estuarine and societal health in a changing environment*) aims to replicate this work at more sites (>100) spread more widely across the Peel-Harvey Estuary System as well as develop an index of ecosystem health based on benthic invertebrates and investigate the effects of perturbation (e.g. dredging operations) on benthic invertebrates, commencing late 2017.

Fish

Data

As part of a \$14.5 Million initiative by the State Government to gain third-party assessment of sustainability in its managed fisheries, the Marine Stewardship Council (MSC) in June 2016 certified the Peel-Harvey Estuarine Fishery as sustainable for certain fishing methods for the target species of blue swimmer crabs and sea mullet. The certification is underpinned by Harvest Strategies for the Blue Swimmer Crab resource (Department of Fisheries, 2015a) and Finfish resources (Department of Fisheries, 2015b) of the Peel-Harvey Estuary. Each Harvest Strategy prescribes targets, limits and thresholds based on catch and catch rate data for the target species from both the recreational and commercial sectors, set from baseline data collected in 2001/02 – 2011/12 inclusive. Catches of by-catch and retained species (e.g. tailor, yellow-eye mullet, and whiting) are also considered in the Harvest Strategy for Finfish in assessing the sustainability of the estuarine fishery.

Control rules are set based on observed catch and catch rate against the targets, limits and thresholds. These control rules are linked to management actions to protect the sustainability of the fish stocks. For example, an exceedance of the limit may lead to closure of the recreational and/or commercial fisheries.

Implications

As described above, implementation of the Point Grey proposal poses a risk to the condition of the Peel-Harvey Estuary through declining sediment and water quality. The effect of this potential habitat degradation on catches of benthic feeders such as blue swimmer crabs and sea mullet has not been considered in setting the sustainable catch through the respective harvest strategies. **Implementation of the proposal thereby has the potential to cause the closure of the recreational and/or commercial fishery due to factors other than fishing pressure, or alternatively places the MSC certification of the fishery at risk. We therefore recommend that the Time Limit of Authorisation for substantial commencement of the proposal is not extended.**

Flora and Vegetation

Salt Marsh (Samphire) Threatened Ecological Community

New information

In 2013, the Commonwealth Government Minister for Environment, Heritage and Water listed the *Subtropical and Temperate Coastal Salt Marsh Ecological Community* as a threatened ecological community (TEC) in the vulnerable category. These marshes occur as fringing vegetation to the Peel-Harvey estuary, including in the embayments of the Peel-Harvey estuary in the vicinity of the proposed marina. The *Conservation Advice* notes that “population growth and development in the coastal zone ... continue to exacerbate all threats to the ecological community”. These threats include *inter alia* clearing and fragmentation, recreation, eutrophication and acid sulfate soils, all of which are potential impacts of the proposed development.

Implications

Preliminary results from a survey of vegetation fringing the Ramsar wetlands undertaken by PHCC in Sep 2017/18 show the occurrence of samphire in the vicinity of the proposed marina development (R. Paice 2017, personal communication, 20 Sep.).

The proposed marina represents a coastal development, identified as a factor in exacerbating the threats to the TEC according to the Conservation Advice accompanying the listing. Dispersal of sulfidic materials (MBOs and pyrite) disturbed during construction, operation and maintenance of the proposed marina and navigation channel also present a threat to the samphire TEC.

The listing of this community as vulnerable since the initial assessment of the Point Grey Marina in 2011, and its occurrence in fringing vegetation near to the proposed site must be considered in a reassessment of the proposal. Samphire is also an important habitat for shorebirds and their prey. We therefore recommend that the Time Limit of Authorisation for substantial commencement of the proposal is not extended.

Tuarts

New information

The Tuart woodlands (*Eucalyptus gomphocephala*) are currently being considered for listing under the EPBC Act as a Threatened Ecological Community by the Threatened Species Scientific Committee. Ministerial advice is expected in late 2017 or early 2018. There are 82 tuarts that will be destroyed through the development of the marina (RPS 2011 p.56). **In January 2016 the Waroona/Yarloop bushfire destroyed a large portion of tuart habitat across private land, State Forest and Yalgorup National Park.**

Implications

The *endangered* Carnaby's Cockatoos are known to nest in Tuart woodlands (e.g. at Lake Clifton, Biota 2006) and so with the loss of trees due to the bushfires, it is likely that the importance of the tuart trees at Point Grey for foraging and nesting has increased significantly since the initial assessment.

Implementation of the marina proposal will in turn enable the terrestrial subdivision of the remainder of Point Grey. While this submission is directly relevant to the proposal for the navigation channel and the marina only, their development is commercially interdependent with the development of the terrestrial subdivision and construction of Point Grey, and therefore this should be considered in respect to this assessment. Implementation of the terrestrial subdivision will mean a significantly larger number than the 82 tuarts associated with the marina development will be destroyed through clearing of 3.6 ha (canopy cover) of foraging habitat and 30.45 ha (canopy cover) of foraging and nesting trees in the *E. gomphocephala* vegetation unit. We therefore recommend that the Time Limit of Authorisation for substantial commencement of the proposal is not extended.

Seagrass

New information

A survey of submerged aquatic vegetation coverage and diversity is proposed via the above-mentioned ARC-Linkage Project LP150100451 to be completed 2019/2020. A report by Pedretti *et al.* (2009) predates, but does not appear to have been considered in the 2011 assessment. The

report (p. 64) notes, “The distribution of seagrass had also altered; in 2009 the greatest densities of biomass occurred on the north eastern shoreline of the Harvey and in the areas around the Dawesville and Mandurah Channels.” In her PhD thesis Veale (2013) made the observation that habitat and/or food in the form of macroalgae or seagrass seems to have the most influence on the fish fauna of the Peel-Harvey Estuary.

Implications

The areas referred to by Pedretti et al (2009) will be directly impacted by the channel dredging. Noting that the navigation channel will be dredged to 4m, an assessment must be undertaken to determine the ability of the seagrasses to recolonise to this depth, after having been removed by their roots, and/or whether they can undertake such re-colonisation in benthic habitat that has rapidly accumulating sulfidic material (MBOs and pyrite) associated low oxygen levels.

We therefore recommend that the Time Limit of Authorisation for substantial commencement of the proposal is not extended.

Terrestrial Fauna

See the discussion above regarding loss of Tuarts as habitat for Black Cockatoo.

Other considerations

Application of the Precautionary Principle

As discussed above, the PYS Ramsar TAG met in March 2017 to consider the condition of the Ramsar site with respect to the LACS. The dominating factor in these considerations was the lack of data. This was the case in 2007 when the Ecological Character Description of the Ramsar site was developed, and remains so in 2017. In 2007 there was insufficient data to even set baseline LACs for a number of the components and processes and this continues to be the case in 2017. Table 3 below summarises the knowledge gaps identified in 2007 by Hale and Butcher (2007) with respect to the monitoring and evaluation of the PHES that still exist and are relevant in 2017.

Table 2: Peel-Harvey Estuary Key Knowledge Gaps at 2007 still relevant in 2017 (adapted from Hale and Butcher 2007, p. 18):

Component / process	Knowledge Gap
Water Quality – Acid sulfate soils, MBOs and other sulfidic materials	The effect on water quality (pH and contaminant concentrations) is not known or understood
Aquatic Plants	Community composition, distribution and temporal patterns of seagrass and macroalgal communities within the estuary
Littoral vegetation	Current extent and condition of salt marsh vegetation
	Current extent and condition of paperbark communities
Fish	Current community composition and abundance of fish communities

Hale and Butcher (2007, p17) state, “Short-term limits of acceptable change (with a corresponding intensive monitoring program) have been set for measures for which change can be detected in the short term” (e.g. water quality). Conversely for other measures, for which change may take longer periods to detect, long-term limits were set. Finally the key biological components are considered. For most of these, quantitative LACs are difficult to determine, either due to a lack of baseline data, inherent high levels of natural variability, or in the case of many waterbird species, factors outside the site affecting their distribution and abundance observed at the site. For this reason, although strict “limits of acceptable change” cannot be set for these components, they form an important element of the monitoring program. Outcomes of the monitoring program are to be reviewed for broad trends and the information used to review and refine the limits of acceptable change for the site.” They also make the assertion that “Maintaining the conditions of the abiotic environment and the primary producers should protect these faunal components and processes” (p. 128).

In regard to the Peel-Harvey Estuary and the “Primary responses” components of Seagrass, Macroalgae, Samphire and Paperbark communities, at 2007 the current extent and biomass was unknown which meant that a baseline for these components needed to be determined before a LAC could be set (Hale & Butcher, 2007, Table 40: Limits of Acceptable Change, p.129). **This remains the case in 2017.**

With regard to the Peel-Harvey Estuary’s “Key species and communities” there was insufficient publicly available data in 2007 to set a baseline and determine a LAC. This was addressed in part by the MSC accreditation process and will be addressed in the future by the ARC-Linkage Project LP150100451.

Other knowledge gaps identified in preceding sections which are relevant to assessing the impact of the proposed marina development on the Peel-Harvey Estuary System include:

- Seagrass: extent, diversity and ability to recolonise at 4 m depth and once roots are removed
- Benthic invertebrates: species diversity, richness, spatial distribution
- Hydrodynamic modelling of the PHES to predict sediment dispersal, salinity and nutrient concentrations and the effect of climate change

Implications

The Precautionary Principle should be applied to this assessment of the environmental condition of the PHES with respect to the Point Grey Marina proposal. The absence of new information regarding some indicators of the current condition of the PHES should not be interpreted to mean that environmental conditions have not deteriorated since the initial assessment of the proposal. We therefore recommend that the Time Limit of Authorisation for substantial commencement of the proposal is not extended.

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Peel Harvey ARC Project Update: May 2012

PARTNER ORGANISATIONS

WA Department of Environment, WA Transport, WA Water, Murray Shire, Mandurah City Council, Southern Cross University, Curtin University, University of WA

PROJECT SUMMARY

The chemistry of anoxic aquatic environments such as the Peel Harvey estuary is dominated by reactions with reduced sulfur, yet many of the fundamentally important reactions are highly transient and elusive. This project is exploring the extreme sedimentary conditions of a eutrophic estuary where hyper-accumulations of iron monosulfide prevail. Reduced inorganic sulfur and organo-sulfur compounds occur in abnormally high concentrations in these sediments, providing an ideal natural material to unravel sulfur biomineralisation pathways.

KEY FINDINGS UPDATE (2011-2012)

Finding 1: Channels in the Peel-Harvey and deep holes in the lower reaches of the tributary rivers provide highly favourable conditions for monosulfidic black ooze (MBO) (this is well known).

