



**Planning &
Infrastructure**

**MAJOR PROJECT ASSESSMENT:
50 BERTH MARINA
19 BRISBANE WATER DRIVE, KOOLEWONG
MP 10_0209**

Proposed by Gemsted Pty Ltd



Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

March 2012

ABBREVIATIONS

Council	Gosford City Council
Department	Department of Planning and Infrastructure
DPI	Department of Primary Industries
EPA	Environment Protection Authority
NOW	NSW Office of Water
RMS	NSW Roads and Maritime Services

ARI	Average Recurrence Interval
AS 3962–2001	Australian Standards Guideline for Design of Marinas
Cardno	Cardno Ecology Lab
CMP	Clean Marinas Program
DCP 111	Development Control Plan 111 – Car Parking
Director-General	Director-General of the Department of Planning and Infrastructure
DGRs	Director-General's Environmental Assessment Requirements
Draft LEP	Draft Gosford Local Environmental Plan 2009
EA	Environmental Assessment
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPI	Environmental Planning Instrument
ESD	Ecologically Sustainable Development
GPSO	Gosford Planning Scheme Ordinance 2011
Minister	Minister for Planning and Infrastructure
OISAS	NSW Oyster Industry Sustainable Aquaculture Strategy 2006
PAC	Planning Assessment Commission
Part 3A	Part 3A of the <i>Environmental Planning and Assessment Act 1979</i>
PMF	Probable Maximum Flood
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
PPR	Preferred Project Report
Proponent	Gemsted Pty Ltd
SEPP	State Environmental Planning Policy

Cover Picture: Aerial Photomontage, Koolewong Marina (source: Environmental Assessment)

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EXECUTIVE SUMMARY

ADW Johnston Pty Ltd on behalf of Gemsted Pty Ltd is seeking project approval for a proposed 50 berth marina at 19 Brisbane Water Drive, Koolewong, in the Gosford local government area, pursuant to Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposal is a transitional Part 3A project involving the following:

- construction of a 50 berth marina extending approximately 100m into Brisbane Water;
- upgrading and raising of the existing timber jetty;
- extension and reconfiguration of the existing car park to provide an additional 14 car parking spaces; and,
- change of use of an existing office to marina use.

The proponent estimates the capital investment value of the project at approximately \$1.52 million. The proposal is expected to create five full-time jobs throughout construction of the project, and up to four full-time equivalent jobs during operation.

The EA for the proposal was publicly exhibited at three locations and also on the Department of Planning and Infrastructure's (the department) website for a period of 31 days from 5 October 2011 to 4 November 2011. During the public exhibition period, the department received a total of 24 submissions, including 18 submissions from the general public and six submissions from public authorities. Of the public submission received, nine were in support of the proposal and nine were in objection. The issues raised in the submissions form key components of the department's assessment. Key issues considered by the department include;

- car parking requirements
- provision of a sewage pump out facility
- impacts on aquatic ecology
- impacts of flooding, climate change and sea level rise
- visual impacts
- Aboriginal cultural heritage

The department has assessed the merits of the project and is satisfied that the key issues identified throughout exhibition of the proposal can be appropriately managed through the proponent's Statement of Commitments and the recommended conditions of approval. The proposal is expected to maintain an acceptable level of environmental performance at the site and is therefore recommended for approval, subject to conditions.

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1. BACKGROUND

Gemsted Pty Ltd (the proponent) proposes a 50 berth marina and associated car parking at Lot 519 DP 729020 – 19 Brisbane Water Drive, Koolewong. The site is located on reclaimed Crown land above and below the mean high watermark of Brisbane Water Drive and adjoining unsurveyed Crown land comprising part of the bed of Brisbane Water, currently held under lease by the proponent. The land and water based component of the site is owned by the Department of Primary Industries – Catchments and Lands (DPI) (formerly the Land and Property Management Authority). DPI has granted consent to the lodgement of the project application and has agreed to commence negotiations with the proponent for a 25 year lease, subject to the proposed marina obtaining project approval. **Appendix I** contains written consent from the DPI.

The site encompasses a total area of approximately 2,533m² and is located at the southern end of Murphy's Bay, approximately 2km north of Woy Woy and 5km south of Gosford. Murphy's Bay forms part of the wider Brisbane Water locality, which is a tidal arm of Broken Bay, approximately 50km north of the Sydney metropolitan area.

The site context and site location is shown in **Figures 1 to 3**.



Figure 1: Site Context (source: Google)

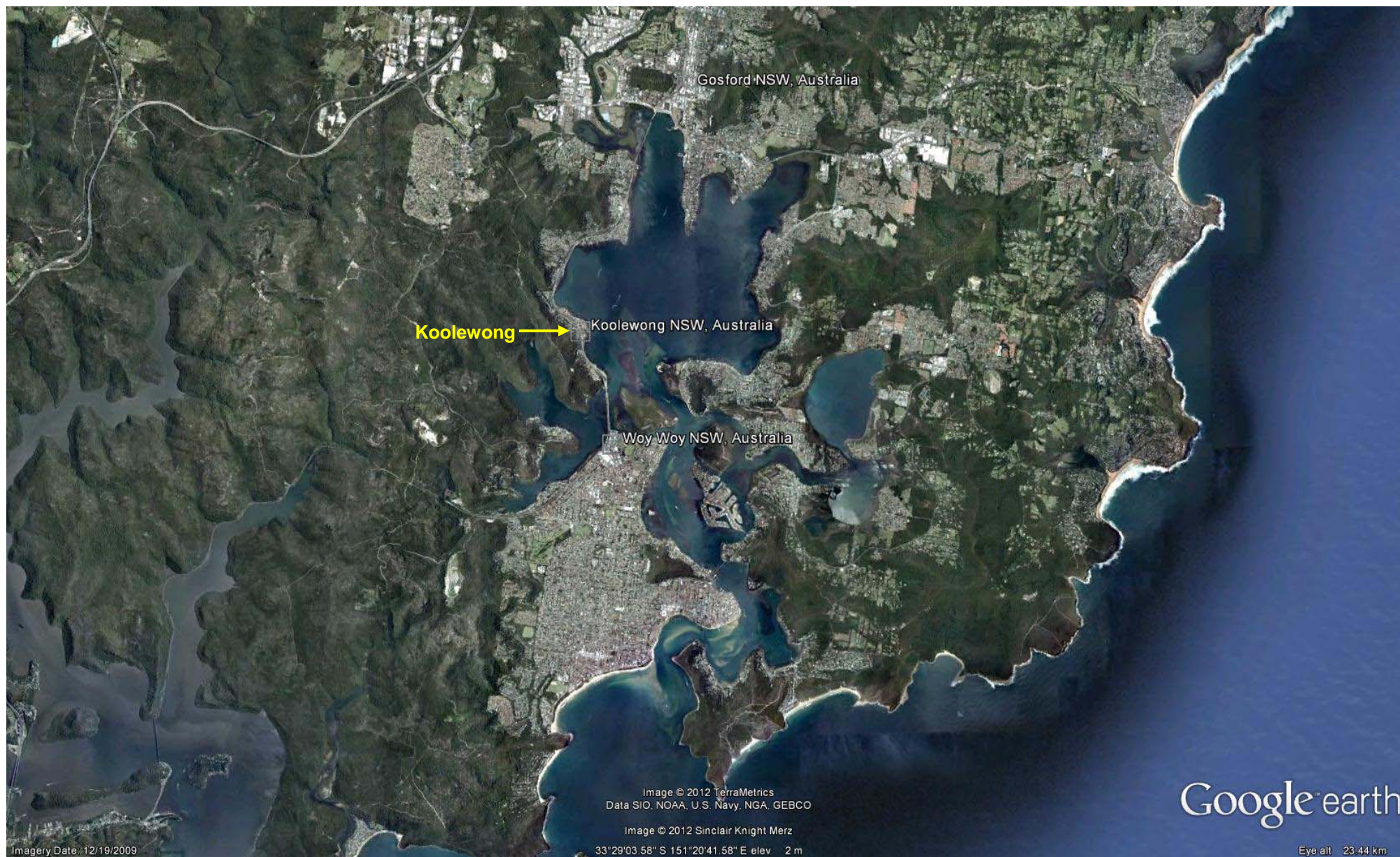


Figure 2: Wider Brisbane Water Locality (source: Google)



Figure 3: Site Context (source: Google)

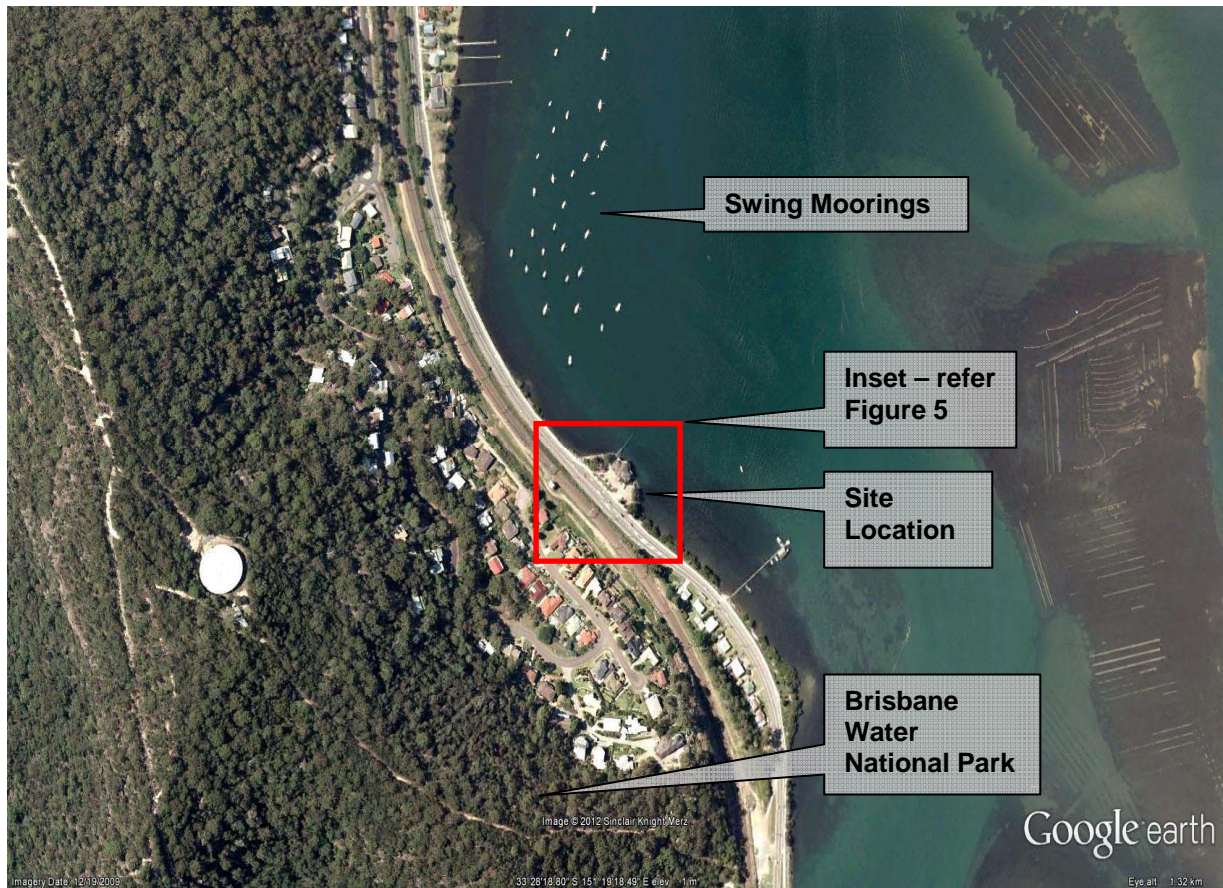


Figure 4: Koolewong (source: Google)

Surrounding Land Uses

The subject site is located within Murphy's Bay, on the western side of Brisbane Water which forms part of the northern arm of Broken Bay. Brisbane Water is a broad, shallow estuary with an approximate area of 2,768ha and connected to the ocean through a relatively narrow channel. Several urban localities are located along the shores of Brisbane Water including Koolewong, Gosford, Woy Woy, and Saratoga, all of which are identified on **Figures 1 to 3** above.

