environmental management

saunders havill group

# Country Club Drive, Helensvale

## EPBC Act Referral

villawood properties

Villawood Properties
4 December 2015
7729

# Referral of proposed action

## Project title: Country Club Drive Urban Development, Helensvale

# 1 Summary of proposed action

### 1.1 Short description

The action being undertaken by **Helensvale Property Development Pty Ltd** (part of the **Villawood Properties** group**)** is a predominantly urban development including residential dwellings, commercial/retail precincts, community facilities and open space covering approximately 90 ha at Helensvale, Queensland. Current land use includes an existing golf course and driving range as well as open paddocks which are periodically slashed and occasionally utilised by the film industry. The site is bounded by a shopping centre to the west, urban development to the south and intertidal wetland associated with Coombabah Creek to the east and north. Development of the site will be staged into two broad precincts, south and central and north.

### 1.2 Latitude and longitude

| Point ID | Longitude | Latitude | Point ID | Longitude | Latitude |
|---|---|---|---|---|---|
| 1 | 153°20'30.2"E | 27°55'9.4"S | 22 | 153°20'31.9"E | 27°55'45.3"S |
| 2 | 153°20'22.1"E | 27°55'38.3"S | 23 | 153°20'27.7"E | 27°55'49.0"S |
| 3 | 153°20'21.6"E | 27°55'53.1"S | 24 | 153°20'23.6"E | 27°55'50.8"S |
| 4 | 153°20'29.0"E | 27°56'17.6"S | 25 | 153°20'27.0"E | 27°55'48.8"S |
| 5 | 153°20'31.1"E | 27°56'18.7"S | 26 | 153°20'30.1"E | 27°55'46.1"S |
| 6 | 153°20'33.6"E | 27°56'15.5"S | 27 | 153°20'31.4"E | 27°55'42.8"S |
| 7 | 153°20'39.7"E | 27°56'17.3"S | 28 | 153°20'29.7"E | 27°55'39.0"S |
| 8 | 153°20'48.0"E | 27°56'14.0"S | 29 | 153°20'28.4"E | 27°55'33.7"S |
| 9 | 153°20'50.2"E | 27°56'12.4"S | 30 | 153°20'32.8"E | 27°55'31.5"S |
| 10 | 153°20'50.8"E | 27°56'9.3"S | 31 | 153°20'36.7"E | 27°55'34.1"S |
| 11 | 153°20'55.2"E | 27°56'11.4"S | 32 | 153°20'41.7"E | 27°55'34.7"S |
| 12 | 153°20'57.7"E | 27°56'11.5"S | 33 | 153°20'44.8"E | 27°55'31.6"S |
| 13 | 153°20'58.4"E | 27°56'9.7"S | 34 | 153°20'44.6"E | 27°55'28.8"S |
| 14 | 153°20'57.2"E | 27°56'7.3"S | 35 | 153°20'41.7"E | 27°55'27.1"S |
| 15 | 153°20'50.7"E | 27°56'4.7"S | 36 | 153°20'35.6"E | 27°55'29.8"S |
| 16 | 153°20'46.8"E | 27°55'53.0"S | 37 | 153°20'30.6"E | 27°55'24.7"S |
| 17 | 153°20'45.2"E | 27°55'45.6"S | 38 | 153°20'31.3"E | 27°55'20.8"S |
| 18 | 153°20'42.6"E | 27°55'41.4"S | 39 | 153°20'29.6"E | 27°55'17.1"S |
| 19 | 153°20'38.0"E | 27°55'39.0"S | 40 | 153°20'32.0"E | 27°55'13.8"S |
| 20 | 153°20'37.2"E | 27°55'40.1"S | 41 | 153°20'34.3"E | 27°55'12.0"S |
| 21 | 153°20'37.6"E | 27°55'43.9"S | 42 | 153°20'35.8"E | 27°55'9.5"S |

1.3 **Locality and property description**

Contextually, the site is located in Helensvale approximately 12 km north west of the Gold Coast CBD and less than 1 km from Exit 62 (Helensvale South) from the Pacific Motorway. The site is located adjacent to the Westfield Helensvale shopping centre and a transport corridor to the west, urban residential areas to the north and south and Coombabah Creek and Wetland along the eastern boundary. The region is dominated by high density urban residential development and supporting commercial development such as shopping and dining hubs.

The site itself has been cleared of most vegetation with the southern section currently being utilised as a golf course and driving range and the central and northern areas open paddock that is periodically slashed and has recently been used as a set for the local film industry. The site contains a small amount of remnant vegetation mapped as "least Concern" under the Queensland *Vegetation Management Act 1999*. These areas are associated with the adjacent Coombabah Creek and have been heavily disturbed by the golf course in most areas.

The north and central precinct is within the Helensvale Town Centre Local Area Plan (LAP) where it is identified as "residential town centre". The south precinct's current use precludes it from being included in the LAP however it is identified as urban residential under Gold Coasts Planning Strategy land use themes mapping.

The referral area covers approximately 90 hectares of mostly cleared land with a buffer provided between the development and Coombabah Creek. The buffer ranges from 40m to over 75m in sections with an average width of 70m over the length of Coombabah Creek. Refer to **Figure 1** for the site context and **Figure 2** for the site aerial. All Figures supporting this referral document are provided in **Attachment 1**.

1.4 **Size of the development footprint or work area (hectares)**

The full development will cover approximately 90 ha including 59 ha of residential development, 7 ha of open space, and 24 ha of rehabilitation area.

1.5 **Street address of the site**

Country Club Drive, Helensvale, Queensland

1.6 **Lot description**

The referral area covers three separate lots: Lot 18 on RP868223, Lot 43 on SP180511 and Lot 16 on SP180511.

1.7 **Local Government Area and Council contact (if known)**

City of Gold Coast – No specific officer

1.8 **Time frame**

The project has acquired preliminary approval for a material change of use (MCU) for the entire site with individual precincts still subject to future MCU, Reconfiguration of Lot and operational works permits prior to commencement of any site works. The conditions of approval for the preliminary approval have been provided as **Attachment 2**. The proponent is in the process of obtaining the required approvals for the south precinct with the intention of commencing construction in first quarter 2016.

The central and north precinct will follow the southern with full development of the site expected to occur over an 8 - 10 year period depending on market forces.

| | | | |
|---|---|---|---|
| 1.9 | **Alternatives to proposed action** | **X** | **No**<br>There are no feasible alternatives to the proposed action. The site has been approved for urban uses by the Gold Coast City Council (GCCC) and the Queensland State Government. The site is surrounded by urban uses and has also been earmarked as residential development by GCCC strategic planning implements. |
| | | | Yes, you must also complete section 2.2 |
| 1.10 | **Alternative time frames etc** | **X** | **No**<br>There are no alternate timeframes proposed |
| | | | Yes, you must also complete Section 2.3. |
| 1.11 | **State assessment** | **X** | **No**<br>The site was not subject to an Environmental Impact Statement under Queensland or Commonwealth Legislation. Local and State approvals were obtained through the relevant processes. |
| | | | Yes, you must also complete Section 2.5 |
| 1.12 | **Component of larger action** | **X** | **No**<br>The project is not being developed as part of a component of a larger action. |
| | | | Yes, you must also complete Section 2.7 |
| 1.13 | **Related actions/proposals** | **X** | **No**<br>This referral is not related to other actions in the region (refer to response 1.12). |
| | | | Yes, provide details: |
| 1.14 | **Australian Government funding** | **X** | **No**<br>The proponent has not received funding from the Australian Government to undertake the project. |
| | | | Yes, provide details: |
| 1.15 | **Great Barrier Reef Marine Park** | **X** | **No**<br>The proposed action is not located inside the Great Barrier Reef Marine Park. |
| | | | Yes, you must also complete Section 3.1 (h), 3.2 (e) |

# 2 Detailed description of proposed action

### 2.1 Description of proposed action

The action is predominately urban development including residential dwellings, commercial/retail precincts, community facilities and open space covering approximately 90 ha. Current land uses include an existing golf course, and driving range. The site is bounded by a shopping centre to the west, urban development to the south and intertidal wetland associated with the Coombabah Creek to the east and north. The wetland forms part of the Moreton Bay Ramsar site.

The project will be delivered over two broad precincts:

1. The southern precinct will include residential density in the order of 15-25 dwellings/Ha across the precinct, with a mix of residential and community uses.
2. The central and northern Precinct will include a mix of residential, commercial and retail uses across the precincts. Residential dwelling densities will be in the range of 25 -100 dwellings/Ha, with retail and commercial uses throughout to compliment the surrounding residential.

The project will be constructed and delivered over several years depending on a number of factors. Generally sequencing will be carried out using the following methodology:

1. Construction will commence to the southern precinct, consisting of initial earthworks to the entirety of the southern precinct, followed by sequential civil construction of a 10 -15 stage residential development.
2. Following the commencement and progression of the southern precinct works, works will progress to the Central and Northern Precincts, subject to market timing and approvals. Initial works will be staged earthworks and civil construction to a management lot subdivision including masterplan road network, followed by sequential staged residential and commercial/retail development across varying product. Product likely to include, townhouses, Villa homes, mid-rise apartment complexes across varying levels from 3-11 storeys, as well as retail and commercial product to create mixed use development.

The project has acquired preliminary approval for a material change of use (MCU) for the entire site with individual precincts still subject to future MCU, Reconfiguration of Lot and operational works permits prior to commencement of the development. The conditions of approval for the preliminary approval have been provided as Attachment 2. The proponent is in the process of obtaining the required approvals for the south precinct with the intention of commencing construction in first quarter 2016.

### 2.2 Alternatives to taking the proposed action

There are no alternatives proposed (refer to response 1.9).

### 2.3 Alternative locations, time frames or activities that form part of the referred action

There are no alternatives proposed (refer to response 1.10).

### 2.4 Context, planning framework and state/local government requirements

The site is within an area earmarked for urban development with the northern half identified as “residential town centre” under the Helensvale Town Centre Local Area Plan with the balance zoned as urban residential under Gold Coast Planning Strategy land use themes mapping.

The project has acquired preliminary approval for a material change of use (MCU) for the entire site with individual precincts still subject to future MCU, Reconfiguration of Lot and operational works permits prior to commencement of the development. The conditions of approval for the preliminary approval have been provided as Attachment 2.

The proponent is in the process of obtaining the required approvals for the south precinct with the intention of commencing construction in first quarter 2016.

**2.5 Environmental impact assessments under Commonwealth, state or territory legislation**

No environmental impact assessments are required under Commonwealth or State legislation (refer to response 1.11).

Local and State approvals were obtained through the relevant processes as outlined in the responses to section 2.1, 2.4 and Attachment 2.

**2.6 Public consultation (including with Indigenous stakeholders)**

As part of the development assessment process for the MCU Approval, the proponents were required to engage in public consultation which involved the notification of the project to seek public comment in accordance with section 300 of the *Sustainable Planning Act 2009*. Activities carried out as part of the public consultation process include:

- Notifying adjoining landowners in writing;
- Placing signs in prominent areas around the property such as public roads; and
- Advertising in the local paper.