Management Implication: Changes to bedform that result in sinkholes and troughs will enhance localised MBO accumulation. This has relevance to developments that involve new dredging and maintenance dredging of navigational channels.

Finding 2: The formation of MBO is strongly linked to the presence/deposition of fine-grained sediment (silt), '*find the silt and you find the monosulfidic sediments*'. The fine sediments appear to restrict oxygen diffusion into the sediment, enhancing the formation and preservation of otherwise labile iron monosulfide minerals.

Management Implication: Understanding catchment sediment yield and the mobilization and redistribution of fine sediments within the Peel-Harvey is necessary to predict the accumulation of MBO.

Finding 3: Fine sediments associated with MBO are likely to include both contemporary catchment inputs and sediment redistribution within the estuary.

Management Implication: The construction and on-going management of man-

made channels in the Peel Harvey estuary will need to account for the hazard of MBO accumulation in their design and on-going maintenance.

Finding 4: MBO are prone to scour and suspension.

Management Implication: The mobilization of fine sediments as a result of dredging will cause MBO materials to oxidize and release associated contaminants. Current hazards associated with the mobilisation of these sediments are poorly defined. A clear understanding of these hazards will improve the environmental assessment and management of MBO in areas of dredging and dredge disposal.

Finding 5: Coarser sediments (silty sands) hold only small amounts of iron monosulfide (FeS), but have high contents of pyrite (FeS₂), another major potential source of acidity and cause of deoxygenation.

Management Implication: The sandy textured sediments of the Peel Harvey estuary have exceptionally high pyrite contents. The oxidation and acidification hazard for these materials is substantial and should be a key aspect of environmental impact assessment for developments involving benthic sediment disturbance.

Finding 6: Thin, buried layers of monosulfidic sediments (e.g. resulting from incomplete removal during dredging) completely dominate the sediment porewater chemistry, providing nutrients and high levels of dissolved sulfide to the sediment porewaters and overlying water column.

Management Implication: Chronic impacts from even very small amounts of MBO material in dredge disposal areas may cause these areas to become hotspots for prolonged nutrient release and sulfide toxicity. The disposal of dredge materials containing MBO needs further consideration.

Finding 7: The availability of Fe limits monosulfidic sediment formation in the Peel Harvey. Fe-rich runoff or groundwater that enters the estuary will potentially increase the rate and magnitude of sulfidic sediment accumulation. The sensitivity of the Peel Harvey estuary to the addition of Fe is yet to be fully quantified.

Management Implication: Activities in the catchment (particularly near shore), that may enhance the supply of Fe to the estuary in either run-off or groundwater, are likely to directly enhance iron sulfide formation.

Finding 8: Although phosphorus burial is limited in the MBO sediments, stable Fe oxides seem to play an important role in long-term phosphorus retention from the overlying water column.

Management Implication: Phosphorus cycling within the Peel-Harvey sediments may be sufficient to fuel major productivity and blooms, irrespective to the contemporary supply of nutrients in run-off. Activities that change the benthic sediment chemistry will have a direct impact on nutrient supply and potential to

trigger cycles of algae blooms.

Finding 9: Preliminary ^{210}Pb analyses indicate that the top ~ 20 cm of the sediment can be disturbed and readily remobilised by turbulent flows.

Management Implication: *The data indicates that MBO materials are impacting water quality continually as a result of even minor, but regular disturbances, such as general recreational boating.*

Finding 10: A detailed geochemical appraisal of the Murray River shows a dominance of terrestrial carbon input compared to the estuary.

Management Implication: *The processes driving MBO accumulation within the lower river systems differ somewhat to the open estuary. Different issues are at play in these adjacent waterways, resulting in the MBO's exhibiting different properties and hazards.*

Attachment 3: Water quality and phytoplankton data collected from the Peel-Harvey Estuary 2012-2016 (DoW, 2017) compared against Limits of Acceptable Change (LACs) for the Peel-Yalgorup System (Hale and Butcher 2007) and trigger values from the ANZECC and ARMCANZ Guidelines (2000).

Note that it is assumed here that the LACs for concentrations of nitrate and ammonium are expressed as the equivalent concentration of nitrogen (N) and phosphate as phosphorus (P) equivalent.

Water Quality A & Phytoplankton: Peel-Harvey Estuary (Hale and Butcher 2009)		
Component	Measure	Current status (Met ■ ; Borderline ■ ; Outside Acceptable Range ■)
Estuarine Water Quality: Nutrients	Total phosphorus concentrations < 30 µg P / L	Median Total Phosphorus (2012 to 2016) <ul style="list-style-type: none"> The Peel-Harvey Estuary met the LAC for both surface and bottom waters. ■ Serpentine River surface and bottom waters exceeded the LAC (same as the ANZECC guideline). ■ Murray River surface and bottom waters exceeded the LAC only in autumn. Bottom waters exceeded the LAC in summer and winter. ■
	Median phosphate (PO ₄ ³⁻) concentration < 10 µg P / L	Median filterable reactive phosphorus (2012-16) <ul style="list-style-type: none"> Serpentine River exceeded the LAC and the ANZECC guideline for both surface and bottom samples in spring ■ and exceeded ANZECC for Surface in spring and ANZECC and the LAC for Bottom waters in spring.
	Total nitrogen < 750 µg N / L ANZECC & ARMCANZ (2000)	Median total nitrogen (2012-16) <ul style="list-style-type: none"> There is no LAC for total nitrogen, however, Serpentine River exceeded the ANZECC guideline for surface and bottom samples in all periods.
	Median ammonium (NH ₄ ⁺) concentration < 10 µg N / L	Median ammonia / ammonium (2012-16) <ul style="list-style-type: none"> The LAC is set at a lower concentration than ANZECC trigger value (40 µg N / L). Nearly all results for the two rivers and Peel-Harvey Estuary, over the period exceed the LAC ■. The Serpentine River waters exceed ANZECC Guidelines in all seasons except autumn.
	Median oxidised nitrogen (NO _x ⁻) concentration < 10 µg N / L	Median total oxidised nitrogen (2012-16) <ul style="list-style-type: none"> The LAC is exceeded in top and bottom waters of both rivers and the estuary for all seasons. ■ The LAC is set lower than the ANZECC Guideline (40 µg N / L) so only the surface waters from the Murray River (in winter) and Serpentine River (in winter and spring) and the bottom waters from the Serpentine (in winter and spring) exceeded the ANZECC Guideline value.

Attachment 3: Water quality and phytoplankton data collected from the Peel-Harvey Estuary 2012-2016 (DoW, 2017) compared against Limits of Acceptable Change (LACs) for the Peel-Yalgorup System (Hale and Butcher 2007) and trigger values from the ANZECC and ARMCANZ Guidelines (2000).

Note that it is assumed here that the LACs for concentrations of nitrate and ammonium are expressed as the equivalent concentration of nitrogen (N) and phosphate as phosphorus (P) equivalent.

Water Quality A & Phytoplankton: Peel-Harvey Estuary (Hale and Butcher 2009)		
Component	Measure	Current status (Met ■ ; Borderline ■ ; Outside Acceptable Range ■)
	Chlorophyll a – median concentrations < 10 µg/L	<p>Median chlorophyll a (2012-16)</p> <ul style="list-style-type: none"> The waters of the Peel-Harvey estuary within the boundaries of the PYS Ramsar site do not exceed the LAC or ANZECC Guideline values ■. The concentration of chlorophyll a exceeds the LAC only in the Serpentine River waters (in integrated samples only) during autumn ■. Note that integrated samples are collected from the whole depth profile while surface samples are collected from the upper 0.5 m of the water column.
	Dissolved Oxygen 70–80 % saturation	<p>Dissolved oxygen (2012-2016)</p> <ul style="list-style-type: none"> The median concentrations met the LAC for the surface waters of the estuary and rivers ■. The waters near the bottom of these waterways also met the LACs with the exception of the Murray River ■.
	pH > 7 at all times	<p>pH (2012-2016)</p> <ul style="list-style-type: none"> The median pH for the surface and bottom waters of the estuary and rivers met the LAC. ■
	<p>Salinity</p> <ul style="list-style-type: none"> Winter salinity in the centre of the Peel Inlet and Harvey Estuary < 30 ppt for a minimum of 3 months. Water in the Harvey River mouth over winter < 3 ppt 	<ul style="list-style-type: none"> The LAC for the Peel-Inlet and Harvey Estuary was met in 2014 and 2016 but not in 2012, 2013 or 2015 ■. The salinity at the mouth of the Harvey River exceeded the LAC each year 2012-2016 inclusive ■.

Attachment 4: Shorebird data collected from the Peel-Yalgorup System 2008-2016 compared with Limits of Acceptable Change (Hale and Butcher 2007)

Component	Measure	Current status (Met ■ ; Borderline ■ ; Outside Acceptable Range ■)
Waterbirds A: Red-Necked Stints & Sharpies	The PYS will support more than 1% of the Flyway populations at a min of 3 years out of 5.	For the period 2008 to 2016: <ul style="list-style-type: none"> Red-necked Stint exceeded 1% threshold all years except 2008. ■ Sharp-tailed Sandpipers only exceeded 1% threshold in 2009, 2010 and 2014 i.e. three out of nine years. ■
Waterbirds B: Cormorants-Ornithological Technical Services' report July 2016	Measure the breeding status of the Little Black and Little Pied Cormorants at Len Howard Reserve to assess maintenance of PYS ecological character to inform limits of acceptable change for breeding waterbirds.	The July report compares findings with the 2010 monitoring report – colours indicates trends as LACs not set: <ul style="list-style-type: none"> Number of nests had significantly declined. ■ Number of active nests showed a slight increase. ■ Number of Little Black eggs had increased. ■ Number of Little Pied eggs had declined from a low base level. ■
Waterbirds C: Hooded Plovers 2012 to 2016	The PYS supports more than 60 Hooded Plovers three years out of five. PYS supports successful breeding of Hooded Plovers three years out of five.	<ul style="list-style-type: none"> Nesting data for the Hooded Plovers indicates the LAC is met. ■ The 1% threshold for Hooded Plover was exceeded in all years for the period 2001 to 2016 except for 2014 and 2015. ■ Caution is noted due to the two recent years in which it wasn't met. ■
Shorebird 2020 Count Trends Over Time	Criteria 5 for Ramsar Listing: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.	<ul style="list-style-type: none"> The 20,000 threshold was exceeded every year between 2008 and 2016 with over 90,000 counted in 2013 and the lowest being ~28,000 to ~30,000 in 2008, 2009, 2011 and 2016. ■ In 2015 40 different shorebird species were recorded. In all other years for the period 2008 to 2016, 50 or more species were recorded with the highest being 62 in 2013. ■