Access to the site is obtained via Brisbane Water Drive which borders the site immediately to the west. The Great Northern Railway is located further west, running parallel to Brisbane Water Drive, as shown in **Figures 4** and **5**. A number of low density residential dwellings are located on the western side of the railway line and adjoining the eastern boundary of Brisbane Water National Park.

The Brisbane Water locality is popular with recreational boating and sailing activities. There are numerous private jetties located both north and south of the subject site, ranging in length from 30m to 50m. A number of commercial marinas are also located throughout Brisbane Water. **Table 1** lists the existing marinas in proximity to the site, and the number of permanent berths provided.



Figure 5: Subject Site – Brisbane Water Drive, Koolewong (source: Google)

Table 1: Marinas within Brisbane Water

Marina	Distance from Subject Site	Number of Permanent Berths
The Gosford Sailing Club	4.5km to the NE	29
Empire Bay Marina	4.5km to the SE	8
Booker Bay Marina	5km to the SE	22 (with 4 more pending consent from the Department of Primary Industries)
Andersons Marina	5.5KM to the SE	12
Machan's Marina	6km to the SE	21
Killcare Marina	7km to the SE	23

In addition, hundreds of private swing moorings are provided throughout the locality. The existing swing moorings to the north-east of the site are identified in **Figure 4** above.

Existing Site Features and Operations

An existing two-storey building is located on the site containing a restaurant on the ground floor, and office facilities on the first floor. A total of 30 car parking spaces are provided. The restaurant incorporates an enclosed verandah, associated kitchen, amenities, and foyer area. The restaurant operates from Wednesday to Saturday, and some Sundays depending on bookings. The restaurant is regularly used as a function centre for weddings, parties, etc. for a maximum of 130 patrons.

Seven small offices are located on the first floor of the building, all of which are currently untenanted. The existing building and its use was approved by council under DA 21637/96.

The site is enclosed by a protective rock wall which continues along Brisbane Water Drive. An existing timber jetty of 1m in width and approximately 30m in length extends from the site into Brisbane Water, and is currently used as a means of access for boat users attending the restaurant. The existing building and timber jetty are identified in **Figure 5** above. **Figures 6 to 9** below are photographs taken of the site during a site visit by the department in November 2011.



Figure 6: Existing restaurant and office building



Figure 7: Existing jetty



Figure 8: View north from the existing car park



Figure 9: View west from the site to the nearest residential dwellings. Brisbane Water Drive and the Great Northern Railway pictured in the foreground

Existing Site Approvals

As mentioned above, the site currently contains an existing restaurant and office facilities within a two-storey building, approved by council on 11 February 1997 as part of DA 21637/96. The approved plans show 33 car parking spaces for the site. It is noted, however, that the approved car parking plan was later amended by council as there are only 30 car parking spaces actually marked at the site.

On 26 June 2006, council granted consent to the demolition of an existing storage shed and construction of a new storage shed on the site (DA 30025/2006). The proponent advised that a new storage shed was never constructed and the consent has since lapsed.

2. PROPOSED PROJECT

2.1 Project Description

The proposal is for a marina development comprising the following:

- construction of 50 marina berths and upgrading of the existing timber jetty;
- extension and reconfiguration of the existing car park; and,
- change of use to the existing first floor offices.

Marina Berths and Jetty Upgrade

The proposal seeks to provide 50 marina berths extending approximately 100m from the end of the existing 30m jetty. The main walkway will be 2.5m in width, with two arms configured in a 'reverse F' formation. The outer arm will be 124.5m in length and the inner arm 80m in length. Three nearby swing moorings will be relocated as a result of the proposal. **Figures 10 and 11** below illustrate the proposed marina dimensions and configuration.



Figure 10: Proposed Marina Dimensions (source: Environmental Assessment)

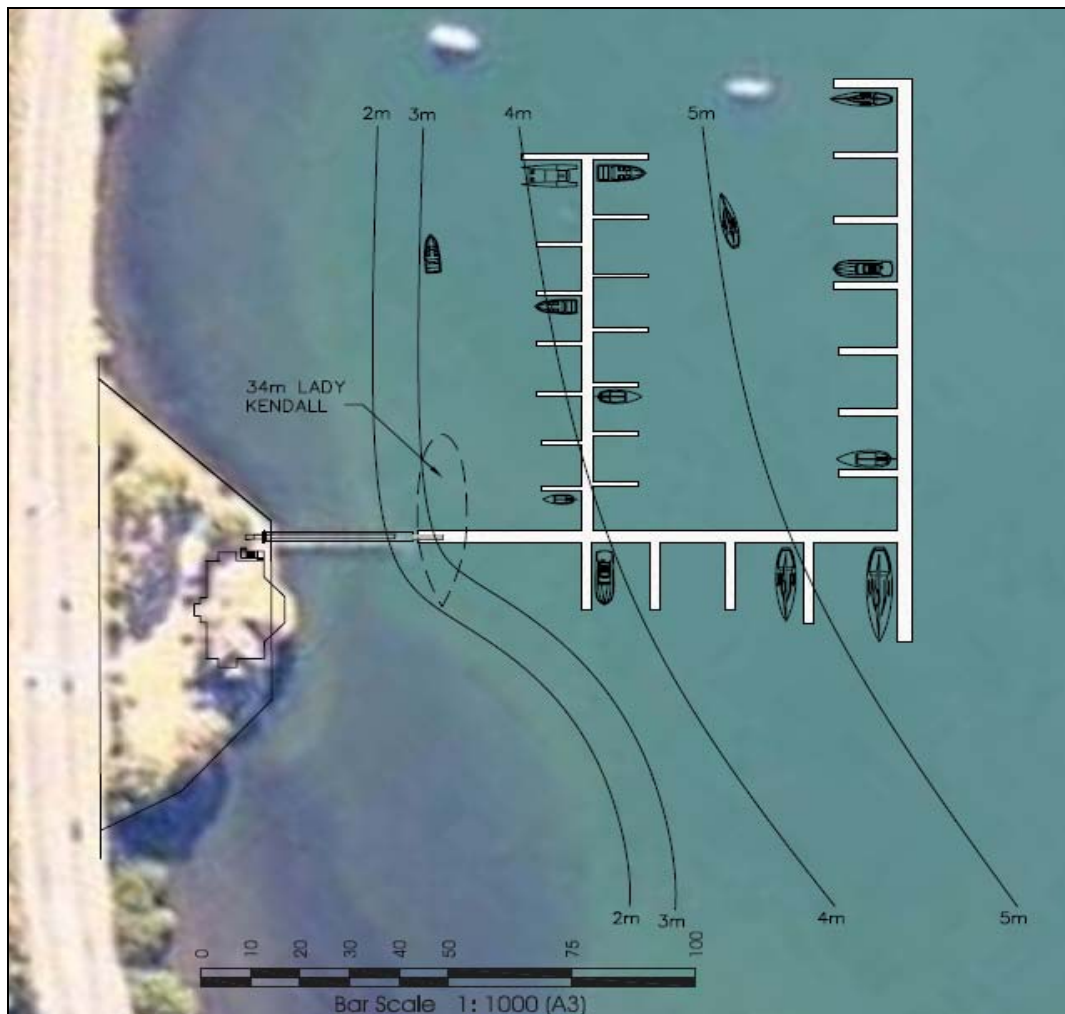


Figure 11: Proposed Marina Configuration (source: Environmental Assessment)

The marina will be constructed in the form of a floating pontoon held in place by 31 hollow steel piles. The pontoon will have rollers surrounding the piles to allow the marina to rise and fall with the tide. The existing timber jetty is to be replaced with a seagrass-friendly polypropylene decking of 1.5m in width and located at an RL of 1.75m AHD (500mm higher than the existing timber jetty). **Figure 12** below provides an illustration of the proposed floating pontoon and jetty.

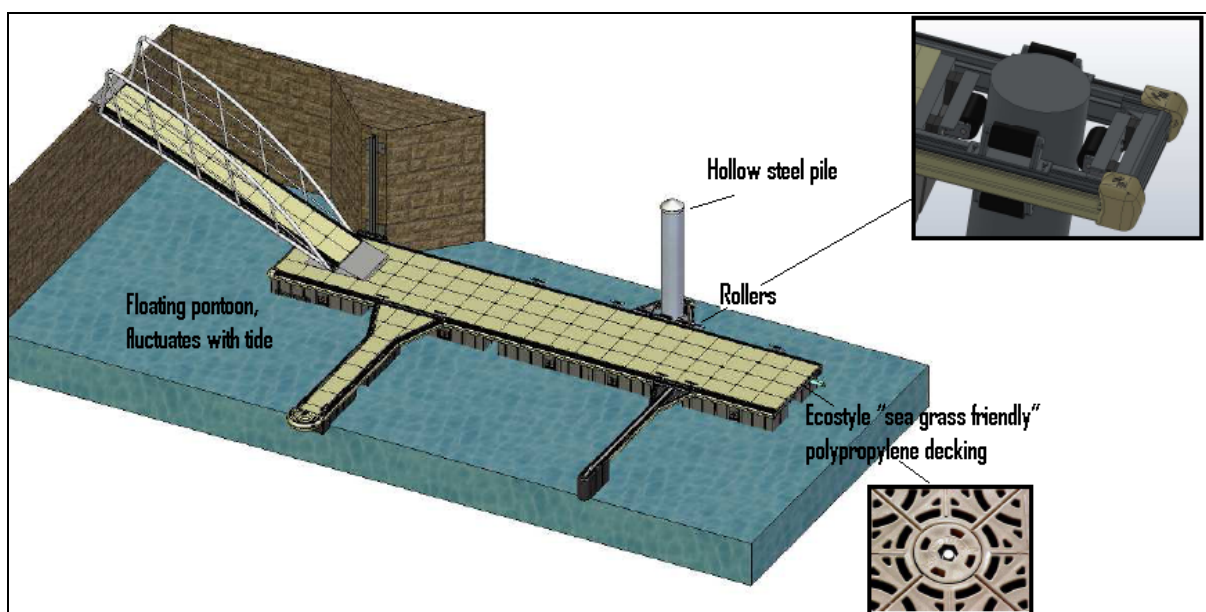


Figure 12: Example Floating Pontoon System (source: Environmental Assessment)

Of the vessels proposed to be moored at the marina, the proponent has advised that approximately 75% will be power vessels and 25% sail driven vessels with drafts between 1m and 2.2m. The length of proposed vessels will range from approximately 8m to 21.5m, with the majority of these being between 8.5m and 13m.