**2.7 A staged development or component of a larger project**

No, the project is a stand-alone project and is not a staged development or a component of a larger project. Refer to responses 1.12 and 1.13.

# 3 Description of environment & likely impacts

## 3.1 Matters of national environmental significance

### 3.1 (a) World Heritage Properties

**Description**

Not applicable. The site does not contain and is not located within close proximity to listed World Heritage Properties.

**Nature and extent of likely impact**

Not applicable.

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### 3.1 (b) National Heritage Places

**Description**

Not applicable. The site does not contain and is not located within close proximity to listed National Heritage Places.

**Nature and extent of likely impact**

Not applicable.

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### 3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

**Description**

A section of the Moreton Bay Ramsar wetland is located adjacent to the site and encompasses Coombabah Creek and Coombabah Lake Conservation Area (refer to Figure 2). The conservation area is protected under State and Local legislation and managed by Gold Coast City Council. No works will be carried out within the wetland itself.

The wetland near the site is part of the broader Moreton Bay Ramsar site which extends north to Caloundra and encompasses all of Moreton Island, and parts of North and South Stradbroke Islands, Bribie Island and the Southern Bay Islands covering approximately 113,314 ha (**Figure 3**). Other parts of the site include waters and tributaries of Pumicestone Passage, some intertidal and subtidal areas of the western bay, southern bay and sandy channels of the Broadwater region, marine areas and sand banks within the central and northern bay and some ocean beach habitats.

The wetland is listed as a Ramsar site as it fulfils six of the nine criteria for identifying wetlands of international importance. These criteria are:

- Criterion 1: contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.
- Criterion 2: supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
- Criterion 3: supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.
- Criterion 4: supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.
- Criterion 5: regularly supports 20,000 or more waterbirds.
- Criterion 6: regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

As noted Moreton Bay Wetland covers a large spatial area with many different habitat types and biological functions. Not all of these features are present in the segment of the wetland adjacent to the site therefore an assessment was carried out to identify if and how each of the criteria are represented at the site. This assessment is provided in **Table 1**.

**Table 1: Assessment of adjacent wetland against Moreton Bay Criteria**

| Listing Criteria | Moreton Bay Justification | Site representativeness |
|---|---|---|
| **Criterion 1**: contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region. | The Moreton Bay Ramsar site is located in the North-east Coast Australian Drainage Division. It is one of the largest estuarine bays in Australia which is enclosed by a barrier island of vegetated sand dunes. Moreton Bay protects the local area from oceanic swells, providing habitat for wetland development. The site receives and channels the flow numerous rivers and creeks east of the Great Dividing Range. | The project will not be carried out within the wetland itself, however, is adjacent to Coombabah Creek and Conservation Area, which is mapped as part of the Ramsar Site. Field survey identified that the creek was highly degraded on the western side as a result of clearing associated with the existing golf course. The conservation area displayed some signs of disturbance however was in reasonable condition and displayed characteristics of an intertidal wetland including the presence of flora species such as salt couch, mangroves and succulent marine species. All species identified on site are common and found in intertidal areas throughout South East Queensland and beyond. |
| **Criterion 2**: supports vulnerable, endangered, or critically endangered species or threatened ecological communities. | Moreton Bay supports large numbers of the nationally threatened Green Turtle, Hawksbill Turtle, and Loggerhead Turtle. Other nationally threatened species that the site supports are the Oxleyan Pygmy Perch, Honey Blue-eye, Water Mouse and the Australia Painted Snipe. The site is ranked among the top ten habitats in Queensland for the Internationally vulnerable Dugong. | All three of these turtle species are generally found in open ocean environments. The site and adjacent areas would not provide suitable habitat for these species at any stage of their lifecycle. The other species identified have a low likelihood of occurring at the site. Refer to Section 4 of this report and the EAR for an assessment of likelihood of occurrence and risk of impact. |
| **Criterion 3**: supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region. | The Moreton Bay Ramsar site supports over 355 species of marine invertebrates, at least 43 species of shorebirds, 55 species of algae associated with mangroves, seven species of mangrove and seven species of seagrass. At least 43 species of shorebirds use intertidal habitats in the Bay, including 30 migratory species listed by international migratory bird conservation agreements. | The project will not be carried out within the wetland itself, however, is adjacent to Coombabah Creek and Conservation Area, which is mapped as part of the Ramsar Site. These areas contain characteristics of the Moreton Bay Ramsar wetland such as migratory birds and mangroves. However, all species identified are common to the region and were generally found in low diversity. For example, only one mangrove species (River Mangrove) was observed at the site and adjacent wetland. |

| | | |
|---|---|---|
| **Criterion 4**: supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions. | Moreton Bay is a significant feeding ground for the threatened Green Turtle and is a foraging and breeding ground for the Dugong. The Bay also has the most significant concentration of the young and mature Loggerhead Turtle in Australia. | The area of the wetland adjacent to the site is a tidal creek and intertidal wetland. It would not provide any feeding grounds for the Green Turtle or breeding grounds for the Dugong (refer to section 4 and the EAR for an assessment on the likelihood of occurrence of threatened species). It also would not provide any habitat for the loggerhead turtle as it is an oceanic species. |
| **Criterion 5**: regularly supports 20,000 or more waterbirds. | The Moreton Bay Ramsar site supports more than 50,000 wintering and staging shorebirds during the non-breeding season. | A number of water birds were observed around the site and in the adjacent wetlands. These were generally common species such as Wood and Pacific black duck and the Cattle egret. Most of the individuals observed were located in the adjacent conservation area and not the project footprint although some species were viewed flying over the existing golf course. |
| **Criterion 6**: regularly supports 1% of the individuals in a population of one species or subspecies of waterbird. | The Moreton Bay Ramsar site regularly supports more than 1% of the population the wintering Eastern Curlews and the Grey-tailed Tattler. | No individuals of these species were identified either within the project footprint or the adjacent wetlands during field surveys. No habitat was observed on the application site which could support this species however both species have been recorded in saltmarsh therefore potential habitat exists within the adjacent Coombabah Creek conservation area. This type of habitat is common throughout the Moreton Bay region. There is no evidence that the wetlands adjacent to the site provide any unique or high value habitat for these species and it is not expected that the conservation area will be impacted by the action. |

Field assessment was carried out in the areas of the wetland adjacent to the site. Details of the assessment can be found in the Ecological Assessment Report (**Attachment 3**) with key findings summarised below:

- Although the current golf course has cleared all vegetation to the tidal zone of Coombabah creek, the vegetation remaining is dominated by *Aegiceras corniculatum* (River Mangrove).
- Riparian width along the edge of the creek ranges from a few meters up to approximately 10 meters. The western edge recorded the majority of introduced species specifically associated with the terrestrial environment. Species such as *Lantana camara* (Lantana) and *Schinus terebinthifolius* (Broad Leaf Pepper Tree) occurred throughout this area.
- Freshwater and tidal influences were observed throughout the Coombabah Creek Conservation Reserve with the site dominated by *Sporobolus virginicus* (Salt Couch). Some patches of native juncus and rushes as well as *Melaleuca quinquenervia* (Broad Leaf Paperbark) and *Casuarina glauca* (Swamp She Oak) were also observed.

The project will not be carried out within the Ramsar wetland itself and is located in an area adjacent to the wetland that is already significantly disturbed by an established and operational golf course. The area of wetland mapped adjacent to the site is a conservation area which contains some characteristics of the listing criteria for the Moreton Bay wetland however species identified and environmental features are common to the region and it does not provide any unique or significant ecological values. The site is part of a mosaic of intertidal habitat found along the western boundaries of the Moreton Bay Wetland.

**Nature and extent of likely impact**

An action is likely to have a significant impact on the ecological character of a declared Ramsar wetland if there is a real chance or possibility that it will result in:

- areas of the wetland being destroyed or substantially modified;
- a substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland;
- the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland being seriously affected;
- a substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health; or
- an invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland.

**Areas of the wetland being destroyed or substantially modified**

No areas of wetland will be destroyed or substantially modified by the action. The project footprint is not located within the wetland therefore no direct impacts will occur as a result of the works. The project is located adjacent to the wetland and therefore has the potential to modify it through indirect means such as changes to the quality of surface water runoff.

Through the design process an average buffer of approximately 70m from the western bank of Coombabah Creek has been provided over the length of the development. The buffer will consist of open space area, soft storm water treatment devices (i.e. grass swales and bio retention) and rehabilitation areas.

A number of management measures will also be put in place prior to any works being carried out at the site to minimise the potential for impacts to occur outside of the project footprint. Management measures are addressed in detail in section 4 of this referral document, these include:

- Development of an erosion and sediment control management plans by a suitably qualified person for each specific stage of works prior to the commencement of any works on site.
- Modelling of permanent stormwater runoff treatment devices for future use of the urban area. Stormwater treatment will utilise Water Sensitive Urban Design measures such as grassed swales and bio-retention systems.

The Erosion and Sediment Control and Stormwater Quality Management plans will be developed using current best practice guidelines and will require sign off from Gold Coast Regional Council prior to any works being undertaken on site.

**A substantial and measurable change in the hydrological regime of the wetland**

A detailed flood impact assessment investigation has been carried out for the site and has been included as **Attachment 3**. Flooding assessments were carried out for a range of flood events, from ARI 2 year to 100 year. Results show no, or very small impacts on flood depth.

Generally, flood depths are more than one metre over the wetland for the ARI 2 year event, and greater for more severe events. Impacts on flood depths due to the development are generally less than 2.5cm. This change would be undetectable on ground. Flood velocities are low, and no measurable impact is predicted over the wetland area due to the development.

The adjacent wetland is subject to tidal inundation, which dominates the hydrologic regime. The wetlands also experience periodic flood inundation however as identified above and in Attachment 3, impacts of the development on flooding are negligible and would result in no observable change to flood water levels in the wetland.

The proposed development is physically separated from the Ramsar wetlands by Coombabah Creek, will have no impact on tidal regime and result in very minor changes to flood levels in the wetland. Therefore, there will be no significant adverse impacts on the hydrologic regime of the wetlands due to the proposed development.

**The habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland being seriously affected**

As noted in the assessment against the previous criteria no significant change to watery quality or quantity is expected to occur as a result of the proposed development. An assessment of the project's potential to impact on threatened and migratory species listed under the EPBC Act is included in sections 3.1(d) and 3.1(e) of this referral document. The assessment found that none of these species would be significantly impacted by the action.

**A substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health**

As noted previously management plans will be put in place to ensure stormwater runoff from the site is treated prior to entering the wetland. The water quality parameter with the most potential to be affected is turbidity as vegetation will progressively be cleared during the construction phase exposing soils to erosional forces.