Deputation by the Peel-Harvey Catchment Council

PO23/2019 – Proposed Stage One Earthworks – Point Grey Marina Lot 572 Carrabungup Road, Point Grey – Recommend Refusal



24 April, 2019

- Jane O'Malley, CEO
- Paddi Creevey, OAM, Board Member
- Dr. Steve Fisher, Science Advisor & Program Manager, Science & Waterways (available in audience to answer science questions)

Key points:

1. **Ongoing financial costs.** How will the Shire ensure there will be no future dredging maintenance costs to tax payers and/or Shire of Murray ratepayers?
2. **Impacts on environment including recreational and commercial fishing.** Does the Shire have the information required to make informed decisions?
3. **Compliance with Planning Conditions.** Is the Shire confident in approving the DA, given that no management plans have been approved, particularly the Capital Dredging and Spoil Disposal Management Plan (CSDSMP) and Maintenance Dredging and Spoil Disposal Management Plan (MDSMP);
4. **Splitting the overall proposal into small Development Applications.** Is the Shire comfortable with the applicant splitting the proposal into small applications and, dealing with them one at a time without consideration of cumulative impacts as per the State and Commonwealth conditions, and without referral to the **Metro South-West Joint Development Assessment Panel (JDAP).**

Deputation:

The PHCC acknowledges the proponent's rights provided under the State and Commonwealth approvals, subject to meeting the conditions associated with those approvals. The conditions are significant and clearly defined in relevant approvals, against the heads of power to:

- a) protect Matters of National Environmental Significance (Ramsar Wetlands of International Importance) [EPBC Act, 1999] and
- b) promote the sustainable use and development of land in the State [Planning and Development Act 2005].

These conditions have been set based on the integrated proposal of the proposed marina and channel, to ensure that the actions of developing the marina and channel are managed against the objectives of this legislation.

We also acknowledge the statutory framework that requires the Shire to consider the development application, within the statutory timeframe.

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In considering the DA, we ask Elected Members to ensure that they have a clear understanding of the implications to the Shire of Murray of approving a series of piece-by-piece applications, leading to the overall approval, and understand how they will manage the implementation of State and Commonwealth Conditions, in a piece-by-piece approach.

While the officer's report states that compliance with the State and Commonwealth conditions are the responsibilities of the state and commonwealth, it is naïve to think that the Shire will not have a significant role in the assessment and implementation of conditions, and the ultimate social, environmental and economic implications of the marina and channel. The Department of Biodiversity, Conservation and Attractions (DBCA) have advised that it is their expectation that the Shire will ensure the development complies with all conditions of Ministerial Statement 906. Similarly, the Department of Water have advised that "it is important that there is consistency between the DA and the information in the management plans to satisfy the relevant conditions of Statement 906."

Elected Members are asked to consider if they are comfortable approving a DA, without the appropriate information to provide confidence that the overall marina and channel will meet all conditions and enable it to progress. Our submission details outstanding conditions at both state and commonwealth levels, and while our submission, like all others, was based on the previous Commonwealth conditions and timeframes, the fundamental elements of our submission remain. The applicant has many varied and significant conditions that they are required to comply with, many of which are to be made public and many of which are required prior to the commencement of ground disturbing activities, e.g.

- State Statement No. 906 (1 August 2012) 8-2 states that *"....the proponent shall prepare a **Channel and Marina Management Monitoring Plan for estuary water and sediment quality**.... Prior to the commencement of construction"*.
- Commonwealth variation of conditions to terrestrial component (15 March 2019), No. 15 *"....must not commence construction of any stage of the project unless the Minister has approved the **Waterbird Management Plan** which addresses the stage of the action."*

Given that the applicant now has time extensions from both the State and Commonwealth Governments, it provides the opportunity for the applicant to comply with relevant outstanding conditions, including making plans and data publicly available. This will provide Elected Members information required to determine the impacts and how they will be managed, demonstrate a willingness and ability to comply with conditions, and importantly demonstrate how any future cost implications will not be shifted to the Shire of Murray.

The PHCC and many other community members have advocated to decision makers to use evidence based science in the protection of our internationally significant Ramsar-listed wetlands. Our Ramsar site covers 26,530 ha and sits within a 1.1 million hectare surface water catchment – of which the PHCC is the recognised Natural Resource Management (NRM) Regional body at a State and National Level.

The Shire of Murray itself has been proactive in a range of programs to protect the state of the Estuary. It is an industry partner in the Australian Research Council (ARC) Linkage project

(Balancing Estuarine and Societal Health in a Changing Environment) that is currently being undertaken by a range of researchers to determine the State of the Estuary and inform future management and decisions. The results of this research will be available within 12 months.

It is widely recognised that the Peel-Harvey waterways are in a very poor health, and another ecological collapse highly probable. All tiers of government have, and are continuing to invest significant resources in trying to improve the health of the Estuary, and the Rivers leading into the Estuary. Science informs us that the Murray River is in such a poor state that most juvenile black bream spawned before 2010 have not made it to adulthood. On the Swan Coastal Plain, only 1% of the 4000km of waterways assessed are in pristine condition.

Science is showing us that we need to make better planning decisions. The State and Commonwealth have approved the Marina and Channel proposal, but with strict conditions to guide the actions. These conditions must be complied with, to understand if the impacts can be managed. The highest priorities are the Capital Dredging and Spoil Disposal Management Plan (CDSMDMP) and Maintenance Dredging and Spoil Disposal Management Plan (MDSMDMP), which are required to set out how the Channel will be constructed and maintained, including how the maintenance spoil will be managed, because it is a condition that it is not sidecast into the Estuary, as was the process for keeping the Yunderup Canals open in 2018. If the proponent cannot demonstrate that the Capital Dredging and ongoing Spoil Management can be managed, no actions should be undertaken.

The PHCC is a science and evidence based organisation. This is demonstrated by the nearly 2 decades of working to improve the health of the Estuary, attracting and investing ~ \$40 million dollars in the process. We prepared the Management Plan for the Peel-Yalgorup Ramsar Site when the State couldn't do it. We prepared the Ecological Character Description and monitoring and evaluation guidelines. We have managed and supported the Ramsar TAG for 12 years. We support the annual Shorebird 2020 ID training and monitoring event, consistently the largest count in Australia. We prepared Australia's only Wetlands and People Plan, as recommended by the Ramsar Secretariat. In 2018 we represented Australia with 9 other countries in Manila to prepare a global community engagement project. In 2018 we won a \$5 million tender to restore and reduce threats to the ecological character of our Ramsar site through the implementation of priority actions.

Because we are nationally appointed stewards of ratepayers and tax payer's money, in the protection of this Estuary, it is our obligation to bring these matters to your attention.

We hold significant knowledge and data about it. We work with our community, in the broadest sense and to their credit, hundreds of volunteers spend their time and resources to help manage it. How will these people act in the future? How will they be motivated to contribute their voluntary time in the future if we continue to make decisions that put their livelihoods and the things they value at such risk?

Our waterways are clearly and consistently recognised as our biggest economic asset. The submissions received against this DA highlight the varied concerns across industry and community. We note there was not one submission in support of this DA.

We appreciate that people use the Estuary for commercial purposes, recreation and for tourism and fully support initiatives that are appropriate to a Ramsar listed wetland.

The risks of this marina and channel are too high, and they cannot be mitigated – no amount of monitoring can undo the damage this channel will cause. We need to learn from other projects and ask ourselves why they have failed and why community's are wearing the ongoing cost of these marinas and channels that did not work.

We understand that this DA is about an earthworks proposal for the excavation of 5.8 hectares to a depth of 1 metre, with arguably small scale environmental impact. However, is the Shire comfortable with the applicant splitting the proposal into small applications, and dealing with them one at a time, without consideration of cumulative impacts as per the State and Commonwealth conditions?

We ask that, as Leaders, the Shire of Murray play your part and refuse this DA, until outstanding conditions are complied with and you are in receipt of the essential information, as required by the peak agencies, to make a decision in the best interest of your rate payers.

We respectfully submit the following alternative recommendation:

Recommendation:

That the Shire of Murray refuse the Development Application (DA) for Stage One Earthworks for the Point Grey Marina:

- 1. Noting that this is an integrated development proposal and the ability to manage the impacts of the overall Marina and Channel need to be considered in total;**
- 2. Noting the applicant's time extensions at both State and Commonwealth levels and therefore encourage the applicant to resubmit the DA, after they have complied with all relevant State and Commonwealth conditions, thereby:**
 - a) demonstrating their ability to meet overall requirements to enable the ultimate construction and maintenance of the Marina and Channel; and**
 - b) providing Elected Members with the knowledge required to satisfy themselves that the impacts of the integrated proposal can be appropriately managed and will not adversely impact on the amenity of the Shire; and**
 - c) demonstrating the ongoing implications to the Shire of Murray.**
- 3. Require a full financial costing for the ongoing maintenance and upkeep of the Marina and Channel, demonstrating how, in perpetuity, the ongoing maintenance will not result in a financial burden to future Shire of Murray ratepayers.**

It is further recommended that any future DA approvals;

- 4. mirror relevant State and Commonwealth conditions, noting the Shire of Murray's role and responsibilities in respect to the delivery of these conditions; and**
- 5. are referred to the Metro South-West Joint Development Assessment Panel (JDAP).**

Deputation by the Jane O'Malley, CEO of Peel-Harvey Catchment Council, on behalf of the Peel-Harvey Catchment Council Inc.



PHCC Working Together
Peel-Harvey Catchment Council

11.4 - Application for Development Approval for Stage 1
Earthworks for the Point Grey Marina – Lot 672 Carrabungup Road,
Point Grey

Recommend Deferral

The PHCC applauds the Shire's decision of 24 April, to refuse the Development Application for Point Grey, to enable a new application to be submitted demonstrating how the applicant has met all outstanding conditions and provide a financial model for dredging and maintenance of the proposed channel, to the satisfaction of the Council.

We don't believe that the new DA provides the information that the Shire requires. It doesn't demonstrate how it is meeting outstanding conditions and it does not provide details of the financial model to assist the Shire in their decision.

The proponent is not proposing to finalise the legal agreement for maintenance dredging, until the marina subdivision conditions have been cleared – that is, after they have constructed the marina, and prior to the final subdivision condition being cleared. Councillors – are you comfortable with that?