Extension and Reconfiguration of the Existing Car Park

The existing car park is proposed to be extended and reconfigured to provide 14 additional car parking spaces to complement the existing 30 spaces. The site is therefore proposed to provide a total of 44 car parking spaces to service both the existing commercial use of the site (restaurant and offices) and the proposed marina. Four existing mature trees and a cluster of approximately six Casuarina species are to be removed as part of the car park reconfiguration.

Change of Use to Existing First Floor Offices

The site currently provides seven untenanted offices on the first floor of the existing building (approved for general office use). The application seeks a change of use for one of the approved offices (GFA of 43.3m²) to be converted into a marina recreation/amenities room. The proponent advises that the amenities room will provide a space for marina berth holders to congregate before and after boating activities. In addition, three of the approved water-side offices (with a combined GFA of 63.5m²) are proposed to be utilised by a marina manager and yacht broker permanently located at the site. **Figure 13** shows the approved first floor layout of the existing building with the proposed office to be converted to marina and recreational usage; and the three offices to be tenanted with a marina manager and yacht broker.

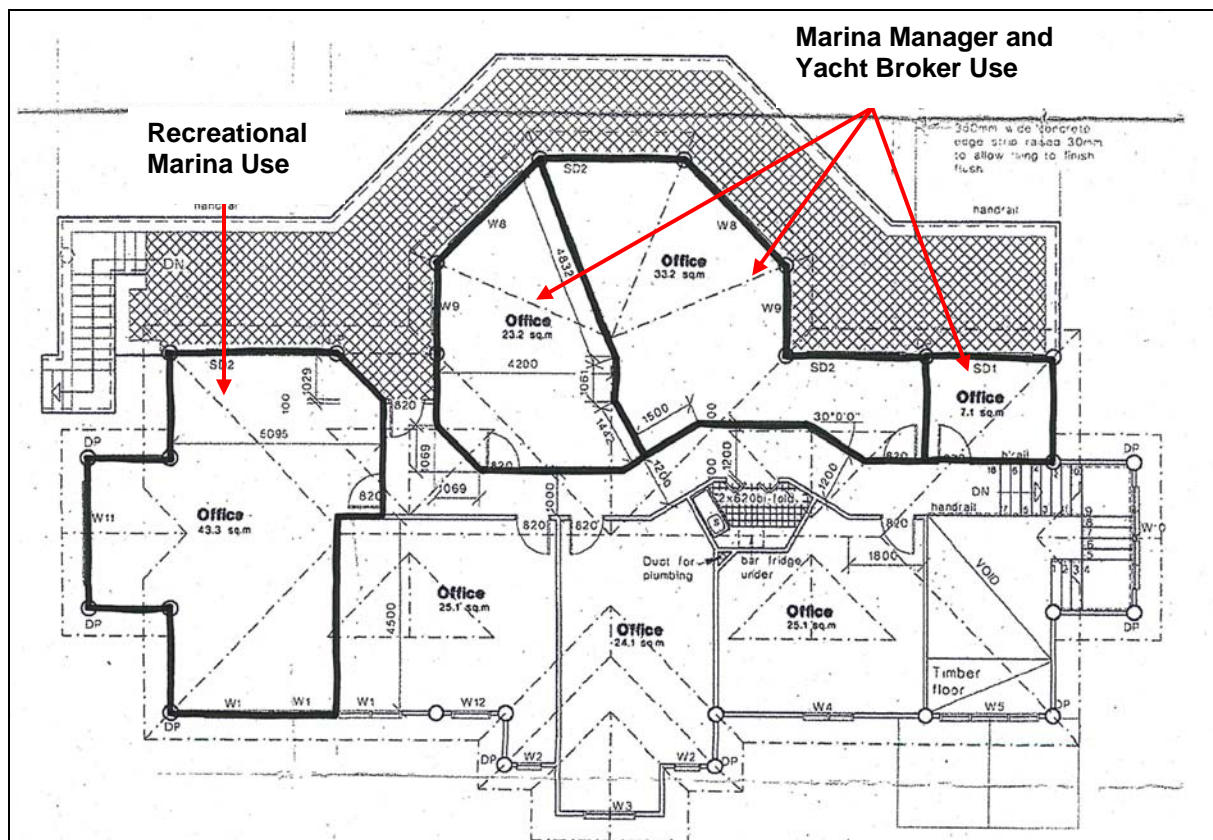


Figure 13: First Floor Office Space (source: Environmental Assessment)

Operational Details

The opening hours for the existing restaurant and office facility will remain as approved, with marina users able to access the first floor amenities facility during these hours.

Marina berth holders will have access to their vessels 24 hours a day, 7 days a week via authorised swipe card/security gate access which will be located at the end of the jetty/start of the marina structure. The boating public will have access to the fixed jetty 24 hours a day.

The marina will have a full-time manager on-site seven days a week to help with general boating enquiries, to assist in boating navigation, and to monitor all operational and environmental aspects of the marina.

The proponent has advised in the application as lodged that the marina will not provide for, or involve any of the following:

- the construction, repair or maintenance of boats;
- refuelling of boats;
- sewage pump out facilities;
- boat launching or landing facilities;
- slipways for construction, repair or maintenance activities; or
- land reclamation or dredging.

2.2 Project Need and Justification

The proponent has identified the need for permanent mooring facilities in Brisbane Water, with only five small marinas currently servicing the entire Brisbane Water locality. The demand for permanent moorings in the area is growing, with the proponent advising in its Environmental Assessment (EA) that there is a waiting list for berths at the recently constructed Gosford Sailing Club which provides only 29 permanent berths. The location of the proposed marina is justified given the identified need for additional berths, being in a locality that is popular with recreational boating and sailing activities.

3. STATUTORY CONTEXT

3.1. Major Project Declaration

The proposal was declared a major project under Part 3A of the EP&A Act as it is development for the purpose of a marina of more than 30 vessels or other related land or water shoreline facilities that moor, berth, or store vessels (excluding dinghies and other small craft) at fixed or floating berths in Broken Bay, as described under clause 14(1)(c) of Schedule 1 of State Environmental Planning Policy (Major Development) 2005. Therefore, the Minister for Planning and Infrastructure (the Minister) is the approval authority.

The proposal was declared a Part 3A project on 23 January 2010. Part 3A of the EP&A Act, as in force immediately before its repeal on 1 October 2011 and as modified by Schedule 6A to the EP&A Act, continues to apply to transitional Part 3A projects. The Director-General's Environmental Assessment Requirements were issued in respect of the project prior to 1 October 2011. The project has consequently been assessed as a transitional Part 3A project.

3.2. Minister's Delegation

Under the Instrument of Delegation dated 14 September 2011 and taking effect from 1 October 2011, the Minister has delegated his functions to determine Part 3A applications to the Planning Assessment Commission (PAC) where:

- Council has made an objection in relation to the proposal;
- More than 25 public submissions objecting to the proposal were received; or,
- A political disclosure statement has been made in relation to the application.

The application is being referred to the PAC for determination under delegation as Gosford City Council (council) has lodged a submission objecting to aspects of the proposal. It is noted that there were less than 25 public submissions received in objection to the proposal, and no political disclosure statement has been made in relation to the application.

3.3. Statement of Compliance

In accordance with section 75I of the EP&A Act, the department is satisfied that the Director-General's Environmental Assessment Requirements (DGRs) have been complied with. The DGRs are included at **Appendix A**.

3.4. Permissibility

Part of the site, including the proposed car parking area, is located on reclaimed land that is currently unzoned land (UL) under the Gosford Planning Scheme Ordinance (as at 28 October 2011) (GPSO), as shown at **Figure 14**.



Figure 14: Existing Zoning – Gosford Planning Scheme Ordinance
(source: Gosford City Council)

In accordance with GPSO, unzoned land requires consent under Clause 49, which states the following:

(1) Despite any other provision of this Ordinance, a person must not, without the consent of the Council:

(a) carry out development on any land that is within the City of Gosford that was shown uncoloured on the Scheme map on the date this Ordinance commenced, being 24 May 1968, forming part of or adjacent to or adjoining the bed of a harbour, bay, lake, river, lagoon, creek or any other natural watercourse which land, in the case of tidal waters, was shown on the Scheme map at that date as land below high water mark, or

(b) use the land described in paragraph (a) for any purpose other than for a purpose for which it could lawfully be used immediately before the commencement of Gosford Local Environmental Plan No 404.

(1A) In considering whether to grant consent under subclause (1), the Council must take into account the estuary management principles in the Estuary Management Manual (State Government), available for inspection at the office of the Council.

The proposal involves development on the bed of Brisbane Water and therefore clause 49(1)(a) requires consent prior to the carrying out of any development on the land. The proposal is permissible with consent under the GPSO.

Draft Gosford Local Environmental Plan 2009

The draft Gosford Local Environmental Plan 2009 (draft LEP) was exhibited in April and May 2010 – this being the draft Standard Instrument LEP for the Gosford local government area. Under the zoning provisions of the draft LEP, the subject site is located within the RE1 Public Recreation zone (RE1 zone) and the W2 Recreational Waterways zone (W2 zone).

The proposed car parking works are within the RE1 zone and the proposed marina is within the W2 zone. In accordance with the draft LEP, the proposed use is defined as a *marina*.



Figure 15: Draft LEP Zoning (source: Gosford City Council)

RE1 Public Recreation Zone

The objectives of the RE1 zone are to enable land to be used for public open space or recreational purposes; provide a range of recreational settings, activities, and compatible land uses; and to protect and enhance the natural environment for recreational purposes. The only works proposed within the RE1 zone include extension and reconfiguration of the existing car park; and change of use of one of the existing offices to be used for recreational marina use.

The department has assessed the merits of the proposal and it is considered that the additional car parking and change of use to an existing office within the RE1 zone does not detract from the zoning objectives.

W2 Recreational Waterways Zone

The objectives of the W2 zone are to protect the ecological, scenic and recreation values of recreational waterways; allow for water-based recreation and related uses; and provide for sustainable fishing industries and recreational fishing. The marina structure will be located within the W2 zone and is permissible with consent.

3.5. Environmental Planning Instruments

Under Sections 75I(2)(d) and 75I(2)(e) of the EP&A Act, the Director-General's report for a project is required to include a copy of, or reference to, the provisions of any State Environmental Planning Policy (SEPP) that substantially governs the carrying out of the project, and the provisions of any environmental planning instruments (EPI) that would (except for the application of Part 3A) substantially govern the carrying out of the project and that have been taken into consideration in the assessment of the project.

The Department's consideration of relevant SEPPs and EPIs is provided at **Appendix D**.

3.6. Objects of the EP&A Act

Decisions made under the EP&A Act must have regard to the objects of the Act, as set out in Section 5 of the Act. The relevant objects are:

- (a) *to encourage:*
 - (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
 - (ii) *the promotion and co-ordination of the orderly and economic use and development of land,*
 - (iv) *the provision of land for public purposes,*
 - (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
 - (vii) *ecologically sustainable development, and*
- (b) *to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*
- (c) *to provide increased opportunity for public involvement and participation in environmental planning and assessment.*

The proposal is considered to be consistent with the objects of the EP&A Act as listed above. The department has assessed the proposal having consideration for the principles of ESD. The recommended conditions of approval and proponent's Statement of Commitments aim to mitigate the environmental impact of the proposal through stringent management measures. The proposed use of the site is considered to promote the economic and orderly use of the land as it seeks to provide a facility that is not out of character with the surrounding locality whilst also incorporating measures to minimise any associated impacts to an acceptable level.