Drainage areas and detention basins will be implemented to capture site runoff allowing it to be treated prior release into the waterway. Water quality release limits and discharge points will be specified in the erosion and sediment control plan and will be required to meet stringent requirements set out by State government agencies and the local government. At a minimum these will include:

- Total Suspended Solids - 90th %ile <50mg/L
- pH - 6.5 to 9.0
- Dissolved Oxygen - 90th %ile >80% saturation or 6mg/L
- Hydrocarbons - No visible sheen on receiving waters
- Litter - No visible litter washed from site

**An invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland.**

Construction materials and equipment will be sourced from suppliers in the south east Queensland region reducing the potential for exotic or pest species to be transported to the wetland. Weed management will also form part of the construction environmental management plan with measures such as vehicle wash down points and equipment inspections implemented to further reduce any risk. Under Queensland law invasive species are required to be managed on any site in accordance with the relevant Legislation and guidelines.

### 3.1 (d) Listed threatened species and ecological communities

**Description**

An EPBC Act Protected Matters Search for the site using a 5 kilometre radius identified the following as having potential to occur on, or in vicinity to, the site:

- 2 Listed Threatened Ecological Communities (TEC):
  - Lowland Rainforest of Subtropical Australia (critically endangered)- community may occur within the area
  - Subtropical and Temperate Coastal Saltmarsh (Vulnerable) - community likely to occur within area.
- 17 listed threatened flora species
- 40 listed threatened fauna species

Refer to **Attachment 4** for the full Protected Matters Search Tool Report.

Flora and fauna field surveys were carried out from 21 to 23 April 2015 including targeted investigations for EPBC species, known habitat features and assessment of the adjacent areas mapped as Ramsar Wetland.

A detailed Ecological Assessment Report (EAR) outlining the scope and results of field surveys has been provided as Attachment 4. As part of the EAR a likelihood of occurrence and risk of impact analysis for threatened species and communities identified as having the potential to occur on or near the site was carried out. A summary of the assessment is included in **Table 2** including a rating of the potential for listed threatened species to be impacted by the action. Ratings are as follows:

- High – individuals of the species were observed or significant indications of its presence (a high level of scats, scratch marks, etc) were observed in areas where impacts are likely to occur;
- Medium – some indications of the species presence were observed or the species is known to be present in the region and habitat characteristics considered to be of high value for the species were identified on site in areas where impacts are likely to occur; and
- Low – no indications of the species utilising the site were observed. The site may contain some habitat characteristics attributed to that species but it is not known to occur in the region or habitat is not considered to provide high value for the species therefore the species is highly unlikely to be impacted by the action.

All threatened communities and species with the potential to occur at the site were considered to have a low risk of being impacted by the actions. The assessment is summarised as follows:

- Patches of the Subtropical and Temperate Coastal Saltmarsh TEC were confirmed as being present within the area of the Moreton Bay Ramsar Wetland adjacent to the development site. The TEC is associated with areas mapped as the Queensland Regional Ecosystem 12.1.2 - *Saltpan vegetation including grassland, herbland and sedgeland on marine clay plains* (**Figure 4**). As identified in section 3 of this report impacts to this area are expected to be minimal therefore no significant impact is expected to the TEC.
- No flora or fauna species listed as threatened under the EPBC Act was observed on or adjacent to the site.
- No vegetation communities or features associated with breeding or feeding habitat of listed threatened species occurs on the site. The adjacent wetlands has the potential to provide feeding or resting areas for some bird species however the values in this area are not unique or of high ecological value with similar wetland areas present throughout South East Queensland.

**Table 2: Likelihood of occurrence and risk of impact assessment for Threatened Species**

| Listed Threatened Ecological Communities | | | | | |
|---|---|---|---|---|---|
| **Name** | **Status** | **Type of Presence** | **Description of Community** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Lowland Rainforest of Subtropical Australia* | Critically Endangered | This Threatened Ecological Community is listed as a community that may occur within area. | Typically there is a relatively low abundance of species from the genera *Eucalyptus, Melaleuca* and *Casuarina*. Buttresses are common as is an abundance and diversity of vines. This community is usually associated Regional Ecosystems 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1, and 12.12.16. | No species representing these characteristics or vegetation communities were observed within the assessment area. The site is mapped as containing non-remnant vegetation, preclear vegetation does not include any regional ecosystems representing this TEC as occurring on or adjacent to the site. | Low |
| *Subtropical and Temperate Coastal saltmarsh* | Vulnerable | This Threatened Ecological Community is listed as a community that is likely to occur within the area. | The Coastal Saltmarsh ecological community consists mainly of salt-tolerant vegetation (halophytes) including grasses, herbs, sedges, rushes and shrubs. Succulent herbs, shrubs and grasses generally dominate and vegetation is generally of less than 0.5 m in height. The proportional cover by tree canopy such as mangroves, Melaleucas or Casuarinas is not greater than 50%, nor is proportional ground cover by seagrass greater than 50%. Only one regional ecosystem community including RE12.1.2 equates to the coastal saltmarshes ecological community. Key species include *Sporobolus virginicus* (Salt Couch), *Sarcocornia quinqueflora* (Samphire), *Juncus kraussii* (Rush), *Samolus repens* (Creeping Brookweed), *Suaeda australis* (Seabite), *Tecticornia pergranulata* (Blackseed Samphire), *Triglochin stricta* (Three-ribbed Arrowgrass), *Gahnia filum* (Clumped Sedge). | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. Adjacent to the site on the eastern side of Coombabah Creek are a small number of polygons mapped as containing Regional Ecosystem 12.1.2 which equates to the coastal saltmarshes ecological community. These listed Threatened ecological communities are contained within the Coombabah Creek Conservation Reserve on the eastern side of Coombabah Creek. Appropriate buffers to Coombabah Creek and stormwater detention basins will provide significant management to rectify any potential impacts to these adjacent remnant vegetation communities. | Low |

| Listed Threatened Species | | | | | | |
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| **Birds** | | | | | | |
| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Anthochaera phrygia* | Regent Honeyeater | Endangered | 82338 | Regent Honeyeaters mostly occur in dry Box-Ironbark Eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister, more fertile sites. These areas are generally associated with creek flats and river valleys and foothills. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. They are a generalist forager, which mainly feed on nectar from a wide range of eucalypts and mistletoes. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| *Botaurus poiciloptilus* | Australasian Bittern | Endangered | 1001 | The Australasian Bittern occurs in terrestrial wetlands and, rarely, estuarine habitats, mainly in the temperate southeast and southwest. It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and / or reeds or cutting grass growing over muddy or peaty substrate. The Australasian Bittern occurs in the far South-East of Queensland; it has been reported North to Baralaba and West to Wyandra, although in most years it is probably confined to a few coastal swamps. It is rarely recorded in Queensland, and possibly survives only in protected areas such as the Cooloola and Fraser regions. | This species favours freshwater terrestrial wetlands which have not been identified on the application site. A number of constructed dams occur within the Golf course however very little aquatic vegetation such as sedges, rushes or reeds were identified. The central dam contained an edge of established *Melaleuca quinquenervia* (Broad Leaf Paperbark) specimens however provided little foraging habitat. | Low |

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| *Cyclopsitta diophthalma coxeni* | Coxen's Fig Parrot | Endangered | 59714 | The Coxen's fig Parrot occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest. Food is mainly taken from figs however other species fruit have been recorded in their diet including *Elaeocarpus grandis, Syzygium corynanthum, Litsea reticulata* and *Grevillea robusta*. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| *Dasyornis brachypterus* | Eastern Bristlebird | Endangered | 533 | The Eastern Bristlebird inhabits low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest. It occurs near the coast, on tablelands and in ranges. The Eastern Bristlebird is found in habitats with a variety of species compositions, but is defined by a similar structure of low, dense, ground or understorey vegetation. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| *Diomedea exulans antipodensis* | Antipodean Albatross | Vulnerable | 82269 | The Antipodean Albatross is marine, pelagic and aerial. This species nets in open patchy vegetation, such as among tussock grassland or shrubs on ridges, slopes and plateaus. It sleeps and rests on ocean waters when not breeding. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |

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| *Diomedea exculans exulans* | Tristan Albatross | Endangered | 82337 | The Ttistan Albatross is a marine, pelagic seabird. It forages in open water in the Atlantic Ocean near the Cape of Good Hope. It sleeps and rests on ocean waters when not breeding. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Diomedea exculans gibsoni* | Gibson's Albatross | Vulnerable | 82237 | Gibson's Albatross is marine, pelagic and aerial. On breeding islands this species nests on coastal or inland ridges, slopes, plateaux and sand plains, often on marshy ground. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Diomedea exculans (sensu lato)* | Wandering Albatross | Vulnerable | 1073 | Habitat is marine: open oceans, edge of pack-ice; feeds over both deep pelagic and shallower continental shelf waters. Usually keeps within 15m of sea's surface, often rests on sea in calm conditions. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Erythrotriorchis radiatus* | Red Goshawk | Vulnerable | 942 | A wide ranging and highly mobile species generally observed over eucalypt habitats. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds) and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Habitat has to be open enough for fast attack and manoeuvring in flight, but provide cover for ambushing of prey. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| *Geophaps scripta scripta* | Squatter Pigeon | Vulnerable | 64440 | This species inhabits open grasslands and woodlands typically with a native understorey although may occur in artificial pasture. | Although this species has been recorded in highly disturbed environments, it is a rare occurrence to be identified in the southern portion of its range which includes South East Queensland. | Low |

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| *La cincta cincta* | Swift Parrot | Endangered | 744 | Swift Parrots breed in Tasmania during spring to early summer. During autumn and winter the species migrates to the mainland where it follows a nomadic existence linked to the availability and timing of flowering of trees in various locations. While the species is very uncommon in south-east Queensland, its occurrence cannot be completely discounted. There are suitable winter flowering species such as Euclayptus and Corymbia species that could attract species. | Only a small number of established Eucalypt and Corymbia species were recorded scattered amongst the golf course at the time of the assessment. These small numbers do not provide ideal conditions and feeding habitat for the Swift Parrot. More suitable habitat would possible occur further west outside the highly dense urban and commercial environment. | Low |
| *Macronectes giganteus* | Southern Giant-Petrel | Vulnerable | 1060 | The Southern Giant-petrels range widely throughout the southern oceans. In summer they occur predominantly below 60° S in sub-Antarctic to Antarctic waters. At this time they can be found in Australian waters on and around Heard and Macquarie Islands. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Macronectes halli* | Northern Giant-Petrel | Vulnerable | 1061 | The Northern Giant Petrel breeds in the sub-Antarctic, and visits areas off the Australian mainland mainly during the winter months (May to October). | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Poephila cincta cincta* | Black Throated Finch | Enddangered | 64447 | The Black-throated Finch (southern) occurs mainly in grassy, open woodlands and forests, typically dominated by Eucalyptus, Corymbia and Melaleuca, and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water. It occurs at two general locations: in the Townsville region, where it is considered to be locally common at a few sites around Townsville and Charters Towers; and at scattered sites in central-eastern Queensland (between Aramac and Great Basalt Wall National Park). It has been absent from Brisbane and its surrounds since the 1930s. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |

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| *Rostratula australis* | Australian Painted Snipe | Endangered | 77037 | The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania. | This species favours freshwater terrestrial wetlands which have not been identified on the application site. A number of constructed dams occur within the Golf Course however very little aquatic vegetation such as sedges, rushes or reeds were identified. The central dam contained an edge of established *Melaleuca quinquenervia* (Broad Leaf Paperbark) specimens however provided little foraging habitat. | Low |
| *Thalassarche cauta cauta* | Shy Albatross | Vulnerable | 82345 | The Shy albatross is the only albatross to breed in Australian waters and breed only within the Australasian region. Wanders from subtropical to sub-Antarctic oceans, often visiting shallower waters on the shelf and around waters. Comes close inshore, entering bays and harbours extending offshore beyond the shelf edge; is scarce further out over pelagic depths. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Thalassarche cauta steadi* | White-capped Albatross | Vulnerable | 82344 | The White-capped Albatross is a marine species and occurs in subantarctic and subtropical waters. This species breeds on the islands off New Zealand | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Thalassarche eremita* | Chatham Albatross | Endangered | 64457 | Breeding for the Chatham Albatross is restricted Pyramid Rock, chatham Islands, off the coast of New Zealand. This is a marine species with principle foraging range for this species is in coastal waters off eastern and southern New Zealand and Tasmania. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Thalassarche melanophris* | Black-browed Albatross | Vulnerable | 66472 | This species uses wide range of marine habitats from inshore shallows, bays and channels to the edge of the continental shelf and beyond to pelagic ocean environs. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |

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| *Thalassarche melanophris impavida* | Campbell Albatross | Vulnerable | 82449 | The Campbell Albatross is a non-breeding visitor to Australian waters. Non-breeding birds are most commonly seen foraging over the oceanic continental slopes off Tasmania, Victoria and New South Wales. This species is a marine sea bird inhabiting sub-Antarctic and subtropical waters from pelagic to shelf-break water habitats. The Campbell Albatross breed on Campbell Island. They make their nests on tussock-covered ledges and terraces of cliffs, slopes and hills, overlooking the sea or valleys, and on the summits of rocky islets. | This is largely an oceanic species and is not considered to be at risk as a result of this development proposal. Breeding and life cycles of this species, including feeding habitats are not associated with any estuarine habitat or constructed dam associated with this site. | Low |
| *Turnix melanogaster* | Black -breasted Button-quail | Vulnerable | 923 | Typical habitat occurs in dry rainforest and vegetation immediately adjacent to rainforest. However, the species has also been recorded in a variety of low coastal heathlands around Frazer Island and nearby mainland. Deep leaf litter in which the species can forage appears to be particularly favoured. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| **Fish** | | | | | | |
| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Epinephelus daemelii* | Black Rockcod | Vulnerable | 68449 | The Black Rockcod is known from coastal and offshore reefs and islands from southern Queensland to eastern Victoria. | Only a small number of constructed dams are located on site. The eastern property boundary of the development includes the tidal portion of Coombabah Creek which is mapped as containing regional ecosystem 12.1.3, dominated by Mangrove species. No habitat suitable to this species is identified on or adjacent to the site, located approximately 8km directly east of the Gold Coast Seaway. | Low |

| Mammals | | | | | | |
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| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Chalinolobus dwyeri* | Large-eared Pied bat | Vulnerable | 183 | The Large-eared Pied Bat prefers sandstone cliffs and fertile woodland valley habitat. Records from south-east Queensland suggest that rainforest and moist eucalypt forest habitats on other geological substrates at high elevation are of similar importance to the species. The majority of records are from canopied habitat, suggesting a sensitivity to clearing. | No roosting habitat to support this species is observed on or adjacent to the proposed development. Vegetation adjacent to the site associated with the Coombabah Creek Conservation Area is all associated with land zone 1 typical of saltpan and mangrove and Casuarina vegetation communities. The site itself is highly disturbed, reflective of the current regional ecosystem maps which includes the site as non-remnant vegetation. | Low |
| *Dasyurus hallucatus* | Northern Quoll | Endangered | 331 | The species occupies rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grassland and desert. Preferred habitat in Queensland suggests the Northern Quoll are more likely to be present in high relief areas that have shallower soils, greater cover of boulders, less fire impact and were close to permanent water. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |

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| *Dasyurus maculatus gracilis* | Spotted-tailed Quoll | Endangered | 64475 | The Spot-tailed Quoll has a preference for mature wet forest habitat. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This predominantly nocturnal species rests during the day in dens. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. Individuals require an abundance of food such as birds and small mammals, and large areas of relatively intact vegetation through which to forage. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| *Petrogale penicillata* | Brush-tailed rock Wallaby | Vulnerable | 225 | The Brush tailed rock wallaby prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. This species typically shelters during the day in rock crevices, caves and overhangs. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities, including rocky habitats associated with the habitat of this species occurs on or adjacent to the site. | Low |

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| *Phascolarctos cinereus* | Koala | Vulnerable | 85104 | They are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland. | The site is largely constrained for any koala movement with the western boundary containing dense urban and commercial development, including a railway line, the eastern and southern boundary occupied by mangrove communities along the embankments of Coombabah Creek and the northern boundary by the Gold Coast Highway and also the proposed Intra regional transport corridor. Some scattered established Eucalypt and Corymbia specimens were observed amongst the Golf course however no evidence of use by koala was observed. | Low |
| *Potorous tridactylus tridactylus* | Long-nosed potoroo | Vulnerable | 66645 | Species generally prefers rainforest and adjacent to wet sclerophyll forest, coastal heathlands and similar habitats with a dense understorey. Like all Potoroos, fungi are the major component of the diet and is also known to feed on invertebrates. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | low |

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| *Pseudomys novaehollandiae* | New Holland Mouse | Vulnerable | 96 | The New Holland Mouse has been found from coastal areas and up to 100km inland in sandstone country. They have been associated with open heathland, open woodland with a heathland understorey and vegetated sand dunes. Due to the largely granivorous diet of the species, sites where the New Holland Mouse is found are often high in floristic diversity. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | low |
| *Pteropus poliocephalus* | Grey Headed Flying Fox | Vulnerable | 186 | Species generally roosts in camps in trees adjacent to larger permanent watercourse. The Grey-headed flying fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feed son commercial fruit crops. The primary food source is blossom from Eucalyptus and related genera. | The Queensland National Parks and Wildlife Service has mapped a number of Flying Fox Roost sites within a few kilometers of the site including Mildura Drive, Helensvale; Coombabah Creek, Coombabah and Biggera Creek, Arundal. Although these colonies were not confirmed at the time of the assessment, they do not occur on or immediately adjacent to the site. Some scattered Eucalypt, Corymbia and Melaleuca species are located amongst the golf course which may provide minor feeding opportunity when in flower, however no significant habitat is observed. | low |

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| *Xeromys myoides* | Water Mouse | Vulnerable | 66 | The Water mouse requires mangroves and the associated saltmarsh, sedgelands, clay pans, heathlands and freshwater wetlands. Essential habitat for this species is generally recorded within land zone 1 and land zone 2. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern boundary is associated with Coombabah Creek which also includes a drainage feature extending west through the central portion of the site. Small patches of vegetation along the embankments are mapped as containing remnant vegetation dominated by Mangrove species and are generally associated with this species. Significant checks throughout the embankments on both sides of the western drainage feature as well as along Coombabah Creek for this species was completed, including checks from a kayak at low tide to see potential roosting sites and evidence of feeding. It was noted that no raised roosting sites were observed throughout this survey and no evidence of this species. | low |
| **Plants** | | | | | | |
| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Acacia attenuata* | | Vulnerable | 10690 | *Acacia attenuata* occurs on coastal lowland plains at altitudes of lower than 30m above sea level. This species typically occurs in seasonally waterlogged areas of wet heathland or heathland margins, open forest and woodland communities and specifically on sandy poorly drained soils or peat swamps which are infertile. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |

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| *Allocasuarina defungens* | Dwarf Heath Casuarina | Endangered | 21924 | The dwarf Heath Casuarina is found in coastal areas of wet to dry, dense, low, closed heath land growing on Pleistocene marine aeolian derived soils. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| *Arthraxon hispidus* | Hairy-joint Grass | Vulnerable | 9338 | Hairy-joint grass is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| *Baloghia marmorata* | Marbeled Balogia | Vulnerable | 8463 | *Marbeled Balogia* is a rainforest plant generally associated with sub-tropical rainforest at low altitudes. It has also been recorded in notophyll vine forest and wet sclerophyll forest on soils derived from basalt. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |

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| *Bosistoa selwynii* | Heart leaved bosistoa | Vulnerable | 13702 | The Heart-leaved Bosistoa is similar to the Three-leaved Bosistoa and is conserved within Mt Warning National Park, Numbinbah Nature Reserve, Limpinwood Nature Reserve and When Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 3oo meters in altitude. It is commonly associated with *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis* and *Diospyros mabacea*. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Bosistoa transversa* | Three-leaved Bosistoa | Vulnerable | 16091 | The Three-leaved Bosistoa is conserved within Mt Warning National Park, Numbinbah Nature Reserve, Limpinwood Nature Reserve and Whian Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 3oo meters in altitude. It is commonly associated with *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis* and *Diospyros mabacea*. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Cryptocarya foetida* | Stinking Laurel | Vulnerable | 11976 | The Stinking Cryptocarya is found in rainforest, usually on sandy soils, but mature trees are also known on basalt soils. Although seeds are dispersed by fruit-eating birds, individual specimens can be recorded in other habitats however unlikely to grow to maturity. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Cryptostylis hunteriana* | Leafless tongue-orchid | Vulnerable | 19533 | The Leafless-tongue orchid occurs in a wide variety of habitats including heathlands, heathy woodlands, sedgelands, Xanthorrhoea spp. Plains, dry sclerophyll forests, forested wetlands, freshwater wetlands, grasslands, grassy woodlands, rainforests and wet sclerophyll forests. Soils are generally considered to be moist and sandy. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Endiandra floydii* | Floyd's Walnut | Endangered | 52955 | Floyd's Walnut is a small-sized rainforest tree and is also found as an understorey plant in Brush Box ecotone areas on moderately steep slopes no higher than 430m above sea level. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Macadamia integrifolia* | Macadamia Nut | Vulnerable | 7326 | In its natural state, the Macadamia nut grows in remnant rainforest, preferring partially open areas such as rainforest edges. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |

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| *Phaius australis* | Lesser Swamp Orchid | Endangered | 5872 | The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (*Lophostemon suaveolens*), swampy rainforest (often with sclerophyll emergent), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (*Archontophoenix cunninghamiana*) or Cabbage Tree Palm (*Livistona australis*). | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Phebalium distans* | Mt Berryman phebalium | Critically Endangered | 81869 | Mt Berryman Phebalium is found in semi-evergreen vine thicket on red volcanic soils, or in communities adjacent to this vegetation type. Geology of the area in which this species occurs is deeply weathered basalt with undulating to hilly terrain. Soils range from red-brown earths to brown clays (derived from siltstone and mudstones), and lithosols to shallow, gravelly krasnozems (very dark brown loam), derived from the Main Range Volcanics of the Tertiary period. Vegetation associations in which Mt Berryman Phebalium occur include microphyll to notophyll vine forest with or without Araucaria cunninghamii and low microphyll vine forest and semi-evergreen vine thicket with or without Araucaria cunninghamii which can be divided further into regional ecosystems depending on substrate, geography and associated vegetation species. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Randia moorei* | Spiny Gardenia | Endangered | 10577 | Spiny Gardenia grows in subtropical, riverine, littoral and dry stunted rainforests along moist scrubby water courses at altitudes up to 360m above sea level. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Streblus pendulinus* | Siah's Backbone | Endangered | 21618 | On the Australian mainland, Siah's Backbone is found in warmer rainforests, chiefly along watercourses. The altitudinal range is from near sea level to 800 m above sea level. The species grows in well-developed rainforest, gallery forest and drier, more seasonal rainforest. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Syzygium hodgkinsoniae* | Smooth-bark Rose Apple | Vulnerable | 3539 | The Smooth-bark Rose Apple grows in riverine subtropical or gallery rainforest on deep rich alluvial and basalt soils at altitudes of up to 300m above sea level. The species has adapted to growing along or within fast-flowing streams. This species is known to be pollinated by the Richmond Birdwing Butterfly. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |

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| *Thesium australe* | Austral toadflax | Vulnerable | 15202 | Austral Toadflax is semi-parasitic on roots from a range of grass species, notably *Themeda triandra* (Kangaroo Grass). It occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It occurs in shrubland, grassland or woodland often on damp sites. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Zieria collina* | | Vulnerable | 2178 | *Zieria collina* forms thickets in light rainforest, and often a dominant shrub in regrowth. It appears to be restricted to the environs of Tamborine Mountain in South East Queensland. Grows at an altitude of around 550m. | No habitat to support this species is observed within the application site nor within the adjacent Coombabah Creek Conservation Area. | Low |
| **Reptiles** | | | | | | |
| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| Caretta caretta | Loggerhead Turtle | Endangered | 1763 | The Loggerhead Turtle occurs in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia. Low density and sporadic nesting occasionally occurs along the Sunshine coast beaches and on the northern ends of Fraser, Moreton and north Stradbroke Islands however is concentrated between Shark Bay and Western Australia. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| Chelonia mydas | Green turtle | Vulnerable | 1765 | The Green Turtle are found in tropical and subtropical waters throughout the world. This species spends the first 5 to 10 years drifting in ocean currents. After this they settle in shallow benthic foraging habitats such as tropical tidal and sub-tidal coral and rocky reef habitat or inshore seagrass beds. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| Coeranoscincus reticulatus | Three-toed Snake-tooth Skink | Vulnerable | 59628 | Found mostly in closed forest and possibly open layered Eucalyptus forest. Generally recorded in moist layered forest on loamy basaltic soils, but also found in closed forest overlying silica sand dunes at Cooloola. Within forests, this species is found in well-mulched, loose, friable rainforest soil in leaf litter, often immediately adjacent to fallen tree trunks. Much of the lowland closed forest within its range has been cleared for agriculture and grazing, pasture improvement, crop production, tropical fruit production, and native forest logging. Suitable habitat has generally been reduced to patches, especially in lowland areas. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |

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| Delma torquata | Collared Delma | Vulnerable | 1656 | In general, the species occurs on rocky hillsides on basalt and lateritic soils supporting open eucalypt and Acacia woodland with a sparse understorey of shrubs and tussocks or semi-evergreen vine thicket. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Dermochelys coriacea* | Leatherback Turtle | Endangered | 1768 | The leatherback turtle is a pelagic feeder found in tropical, subtropical and temperate waters throughout the world. No major nesting has been recorded within Australia although scattered isolated nesting has been recorded in Queensland. This species is highly pelagic, venturing close to shore mainly during the nesting season. This species requires sandy beaches to nest. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| *Eretmochelys imbricata* | Hawksbill Turtle | Vulnerable | 1766 | Hawksbill Turtles spend their first 5 to 10 years drifting in ocean currents. Post this they settle and forage in tropical tidal and sub-tidal coral and rocky reef habitat. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| *Lepidochelys olivacea* | Olive Ridley Turtle | Endangered | 1767 | No concentrated nesting occurs within Australia, although low density nesting occurs along the Arnhem Land coast of the Northern Territory. A substantial part of the immature and adult population forage over shallow benthic habitats. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| *Natator depressus* | Flatback Turtle | Vulnerable | 59257 | Adult Flatback Turtles inhabit soft bottom habitat over the continental shelf of Northern Australia. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |

**Nature and extent of likely impact**

Criteria for significant impact differentiates depending on the status of the species however the criteria are similar and generally include:

- lead to a long-term decrease in the size of an important population of a species;
- reduce the area of occupancy of an important population;
- fragment an existing important population into two or more populations;
- adversely affect habitat critical to the survival of a species;
- disrupt the breeding cycle of an important population;
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;
- introduce disease that may cause the species to decline; or
- interfere substantially with the recovery of the species.

**Lead to a long-term decrease in the size of an important population of a species**
No evidence of the presence of threatened species was identified across the site or adjacent areas. No high value habitat associated any species was identified on or adjacent to the site however potential foraging habitat is present within the adjacent wetland areas. These areas are not expected to be impacted by the proposal however if any impacts were to occur similar habitat can be found throughout the South East Queensland coastline.

Given no threatened species were identified by the survey, no high value habitat was identified and similar foraging habitat can be found through the region the action will not lead to a long-term decrease in the size of an important population of any threatened species.

**Reduce the area of occupancy of an important population**
The action may result in minor impacts to potential foraging habitat for some listed bird species through minor changes to hydrology in the adjacent wetland. However, given the wide habitat range of these species and their highly mobile nature, the action is not considered to restrict its occupancy in the surrounding area.

**Fragment an existing important population into two or more populations**
As noted above threatened species with the most potential to be impacted by the action are bird species. These species generally have large ranges making population fragmentation a low risk. No habitat was identified within the project footprint and the adjacent area would not be considered high value or core habitat for any listed species. As such, the proposed action is extremely unlikely to fragment an existing population.

**Adversely affect habitat critical to the survival of a species**
Field surveys did not identify breeding or any other habitat critical to the survival of a threatened species on or adjacent to the project site. The proposed action is not considered to have a significant impact on habitat critical to the survival of any threatened species.

As noted in Table 2 the vulnerable Subtropical and Temperate Coastal saltmarsh threatened ecological community was identified in the wetland adjacent to the site. As addressed in detail in response to section 3.1(c) – Wetlands of International Importance - of this referral the action will not result in any impacts to the wetland, in particular the water quality and hydrology in the wetland will not be affected by the works therefore no impacts to the TEC are expected.

**Disrupt the breeding cycle of an important population**
No evidence of breeding for any listed species was exhibited across the site or the adjacent wetland areas. In addition, no evidence of occurrence of any threatened species was found. As such, the proposal is unlikely to disrupt the breeding cycle of an important population.

**Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
Given the extensive availability of similar intertidal habitat in the southeast Queensland region and the limited evidence to suggest that any threatened species actually utilise the site or adjacent areas, the proposed action is considered highly unlikely to result in a decline of the species.

**Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**
Construction materials and equipment will be sourced from suppliers in the south east Queensland region reducing the potential for exotic or pest species to be transported to the wetland. Weed management will also form part of the construction environmental management plan with measures such as vehicle wash down points and equipment inspections implemented to further reduce any risk. Under Queensland law invasive species are required to be managed on any site in accordance with the relevant Legislation and guidelines.

**Introduce disease that may cause the species to decline**
The nature of the development is unlikely to result in the introduction of any disease that would cause a species to decline.

**interfere substantially with the recovery of the species**
The development will not interfere with any known recovery programs for listed species.

### 3.1 (e) Listed migratory species

**Description**

The Protected Matters Search Tool identified 58 migratory species as having potential to occur on or in the vicinity of the site. A likelihood of occurrence schedule and risk of impact assessment for these migratory species is provided in **Table 3**. The same methodology has been employed for this assessment as the threatened species and ecological communities.

Four migratory bird species, White-bellied Sea-Eagle, Rainbow Bee-eater, Cattle Egret and Black-winged Stilt were observed over the survey though only the cattle egret was seen within the development area. The rest were observed either flying over the site or in the adjacent wetland areas. All of these species are common in South East Queensland, have wide ranges and have low potential to be impacted by the action.

It is noted that while only one field survey was carried out in April 2015 this is considered an optimal time to identify migratory species as many would be feeding prior to winter migration. In addition, all migratory species identified as having the potential to occur at the site by the protected matters search were found to have a low risk of impact from the action given the development footprint has been predominantly cleared for its current use as a golf course.

**Table 3: Likelihood of occurrence and risk of impact assessment for Migratory Species**

| **Migratory Marine Birds** | | | | | | |
|---|---|---|---|---|---|---|
| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Apus pacificus* | Fork-tailed Swift | Migratory | 678 | This species is almost exclusively aerial and mostly occur over inland plains but sometimes above foothills or in coastal areas. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| **Migratory Marine Species (not listed above)** | | | | | | |
| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Caretta caretta* | Loggerhead Turtle | Endangered | 1763 | The Loggerhead Turtle has a global distribution throughout tropical, sub-tropical and temperate waters. Nesting is mainly concentrated on sub-tropical beaches. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| *Lamna nasus* | Mackerel Shark | Migratory | 83288 | The Porbeagle or Mackerel Shark is wide ranging and inhabits temperate, subarctic and subantarctic waters. This species primarily inhabits oceanic waters and areas around the edge of the continental shelf. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| *Manta birostris* | Giant Manta Ray | Migratory | 84995 | This species can be found in temperate, subtropical and tropical waters. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| *Orcaella brevirostris* | Irrawaddy Dolphin | Migratory | 45 | This species occurs from Brisbane River north across to Broom in Western Australia. They have been recorded almost exclusively in coastal and estuarine waters. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| *Sousa chinensis* | Indo-Pacific Humpback Dolphin | Migratory | 50 | Indo-Pacific Humpback Dolphins preferably inhabit shallow coastal, estuarine, and occasionally riverine habitats, in tropical and subtropical regions. The species usually occurs close to the coast, generally in depths of less than 20 m however in regions such as the Great Barrier Reef, they can be observed far offshore in protected, shallow waters created by outer reefs, sandbanks and continental islands. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| **Migratory Terrestrial Species** | | | | | | |
| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Haliaeetus leucogaster* | White-bellied Sea-Eagle | Migratory | 943 | The White-bellied Sea-eagle is found in coastal habitats and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats are characterised by the presence of large areas of open water. | This species was observed as a fly over during the field assessment. No nests were observed on site or within the adjacent portion of the Coombabah Creek Conservation Area. | Low |