On Monday, the PHCC provided elected members with an independent report which detailed 8 case studies relevant to the proposed Point Grey Marina and Channel. Coincidentally, on the same day 4Corners ran their "Extinction Nation" program, which highlighted one of the case studies in the Moreton Bay Ramsar Site at Toondah Harbour. A link to the program was also provided to Elected Members.

The case studies are compelling, and provide clear evidence that with all the approvals in place and compliance with conditions, the costs for marinas and channels will be borne by the greater community. Annual costs of the case studies were between \$100,000 and \$3 million.

We reiterate that we acknowledge the proponent's rights provided under the State and Commonwealth approvals, subject to meeting the conditions associated with those approvals. The conditions are significant and clearly defined in relevant approvals, against the heads of power to:

- a) **protect Matters of National Environmental Significance** (Ramsar Wetlands of International Importance) [EPBC Act, 1999] and
- b) **promote the sustainable use and development of land in the State** [Planning and Development Act 2005].

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*We acknowledge the Noongar people as Traditional Custodians
of this land and pay our respects to all Elders past and present*

These conditions have been set based on the integrated proposal of the proposed marina and channel, to ensure that the actions of developing the marina and channel are managed against the objectives of this legislation.

We also acknowledge the statutory framework that requires the Shire to consider the development application, within the statutory timeframe – which is the 9th of August 2019.

In considering the DA, we ask Elected Members to ensure that they have a clear understanding of the implications to the Shire of Murray of approving a series of piece-by-piece applications, leading to the overall approval, and understand how they will manage the implementation of State and Commonwealth Conditions, in this piece-by-piece approach.

Appendix 17 should not be used as the basis for a condition by Council. It does not demonstrate the overall roll out of the proposed development, it is inconsistent in conditional requirements, e.g. the staged “Foreshore Management Plan” is included in Table 2 as required for this Stage 1 DA, but not on the flow chart. Most alarmingly, it leaves the preparation of a legal agreement for the dredging maintenance until after the marina has been constructed. This is confirmed in Section 3.2 of Appendix 17 which states “The proposed application **does not trigger the requirement for the preparation of the legal agreement** for the long term funding arrangements.....”.

We appreciate the difficulty in determining the costs of maintenance dredging. But, Councillors, without this legal agreement in place, you place the Shire of Murray and its ratepayers at great financial risk.

In 2012 the Minister for Environment stated that the “proponent would be required to implement dredging, mechanical oxygenation of the water column and application of binding agents”. For the Minister to put in writing that mechanical oxygenation would be required is an indication of the seriousness and expense that, if the Shire is not diligent, will be borne by the community.

We ask the Shire to ensure that conditions for the DA be explicitly linked to the State and Commonwealth approvals, as well as the Shire’s specific recommended conditions to the WAPC, and not to Appendix 17.

Conditions relate to:

- a. Variations to Conditions attached to Point Grey Marina Project (EPBC 2010/5515) (15 March, 2019)
- b. Variations to Conditions attached to approval Point Grey Residential Development – Terrestrial Component (EPBC 2011/5825) (15 March, 2019)
- c. Notification of Extension of Period of Effect of Approval Project (EPBC 2011/5825) (15 March, 2019)
- d. Statement that a proposal may be implemented (pursuant to the provisions of the Environmental Protection Act 1986 (Statement 906) (Assessment Number 1751)
- e. Statement to change the implementation of conditions applying to a proposal (Section 46 of the EP Act 1986) (Statement 1082) (Previous Assessment Numbers 1751, 2106)

The Shire will have the major role in the co-ordination, assessment and implementation of conditions as well as the ultimate social, environmental and economic implications of the marina and channel. The Department of Biodiversity, Conservation and Attractions (DBCA) have advised that it is their expectation that the Shire will ensure the development complies with all conditions of Ministerial Statement 906. Similarly, the Department of Water and Environmental Regulation (DWER) have advised that “it is important that there is consistency between the DA and the information in the management plans to satisfy the relevant conditions of Statement 906.”

Compliance of conditions are already in question. The “Annual Compliance Assessment Plan” (condition 4-2 of State approval 1 August 2012 – statement 906), was required within 15 months of the approval – being November 2013. In correspondence from State Minister for Environment to Hon. Sally Talbot, MLC, he states that the report was submitted to DWER in November 2018. Appendix 17 states it was approved by DWER on 17 July, 2018. Condition 4-6 requires the report be made publicly available within 60 business days. Yet no plans are publicly available. How will non-compliance be managed and resourced by the Shire?

It is strongly recommended that the Shire incorporate requirements that ensure that they are appropriately resourced, and that they manage a process of all plans being independently reviewed by suitably qualified and experienced persons and that the independent review be provided to decision makers when the plans are submitted seeking endorsement. It is further recommended that all draft plans, independent reviews and results, be publicly available for comment.

We again ask if Elected Members are comfortable approving a DA, without the appropriate information to provide confidence that the overall marina and channel will meet all conditions to enable it to progress.

Again, given that the applicant now has time extensions from both the State and Commonwealth Governments, it provides the opportunity for the applicant to comply with relevant outstanding conditions, including making plans and data publicly available. This will provide Elected Members information required to determine the impacts and how they will be managed, demonstrate a willingness and ability to comply with conditions, and importantly demonstrate how any future cost implications will not be shifted to the Shire of Murray.

The PHCC is a science and evidence based organisation. We have spent nearly 2 decades working to improve the health of the estuary, attracting and investing ~ \$40 million dollars in the process.

We hold significant knowledge and data about our Ramsar Site, our estuary and the rivers and streams and landscapes that feed it. We work with our community, in the broadest sense and to their credit, hundreds of volunteers spend their time and resources to help manage it.

Our waterways are clearly and consistently recognised as our most valuable economic asset. The submissions received against this DA highlight the varied concerns across industry and community. We note there was not one submission in support of this DA.

We appreciate that people use the estuary for commercial purposes, recreation and for tourism and fully support initiatives that are appropriate to a Ramsar listed wetland. It also holds significant cultural values.

The risks of this marina and channel are too high, and they cannot be mitigated.

We understand that this DA is about an earthworks proposal for the excavation of 5.8 hectares to a depth of 1 metre, with an arguably small environmental impact. However, in considering this first action, Council needs to be comfortable that the overall marina and channel conditions can be achieved.

We ask that the Shire of Murray defer this DA, until outstanding conditions are complied with by the proponent and you are in receipt of the essential information, as required by the peak agencies, to make a decision in the best interest of your rate payers.

We respectfully submit the following alternative recommendation:

Recommendation:

That Council:

- 1. Defer consideration of the Development Application, for a two (2) week period, with the DA being further considered at a Special Council Meeting to be held before 18 July* to enable outstanding issues to be resolved, including but not limited to the following:**
 - **The implications of the legal agreement for the funding arrangement to the satisfaction of the Shire, being prepared “prior to marina subdivision conditions being cleared”;**
 - **Make requirements of conditions consistent across all levels of government, and not linked to Appendix 17;**
 - **Outstanding conditions, such as the preparation of an Annual Compliance Assessment Plan;**
 - **Resources for the Shire to have independent assessments of plans and legal agreements; and**
 - **Mechanisms for making Plans publicly available**

***The timing of this meeting Special Council Meeting should allow the proponent sufficient time to proceed to the State Administrative Tribunal hearing scheduled for 18 July should these issues not be resolved;**

- 2. Invite the proponent to work with the community on an alternative vision for the Point Grey site, capitalising on the unique natural assets of the site.**

Deputation by the Peel-Harvey Catchment Council

11.4 - Application for Development Approval for Stage 1 Earthworks for the Point Grey Marina – Lot 672 Carrabungup Road, Point Grey

27 June, 2019

Dr. Steve Fisher, Science Advisor & Program Manager, Science & Waterways



Key points:

1. **PHCC's concerns and disagreement with the recommendations of the Environmental Protection Authority (EPA) in granting an extension to the Time Limit of Authorisation for the Point Grey Development:** In 2017 PHCC provided information to the EPA showing a deterioration in the condition of the Peel-Harvey Estuary and new environmental factors that had emerged since 2012 when approval was granted.
2. **The imminent release of the findings from a research project designed to assess the ecological condition of the estuary,** including in the vicinity of the proposed development, will fill some of the key knowledge gaps
3. **PHCC maintains that the proposed Point Grey development should never have been approved and should not be implemented,** however, given the compromised position that the Shire of Murray is in, we urge the Shire to make decisions based on the best available scientific evidence.

Deputation:

In this deputation I will summarise PHCCs recent (since 2017) involvement in assessing the health of the Peel-Harvey Estuary in the context of the proposed Point Grey development.

PHCC has concerns with the Report and Recommendations of the Environmental Protection Authority to the Minister for Environment (EPA R&R No: 1621) *Point Grey Marina Proposal– Inquiry under Section 46 of the Environmental Protection Act 1986 to amend Ministerial Statement 906*

This report was released in August 2018 with the recommendation that the Minister for Environment grant a 5-year extension to the *Time Limit of Authorisation / Substantial Commencement* for the proposal. It followed a brief consultation period in September 2017 when PHCC were invited to make a submission to the EPA providing any evidence of significant environmental decline in the Peel-Harvey Estuary; significant change in relevant environmental factors or new environmental factors identified since the original State assessment in 2011, particularly in the Point Grey area.

In our opinion, the EPA did not adequately address PHCC's concerns in their report EPA R&R No: 1621, summarised as follows.

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We acknowledge the Noongar people as Traditional Custodians of this land and pay our respects to all Elders past and present

Sediment quality and implications of dredging

PHCC's major concern is the likelihood that the initial (capital) dredging works of the proposed navigation channel and marina will disturb and mobilise sediments that are likely to contain high concentrations of monosulfidic black ooze (MBOs). We provided evidence from independent research conducted in the estuary in 2012 (Australian Research Council-Linkage project LP0991658) that disturbance of these materials is likely to lead to a deterioration in water quality through the release of nutrients and heavy metals.

Based on findings from this research summarised in the statements '*channels in the Peel-Harvey estuary provide highly favourable conditions for MBO formation*', and '*find the silt and you find the monosulfidic sediments*' we also raised concerns that the proposed Point Grey navigation channel and marina would provide sites for the accumulation of monosulfidic black ooze that would require removal through subsequent maintenance dredging operations.

EPA R&R No. 1621 dismissed these concerns, claiming these sediments are unlikely to occur in the vicinity of the proposed development, irrespective of the evidence showing the navigation channels in the Peel-Harvey Estuary to have some of the highest concentrations of this material in the world. The EPA did concede, however, that the surface sediment quality be re-established prior to commencement of the dredging program and that this should be addressed in the Capital Dredge and Spoil Disposal Management Plan for the development.