3.7. Ecologically Sustainable Development

The EP&A Act adopts the definition of Ecologically Sustainable Development (ESD) found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

- (a) *the precautionary principle,*
- (b) *inter-generational equity,*
- (c) *conservation of biological diversity and ecological integrity,*
- (d) *improved valuation, pricing and incentive mechanisms.*

The department has considered the principles of ESD in its assessment of the proposal and considers the development is consistent with the principles listed above. A detailed assessment of the potential impacts associated with the proposal is discussed under **Section 5.0**.

3.8. NSW State Plan 2012

The NSW State Plan 2012 is a 10 year vision for the future of NSW with specific priorities and targets to be delivered by the NSW government. Key priorities of the plan in relation to the proposed development include:

- Goal 1 – *Improve the Performance of the NSW Economy* – the proposal contributes to the NSW economy through the provision of employment opportunities generated during both construction and operation of the development.
- Goal 22 – *Protect Our Natural Environment* – the proponent's Statement of Commitments incorporate a number of initiatives to protect the natural environment, including both during construction and operation of the proposal, including; measures to maintain water quality; measures to remove and prevent the spread of marine pests; and measures to ensure existing seagrass habitats are protected.
- Goal 27 – *Enhance Cultural, Creative, Sporting and Recreation Opportunities* – enhanced participation in recreational activities contributes to economic and social development. The proposal involves the creation of an additional 50 marina berths, providing greater opportunity for recreational boating activities within Brisbane Water.

4. CONSULTATION AND SUBMISSIONS

4.1. Exhibition

The EA for the project was publicly exhibited in accordance with section 75H(3) of the EP&A Act from 5 October 2011 until 4 November 2011 (31 days). The EA was made available to the public at three exhibition locations and on the department's website. Notification of the exhibition, including information on how to make a submission was circulated in the Central Coast Advocate (Gosford edition). Letters were sent to all adjoining and nearby landowners notifying of the exhibition and inviting a submission. The public exhibition locations were:

- The Department of Planning and Infrastructure – Information Centre, 23-33 Bridge Street Sydney;
- The Department of Planning and Infrastructure (Gosford Regional Office) – Level 3, 107 Mann Street, Gosford; and
- Gosford City Council – Administration Building, 49 Mann Street, Gosford.

A Preferred Project Report (PPR) was lodged on 5 December 2011. As the changes to the nature of the project were not considered to be significant, the proposal was not re-exhibited. It was, however, made available to the public on the department's website.

The Department received 24 submissions during the exhibition of the EA, including six submissions from public authorities and 18 submissions from the general public and special interest groups. A summary of the issues raised in submissions is provided in **Sections 4.2 and 4.3**.

4.2. Public Authority Submissions

The department received six submissions from public authorities during the exhibition period, including submissions from:

- Gosford City Council;
- Environment Protection Authority;
- Department of Primary Industries;
- NSW Office of Water;
- NSW Maritime; and,
- Roads and Maritime Services.

The issues raised by public authorities are summarised in **Sections 4.2.1 to 4.2.6**.

4.2.1 Gosford City Council

Key issues raised in council's submission on the EA include:

Car Parking

- The existing number of car parking spaces at the site is 30, not 33 as stated in the EA.
- The existing restaurant caters for functions which result in a high demand for car parking.
- The provision of additional parking spaces requires extension of the paved car parking area onto the adjoining rock wall – this requires certification of structural adequacy and supported by a geotechnical report. A retaining wall may be required.
- The higher car parking rate of 0.6 spaces per wet berth (in accordance with the Australian Standards for the design of marinas) should be used for the car parking calculations given there is no potential for overflow parking along the street or nearby parking areas.

Sewage Pump Out Facility

- A marina of the size proposed must be provided with a sewage pump out facility as Brisbane Water has limited existing facilities. The reliance on existing pump out facilities of other marinas is not supported.
- The proposal must comply with the Clean Marina Program to ensure environmental compliance and use of best practice.

Other Issues

- There are inconsistencies with the nominated trees for removal outlined on the landscape plan. It is difficult to determine which trees are to be retained and removed.
- Floating pontoons/jetties should be provided with transparent or mesh deck materials to permit light penetration to areas of sea grass habitat.
- Water supply and sewer systems capacity analysis should be undertaken on the water and sewer reticulation mains servicing the development.
- A nutrient control facility must be provided to prevent nutrients and oils from the car parking area directly flowing into Brisbane Water.
- Driveways and car parking areas are to be designed according to the requirements of the current Australian Standards.
- Erosion and sediment control measures shall be implemented in respect to all civil works.

4.2.2 Environment Protection Authority

The Environment Protection Authority (EPA) (formally NSW Office of Environment and Heritage) did not raise any specific concerns with the proposal. It was, however, advised that the *Protection of the Environment Act Operations 1997* (POEO Act) prohibits the pollution of waterways and that any activity carried out at the site must comply with the POEO Act at all times. The EPA also provided recommended conditions of approval to protect any features of Aboriginal cultural heritage.

4.2.3 Department of Primary Industries

The Department of Primary Industries (DPI) advised that there were no objections to the proposal provided a number of conditions are met to protect environmentally sensitive seagrass beds. This includes the preparation of a construction management plan to identify the presence and distribution of existing seagrass populations; and any navigational movements over seagrass during construction should be done at high tide while travelling slowly. During operation of the marina, DPI recommends buoys be deployed outside of seagrass areas to provide visual identification; and that vessels be prohibited from deploying anchors within seagrass areas.

Further advice from the DPI advised that a sewage pump out facility should be required as a condition of approval in order to protect existing oyster leases located within the adjacent NSW Shellfish Harvest Zone.

4.2.4 NSW Office of Water

The NSW Office of Water considered the EA to be satisfactory and did not raise any issues.

4.2.5 NSW Maritime

NSW Maritime advised that navigational impacts were considered and that the development as proposed will not constitute a hazard to safe navigation. NSW Maritime further advised that the removal or relocation of any swing moorings should be undertaken by the proponent and at no cost to NSW Maritime.

4.2.6 Roads and Maritime Services

Roads and Maritime Services (RMS) advised that there were no objections in regards to the proposal provided a number of recommended conditions of approval in relation to construction activities, access and car parking, and signage are incorporated as part of any approval.

4.3. Public Submissions

A total of 18 submissions were received from the public. Of the public submissions received, nine were in support and nine provided objections in relation to the proposal.

Key issues raised in objection to the proposal include:

- Insufficient car parking to service both the marina and the existing restaurant.
- Increased traffic will cause congestion along local roads.
- The proposed marina is too large for the locality and reduces the space for public recreational use.
- There is an increased likelihood of fuels and oils polluting the marine ecosystem, including impacts on nearby oyster leases.
- There is an increased likelihood of impacts on existing seagrass communities.
- There is an increased likelihood of boat strikes on marine animals, including turtles.
- The noxious weed *Caulerpa taxifolia* is found in the area and increased boat traffic will potentially spread the weed throughout Brisbane Water.
- Increased boat traffic has the potential to cause erosion along the foreshore and bed of Brisbane Water.
- Predictions of sea level rise will impact on the proposal.
- The aesthetics of Brisbane Water will be detrimentally impacted upon.

Key issues raised in support of the proposal include:

- There is a currently an undersupply of available berths in Brisbane Water.
- The proposal will improve the aesthetics of the locality.
- The proposal will attract tourism to the area.

The department has considered the issues raised in submissions in its assessment of the proposal, as discussed further under **Section 5**.

4.4. Proponent's Response to Submissions and Preferred Project Report

The proponent has provided a response to the issues raised in the submissions through a Preferred Project Report (PPR) (refer **Appendix C**). The PPR outlines minor amendments to the proposal as presented in the EA. The proposed amendments involve:

- Converting one of the approved offices within the existing building (GFA of 63.5m²) to be used for marina-related activities, and
- The north-eastern side of the outer marina arm will be used for temporary public berthing. The proponent has advised that this was always proposed as part of the application, however, the following details are provided for clarity as part of the PPR:
 - seven temporary berthing spaces will be provided, based on an average boat size of 12m requiring a four metre clearance – refer **Figure 16**; and
 - the inclusion of additional management measures to control temporary berthing.

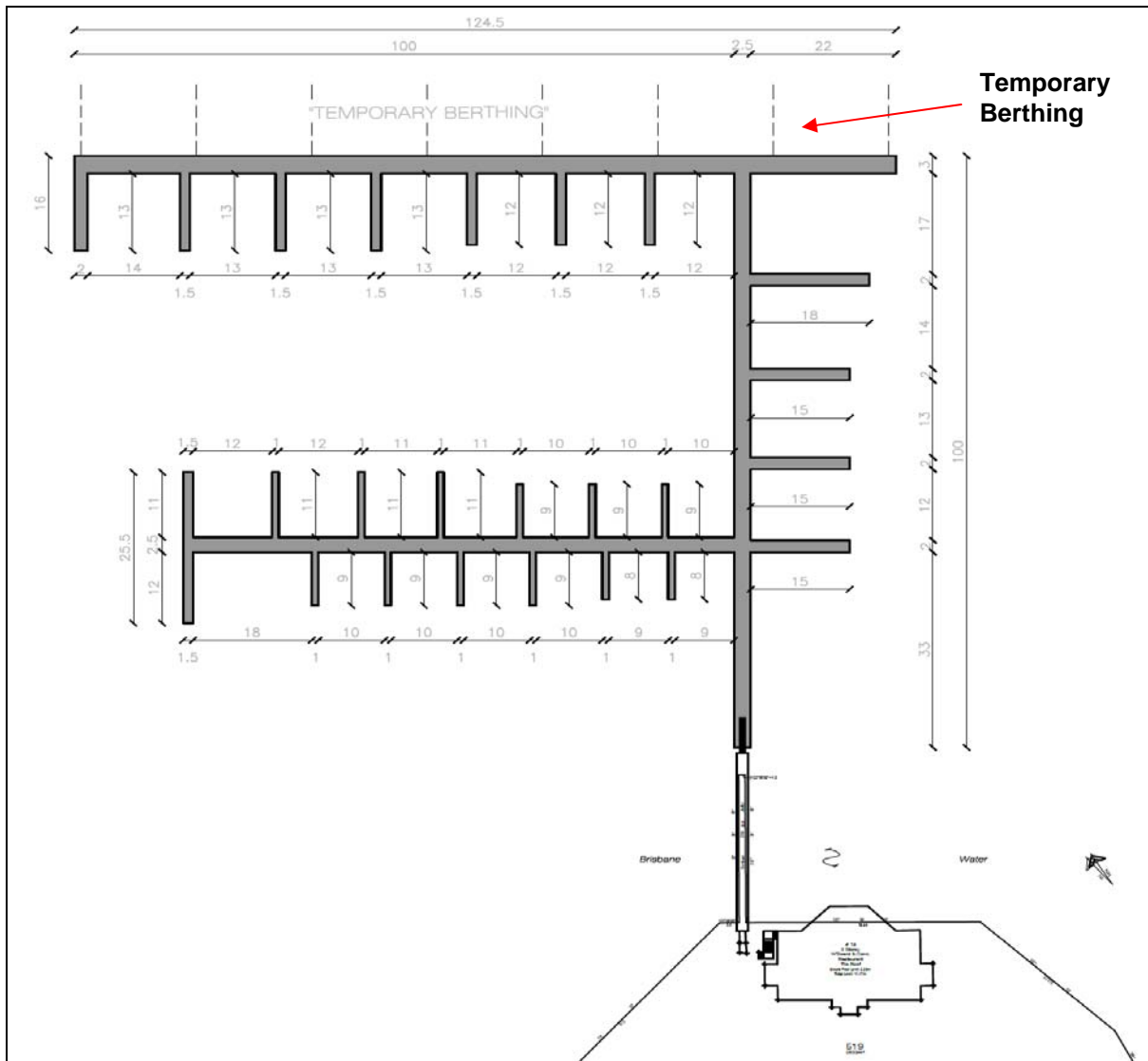


Figure 16: Proposed Marina Layout with Temporary Berthing (source: Preferred Project Report)

5. ASSESSMENT

Key issues considered in the department's assessment of the Environmental Assessment (EA) and Preferred Project Report (PPR), and consideration of the proponent's Statement of Commitments includes the following:

- Car parking requirements;
- Provision of a sewage pump out facility;
- Impacts on aquatic ecology;
- Impacts of flooding, climate change and sea level rise; and
- Visual impacts;
- Aboriginal cultural heritage.