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| *Hirundapus caudacutus* | White-throated Needletail | Migratory | 682 | The White-throated needletail is almost exclusively aerial. This species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. The species breeds in wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |
| *Merops ornatus* | Rainbow Bee-eater | Migratory | 670 | The rainbow bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation. | This species was observed as a fly over during the field assessment. No nests were observed on site or within the adjacent portion of the Coombabah Creek Conservation Area. | Low |
| *Monarcha melanopsis* | Black-faced Monarch | Migratory | 609 | The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine thickets, complex notophyll vine forests, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and occasionally cool temperate rainforest. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No vegetation communities associated with the habitat of this species occurs on or adjacent to the site. | Low |

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| *Monarcha trivirgatus* | Spectacled Monarch | Migratory | 610 | The Spectacled Monarchs natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests. Its preference is for thick understorey areas. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No species were observed at the time of the assessment. | Low |
| *Myiagra cyanoleuca* | Satin Flycatcher | Migratory | 612 | Satin Flycatchers inhabit heavily vegetated gullies in eucalypt dominated forests and taller woodlands, and on migration occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No species were observed at the time of the assessment. | Low |
| *Rhipidura rufifrons* | Rufous Fantail | Migratory | 592 | The Rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as *Eucalyptus microcorys, Eucalyptus pilularis, Eucalyptus resiniferia* and a number of other Eucalyptus species. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. No species were observed at the time of the assessment. | Low |

| Migratory Wetland Species | | | | | | |
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| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Actitis hypoleucos* | Common Sandpiper | Migratory | 59309 | The Common Sandpiper utilises a wide range of coastal wetlands and some inland wetlands, including estuaries and deltas of streams, banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and clay pans, and occasionally piers and jetties. They are mostly found in shallow water, around muddy margins or rocky shores and sometimes in muddy areas littered with rocks or snags. The species commonly utilises mangroves for foraging and roosting but is rarely seen on mudflats. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. Although not recorded throughout the assessment, habitat to support this species was observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Ardea alba* | Great Egret | Migratory | 59541 | The Great Egret has been recorded in a wide range of wetland habitats including inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial. | The site is mapped as containing non-remnant vegetation and has historically been managed as a golf course. The eastern property boundary boarders the embankments of Coombabah Creek which contains Mangrove shrubland to low closed forest on marine clay plains and estuaries. Remnant vegetation communities associated with landzone 1 are also mapped on the opposite or eastern side of Coombabah Creek. These are associated with Casuarina and Mangrove forests as well as saltpan vegetation communities. The broader contextual area is dominated by urban and commercial development. Although not recorded throughout the assessment, habitat to support this species was observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Ardea ibis* | Cattle Egret | Migratory | 59542 | The Cattle egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It often forages away from water on low lying grasslands, improved pastures and croplands and is commonly found in cattle fields and other farm areas that contain livestock. | Species observed throughout the survey both within the Golf course area as well as within the adjacent Coombabah Creek Conservation Area. | Low |

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| *Arenaria interpres* | Ruddy Turnstone | Migratory | 872 | In Australia, the Ruddy Turnstone is mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can, however, be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral, and mudflats. . It has occasionally been sighted in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats. | No habitat to support this species is observed within the application site not observed within the adjacent Coombabah Creek Conservation Area. | Low |
| *Calidris acuminata* | Sharp-tailed Sandpiper | Migratory | 874 | In Australia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh, beach cast algae / seaweed or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland. They also occur in salt works and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Calidris alba* | Sanderling | Migratory | 875 | In Australia, the species is almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks, where they forage in the wave-wash zone and amongst rotting seaweed. Sanderlings also occur on beaches that may contain wave-washed rocky outcrops. Less often the species occurs on more sheltered sandy shorelines of estuaries, inlets and harbours. Rarely, they are recorded in near-coastal wetlands, such as lagoons, hypersaline lakes, salt ponds and samphire flats. There are rare inland records from sandy shores of ephemeral brackish lakes and brackish river-pools. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |
| *Calidris canutus* | Red Knot | Migratory | 855 | In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and salt works, but rarely use freshwater swamps. They rarely use inland lakes or swamps. The Red Knot usually forage in soft substrate near the edge of water on intertidal mudflats or sandflats exposed by low tide. | This is a marine species. The site is located more than 8km west of the Gold Coast Sea Way. No habitat to support this species is on the application site. | Low |

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| *Calidris ferruginea* | Curlew Sandpiper | Migratory | 856 | Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in salt works and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Calidris ruficollis* | Red-necked Stint | Migratory | 860 | In Australia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in salt works and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in salt flats. They sometimes use flooded paddocks or damp grasslands. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Calidris tenuirostris* | Great Knot | Migratory | 862 | In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in salt works, at swamps near the coast, salt lakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Charadrius bicinctus* | Double-banded Plover | Migratory | 895 | The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It occurs on muddy, sandy, shingled or sometimes rocky beaches, bays and inlets, harbours and margins of fresh or saline terrestrial wetlands such as lakes, lagoons and swamps, shallow estuaries and rivers. The species is sometimes associated with coastal lagoons, inland salt lakes and saltworks, seagrass beds at low tide and kelp beds | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |

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|---|---|---|---|---|---|---|
| *Charadrius leschenaultii* | Great Sand Plover | Migratory | 877 | In Australia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal salt works and salt lakes, including marginal saltmarsh, and on brackish swamps. They seldom occur at shallow freshwater wetlands. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Charadrius mongolus* | Lesser Sand Plover | Migratory | 879 | In Australia, this species usually occurs in coastal littoral and estuarine environments. It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. It also sometime occurs in short saltmarsh or among mangroves. The species also inhabits salt works and near-coastal saltpans, brackish swamps and sandy or silt islands in river beds. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Charadrius veredus* | Oriental Plover | Migratory | 882 | Oriental Plovers spend a few weeks in northern Australian coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands, before dispersing further inland. Thereafter they usually inhabit flat, open, semi-arid or arid grasslands, where the short, sparse grass is interspersed with hard, bare ground, such as clay pans and dry paddocks. At the onset of the Wet Season, they may be found in lightly wooded grasslands, estuarine and littoral environments, and occasionally around terrestrial wetlands or flooded paddocks. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Gallinago hardwickii* | Latham's Snipe | Migratory | 863 | Latham's Snipe occurs in permanent and ephemeral wetlands. They usually inhabit open, freshwater wetlands with low, dense vegetation. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Heteroscelus brevipes* | Grey-tailed Tattler | Migratory | 59311 | The Grey-tailed Tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayment, estuaries and coastal lagoons, especially fringed with mangroves. It can be abundant in areas, such as Moreton Bay, with dense seagrass beds. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |

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|---|---|---|---|---|---|---|
| *Limicola falcinellus* | Broad-billed Sandpiper | Migratory | 842 | The Broad-billed Sandpiper occurs in sheltered parts of the coast, favouring estuarine mudflats but also occasionally occur on saltmarshes, shallow freshwater lagoons, salt works and sewage farms, and in areas with large soft intertidal mudflats, which may have shell or sandbanks nearby. Occasionally they occur on reefs or rocky platforms. They have also been recorded in creeks, swamps and lakes near the coast, particularly those with bare mudflats or sand exposed by receding water. They often favour mud among, or fringed by, mangroves, particularly on the seaward side and sometimes occur in estuaries edged by saltmarsh. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Limosa lapponica* | Bar-tailed Godwit | Migratory | 844 | The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and salt works, salt lakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Limosa Limosa* | Black-tailed Godwit | Migratory | 845 | In Australia the Black-tailed Godwit is mostly found in coastal habitat such as sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; and occasionally on rocky coasts or coral islets. It is also found in shallow and sparsely vegetated, near-coastal, wetlands; such as saltmarsh, saltflats, river pools, swamps, lagoons and floodplains. There are a few inland records, around shallow, freshwater and saline lakes, swamps, dams and bore-overflows. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Numenius madagascariensis* | Eastern Curlew | Migratory | 847 | The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes use the mangroves. The birds are also found in saltworks and sewage farms | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |

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|---|---|---|---|---|---|---|
| *Numenius minutus* | Little Curlew | Migratory | 848 | The Little Curlew is most often found feeding in short, dry grassland and sedgeland, dry floodplains and blacksoil plains, which have scattered, shallow freshwater pools or areas seasonally inundated. Open woodlands with a grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts, mown lawns and recreational areas are also used. The species congregates around pools, river beds and water-filled tidal channels, and shallow water at edges of billabongs. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Numenius phaeopus* | Whimbrel | Migratory | 849 | The Whimbrel is often found on the intertidal mudflats of sheltered coasts, in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, un-vegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. It also used saltflats with saltmarsh, or saline grasslands with standing water. There are a small number of inland records from saline lakes and canegrass swamps. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Pluvialis fulva* | Pacific Golden Plover | Migratory | 25545 | In Australia Pacific Golden Plovers usually inhabits coastal habitats, though it occasionally occurs around inland wetlands with submerged vegetation or short emergent grass. The species usually occur on beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh such as Sarcocornia, or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in evaporation ponds in saltworks. The species is also sometimes recorded on islands, sand and coral cays and exposed reefs and rocks. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Pluvialis squatarola* | Grey Plover | Migratory | 865 | Grey Plovers occur almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons. They also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. Further inland, they can occur around wetlands or salt-lakes | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Rostratula benghalensis* | Painted Snipe | Endangered/ Migratory | 889 | The Australian Painted Snipe generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. The also utilise inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |

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|---|---|---|---|---|---|---|
| *Tringa glareola* | Wood Sandpiper | Migratory | 829 | The wood sandpiper uses well-vegetated, shallow, fershwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and Eucalyptus camaldulensis and often with fallen timber. This species does not breed in Australia. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Tringa stagnatilis* | Marsh Sandpiper | Migratory | 833 | The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In north Australia they prefer intertidal mudflats. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Xenus cinereus* | Terek Sandpiper | Migratory | 59300 | The Terek Sandpiper mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. The species has also been recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire (Halosarcia spp.) or on sandy beaches, among seaweed and other debris and in rocky areas. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| **Listed Marine Bird Species (that are not listed above)** | | | | | | |
| **Species** | **Common Name** | **Status** | **EPBC Code** | **Description of Community / Habitat** | **Likelihood of Occurrence** | **Risk of Impact** |
| *Anseranas semipalmata* | Magpie Goose | Migratory | 978 | The magpie goose is mainly found in shallow wetlands with dense growth or rushes or sedges. | No habitat to support this species observe don or adjacent to the application site. | Low |
| *Calidris melanotos* | Pectoral Sandpiper | Migratory | 858 | the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. Occasionally found further inland. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Charadrius ruficapillus* | Red-capped Plover | Migratory | 881 | Red-capped plovers inhabit a range of settings from littoral to estuarine and terrestrial wetlands. They prefer saline or brackish waters and are commonly observed at coastal and estuarine locations or inland salt lakes. They may also be observed at permanent or ephemeral wetlands that have wide, open bare mudflats with sparse vegetation, or on other inland waters such as rivers, brackish and freshwater lakes, water holes and dams, springs and artesian bore drains, and swamps. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |

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| *Gallinago megala* | Swinhoe's Snipe | Migratory | 864 | The species inhabits dense clumps of grass and rushes round the edges of fresh and brackish wetlands. This includes swamps, billabongs, river pools, small streams and sewage ponds. They are also found in drying claypans and inundated plains pitted with crab holes, grasslands, drier cultivated areas (including crops of rapeseed and wheat) and market gardens. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Gallinago sternura* | Pin-tailed Snipe | Migratory | 841 | During non-breeding period the Pin-tailed Snipe occurs most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation. The species is also found in drier, more open wetlands such as claypans. Not normally in saline or inter-tidal wetlands. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Heteroscelus incanus* | Wandering Tattler | Migratory | 59547 | The Wandering Tattler is generally found on rocky coasts with reefs and platforms, points, spits, piers, offshore islands and shingle beaches or beds. It is occasionally seen on coral reefs or beaches, and tends to avoid mudflats. Foraging habitat is among rocks or shingle, or in shallow pools at edges of reefs or beaches. | No habitat to support this species is observed on or adjacent to the application site. | Low |
| *Himantopus himantopus* | Black-winged Stilt | Migratory | 870 | Black-winged Stilts prefer freshwater and saltwater marshes, mudflats, and the shallow edges of lakes and rivers. | Species observed throughout the adjacent Coombabah Creek Conservation Area. None observed within the development site. | Low |
| *Limnodromus semioalmatus* | Asian Dowitcher | Migratory | 843 | The Asian Dowitcher occurs in sheltered coastal environments, such as embayments, coastal lagoons, estuaries and tidal creeks. They are known to frequent shallow water and exposed mudflats or sandflats. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent conservation area. | Low |
| *Pandion haliaetus* | Osprey | Migratory | 952 | Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers. | None were observed, though Coombabah Creek and the Conservation Area contain potential habitat for this species. | Low |
| *Philomachus pugnax* | Ruff (reeve) | Migratory | 850 | In Australia the Ruff is found on generally fresh, brackish of saline wetlands with exposed mudflats at the edges. It is found in terrestrial wetlands including lakes, swamps, pools, lagoons, tidal rivers, swampy fields and floodlands. They are sometimes found on wetlands surrounded by dense vegetation including grass, sedges, saltmarsh and reeds. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |
| *Recurvirostra novaehollandiae* | Red-necked Avocet | Migratory | 871 | The Red-necked Avocet is found in large shallow freshwater or saltwater wetlands and estuarine mudflats. | No habitat is observed on the application site which could support this species. However, habitat to support this species is observed within the adjacent Coombabah Creek conservation area. | Low |

**Nature and extent of likely impact**

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;
- Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

**Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species**

Important habitat for migratory species is defined as habitat used occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or habitat that is of critical importance as a particular life stage, and/or habitat utilised by a migratory species which is at the limit of the species range, and/or habitat within an area where the species is declining.

The species observed on site are not considered to represent an ecologically significant proportion of the population. All of the species observed on or adjacent to the site are considered common in south east Queensland and none of are considered to be threatened or in decline. Additionally, the site and adjoining is not known to support an ecologically significant proportion of any of the species' populations.

Habitat availability for all of these species is widespread throughout South East Queensland and habitat on site is not considered to be unique or of special value. As such, the sequential development of the already disturbed golf course and potential minor impacts to the adjacent wetland is not considered to have a significant impact on habitat availability for these species.

**Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species**

The best known threat from an invasive species to a range a migratory bird species is the Cane Toad (*Bufo marinus*). Cane Toads can reduce the breeding success and productivity of migratory bird species by feeding on eggs and occupying burrows. A study in the Cooloola National Park in Queensland found that one third of all breeding attempts by the Rainbow Bee-Eater (one of the species identified at the site) failed because of interference with the Cane Toad. This has potential to reduce the breeding success of migratory bird species in northern Australia.

Cane Toads were observed throughout the site and adjacent wetland during field surveys, as they are throughout most of South East Queensland. The proposed development is not likely to result in additional invasive species established on the site as the action will result in development similar to surrounding areas. Under Queensland law invasive species are required to be managed on any site in accordance with the relevant Legislation and guidelines.

**Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species**

The site is not considered to support an ecologically significant proportion of the population of any of the four species. In addition, given the widespread availability of habitat within the surrounding landscape, the proposed urban development is not considered too seriously disrupt the lifecycle of any migratory species.

**3.1 (f) Commonwealth marine area**

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

**Description**

Not applicable

**Nature and extent of likely impact**

Not applicable

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**3.1 (g) Commonwealth land**

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

**Description**

Not applicable

**Nature and extent of likely impact**

Not applicable

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**3.1 (h) The Great Barrier Reef Marine Park**

**Description**

Not applicable

**Nature and extent of likely impact**

Not applicable

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**3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development**

**Description**

Not applicable

**Nature and extent of likely impact**

Not applicable

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## 3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

| | | | |
|---|---|---|---|
| **3.2 (a)** | **Is the proposed action a nuclear action?** | **X** | No |
| | | | Yes (provide details below) |
| | **If yes, nature & extent of likely impact on the whole environment** | | |

| | | | |
|---|---|---|---|
| **3.2 (b)** | **Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?** | **X** | No |
| | | | Yes (provide details below) |
| | **If yes, nature & extent of likely impact on the whole environment** | | |

| | | | |
|---|---|---|---|
| **3.2 (c)** | **Is the proposed action to be taken in a Commonwealth marine area?** | **X** | No |
| | | | Yes (provide details below) |
| | **If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))** | | |

| | | | |
|---|---|---|---|
| **3.2 (d)** | **Is the proposed action to be taken on Commonwealth land?** | **X** | No |
| | | | Yes (provide details below) |
| | **If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))** | | |

| | | | |
|---|---|---|---|
| **3.2 (e)** | **Is the proposed action to be taken in the Great Barrier Reef Marine Park?** | **X** | No |
| | | | Yes (provide details below) |
| | **If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))** | | |

## 3.3 Other important features of the environment

### 3.3 (a) Flora and fauna

**Flora**

The site is currently an operational golf course, driving range and open grass paddocks. No remnant vegetation occurs throughout this portion of the site however minor patches along the edge of Coombabah Creek is mapped protruding into the site. This tidal drainage line contains a thin strip of vegetation dominated by River mangrove. Vegetation is largely contained within the confines of the high tide mark, with maintained slashed paddocks and weed species forming most of the riparian vegetation.

The majority of the site contains widely scattered Eucalypt and Corymbia trees amongst planted garden beds and introduced tree species. *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus siderophloia* (Grey Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum) were the most prevalent native tree species. However, *Tipuana tipu* (Tipuana) *Pinus radiata* (Slash Pine), *Syagrus romanzoffiana* (Cocus Palm) and *Corymbia torelliana* (Cadaghi) have been utilised in a number of locations along the edge of the fairways.

Some small patches of *Melaleuca quinquenervia* (Broad Leaf Paperbark) and *Casuarina glauca* (Swamp Sheoak) were also observed throughout the golf course although these were found in isolated locations associated with drainage areas and constructed waterways.

The remaining flora species recorded in the area were associated with introduced pastoral grasses and weeds along the edge of the golf course. Most introduced species are recorded throughout the edges of the mapped remnant vegetation and Coombabah Creek with all terrestrial and aquatic weed species identified listed in **Table 4**. Weeds will be managed through site specific rehabilitation and vegetation management plans developed for each stage of construction and requiring approval from Gold Coast City Council before works can commence (refer to section 5 of this referral).

The site and adjacent areas contain Least Concern Regional Ecosystem 12.3.5 which is described as *Melaleuca quinquenervia* open forest on coastal alluvium (**Figure 5**). No mapped remnant vegetation will be directly impacted by the action.

**Table 5: Identified Weed Species**

| Species | Common Name |
|---|---|
| *Ageratum houstonianum* | Blue Billygoat Weed |
| *Baccharis halimifolia* | Groundsel Bush |
| *Bidens pilosa* | Cobbler's Pegs |
| *Syragrus romanzoffiana* | Cocus Palm |
| *Corymbia torelliana* | Cadaghi |
| *Ipomoea cairica* | Mile-a-minute |
| *Lantana camara* | Lantana |
| *Passiflora foetida* | Stinking Passion Flower |
| *Salvinia molesta* | Salvinia |
| *Schefflera actinophylla* | Umbrella Tree |
| *Schinus terebinthifolius* | Broadleaved Pepper |
| *Senna pendula* | Easter Cassia |
| *Solanum chrysotrichum* | Giant Devil's Fig |
| *Solanum mauritianum* | Wild Tobacco Tree |
| *Solanum nigrum* | Blackberry Nightshade |
| *Solanum seaforthianum* | Brazilian Nightshade |
| *Spirodela punctata* | Common Duck Weed |
| *Xanthium occidentale* | Noogoora Burr |

**Fauna**

Fauna species recorded throughout the survey period both on and adjacent to the site within the Coombabah Creek Conservation Reserve are provided in **Table 5**. A total of 44 species were observed on site with 37 of those being birds. All species seen at the site were common to the region with no species listed as threatened under the EPBC Act observed.