We are concerned that formulating these plans is the only action required by the proponent to mitigate the risk of impacts of dredging operations, and that these plans have not yet been completed. There is no mechanism by which an appeal can be made against the issue of a dredging licence once approved by the DWER so we believe that this licencing process prevents any public consultation taking place, thereby undermining public confidence in regard to the consideration of environmental impacts of the dredging process.

Inconsistencies in assessing impacts on the health of the estuary

We identified several inconsistencies in the way the EPA assessed the current condition of and probable impacts of the proposed development on the Peel-Harvey Estuary. For example the EPA considered measurements of water quality (nutrients) and sediment quality (metals) collected from sites up to 6 km outside of the development envelope to be indicators representative of the ecological condition of the development area but did not give the same consideration to the above-mentioned MBOs because they were found in navigation channels at South Yunderup and not within the development envelope. The potential impacts on habitat for migratory birds including the critically endangered curlew sandpiper and the Sub-tropical and Temperate Saltmarshes Threatened Ecological Community were similarly disregarded because they were observed on the eastern (rather than western) side of the Point Grey Peninsula.

Cumulative impacts

The Shire of Murray should note that the Peel-Harvey Estuary is recognised as a wetland of international importance (Ramsar 482), and provides vital habitat to more than 20,000 waterbirds each year, including occasionally supporting at least 1% of the World Population Estimate of 14 species of waterbirds (see excerpt from Report Card Slides 2 & 3).

The EPA considered the threats from the proposed development at Point Grey in isolation from the pressures that existing development has already applied to the health of the Ramsar Site including the Peel-Harvey Estuary. The existing impacts and management issues of poor water and sediment quality, treatment and disposal of dredge spoil, declining groundwater quantities and quality, declining surface flows in streams and rivers, physical disturbance of birds, loss of aquatic and terrestrial flora, loss of habitat for birds and aquatic fauna and pressures from recreational and commercial fishing on the Peel-Harvey estuary and where appropriate the whole of the Ramsar site should be considered cumulatively with the additional threats posed in the Point Grey development envelope.

In 2015, the Western Australian Government provided funding for the Regional Estuaries Initiative. This \$20 M, five-year initiative applies to six *at-risk* estuaries, including the Peel-Harvey Estuary, with the aim of halting their decline and degradation by restoring function and improving their health. This acknowledgement constitutes a broader and more substantial recognition of the current state of the health of the estuary.

Sustainability of the Peel-Harvey Estuarine Fishery

Our concerns regarding the impact on the sustainability of this Marine Stewardship Council (MSC) certified fishery were not addressed by EPA R&R No. 1621. The impact of the proposed Point Grey development on blue swimmer crab and sea mullet stocks is unknown and was not considered in the Harvest Strategy for crabs or mullet when certified as sustainable by the MSC.

Precautionary principle

The precautionary principle was ignored in considering the impacts of development on the health of the Peel-Harvey Estuary. The absence of new information of some indicators of the current condition of the estuary should not be interpreted to mean that environmental conditions have not deteriorated or improved since the initial assessment of the proposal.

Findings from relevant research is imminent

EPA R&R No. 1621 recommended that the *Time Limit for Authorisation / Substantial Commencement* be extended until 1 August 2022 despite our submission advising of the importance of investigations of hydrodynamic modelling, sediment quality and benthic fauna, seagrass coverage and fish populations being undertaken through the Australian Research Council Linkage Project LP150100451 *Balancing estuarine and societal health in a changing environment*. This project, led by Murdoch University and University of Western Australia is scheduled to be completed in August 2019 and will fill key knowledge gaps regarding the likelihood of siltation of the proposed navigation channel, MBO accumulation and formation and the current ecological health of the estuary. Consider the following preliminary findings as examples:

Seagrass (see Slide 4 – Findings from ARC Linkage)

- overall seagrass biomass has increased substantially over the last decade 2009 -2017, with sites around Pt Grey typically displaying the highest biomass throughout the estuary.
- the area around Point Grey has some of the healthiest macrophyte (seagrass) communities in the system

Sediments (see slide 5 & 6 – Findings from ARC Linkage)

- The poorest sediment condition was observed in navigation channels and other areas of high deposition, including upper parts of the Serpentine and Murray rivers. These are characterised by high nutrient enrichment and mud content (confirming the 2012 research findings)
- Even though the sediments around the development site appear to be in good condition, there is evidence of high sediment enrichment (of organic carbon) between Point Grey and the estuary end of the Dawesville Channel. This **shows that the enriched sediment does not all simply flow out of the channel.**

The sediment and seagrass both provide habitat for blue swimmer crabs and finfish. Constructing a marina and navigation channel through this habitat will affect the sustainability of the recreational and commercial fishery.

Summary

The EPA did not adequately address PHCC's concerns relating to the deterioration in the condition of the Peel-Harvey Estuary since approval was first granted in 2012. The Minister for Environment in October 2018 acted on the advice from the EPA and granted an extension to the Time Limit for Commencement until August 2022. The Australian Government did not even consult in granting an extension to the Time Limit under the Commonwealth legislation i.e. the EPBC Act.

We are very fortunate that findings from a major research project undertaken by more than 15 scientists from 4 universities and the Department of Water and Environmental Regulation to assess the ecological condition of the estuary, including in the vicinity of the proposed development, are imminent – only 8 weeks away. This research, also supported by the Shire of Murray, will fill many of the key gaps in knowledge needed to better assess the impacts of the proposed development on the estuary.

We believe that the assessment of the likely impacts of the development on the Ramsar Site is complex and the Shire of Murray will need resources and support via suitably qualified independent assessors being appointed to review all required management plans for the development.

PHCC maintains that the proposed Point Grey development should never have been approved and should not be implemented, however, given the compromised position that the Shire of Murray is in, we make the following recommendations.

Recommendations:

That the Shire of Murray commit to the following when considering the proposed Point Grey development:

- 1. consider the findings from contemporary science and research, including the ARC Linkage Project LP150100451, relating to the likely impacts on the ecological condition of the estuary**
- 2. consider the environmental impacts and maintenance issues as a legacy of marina developments similar to that proposed at Point Grey;**
- 3. that all management plans submitted by or on behalf of the proponent requiring approval by the Shire, State or Australian Government be subjected to independent review by a suitably qualified and competent assessor**

State Administrative Tribunal

PLANNING AND DEVELOPMENT ACT 2005

Matter No. DR 108 of 2019

BETWEEN:

POINT GREY DEVELOPMENT COMPANY PTY LTD

Applicant

AND

SHIRE OF MURRAY

Respondent

EXPERT WITNESS STATEMENT OF DR STEVEN JAMES FISHER

Date of document:	17 September 2019
Date of filing:	18 September 2019
Filed on behalf of:	The Respondent
Prepared by:	Dr Steven James Fisher Peel Harvey Catchment Council Inc. 58 Sutton St, Mandurah WA 6120 Tel: 6364 7800

1. My full name is Steven James Fisher.
2. I am employed as the Program Manager, Science and Waterways at the Peel-Harvey Catchment Council Inc. and have held that position since 1 July 2018. In this role I oversee projects aimed at monitoring and restoring the condition of the Peel-Yalgorup Wetlands Ramsar Site and rivers and streams that drain into the Peel –Harvey Estuary. I was previously employed at Peel Harvey Catchment Council as the Science Advisor, integrating science into decision-making, a position I held from 20 July 2015 to 30 June 2018.

3. The Peel-Harvey Catchment Council is a not-for-profit, community based Natural Resource Management organisation that promotes an integrated approach to catchment management and the way we protect and restore the environment within the Peel-Harvey catchment. We work with landholders, community groups, industry, the Australian Government, Government of Western Australia and local governments to effect change 'on-ground' and in the way we manage our environment. Our activities address sustainable natural resource management including climate change, river and wetland restoration, biodiversity protection, sustainable agriculture and building community capacity. Due to the past ecological collapse of the Peel-Harvey Estuarine System we maintain a continued emphasis on water quality issues.
4. The Peel-Harvey Catchment Council is one of 56 Natural Resource Management organisations recognised by the Australian Government as a delivery agent for the National Landcare Program. In 2018, Peel-Harvey Catchment Council won a tender under this program valued at approximately \$5 million to restore and reduce threats to the ecological character of the Peel-Yalgorup Ramsar site through the implementation of priority actions.
5. I hold a Bachelor of Applied Science Degree in Applied Chemistry awarded by the Western Australian Institute of Technology in 1986; a Post Graduate Diploma in Chemistry, awarded by Curtin University of Technology in 1989 and a Doctor of Philosophy awarded by Curtin University of Technology in 2003.
6. I have over 30 years of experience as a chemist performing chemical analyses or interpreting results from analyses of environmental samples of sediments, soil, water and biota. In addition to my current role at Peel-Harvey Catchment Council, where I oversee the above-mentioned \$5 million initiative to improve the condition of the Ramsar Site, I have more than 6 years of experience overseeing water-quality monitoring programs in estuaries and their catchments as the Acting Section Manager, Aquatic Ecology and Chemistry and Team Leader of Estuarine Science at the Western Australian Department of Water (2008-2014) and a further 3 years of experience as the Fisheries Chemist at the Western Australian Department of Fisheries (2004 – 2007).

7. I have also been involved as an Industry Partner in two Australian Research Council Linkage Projects investigating the condition of the Peel-Harvey estuary, namely: “Project LP0991658 Hyper-accumulations of monosulfidic sediments: Exploring a biogeochemical extreme to resolve fundamental sulfur biomineralisation pathways (2009-2012)” and “Project LP150100451 Balancing estuarine and societal health in a changing environment (2015-2018)”.
8. I have been requested to provide expert evidence in relation to the environmental values of the Peel-Yalgorup Ramsar Site, the Peel-Harvey Estuary and the threats that the proposed Point Grey Marina development pose to these.
9. I have received and read a copy of the State Administrative Tribunal’s pamphlet entitled ‘A guide for experts giving evidence in the State Administrative Tribunal’ and agree to be bound by the expert’s obligations stated in that document.