5.1 Car Parking Requirements

The site currently provides 30 car parking spaces to service the existing restaurant and office uses. The proponent proposes to extend and reconfigure the existing car parking layout to create an additional 14 spaces, providing a total of 44 car parks for the site. A key issue raised by council and members of the public included the lack of on site car parking to cater for the anticipated demand of both the restaurant and proposed marina, particularly when a function is being held at the restaurant.

As discussed in **Section 1**, the site currently has an existing development consent in force (DA 21637/96 approved by council) for the operation of a restaurant and seven small offices within a two-storey building. The restaurant is located on the ground floor and covers a gross floor area (GFA) of 221.1m² with associated kitchen, amenities and foyer area. The seven offices are located on the first floor and cover a combined GFA of 181.1m². The approved site layout for DA 21637/96, including configuration of the existing car park consisting of 30 car parking space is shown at **Figure 17**. **Figure 18** shows the reconfigured car parking layout as proposed with an additional 14 spaces.

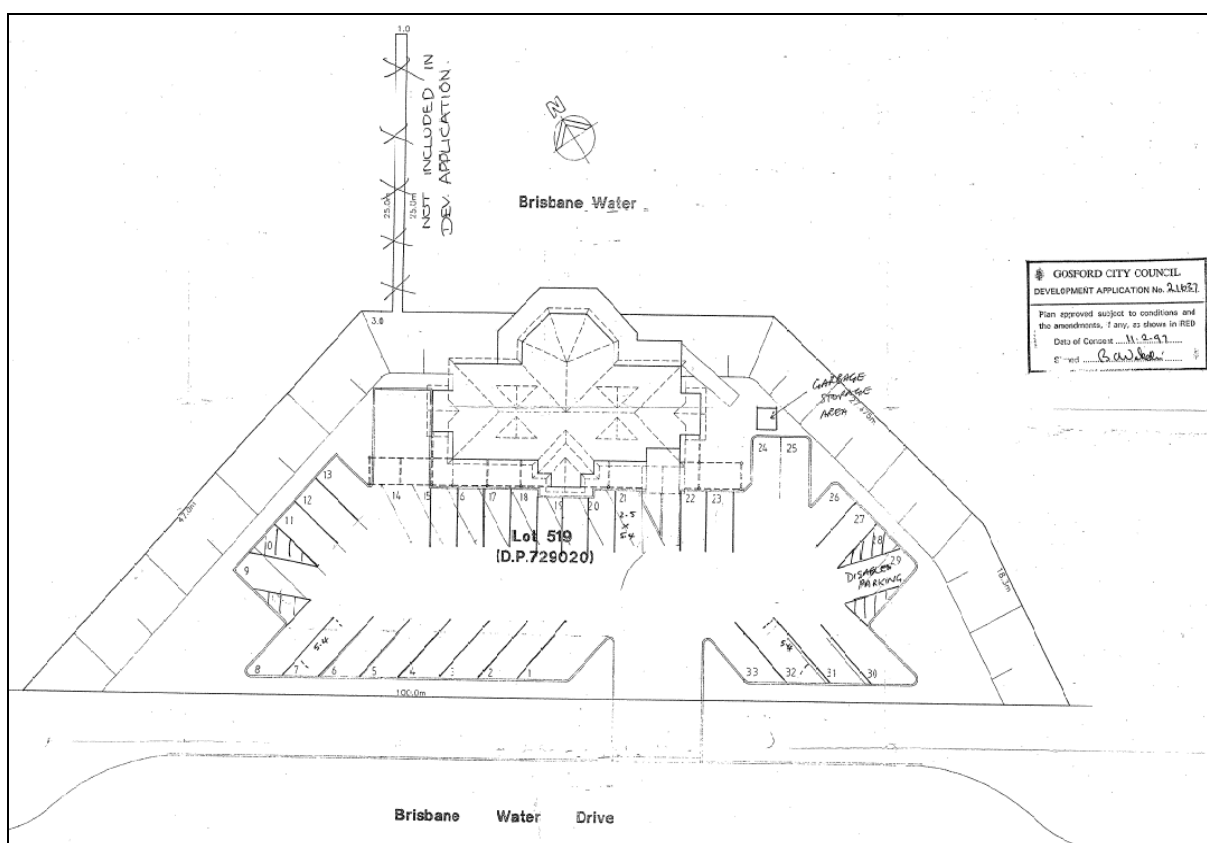


Figure 17: Approved Plan – DA 21637/96 (source: Environmental Assessment)

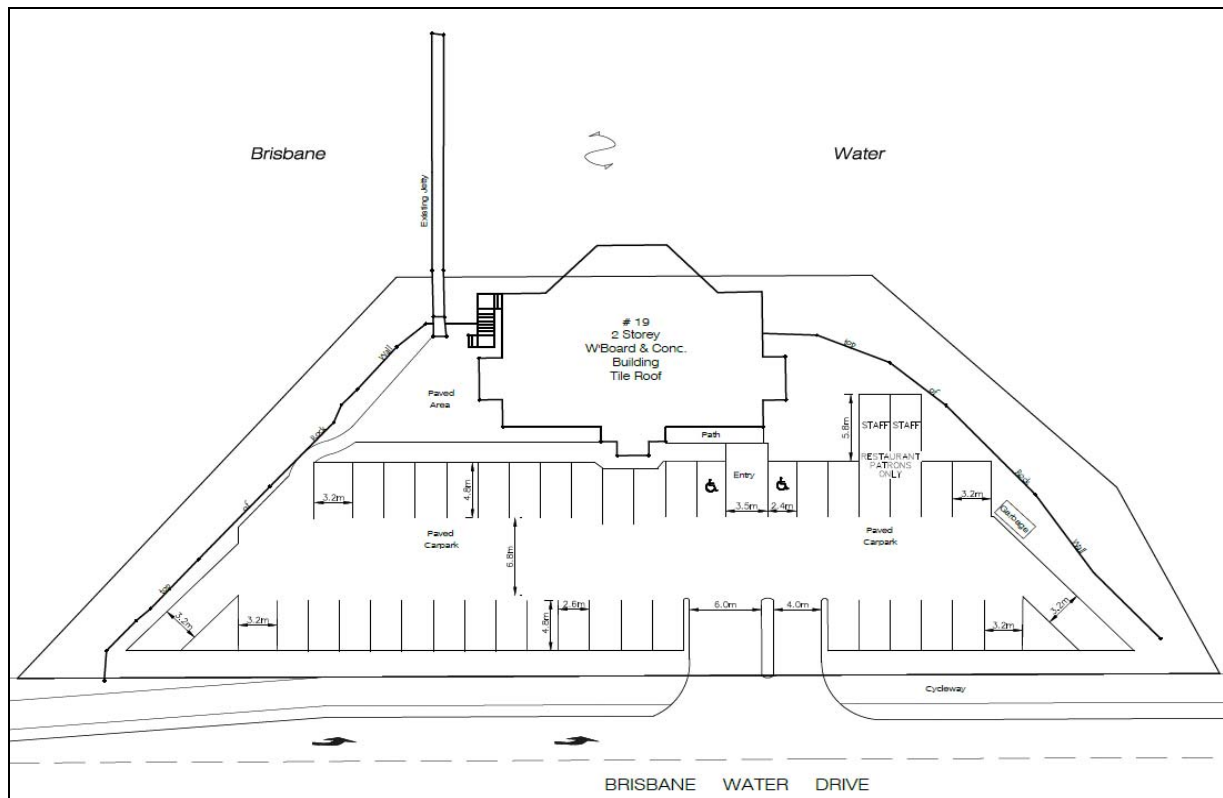


Figure 18: Proposed Car Parking Layout (source: Preferred Project Report)

The proponent advised in the EA that the site's existing uses currently generate a demand for 18 car parking spaces, as determined in accordance with the provisions of council's Development Control Plan 111 – Car Parking (DCP 111), which requires a rate of one car park per 16m² for commercial/retail space (restaurant use) and one car park per 40m² of office space. Based on these provisions, it is the proponent's view that the site currently provides a surplus of 12 car parking spaces for the existing uses. **Table 2** below outlines the site's car parking requirements in accordance with council's DCP 111.

Table 2: Existing Car Parking Requirements in Accordance with DCP 111 – Car Parking

Land Use	DCP 111 Parking Provisions	Required Parking Spaces	Parking Spaces Provided
<u>Restaurant</u> 114.2m GFA (restaurant) 41.5m GFA (kitchen) 66.4m GFA (enclosed verandah) Total GFA of 222.1m	1 space per 16m²	13.9	
<u>Offices</u> Seven offices with a combined total GFA of 181.1m²	1 space per 40m²	4.5	
Total		18.4	30

DCP 111 does not provide a rate of car parking for marina facilities. The proponent has therefore referred to the Australian Standards Guideline for Design of Marinas (AS 3962–2001) in determining an appropriate number of car parking spaces for the proposal. The guideline states that 0.3 to 0.6 car parking spaces per wet berth should be provided for new marina facilities. A further 0.5 spaces per employee is further recommended. In accordance with the guidelines, a lower number of parking spaces should be considered for commercial facilities (i.e. 0.3 spaces per berth); and a larger number should be considered for racing clubs (i.e. 0.6 spaces per berth). The proponent considers the 0.3 spaces per wet berth as appropriate given the proposal is for a commercial marina and not a racing club/facility.

Council advised in its submission on the EA that the higher car parking rate of 0.6 spaces per wet berth should be used as there are no opportunities for overflow parking along Brisbane Water Drive or nearby parking areas. Council considered that there would be a deficiency of car parking spaces for the site, even with an additional 14 spaces as proposed.

The department requested the proponent clarify the proposed car parking arrangement, including further information on how the demand for car parking calculations were arrived at.