ENVIRONMENTAL VALUES OF THE PEEL-YALGORUP WETLANDS SYSTEM

10. The proposed development site is situated on the Point Grey peninsula. The peninsula is surrounded by the Harvey Estuary to the south and west and the Peel Inlet to the east, together referred to as the Peel-Harvey Estuary.
11. In June 1990, the Peel-Yalgorup Wetland system was designated as a “wetland of International importance” under the Ramsar Convention. Also recognised as Global Ramsar Site 482, the wetland system meets at least 6 of the 9 criteria for listing as a wetland of international significance (Ecological Character Description for the Peel-Yalgorup Ramsar Site, Hale and Butcher 2007, pages 35-38), namely:
 - (a) “Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.” The site includes the largest and most diverse estuarine complex in south-western Australia and also particularly good examples of coastal saline lakes and freshwater marshes.
 - (b) “Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or

threatened ecological communities.” The Subtropical and Temperate Coastal Salt Marsh Ecological Community, listed under the Environmental Protection Biodiversity and Conservation Act 1999 (Cth) (**EPBC Act**) as a Threatened Ecological Community in the vulnerable category, occur as fringing vegetation to the Peel-Harvey Estuary. The Ramsar site is one of only two locations in south-western Australia and one of very few in the world where living thrombolites occur in inland waters i.e. the Thrombolite (microbialite) Community of a Coastal Brackish Lake (Lake Clifton), listed under the EPBC Act as a threatened ecological community in the critically endangered category.

- (c) “Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.” The site supports an array of species and communities during critical life stages including providing foraging and/or breeding habitat for tens of thousands of migratory and resident waterbirds, a resident population of approximately 80 bottlenosed dolphins and hundreds of tons of fish and crabs.
- (d) “Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.” The site comprises the most important area for waterbirds in south-western Australia, supporting in excess of 20,000 waterbirds annually.
- (e) “Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.” The site regularly supports 1% of the population of 14 species of bird, including migratory species such as the Curlew Sandpiper, listed under the EPBC Act as critically endangered, and resident species such as the Fairy Tern, listed as vulnerable both under the EPBC Act and by the International Union for Conservation of Nature (IUCN).
- (f) “Criterion 8: A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere,

depend.” The Peel-Yalgorup Ramsar Site is important as a nursery and/or breeding and/or feeding ground for at least 50 species of fish including the commercially significant blue swimmer crab.

A copy of pages 35 to 38 of the Hale and Butcher publication is attached as **Attachment SJF 1** to this Statement.

12. The Peel-Harvey Estuary is one of the subsystems comprising the Peel-Yalgorup wetland system, the other subsystems being: the Yalgorup lake System and the McLarty lake system. The Peel-Harvey Estuary meets Criterion 1, Criterion 2, Criterion 4 and Criterion 8 in its own right and contributes to the Peel-Yalgorup wetland system meeting Criterion 5 and Criterion 6.
13. Australia’s has international obligations to protect wetlands of international importance under the Ramsar Convention. Australia is also party to the following bilateral international agreements, initiatives and conventions for the conservation of migratory birds which are relevant to the Peel-Yalgorup Ramsar Site:
 - (a) JAMBA - The agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment, 1974,
 - (b) CAMBA - The Agreement between the Government of Australia and the Government of the People’s Republic of China for the Protection of Migratory Birds and their Environment 1986
 - (c) ROKAMBA - The Agreement between the Government of Australia and the Republic of Korea for the Protection of Migratory Birds and their Environment, 2006.
 - (d) The Bonn Convention on Migratory Species - The Bonn Convention adopts a framework in which countries with jurisdiction over any part of the range of a particular species co-operate to prevent migratory species becoming endangered. For Australian purposes, many of the species are migratory birds.

14. The Peel-Harvey Estuary supports a commercial fishing industry with 11 commercial fishermen licensed by the Western Australian Government to operate in the Peel-Harvey Estuarine Fishery.
15. The estuary also supports the recreational fishing sector, in particular the blue swimmer crab resource. According to the West Coast Blue Swimmer Crab Resource Status Report 2017 (Johnston, Marks and O'Malley 2018, page 41), blue swimmer crabs represent one of the most important recreationally-fished inshore species in the southwest of WA in terms of participation. In 2007-08, the blue swimmer catch by recreational fishers in the Peel-Harvey Estuary was estimated at 107-193 tonnes (Johnston, Marks and O'Malley 2018, page 42). With the extended closure of the Cockburn Sound Managed Fishery, the importance of the Peel-Harvey Estuarine Fishery to recreational fishers has increased. A copy of the Johnston, Marks and O'Malley publication is attached as **Attachment SJF 2** to this Statement.
16. In 2016, the Peel-Harvey Estuarine Fishery was certified as sustainable by the Marine Stewardship Council. This certification involved development and adoption of Harvest Strategies for the target species of blue swimmer crabs and sea mullet, based on catch data from the period 2000/01 to 2011/12 inclusive. The target for the commercial catch for blue swimmer crabs was set in the range 45 – 104 tonnes per annum with a catch of 58 tonnes in the 2015/16 season (Johnston, Marks and O'Malley, 2018, p43). The fishery was the first in the world to include the recreational sector in this certification.

THREATS TO VALUES BY THE PROPOSED DEVELOPMENT:

17. The proposed earthworks involve the clearing and removal of 10 trees including 5 mature tuart trees. Considered in isolation, these have value as potential habitat for the endangered Carnaby's black cockatoos also recognized under the EPBC Act as a Matter of National Environmental Significance.
18. The Public Environmental Review of the Point Grey Marina Development (RPS 2011, p56) identified the same 5 tuart trees in the marina footprint as well as a further 77 tuart trees within the Disturbance Area immediately adjacent to the marina, an area where the vegetation is likely to be impacted from altered hydrology. A copy of pages 56 and 57 of RPS (2011) is attached as **Attachment SJF 3** to this Statement.

19. In 2019, the Federal Minister for the Environment amended the list of threatened ecological species under section 184 of the EPBC Act to include the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community in the critically endangered category. Information contained in the Public Environmental Review (RPS 2011, pages 56-57) upon which the present Application for Development Approval is based predates this listing and therefore does not demonstrate whether or not the 77 tuart trees meet the criteria that define patches of this ecological community according to the Approved Conservation Advice provided by the Threatened Species Scientific Committee in 2019 under the EPBC Act.
20. Although the 5 tuart trees in the marina footprint appear to be isolated from the other 77 tuarts on the map shown as Figure 11 on an unnumbered page of the Public Environmental Review, they should be similarly assessed according to the Approved Conservation Advice to demonstrate whether or not they meet the criteria to be included in this patch. A copy of Figure 11 of RPS (2011) is attached as **Attachment SJF 4** to this Statement.
21. The terrestrial component of the present application also includes the clearing of approximately 1 ha of vegetation which fringes the Peel-Harvey Estuary. This strip of vegetation is described as “intact native estuarine fringing vegetation which is part of an estuary system that is a continuous link of intact native vegetation along the shore of the Peel Inlet and Harvey Estuary” on page 46 of the Public Environmental Review, (RPS 2011). It has important ecological value through provision of habitat and a potential corridor for movement of native animals and as habitat for birds, including Carnaby’s black cockatoos. A copy of page 46 of RPS (2011) is attached as **Attachment SJF 5** to this Statement.
22. In isolation, these terrestrial components of the proposed Point Grey Marina development do not present the greatest threat to the environmental values of the Ramsar Site or Peel-Harvey Estuary, however, the cumulative effect of further loss of habitat should be considered. For example, in January 2016 the Waroona/Yarloop bushfire destroyed a large portion of tuart habitat across private land, State Forest and Yalgorup National Park. It is likely in my opinion, that the importance of the tuart trees at Point Grey for foraging and nesting for black cockatoos has increased significantly since this loss.

23. Implementation of the proposed marina is an additional disturbance to bird habitat, foraging and reproductive behaviour thereby posing a threat to the international recognition of the Peel-Yalgorup wetlands system as a Ramsar site.
24. The greatest threat to the environmental values of the Peel-Harvey Estuary posed by the Point Grey Marina development are from those activities that intersect with or disturb the estuary, in particular the dredging operations. Although the Application for Development Approval (document 6 of the Respondent's Section 24 Bundle) does not propose excavations that will intercept the groundwater table or any dredging operations during the course of the Earthworks for Stage 1, the applicant acknowledges the marina as central to the future development of the Point Grey project (page 9 of document 12 of Respondent's Section 24 Bundle) including the marina, the entrance channel linking the marina to the estuary and the navigation channel across the estuary linking the marina to the Dawesville Channel.
25. If implemented, this will result in the excavation of approximately 660,000 m³ of material to a depth of -3m AHD from the marina site; excavation of approximately 15,000 m³ of material to a depth of -3.5m AHD from the entrance channel and excavation of 25,000 m³ and dredging of 95,000 m³ of material from the navigation channel to a maximum depth of -3.5 m AHD (page 3, Appendix 2 of document 12 of Respondent's Section 24 Bundle).
26. The current declining state of the health of the Peel-Harvey Estuary, in particular with respect to the risk of nutrient enrichment, is publically recognised by the Western Australian State Government through the Regional Estuaries Initiative. Through this initiative, the State Government has invested \$20 million to undertake actions at 6 at-risk estuaries in the south-west of Australia, including the Peel-Harvey Estuary, with the aim of halting their decline and degradation by restoring function and improving their health.
27. The threat of release of nutrients and other contaminants from disturbance of sulfidic material during construction and maintenance of the proposed marina is of greatest concern. Recent research has shown that this is likely to exacerbate the poor water quality of the Peel-Harvey Estuary. For example:

- (a) Findings of the Australian Research Council Linkage Project LP0991658 “Hyper-accumulations of monosulfidic sediments: Exploring a biogeochemical extreme to resolve fundamental sulfur biomineralisation pathways (2009-2012)” summarised by Bush et al. (2012) and several peer-reviewed publications by Morgan and others produced from her doctoral thesis such as Morgan, Burton and Rate (2012); Morgan, Rate, Burton and Smirk (2012); and Morgan, Rate and Burton (2012) revealed that sediments in the Peel-Harvey Estuary contain high concentrations of acid volatile sulfides (AVS). For example, Morgan, Burton and Rate (2012) at page 129 conclude that “the monosulfide content as measured by AVS, was anomalously high in the sediments examined here compared with other studies of estuarine systems.” Acid volatile sulfides are indicative of Monosulfidic Black Oozes, which release nutrients into the water column especially upon disturbance and resuspension. These observations were confirmed by Morgan, Rate and Burton (2012) in laboratory and field trials as described at page 47 in the Abstract.

A copy of the Bush et al. (2012) research findings is attached as **Attachment SJF 6**; a copy of the Morgan, Burton and Rate (2012) publication as **Attachment SJF 7** and a copy of the Morgan, Rate and Burton (2012) publication as **Attachment SJF 8 to this Statement**.

- (b) Acid volatile sulphides, indicative of Monosulfidic Black Oozes, are widespread throughout the Peel-Harvey Estuary, including in the Harvey Estuary, as shown by Morgan, Rate, Burton and Smirk (2012) by comparing the map shown in Figure 1 at page 62 with the concentrations shown in Table 3 (page 65) but concentrations are highest in the channelized areas near South Yunderup, indicating that the channels are sinks for accumulation and formation of these black oozes.

A copy of Morgan, Rate, Burton and Smirk (2012) is attached as **Attachment SJF 9** to this Statement.

- (c) Bush et al. (2012) at pages 1 and 2 (Findings 2, 3 and 4), also linked the formation of Monosulfidic Black Oozes to fine-grained sediment, and

observing their reactivity on disturbance, releasing nutrients and potentially toxic sulphides into the water column (page 2, Finding 6).

- (d) Bush et al. (2012) also identified management implications of disturbance of these sediments through dredging operations, including on page 2 (Finding 4) “The mobilization of fine sediments as a result of dredging will cause MBOs materials to oxidise and release associated contaminants. Current hazards associated with the mobilization of these sediments are poorly defined. A clear understanding of these hazards will improve the environmental assessment and management of MBOs in areas of dredging and dredge disposal.”
- (e) Bush et al. (2012) made the observation at Finding 5 on page 2 that “Coarser sediments (silty sands) hold only small amounts of iron monosulfide (FeS) but have high concentrations of pyrite (FeS₂), another major potential source of acidity and cause of deoxygenation.” Choppala et al. (2017) later confirmed at page 168 in the Abstract of the paper that the sediments of the Peel-Harvey Estuary contain high concentrations of iron pyrite which are unusually highly reactive upon disturbance and are implicated in acidification and deoxygenation of the water column. It is clear from this research that disturbance of coarser sediments with high pyrite content also poses a threat to water quality in addition to disturbance of the finer grained sediments with high concentrations of acid volatile sulfides.
- (f) Choppala et al. (2017) concluded on page 165 that resuspension and oxidation of these reactive pyrites and Monosulfidic Black Oozes contribute to the deterioration of the environment through smothering of biological surfaces, deteriorating food sources and the quality of benthic habitats through formation of iron (III).

A copy of Choppala et al (2017) is attached at **Attachment SJF 10** to this Statement.

- 28. The effect of this potential habitat degradation on catches of benthic feeders such as blue swimmer crabs and sea mullet has not been considered in setting the sustainable catch through the respective Harvest Strategies. Any change in the benthic

environment is likely to affect the abundance and distribution of these species and their prey. Dredging operations and accumulation of Monosulfidic Black Oozes through implementation of the proposed marina development, may therefore have serious implications on the sustainability of both the commercial and recreational fishery. It has the potential to cause the closure of the recreational and/or commercial fishery due to factors other than fishing pressure and places the Marine Stewardship Council certification of the fishery at risk.

29. The Subtropical and Temperate Coastal Salt Marsh Ecological Community are listed under the EPBC Act as a Threatened Ecological Community in the vulnerable category. These salt marshes, which provide habitat for shorebirds, occur as fringing vegetation and in embayments of the Peel-Harvey Estuary in the vicinity of Point Grey, although not in the development envelope. The Approved Conservation Advice (Threatened Species Scientific Committee, 2013) for this ecological community notes at page 20 that “The concentration of (human) population growth and development in the coastal zone, particularly along the subtropical and temperate Australian coastline, and the sensitivity of coastal saltmarsh to changes in climate and sea level continue to exacerbate all threats to the ecological community”. Threats identified and summarised in this advice include at page 21 eutrophication (nutrient enrichment) and disturbance of Acid Sulphate Soils.

A copy of pages 20 and 21 of the Approved Conservation Advice is **Attachment SJF 11** to this Statement.

30. In my opinion, the dispersal of sulfidic materials (Monosulfidic Black Oozes and pyrite) disturbed during construction, operation and maintenance of the proposed marina, entrance channel and navigation channel will exacerbate the threats of eutrophication and exposure to acid sulfate materials to the salt marsh ecological community of the Peel-Harvey Estuary.

RISK MITIGATION

31. In March 2019, the Australian Government varied the conditions attached to the Approval for the Point Grey Marina Project (as shown in Document 9 in Respondent’s Section 24 Bundle). As a result, Condition 1 states that “at least three months prior to commencement of the capital dredging component of the action, the person taking the

action must prepare and submit a Capital Dredging and Spoil Disposal Management Plan (CDSMDMP) for the Minister's approval, to mitigate the potential impacts from the capital dredging activities and for the protection of the Peel-Yalgorup Wetlands and habitat for listed migratory species and listed threatened species.

32. Prior to this change of conditions, the proponent was required to submit this plan at least three months prior to the implementation of the proposal rather than at commencement of the capital dredging component. As a result, the Capital Dredging and Spoil Disposal Management Plan is not required by the Australian Government environmental approval to be available for consideration in connection with this Application for Development Approval for the Earthworks Stage 1 of the Marina.
33. Condition 4 of the Australian Government approval (as shown as document 9 in Respondents Section 24 Bundle) requires that “At least six months prior to the commencement of any maintenance dredging program the person taking the action must develop and submit a Maintenance Dredging and Spoil Disposal Management Plan (MDSMDMP), for approval by the Minister, to mitigate the potential impacts from the maintenance dredging and disposal activities and for the protection of the Peel-Yalgorup Wetlands and habitat for listed migratory species and listed threatened species”.
34. Formulating and implementing the Capital Dredging and Spoil Disposal and Management Plan and the Maintenance Dredging and Spoil Disposal Management Plan are the only actions required of the proponent to mitigate the risk of impacts of dredging operations. Without these plans in place and the associated risk mitigation actions it is not possible to adequately assess the residual risks of dredging operations on the health of the Peel-Harvey Estuary. Nor is it possible to discount any of the above-mentioned impacts.
35. Condition 2 of the Australian Government Approval for the Point Grey Marina Project (as shown in document 9 of the Respondent’s Section 24 Bundle) states that “No capital dredged or maintenance dredged material or excavated material from the marina, entrance channel or navigational channel is to be disposed of in the Peel Inlet or Harvey Estuary”. To meet this condition, based on current practice the dredge spoil may therefore only be disposed of by dewatering and transporting to an approved

waste disposal facility or by disposal elsewhere on land or into another water body other than the Peel-Harvey Estuary. Without the dredging spoil management and disposal plans in place it is not known how the applicant intends to meet this condition.

36. The intent of Condition 2 is to protect Matters of National Environmental Significance associated with the Peel-Yalgorup wetlands system, and in particular the Peel-Harvey Estuary. On-shore disposal of dredge spoil has the potential to create a legacy of contamination similar to the historical dredge spoil disposal site at Goongoolup Island at the Murray River delta in the Peel Inlet. Goongoolup Island was used as an on-shore disposal site for more than 30,000 m³ of dredge spoil removed from the Yunderup Entrance Channel in the Peel Inlet in 1989 and 1999 as described on page 9 of the Dredge Strategy Report for the Yunderup Entrance Channel (RPS 2015). The site is described on page 16 of RPS (2015) as “a legacy site due (sic) acidification of untreated ASS sediments”. Goongoolup Island has not been used as a disposal site for material from subsequent dredging operations. It has not been restored or landscaped as described on page 17 of the strategy, and currently provides limited amenity for the public. A copy of pages 9 to 18 of RPS (2015) is attached as **Attachment SJF 12** to this Statement.
37. Without the dredge spoil management and disposal plans in place it is not possible to adequately assess the risk of dredge spoil disposal, nor is it possible to discount the risk of perverse outcomes from on-shore treatment and disposal near to the estuary.
38. Until the Capital Dredging and Spoil Management Disposal Plan is completed it is not possible to accurately assess the feasibility and effectiveness of any strategies to reduce the risk of adverse impacts of the dredging program on the condition of the Peel-Harvey Estuary and consequently it is not possible to determine the feasibility of the marina proposal.
39. Recent research led by Murdoch University (ARC Linkage Project LP150100451 Balancing estuarine and societal health in a changing environment) will, upon completion, partially address some key knowledge gaps regarding the sediment quality, including the likelihood of development of Monosulfidic Black Ooze, and the current coverage of sea grass in the Peel-Harvey Estuary.

40. To date the research has provided the following preliminary findings (F. Valesini, personal communication, 25 June 2019) indicating that the sediment and seagrass in the marina development footprint are in relatively good condition prior to any dredging operation:
- (a) Overall seagrass biomass has increased substantially over the last decade 2009-2017, with sites around Point Grey typically displaying the highest biomass throughout the estuary.
 - (b) The area around Point Grey has some of the healthiest macrophyte (seagrass) communities in the Peel-Harvey Estuary
 - (c) The poorest sediment quality in the Peel-Harvey Estuary was observed in navigation channels and other areas of high deposition, including upper parts of the Serpentine and Murray rivers, around the mouth of the Murray River and deeper sections of the Harvey Estuary. These are characterised by high nutrient enrichment and mud content.
 - (d) The shallower sediments around the Point Grey marina development site appear to be in good condition. However, the deeper waters in the northern Harvey Estuary in the vicinity of Point Grey are substantially more enriched with mud, organic carbon and total nitrogen. There is also evidence of high organic carbon enrichment between Point Grey and the eastern end of the Dawesville Channel, indicating that the enriched sediment (a potential precursor to Monosulfidic Black Oozes) does not necessarily all flush out of the channel.

Figures 5, 6, 9 and 10 from the personal communication showing these preliminary findings are attached as **Attachment SJF 13** to this Statement.

SUMMARY STATEMENT

41. The Peel-Yalgorup Wetland system, including the Peel-Harvey Estuary is designated as a Wetland of International Importance under the Ramsar Convention. The Australian Government has international obligations under the Ramsar Convention and several international bilateral agreements for the protection of migratory birds.