In response to the department's request, the proponent re-iterated that in accordance with AS 3962–2001, applying a rate of 0.3 spaces per wet berth is justified given the proposal does not provide a slipway or refuelling services, and is a commercial marina (as opposed to a racing club/facility which requires a higher rate of car parking). The proponent also noted that as no slipway or boat launching facilities are proposed, the demand for car parking is reduced as trailer parking is not required.

To address the issue of increased parking demand when a function is being held at the site, and the lack of available street parking along Brisbane Water Drive, the PPR provided information on the availability of nearby off-site car parking to assist in alleviating the demand for on-site car parking. The PPR lists the following alternative off-site car parking areas in proximity to the site:

- 6 on-street spaces – approximately 350m to the south.
- 20 spaces – approximately 400m to the south; and
- 21 spaces at Koolewong Train Station – approximately 600m to the north.

In response to the PPR, council maintained its position that there is insufficient on-site car parking for both the marina, restaurant and office uses to operate simultaneously. Council advised that the proponent's consideration of 0.3 spaces per wet berth is not justified as the proposal relies on off-site parking, and that external car parking areas should not be relied upon for the proposal.

Department's Consideration

It is the department's view that the existing 30 car parking spaces approved by council as part of DA 21637/96 are to be utilised solely for the purpose of the existing restaurant and office uses; and that the demand for car parking generated by the proposed marina is to be provided in addition to those spaces currently provided.

Council's DCP 111 does not provide a definitive rate of car parking for marinas. The department has therefore referred to AS 3962–2001 in determining an acceptable rate of car parking. In accordance with AS 3962–2001, the proposal, being for a commercial facility, generates a demand for 15 car parking spaces based on the requirement of 0.3 spaces per wet berth. Council's position is that a higher car parking rate of 0.6 spaces per wet berth should be considered, which would require an additional 30 car parking spaces.

The department considers the rate of 0.3 spaces per wet berth is an appropriate consideration for the proposal, on the basis that the proposed marina:

- is a commercial facility;
- will not be used as a racing club, nor will it provide for such facilities;
- does not propose a slipway or boat launching facilities;
- will not be used for boat repairs and maintenance; and
- is in accordance with the relevant Australian Standards.

Based on the requirement of one car space per 40m² of office space in accordance with DCP 111, it is established that of the 30 car parking spaces approved for the existing restaurant and offices uses, three spaces would be attributable to the office space proposed to be converted to marina use. This means the proponent will need to provide a minimum of 12 new car parking spaces in order to comply with the requirement of 15 spaces for the proposed 50 marina berths.

An additional 14 car parking spaces are provided as part of the proposal. This together with the existing three spaces to be reallocated to the marina use will exceed the car parking requirement of AS 3962–2001 based on a rate of 0.3 spaces per wet berth.

The total result of the proposed car parking arrangement will see the provision of 27 existing car parking spaces attributed to the restaurant and remaining office space; three existing spaces attributed to the marina use (as a result of converting 106.8m² of office space to marina use); and 14 additional spaces created for marina use, creating a combined total of 44 car parking spaces for the site.

In order to differentiate between marina car parking and the existing car parking approved for the restaurant/office use, a recommended condition of approval requires the proponent to provide signposting throughout the car parking area to identify 17 car parking spaces designated for marina use (including the marina recreation room and marina manager's office space) and 27 car parking spaces for the separately approved restaurant and office use. The signage is required to clearly state that the marina spaces may only be utilised by marina patrons during operating hours; and the restaurant and office spaces may only be utilised by restaurant patrons and office staff during the existing approved restaurant/office operating hours. Outside of the respective operating hours, the car parking spaces may be utilised by either marina members, or restaurant patrons and office staff.

5.2 Provision of a Sewage Pump Out Facility

A key issue raised by council and the public during exhibition was the need for a sewage pump out facility to be provided as part of the proposal. The proponent advised that no pump out facility was proposed given the risk of water contamination and potential impacts on the nearby aquaculture industry (oyster farming). The proponent also estimates that a maximum of only five boats to be berthed at the marina will be equipped with sewage holding tanks, and therefore the proposal does not generate a demand for such a facility. The EA notes that council provides a free 24-hour self-service sewage pump out facility available for public use at Gosford Wharf approximately 5km northeast of the site; and another council-owned facility is available at Killcare Marina approximately 7km southeast of the site, either of which could adequately cater for the marginal increase in demand generated by the proposal.

Council advised in its submission on the EA that a marina of the size proposed must be provided with a sewage pump out facility as Brisbane Water has limited existing facilities. Council is not supportive of the reliance on existing pump out facilities of other marinas in the locality.

In the absence of a sewage pump out facility provided on site, the department requested the proponent undertake an assessment of alternative pump out facilities in proximity to the site that could be utilised by future marina users. As part of the PPR, the proponent provided a plan of Brisbane Water identifying nearby pump out and refuelling facilities, as shown at **Figure 19** below.

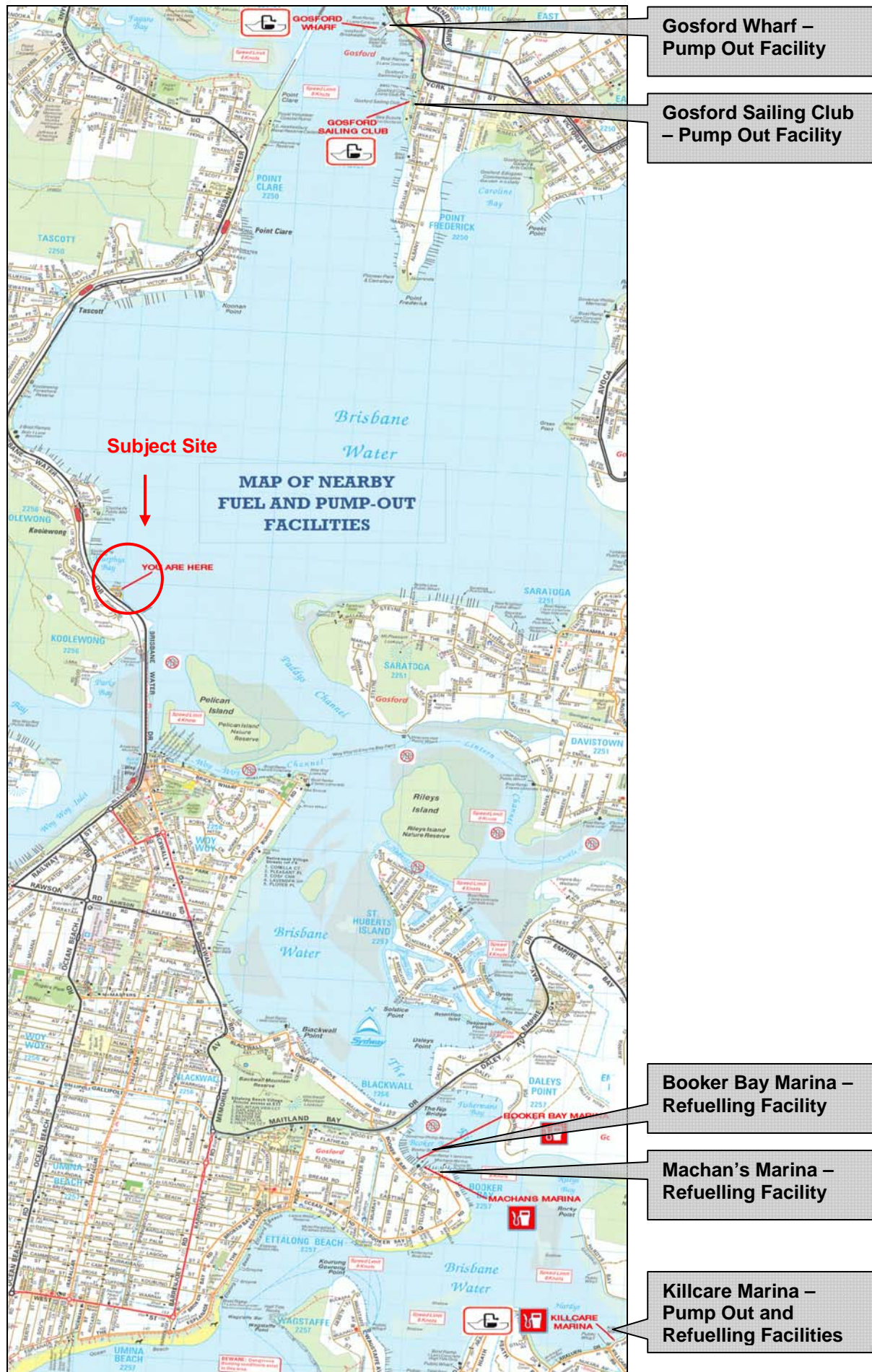


Figure 19: Sewage Pump Out and Refuelling Facilities (source: Preferred Project Report)

Figure 19 shows three alternative pump out facilities in proximity to the site, including:

- Gosford Wharf (council owned, public facility) – 5km northeast;
- Killcare Marina (council owned, public facility) – 7km southeast; and
- The Gosford Sailing Club (private facility) – 4.5km northeast.

Figure 19 also shows the location of three refuelling facilities located at Booker Bay, Machan's, and Killcare Marinas. The proponent considers that as the proposed marina does not provide refuelling facilities, future marina users will likely refuel at one of the marinas located at the southern end of Brisbane Water, and that it is likely they will also utilise the sewerage pump out facility located at Killcare Marina whilst in the vicinity.

Also as part of the PPR, the proponent provided correspondence from the Manager of Killcare Marina who advised that the existing pump out facility is the property of council and available for public use. It was advised that there would be no issues associated with an increase in demand for the facility, based on the current rate of usage and the estimated number of vessels that will be equipped with sewage holding tanks at the proposed marina in Koolewong.

In response to the PPR, council maintained its position that a sewage pump out facility connected to council's reticulated sewerage system must be provided due to the size of the proposed marina, the location of other facilities, and to protect the environment of Brisbane Water in general.

The department notes that the site is located within a 'no discharge zone' under the NSW Marine Pollution Regulation 2006. No discharge zones include all inland waterways, intermittently opening lagoons, Aquatic Reserves and Marine Parks, and all waters within 500 metres of any area where aquaculture occurs. The proposed marina and immediate surrounds are located in the no discharge zone as Brisbane Water is an inland waterway; and there are existing oyster leases within approximately 400m of the proposed marina.

In accordance with State Environmental Planning Policy No. 62 – Sustainable Aquaculture (SEPP 62), the department has taken into consideration the NSW Oyster Industry Sustainable Aquaculture Strategy 2006 (OISAS). The OISAS ensures that water quality requirements for sustainable oyster growing are considered in land and water management, and within the strategic planning framework. **Figure 20** below identifies the existing oyster leases within Brisbane Water in proximity to the site which are identified as being 'Priority Oyster Aquaculture Areas' under the OISAS.



Figure 20: Existing Oyster Leases – Brisbane Water (source: NSW Oyster Industry Sustainable Aquaculture Strategy)

Also in accordance with SEPP 62, the department requested further advice from the Aquaculture Unit of the Department of Primary Industries (Fisheries) (DPI) on the matter. DPI advised that there are numerous Priority Oyster Aquaculture Areas less than 400m from the proposed marina, and that these are located within a NSW Shellfish Harvest Zone (managed by the NSW Food Authority). As oysters from this area can be harvested and sold for consumption following depuration, the protection of sanitary water quality in the area is essential for human health reasons. DPI advised that the installation of a sewage pump out facility should be required as a condition of approval to reduce the risk of pollution to the adjacent oyster lease area.

Department's Consideration

The department has considered the views of the proponent, council and the DPI. Whilst the department acknowledges the proponent's argument that the anticipated demand for such a facility is predicted to be relatively low; the size of the proposed marina and number of vessels berthing at this locality presents the risk of environmental damage through both illegal and accidental release of sewage into Brisbane Water. This has the potential to reduce existing water quality conditions and consequently contribute to contamination of the nearby NSW Shellfish Harvest Zone.

Given the associated risks to the existing environmental conditions and the potential impacts upon human health, the department considers the installation of a sewage pump out facility is required for a marina of the size proposed. A recommended condition of approval therefore requires the installation of a sewage pump out facility. The detailed design and location of the facility is required to be submitted to the satisfaction of the water supply authority, with a copy provided to council and the department.

Even with the provision of a sewage pump out facility, the risk of accidental spillage remains, and therefore a recommended condition of approval requires the proponent to immediately notify the NSW Food Authority in the event of any spillage or illegal dumping in proximity to the proposed marina.

To ensure the proposed marina continually operates to a satisfactory level of environmental performance, and to ensure the nearby NSW Shellfish Harvest Zone is protected, a further recommended condition of approval requires a Level 3 accreditation to be obtained as part of the Clean Marina Program (CMP). The CMP is owned and managed by the Marine Industries Association of Australia and encourages environmental compliance and the use of best management practices for marinas. The focus of the program is to assist marina industry operators in protecting inland and coastal waterways by leading them through a voluntary accreditation process. The proponent will be required to achieve a Level 3 accreditation involving an independent assessment by a qualified CMP consultant every three years.

5.3 Impacts on Aquatic Ecology

Impacts of the proposal on the site's aquatic ecology both during construction and operation of the development were key issues raised during exhibition of the proposal. In particular, the potential impact on existing seagrass habitat was raised by both public authorities and the public.

As part of the EA, the proponent provided an Aquatic Ecology Assessment prepared by Cardno Ecology Lab (Cardno). Cardno considered that the local and surrounding aquatic environment had the potential to be impacted through various processes, including:

- Mobilisation of sediments;
- Impacts on water and sediment quality;
- Damage to aquatic habitats;
- Introduction or spread of marine pests; and
- Shading of the water column.

These potential impacts and appropriate mitigation measures have been assessed below.

Mobilisation of Sediments

The installation of piles for the marina facility has the potential to disturb the seafloor and mobilise sediments in the water column. Sediment mobilisation may also occur through regular boating movements which create shoreline erosion due to boat wash or propeller action. The effects of sediment mobilisation and associated water turbidity may impact on existing seagrass habitats and algae through light attenuation (impacting on photosynthesis) and sedimentation.

Cardno considers that the environmental impacts associated with sediment mobilisation can be minimised through the implementation of the following mitigation measures:

- enforcing a 'no wash' speed limit on vessels during construction of the marina as they approach and move around the work site;
- the use of hollow steel piles during pile installation (as opposed to traditional wooden piles) which displace less sediment;
- the use of silt curtains to minimise the dispersal of sediment; and
- monitoring of water turbidity during installation of the piles.

As part of recommended conditions of approval, the department requires the above mitigation measures to be included as part of a construction management plan, to be approved by the Certifying Authority prior to the issue of a Construction Certificate. It is also noted that the proposed marina structure is to be held in place by hollow steel piles, and not the traditional wood piles that currently hold the existing jetty in place, reducing the impact of

sediment displacement. In addition, the proponent has included the abovementioned mitigation measures as part of the Statement of Commitments.

Impacts on Water and Sediment Quality

In addition to the effects of sediment mobilisation on water quality, the construction and operation of the proposed marinas may impact on water quality through other means.

Vessels using the marina have the potential to introduce chemicals to the aquatic environment through leaching of toxic components (such as anti-fouling paints applied to boat hulls), combustion of fuel in boat engines, accidental fuel and oil spillages, and spillage of bilge water and sewage. The introduction of any of these products into the surrounding environment and increased concentration of vessels in the area have the potential to impact on water quality, which in turn impacts on existing flora and fauna species. Cardno recommends the implementation of the following control measures to manage the risk of boat-derived contamination and impacts on water quality:

- reduced sediment mobilisation during construction activities;
- construction teams are encouraged to remove bilge water using bilge water removing pads.
- boat owners should be educated about the environmental impacts associated with the use of copper-based anti-fouling paints, and discouraged from cleaning boat hulls that have been treated with copper paints.
- boat owners should also be informed that the discharge of untreated sewage into navigable waters is prohibited; and
- fuel and oils spillages should be contained within floating booms and cleaned up as soon as possible.

In order to maintain water quality in the vicinity of the site, the proponent has incorporated the above recommendations as part of their Statement of Commitments. In addition, the proponent advises that the marina manager, to be on site seven days a week during business hours, will ensure these mitigation measures are complied with. For those periods when the marina manager is not on site, the proponent advises that contact details for the EPA will be made available on signage located at the site. The department has included this requirement as a recommended condition of approval.

Damage to Aquatic Habitats

Impacts on the existing aquatic habitat have the potential to occur through displacement by marina structures; and during construction and ongoing operation of the marina.

- Displacement by marina structures – aquatic vegetation in the vicinity of the proposed marina is dominated by mangroves and seagrass species (*Posidona australis* and *Zostera capricorni*). Shore-based construction works are not required and therefore no impacts are anticipated on the existing mangrove habitat. Potential impacts may be experienced on existing seagrass communities.
- Construction and ongoing operation of the marina – the close proximity of seagrass habitat to the proposed marina structure means there is an increased potential for damage during construction and operation. Impacts can occur through boats inadvertently anchoring in seagrass habitat (predominately during construction), or driving through shallow seagrass areas. Similar risks exist during operation of the marina; however, the provision of permanent berthing facilities may reduce the effects as boats are more likely to utilise the berthing facilities and are therefore less likely to anchor.

In order to protect existing seagrass habitat, DPI Fisheries recommended the deployment of marker buoys outside of seagrass beds to give a visual indication of their presence. The proponent advised that deploying buoys often leads to further damage of seagrass habitat

due to boats getting caught on the buoy chains which are then dragged along the sea bed. The proponent further advised that given the location and shallow depth of the sea grass relatively close to the shore, boats are unlikely to enter these areas in any event. The department has therefore not included this recommendation as a condition of approval. The department has, however, recommended a Seagrass Management Plan be prepared to the satisfaction of DPI Fisheries prior to the issue of a Construction Certificate. The plan is required to include the following:

- construction teams are to be made aware of the importance of avoiding navigating over seagrass, particularly in shallow areas. If movements over seagrass are necessary, then these should be done at high tide, while travelling slowly and ensuring that adequate clearance is maintained between seagrass and propellers;
- information regarding the importance of maintaining this environmentally sensitive area is to be provided to all club members, including mapping of seagrass habitat;
- consultation with DPI Fisheries is to occur regularly to monitor the health of existing seagrass habitat; and
- appropriate mitigation measures are to be outlined in the event that the construction and/or operation of the marina cause any unforeseen adverse impacts on the health of existing seagrass habitat.

In addition, the department recommends construction teams be prohibited from anchoring within any area of identified seagrass habitat. As part of the Statement of Commitments, the proponent has committed to provide on-shore signage at the site to identify the presence and distribution of seagrass habitat, and to create a 'vessel exclusion zone' over such areas. **Figure 21** shows the location of existing seagrass habitat and the vessel exclusion zone, as proposed in the proponent's Draft Marina Environmental and Operational Management Plan provided with the PPR.

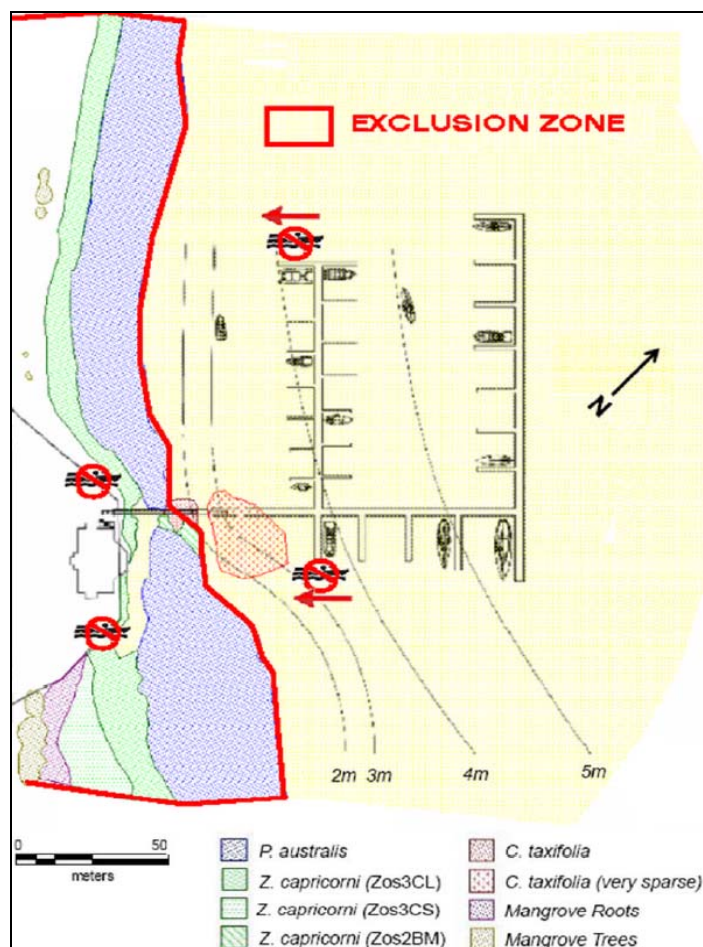


Figure 21: Existing Seagrass and Mangrove Habitat and Proposed Vessel Exclusion Zone
(source: Preferred Project Report)

Introduction or Spread of Marine Pests

Marinas and boating activities have the potential to introduce or spread marine pests. The invasive algae *Caulerpa taxifolia* is found in NSW estuaries and is spread via its attachment to boat anchors. Cardno notes that *C. taxifolia* is present in the vicinity of the proposed marina and that the risk exists in spreading the pest throughout the marina site, and away from marina to previously unaffected areas. It is more likely to be spread during construction than operation of the marina as vessels are more likely to be anchoring during construction. Cardno advises that the spread of *C. taxifolia* and other marine pests can be limited through the implementation of simple control mechanisms as part of the construction and operation of the marina.

The department has included as part of the recommendation a requirement to prepare a construction management plan prior to the issue of a construction certificate. The plan is required to outline protective measures to ensure the spread of *C. taxifolia* is prevented during construction. In addition, the recommended conditions of approval require the area of *C. taxifolia* identified in the Aquatic Ecology Report to be removed prior to the issue of a Construction Certificate.