42. The Peel-Yalgorup Wetland System also supports Matters of National Environmental Significance which the Australian Government has responsibilities to protect under the EPBC Act.
43. The Peel-Harvey Estuary sustains an important commercial and recreational fishery, certified by the Marine Stewardship Council as sustainable.
44. The Earthworks for Stage 1 of the Point Grey marina development is a threat to these environmental values through:
 - (a) The removal of 5 mature tuart trees. It is yet to be demonstrated whether these trees, together with 77 tuart trees outside the excavation area but within the Disturbance Area of the Point Grey marina development constitute a patch of the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain threatened ecological community according to the Approved Conservation Advice.
 - (b) The removal of approximately 1 ha of intact native estuarine fringing vegetation which has important ecological value through provision of habitat and a potential corridor for movement of native animals and as habitat for birds, including Carnaby's black cockatoo, listed as an endangered species under the EPBC Act.
 - (c) The disturbance of migratory and residential waterbirds that define the Peel-Yalgorup wetlands system as a Ramsar Site against Criteria 5 and 6. These include critically endangered and vulnerable species recognised domestically under the EPBC Act and, in the case of the Fairy Tern, the International Union for Conservation of Nature.
45. The proposed earthworks are for Stage 1 of the Point Grey marina development. The marina will not be accessible to boats without construction of the marina entrance channel and the navigation channel in the Peel-Harvey Estuary.
46. The Peel-Harvey Estuary has been identified as an at-risk estuary by the Western Australian State Government primarily due to nutrient enrichment of its waters and sediments.

47. The greatest threats to the environmental values of the Peel-Yalgorup Ramsar site and in particular the Peel-Harvey Estuary are those associated with dredging activity to construct and maintain the marina entrance channel and navigation channel, namely:
- (a) Disturbance of sulfidic materials including Monosulfidic Black Ooze and pyrites during the dredging operations exacerbating the poor water and sediment quality in the Peel-Harvey Estuary.
 - (b) Creation of depositional sinks for accumulation of sulfidic materials in the channelized areas.
 - (c) Disposal of dredge spoil from the capital dredging and maintenance dredging programs.
 - (d) Removal or smothering of seagrass and declining sediment quality for benthic feeders, including blue swimmer crabs and sea mullet.
 - (e) A decline in blue swimmer crab and sea mullet stocks, affecting the sustainability of the Peel-Harvey Estuarine Fishery for both the commercial and recreational sectors and potentially jeopardising the Marine Stewardship Council certification of the fishery.
48. A Capital Dredging and Spoil Disposal Management Plan is required to be submitted to the Australian Government Minister for the Environment at least three months before commencement of the dredging activities. In the absence of this plan it is not possible to assess the likely effectiveness or feasibility of measures to mitigate the risk posed to the environmental values of the estuary by the above-mentioned threats. Consequently it is not possible to determine the feasibility of the marina proposal.
49. The environmental risks posed by future stages of the marina development involving dredging and further excavation intercepting the water table will likely be extremely difficult to mitigate. As was the intent of the conditions of the Australian Government environmental approval for the development prior to the variation in conditions in March 2019, these risks, and the feasibility and effectiveness of their mitigation should be assessed through the development of the Capital Dredging and Spoil

Disposal Management Plan before commencement of any activity including those described in this application for Development Approval.

A handwritten signature in black ink, appearing to read 'S. Fisher', is positioned above a horizontal line.

Steven James Fisher

INDEX OF ATTACHMENTS TO THIS WITNESS STATEMENT

Attachment	Description of Document
SJF 1.	Hale, J. and Butcher, R., 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth, Western Australia, excerpted pages 35-38.
SJF 2	Johnston, D, Marks R. and O'Malley, J. 2018. West Coast Blue Swimmer Crab Resource Status Report 2017. In: <i>Status Reports of the Fisheries and Aquatic Resources of Western Australia 2016/17: The State of the Fisheries</i> eds. D.J. Gaughan and K. Santoro. Department of Primary Industries and Regional Development, Western Australia. pages 41-46
SJF 3.	RPS 2011, Public Environmental Review Point Grey Marina EPA Assessment No. 1751, excerpted pages 56 - 57.
SJF 4.	RPS 2011, Public Environmental Review Point Grey Marina EPA Assessment No. 1751, excerpted Figure 11 at unnumbered page.
SJF 5.	RPS 2011, Public Environmental Review Point Grey Marina EPA Assessment No. 1751, excerpted page 46.
SJF 6	Bush et al., 2012, Peel Harvey ARC Project Update May 2012
SJF 7	Morgan, B., Burton, E.D. and Rate, A.W. 2012, Iron monosulfide enrichment and the presence of organosulfur in eutrophic estuarine sediments, <i>Chem. Geol.</i> , 296-297, 119-130.
SJF 8	Morgan, B., Rate, A.W. & Burton, E.D. 2012, Water chemistry and nutrient release during the resuspension of FeS-rich sediment in a eutrophic estuarine system, <i>Sci. Total Env.</i> , 432, 47-56.
SJF 9	Morgan, B., Rate, A.W., Burton, E.D. and Smirk, M.N. 2012, Enrichment and fractionation of rare earth elements in FeS and organic-rich estuarine sediments receiving acid sulfate soil drainage, <i>Chem. Geol.</i> , 308-309, 60-73.
SJF 10.	Choppala, G., Bush, R., Moon, E., Ward, N., Wang, Z., Bolan, N., Sullivan, L. 2017, Oxidative transformation of iron monosulfides and pyrite in estuarine sediments: Implications for trace metals mobilisation, <i>Journal of Environmental Management</i> , 186 (2), 158-166.
SJF 11	Threatened Species Scientific Committee 2019. <i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (s266B) Conservation Advice for Subtropical and Temperate coastal saltmarsh</i> , excerpted pages 20 and 21.
SJF 12.	RPS 2015, Dredge Strategy Report Yunderup Entrance Channel prepared for Shire of Murray, excerpted pages 9 – 18.
SJF 13.	Personal communication, F. Valesini 25 June 2019. Figure showing preliminary findings from ARC Linkage Project LP150100451 Balancing estuarine and societal health in a changing environment.

Deputation by the Peel-Harvey Catchment Council

11.4 - Amendment to the Town Planning Scheme 4 to Remove Discretion for a Marina at Lot 1132 (745) Carrabungup Road, Point Grey

Dr Steve Fisher, Science Advisor & Program Manager, Science & Waterways

25 June, 2020



My name is Dr Steve Fisher and I am the Science Advisor & Program Manager, Science & Waterways at the Peel-Harvey Catchment Council.

The Peel-Yalgorup Wetland System, of which the Peel-Harvey Estuary is a major component, is designated as a Wetland of International Importance under the Ramsar Convention. The wetlands known as Ramsar Site 482 meet at least 6 of the 9 criteria for listing under this convention as an 'international wetland of importance'.

The Peel-Harvey Estuary also supports Matters of National Environmental Significance (MNES) which the Australian Government has responsibilities to protect under the EPBC Act.

The Peel-Harvey Estuary is an important nursery area for more than 50 species of fish, including blue swimmer crabs and sea-mullet, with the important commercial and recreational fisheries for both of these species certified as sustainable by the Marine Stewardship Council.

The Point Grey Marina development poses a **serious** threat to these environmental values.

The Peel-Harvey Estuary has already been identified as an **at-risk estuary** by the Western Australian State Government primarily due to nutrient enrichment of its waters and sediments.

The greatest threats to the environmental values of the Peel-Yalgorup Ramsar Site and in particular the estuary from the Point Grey Marina development are those associated with dredging activity to construct and maintain the proposed marina entrance channel and navigation channel, namely:

- Disturbance of sulfidic materials including Monosulfidic Black Ooze (MBOs, black muck) and pyrites during the dredging operations exacerbating the poor water and sediment quality in the Peel-Harvey Estuary (**see the picture in the slide**).
- Creation of depositional sinks for formation and accumulation of these sulfidic materials in the channelized areas.
- Disposal of dredge spoil from the capital dredging and maintenance dredging programs: how, when and where.
- Removal or smothering of seagrass and declining sediment quality for benthic (sediment or bottom dwelling) feeders, including blue swimmer crabs and sea mullet.
- A decline in blue swimmer crab and sea mullet stocks, affecting the sustainability of the Peel-Harvey Estuarine Fishery for both the commercial and recreational sectors and potentially jeopardising the Marine Stewardship Council certification of the fishery.

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*We acknowledge the Noongar people as Traditional Custodians
of this land and pay our respects to all Elders past and present*

Evidence from independent research conducted in the estuary in 2012 led by Southern Cross University shows that disturbance of these MBOs and pyrites is likely to lead to a deterioration in water quality through the release of nutrients and heavy metals and deoxygenation of the water.

Based on findings from this research summarised in the statements '*channels in the Peel-Harvey estuary provide highly favourable conditions for MBO formation*', and '*find the silt and you find the MBOs*' PHCC is concerned that the proposed Point Grey navigation channel and marina would provide sites for the accumulation of MBOs that would require removal **and** further impact on the environmental values of the estuary through ongoing maintenance dredging operations.

These findings were confirmed by the 2020 ARC Linkage project '*Balancing estuarine and societal health in a changing environment*', led by UWA and Murdoch University which also found that ecologically the estuary is showing signs of trouble. This is based on key indicators of ecological and environmental health such as fish communities, benthic (bottom dwelling) invertebrates and sediment and water quality, with the southern Harvey Estuary identified as **a trouble hot-spot** along with the shallows of the Peel Inlet and the Murray River which flows into the estuary.

Other research shows that the Murray River is in such a poor state that most juvenile black bream spawned since 2010 have not made it to adulthood – please think about this, our rivers are too sick for our fish to grow to adulthood. On the Swan Coastal Plain, only 1% of the 4,000km of waterways assessed are in a healthy state.

In summary, we **absolutely must consider the cumulative impacts** of the development on the values of the Peel-Yalgorup Ramsar Site and in particular the Peel-Harvey Estuary. We know that scientific research has shown that the estuary is already suffering under existing impacts and management issues of poor water and sediment quality, treatment and disposal of dredge spoil, declining groundwater quantities and quality, declining surface flows in streams and rivers, physical disturbance of birds, loss of aquatic and terrestrial flora, loss of habitat for birds and aquatic fauna and pressures from recreational and commercial fishing.

PHCC urges the Shire of Murray to consider the cumulative impacts of these pressures that existing development has already applied to the health of the Ramsar Site in conjunction with the threats from the proposed development at Point Grey, and thereby support the Officer's recommendations.

Key points:

- 1. The Peel-Harvey Estuary is already suffering under existing impacts and management issues of poor water and sediment quality, treatment and disposal of dredge spoil, declining groundwater quantities and quality, declining surface flows in streams and rivers, physical disturbance of birds, loss of aquatic and terrestrial flora, loss of habitat for birds and aquatic fauna and pressures from recreational and commercial fishing.**
- 2. PHCC urges the Shire of Murray to consider the cumulative impacts of these pressures from existing development in conjunction with the threats from the proposed development at Point Grey.**
- 3. That the Shire of Murray council support the Officers Recommendations as detailed in the agenda resulting in removing discretion for planning approval of a marina from the Shire of Murray Town Planning Scheme.**