Shading of the Water Column

Marina structures shade the seafloor and have the potential to reduce or eliminate aquatic vegetation (through reducing available light) where this vegetation occurs directly beneath, or in close proximity to, the marina footprint. The proposed marina is to be widened from 1m to 1.5m and the existing timber jetty is to be replaced with seagrass-friendly mesh. *Posidonia australis* (seagrass species) was found to be growing up to the edge of the existing timber jetty and in some areas extending under the jetty footprint. There was no seagrass habitat observed under the footprint of the proposed marina extension, refer **Figure 20** above.

Cardno advised that the proposed seagrass-friendly mesh replacing to existing timber jetty will allow for increased light penetration compared to that currently experienced. Therefore, there is unlikely to be an increase in shading effects of the existing seagrass habitat, and no impacts are anticipated as a result of the proposed 0.5m widening of the jetty. Cardno noted that it is possible for seagrass habitat to increase as a result of the proposal, as the species may spread into areas previously shaded by the existing timber jetty once the seagrass-friendly polypropylene decking is in place, which will allow for increased light penetration.

Assessment of Significance

As part of the Aquatic Ecological Assessment, a 7-part test of significance under the NSW *Threatened Species Conservation Act 1995*, and an assessment of significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* were carried out for endangered, vulnerable and migratory species. Two reptile species – Loggerhead turtle and Green turtle; one endangered population – Strapweed seagrass; and 36 estuarine bird species (full list is provided in the EA) were assessed.

- Green and Loggerhead turtles – both species are known to occur within Brisbane Water on occasion. Impacts include increased risk of boat strike, reduced seagrass habitat (an important food source and foraging habitat), and reduced water quality conditions. Cardno advised that boat strike is not considered to be a major issue in Brisbane Water due to existing boat speed limits within the estuary and around the proposed marina. Given the level of boating activity throughout Brisbane Water, the proposal is unlikely to exacerbate the overall risk to either species of turtle and therefore no significant impacts are anticipated.
- Estuarine birds – the construction and operation of the marina is not expected to impact on any habitat utilised by the 36 estuarine bird species recorded in the study area.
- Strapweed seagrass – threats to existing seagrass habitat include physical damage from boat propellers and anchoring; the spread of invasive pest algae *C. taxifolia*; and

reduced water quality conditions. As discussed above, a number of recommended conditions of approval and Statement of Commitments are to be implemented to protect existing seagrass habitat within the vicinity of the site.

In response to the assessment of significance, Cardno concluded that the proposal will not impact upon any threatened species or populations such that a species impact statement is required.

Department's Consideration

The department considers that the proposed construction and operation of the marina will not have a detrimental impact on the site's existing aquatic environment, nor will it detrimentally impact on any endangered, vulnerable or migratory species known to occur within the locality, provided the recommended conditions of approval and Statement of Commitments are complied with. Key agencies including the EPA and DPI Fisheries raised no significant concerns in relation to the environmental impacts of the proposal. DPI Fisheries did, however, request that the existing seagrass habitat be protected as part of any approval. Cardno's assessment found that potential impacts on water quality and existing seagrass habitat are most likely to occur during construction of the marina, and the department has therefore recommended conditions of approval requiring a construction management plan to be prepared prior to the issue of a Construction Certificate, which is to provide a range of measures in order to minimise the impacts of sediment mobilisation and deterioration of water quality. A Seagrass Management Plan is also recommended to protect existing seagrass habitat in proximity to the site. The proponent's Statement of Commitments outline further measures to ensure an acceptable level of environmental performance is achieved both during construction and operation of the proposed marina.

5.4 Impacts of Flooding, Climate Change and Sea Level Rise

The impacts of flooding, climate change and sea level rise were issues raised in the public submissions. The proponent engaged Cardno (NSW/ACT) Pty Ltd to prepare a Coastal Processes Investigations report as part of the EA. Cardno's assessment of the site's flood risk assumed a design life of up to 50 years which was considered representative of a typical design life for a similar structure. The assessment considered the impacts of estuarine flooding upon the development, as well as the likely implications of climate change in accordance with the Practical Consideration of Climate Change – Floodplain Risk Management Guideline (DECC 2007) and the NSW Coastal Planning Guideline: Adapting to Sea Level Rise.

Impacts of Estuarine Flooding

Under day-to-day operational conditions, Cardno advised that there is a very low risk of flooding at the site due to the existing elevation of the land which sits above the high water level of 0.6m AHD. Due to the fact that the site is dominated by estuarine flooding as opposed to catchment flooding, the proposed development will not impact on flood levels of the site itself, or on any neighbouring sites.

The majority of the land-based portion of the site lies above the present day 100-year Average Recurrence Interval (ARI) level of 1.71m AHD. However, under 20-year ARI wave conditions (with a crest of 0.25m) which would typically occur during a 100-year ARI estuarine flood event, the resultant inundation levels would be 1.96m AHD for the present day 100-year ARI and 2.36m AHD for the year 2050. The jetty is proposed to be constructed at a level of 1.75m AHD and thus would be inundated by wave action. The proposed marina itself would be on pontoons and would rise with the estuarine water levels.

Cardno advises that based on the existing deck levels, the jetty is submerged in a 100-year ARI estuarine flood event and patrons of the marina would have difficulty walking between the marina and the foreshore. However, this risk is considered extremely low given the size of Brisbane Water which would allow ample time for boating patrons to reach the jetty before waters rose to this level, with Cardno advising it would take up to six hours for Brisbane

Water to fill. Furthermore, the department has included a recommended condition of approval requiring the proponent to prepare a Flood Emergency Response Plan to ensure that marina patrons are safely evacuated from the site prior to the jetty structure becoming submerged.

Impacts of Climate Change and Sea Level Rise

Cardno's report examined the effects of climate change on the Brisbane Water estuary, in conjunction with the adopted sea level rise projection of a 0.9m rise by the year 2100. A 10%, 20% and 30% increase in rainfall intensity, in conjunction with ocean storm events from the 2 year ARI through to the Probable Maximum Flood (PMF) were also considered in Cardno's hydrodynamic modelling.

Table 3 summarises the peak water levels of ocean storm events at Koolewong up to the PMF without consideration of climate change; whilst **Table 4** summarises the peak water levels with consideration of climate change.

Table 3: Peak Water Levels – Design Ocean Storm Events (without consideration of climate change)

ARI	Peak WL (mAHD)
2	1.23
5	1.34
10	1.41
20	1.48
50	1.58
100	1.66
200	1.73
500	1.84
PMF	2.06

Table 4: Peak Water Levels – Design Ocean Storm Events (with consideration of climate change)

ARI	Peak WL (mAHD)
2	2.13
5	2.24
10	2.31
20	2.38
50	2.48
100	2.56
200	2.63
500	2.74
PMF	2.96

Comparison of **Tables 3** and **4** above show that the attenuation of storm surges through the estuary were not affected and thus flood levels under the 2100 climate change scenario were 0.9m greater than the present day levels, in accordance with the adopted sea level rise predications.

Cardno concluded that severe ocean storm events cause the highest estuarine flood levels in the Koolewong area, and that local catchment flooding does not contribute to flood hazard on the site. It also concluded that the expansion of the marina would not have a significant effect on the existing coastal processes of the area; and that no changes to the hydrodynamic, morphological, or water quality conditions have been identified.

The EPA and council did not raise any concern in relation to the impacts of flooding, climate change and sea level rise. It is noted that the proposed marina structure will be constructed in the form of a floating pontoon, designed to rise and fall with the tide.

In order to manage the effects of flooding and sea level rise, the department recommends the following conditions of approval:

- a Flood Emergency Response Plan to be developed in consultation with council is to be prepared for the site prior to the issue of a construction certificate;
- marina pontoons are to be designed to attenuate wave activity in accordance with AS 3962–2001 and be designed to accommodate the 100-year ARI estuarine flood level for the 2050 planning horizon;
- stormwater drainage is to be designed in accordance with council's Design Specification for Survey, Road and Drainage Works; and
- any electrical services need to be designed to ensure they are not affected by estuarine flood events.

5.5 Visual Impacts

The visual impact of the proposal, particularly on views from the adjoining residential area, was an issue raised in the public submissions. It was argued that the location of such a large marina is obtrusive and will impact on the aesthetic value of the waterway. The proponent provided a Visual Impact Assessment as part of the EA. The study considered that the proposed marina would not be a visually dominant feature when viewed from the adjoining residential areas. **Figure 22** is a photomontage of the marina at full capacity. **Figures 23** and **24** are indicative views to the site from the adjoining residential area.



Figure 22: Photomontage of the Proposed Koolewong Marina (source: Environmental Assessment)



Figure 23: View northeast to the site from Glenrock Parade (source: Environmental Assessment)



Figure 24: View southeast to the site from Glenrock Parade (source: Environmental Assessment)

The department considers the proposed marina is consistent with the surrounding maritime features of Brisbane Water, including numerous swing moorings, private jetties, and a number of existing marina structures. The adjoining residential area to the west of the site, including properties located along both Johns Road and Glenrock Parade are located on raised terrain; with views to Brisbane Water unhindered by the proposed marina. It is noted that a number of public submissions in support of the proposal considered the proposed marina would aesthetically improve the area.

The department is satisfied that the proposed development does not detract from the existing scenic value of Brisbane Water; and that a satisfactory level of aesthetic amenity will be maintained when viewing the proposed marina from the adjoining residential area.

5.6 Aboriginal Cultural Heritage

The potential impact of the proposal on Aboriginal cultural heritage was an issue raised by the public during exhibition.

The proponent engaged Insite Heritage Pty Ltd to undertake a cultural heritage assessment of the site, in accordance with the Draft Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation. The search of heritage databases, a field inspection and consultation with the local Aboriginal community identified no constraints. Further consultation with Aboriginal stakeholders did not identify any cultural values specific to the site. The EPA raised no concern in relation to cultural heritage and provided as part of its submission recommended conditions of approval to manage Aboriginal cultural heritage objects should they be uncovered during construction works. The department has included these conditions as part of the recommendation and is satisfied that the proposal will not have a detrimental impact on Aboriginal cultural heritage.

6. RECOMMENDATION

The department has assessed the proposal for a 50 berth marina at Koolewong on its merits and has considered the issues raised in public and agency submissions. Key issues raised during exhibition of the proposal have been thoroughly assessed. The department is satisfied that an acceptable level of environmental performance and sustainability can be achieved both during construction and operation of the marina through the implementation of recommended conditions of approval. The recommended conditions and the proponent's Statement of Commitments will ensure that any detrimental impacts associated with the proposal are mitigated or appropriately managed.

With only five marinas currently servicing the whole of Brisbane Water, the proposal provides a public benefit through the provision of an additional 50 permanent marina berths and marina facilities in an area popular with recreational sailing and boating activities. The proposal will also provide for the creation of five full-time jobs during construction; and up to four full-time equivalent jobs during operation of the marina. The proposal is not anticipated to introduce any significant impacts upon the existing environment, and does not restrict the existing navigation channel for other users of the waterway. On these grounds, the department considers the site to be suitable for the proposed use and recommends the project be granted approval, subject to the recommended conditions provided at **Appendix G**.

Prepared by:

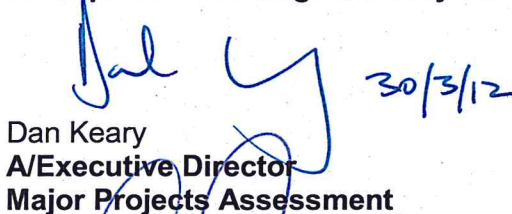


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