**Table 5: Site Fauna Species**

| **Birds** | |
|---|---|
| ***Species*** | **Common Name** |
| *Alcedo azurea* | Azure Kingfisher |
| *Anas castanea* | Chestnut Teal |
| *Anas superciliosa* | Pacific Black Duck |
| *Aquila audax* | Wedge-tailed Eagle |
| *Ardea ibis* | Cattle Egret |
| *Ardea intermedia* | Intermediate Egret |
| *Ardea pacifica* | White-necked Heron |
| *Butorides striatus* | Straited Heron |
| *Cacatua galerita* | Sulphur-crested Cockatoo |
| *Chenonetta jubata* | Australian Wood Duck |
| *Coracina novaehollandiae* | Black-faced Cuckoo-shrike |
| *Corvus orru* | Torresian Crow |
| *Cygnus atratus* | Black Swan |
| *Dicrurus bracteatus* | Spangled Drongo |
| *Egretta novaehollandiae* | White-faced Heron |
| *Gallinula tenebrosa* | Dusky Moorhen |
| ***Species*** | **Common Name** |
| *Gerygone levigaster* | Mangrove Gerygone |
| *Grallina cyanoleuca* | Magpie-lark |
| *Gymnorhina tibicen* | Australian Magpie |
| *Haliaeetus leucogaster* | White-bellied Sea-Eagle |
| *Haliastur sphenurus* | Whistling Kite |
| *Himantopus himantopus* | Black-winged Stilt |
| *Hirundo neoxena* | Welcome Swallow |
| *Malurus cyaneus* | Superb Fairy-wren |
| *Manorina melanocephala* | Noisy Minor |
| *Merops ornatus* | Rainbow Bee-eater |
| *Nycticorax caledonicus* | Nankeen Night-Heron |
| *Phalacrocorax sulcirostris* | Little Black Cormorant |
| *Phalacrocroax varius* | Pied Cormorant |
| *Platalea regia* | Royal Spoonbill |
| *Porphyrio porphyrio* | Purple Swamphen |
| *Rhipidura fuliginosa* | Grey Fantail |
| *Rhipidura leucophrys* | Willie Wagtail |
| *Strepera graculina* | Pied Currawong |
| *Threskiornis molucca* | Australian White Ibis |
| *Trichoglossus haematodus* | Rainbow Lorikeet |
| *Vanellus miles* | Masked Lapwing |
| **Amphibians** | |
| *Bufo marinus* | Cane Toad |
| **Reptiles** | |
| *Hemidactylus frenatus* | Asian House Gecko |
| *Cryptoblepharus virgatus* | Wall Skink |
| *Lampropholis delicata* | Grass Skink |
| *Physignathus lesueurii* | Eastern Water Dragon |
| *Pogona barbata* | Common Bearded Dragon |
| **Mammals** | |
| *Macropus giganteus* | Grey Kangaroo |

### 3.3 (b) Hydrology, including water flows

The site is adjacent to Coombabah Creek with the waterway forming the eastern, southern and northern boundary. Country Club Drive forms the sites western boundary with the Gold Coast Highway situated to the north of the site. The Coombabah Lake Conservation Park forms the majority of the flood plain east of the site. The site drains to Coombabah Creek, which discharges to Coombabah Lake and the Gold Coast Seaway to the north. Ground levels generally slope from west to east across the site with the highest ground elevations at the site occurring adjacent to the Country Club Road with levels up to approximately 10m AHD. The site slopes down to an elevation of approximately 1m AHD adjacent to Coombabah Creek.

### 3.3 (c) Soil and Vegetation characteristics

See 3.3(a) for vegetation characteristics discussion.

The acid sulfate soil map produced by the Department of Natural Resources and Mines for the Tweed River to Nerang River classifies the site as Land >5m AHD where Acid Sulfate Soils will occur within 5m of the surface.

When the acid sulfate soils are disturbed or drained, toxic quantities of acid, aluminium, iron and heavy metals may contaminate land and adjacent waterways. Following significant rainfall flushes, such contamination may cause red spot disease in fish and destroy aquatic flora and fauna (including highly visible fish kills) and can corrode steel and concrete structures. For this reason, it is critical that any excavation and filling operations be carried out in such a way as to limit or avoid any adverse environmental or infrastructure impacts.

### 3.3 (d) Outstanding natural features

No other outstanding natural features exist on the site.

### 3.3 (e) Remnant native vegetation

See 3.3(a) for vegetation characteristics discussion.

### 3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

Ground levels generally slope from west to east across the site with the highest ground elevations at the site occurring adjacent to the Country Club Road with levels up to approximately 10m AHD. The site slopes down to an elevation of approximately 1m AHD adjacent to Coombabah Creek.

### 3.3 (g) Current state of the environment

The site is currently an operational golf course, driving range and open grass paddocks. No intact or remnant vegetation exists within the footprint of the development area.

### 3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

There have been no Commonwealth Heritage Places or other heritage places identified across the site.

### 3.3 (i) Indigenous heritage values

No known indigenous heritage values exist on or near the site.

### 3.3 (j) Other important or unique values of the environment

The site is not located near other notable environmental features that are likely to be affected by the proposed action.

### 3.3 (k) Tenure of the action area (eg freehold, leasehold)

The entire extent of the site is freehold land.

### 3.3 (l) Existing land/marine uses of area

The site is currently vacant land. Surrounding land uses are urban and commercial.

### 3.3 (m) Any proposed land/marine uses of area

The proposed use of the land is for urban development as outlined in the GCCC planning scheme.

# 4 Environmental Outcomes

The project is being referred as a Not Controlled Action as it is not considered to have a significant impact on any MNES. However, in the event the Department of the Environment disagree with the assessment outlined in this referral a number of outcomes based measurement measures have been drafted to assist the referral process. These conditions have been included in section 5 of this referral alongside detailed descriptions of management measures to be implemented at the site. It should be noted that all of the management measures included in this referral will be incorporated in site based management plans requiring sign off from Gold Coast City Council. The management plans will include compliance reporting to council to ensure they are being successfully implemented on ground.

# 5 Measures to avoid or reduce impacts

A number of management measures will be implemented during construction and incorporated into the design of the development as part of the State and Local approval processes to minimise the potential for impacts on the surrounding environment. These measures will cover a broad range of matters therefore only those most relevant to MNES are addressed in detail in this section. The assessment of potential impacts to MNES identified the adjacent Ramsar Wetland area as the key issue of potential concern under the EPBC Act. Therefore, measures will focus on erosion and sediment control during construction and incorporation of stormwater quality and quantity treatment once the urban areas have been completed.

It should be noted that construction erosion and sediment control and ongoing stormwater management measures have been developed to meet and exceed criteria outlined in the Queensland Water Quality Guidelines (QWQG). The QWQG are the local implementation of the ANZECC 2000 Guidelines. The QWQG states: "*where the QWQG provides water quality guideline values for Queensland waters that are more localised than the ANZECC 2000 guidelines, the QWQG takes precedence over the (broader) ANZECC 2000 guidelines*".

**Erosion and sediment control**

An Erosion and Sediment Control Management Plan (ESCMP) will be developed prior to the commencement of construction at the site to meet Local and State approval requirements. These plans will be developed in stages reflecting the implementation of the southern, central and northern precincts. The intention of the plans is to identify measures to minimise potential erosion and sediment impacts during the construction phase of the project. The control measures proposed will be in accordance with the Gold Coast City Council Planning Scheme's Sediment and Erosion Constraint Codes, the Best Practice Erosion and Sediment Control (IECA Australasia, November 2008) and any other relevant local or statutory authority policies at the time of construction.

The ESCMP will address, but not be limited to, the following measures:

- Silt fencing around the entire area of the worksite near the Coombabah Creek;
- Staging of the earthworks to minimize the exposure of soil with the strategic use of silt fencing between stages to decrease the transference of sediment to an unworked area;
- Stabilised site access to reduce the risk of sediment transport from within the boundary of the site;
- Construction of a stabilised main access track for on-site equipment to use in order to limit unnecessary disturbance;
- Stockpiles of topsoil and excess fill material to be surrounded with silt fence to contain sediment transfer;
- Stockpiles to be located in areas where sediment transport is contained within already exposed areas. No stockpiles to be located adjacent to existing water bodies.

- Sediment basins will be constructed in stages to allow for water quality treatment. A water quality testing and controlled release regime will be implemented with release parameters meeting specific water guidelines prior to discharge;
- Water quality to be tested by qualified water testing agencies to ensure release guidelines are adhered to;
- Dirty water catch drains are to include rock check dams and batter chutes to control discharge flow into sediment basins; and
- When stage works are complete, replace topsoil and stabilise worksite (inclusive of leftover soil stockpiles) before continuing onto the next stage of works.

Background water quality testing will be carried out at a minimum of three sites (adjacent to work area, upstream and downstream) in Coombabah Creek three months and one month prior to the commencement of construction to provide baseline water quality levels for comparison during construction. Parameters tested will include:

- pH;
- Dissolved Oxygen;
- Turbidity (NTU) and suspended solids;
- Nutrients (organic and inorganic nitrogen and phosphorus); and
- Herbicides and organochlorine and organophosphorus pesticides.

Release limits from the sediment basins will be set using relevant guidelines and the results of background testing including:

- 50mg/L of total suspended solids (TSS) as a maximum concentration;
- turbidity (NTU) value less than 10% above background;
- pH value must be in the range 6.5 to 8.5 except where, and to the extent that, the natural receiving waters lie outside this range.

Nutrients, herbicides and pesticides will be tested in the sediment basins and backgrounds sites in Coombabah Creek 3 and 6 months after commencement of any stage of works. Values will be compared against pre construction levels with any significant exceedances investigated to identify whether it can be attributed to the work site and if so actions put in place to improve on site management of water quality releases. If exceedances occur quarterly testing will continue to be carried out until results improve.

Detailed drawings will be included within each ESCMP showing specific construction details for the proposed erosion and sediment control devices. **Attachment 5** - Sediment and Erosion Management Conceptual Implementation Technical Note – includes further details on how sediment and erosion controls will be implemented on site. Final ESCMPs will be prepared with assistance from the Principal Contractor to determine construction sequencing and will be reviewed and certified by a Certified Professional in Erosion and sediment Control (CPESC). The ESCMP shall be reviewed and approved by Gold Coast City Council prior to commencement of works.

**Proposed Outcomes Based Condition:** Construction phase erosion and sediment control will be implemented in accordance with the Sediment and Erosion Management Conceptual Implementation Technical Note (Attachment 5) so as to avoid any short or long term impacts from the release of runoff from the site on the adjacent Ramsar wetlands.

**Stormwater Treatment**

A Stormwater Quality Management Plan (SQMP) has been developed for the site providing a conceptual assessment and plan of site runoff and how it will achieve stormwater quality management objectives during the operational phase of the development. Stormwater quality objectives for sites in Queensland are highly regulated and governed by the State Planning Policy (DSDIP 2013). Specific performance criteria include:

- 80% reduction in total suspended solids;
- 60% reduction in total phosphorus;

- 45% reduction in total nitrogen; and
- 90% reduction in gross pollutants.

Load reductions are proposed to be met and exceeded using a combination of public education and Water Sensitive Urban Design (WSUD) measures such as bioretention basins. The MUSIC modelling software has been used to assess the generation, transportation and treatment of flows and pollutant loads from the site and identify whether the reduction criteria will be met.

Education has significant potential to decrease pollutant loads at the source and increases people's understanding and acceptance of water quality issues and stormwater treatment devices. It is proposed that signage be installed at appropriate locations (e.g. adjacent to proposed bioretention basins). While the potential for pollutant load reduction due to education is noted, it has not been assumed within the MUSIC model.

Bioretention systems are a plant and soil-based stormwater management measure (SMM). In these SMMs, stormwater is directed into the bioretention system and infiltrates through the plant and soil environment. Stormwater is treated via a combination of physical, chemical and biological processes.

Results from the MUSIC model showed a reduction in pollutants loads of:

- 84% reduction in total suspended solids;
- 61% reduction in total phosphorus;
- 53% reduction in total nitrogen; and
- 100% reduction in gross pollutants.

In all cases these load reductions exceed the requirements of the State Planning Policy.

These reductions also do not take into account the current land use as a golf course, which would have a much higher nutrient load than pervious ground layers included in the model resulting in much larger reductions in actual nutrient loads on ground.

The SQMP has been included as **Attachment 6**.

**Proposed Outcomes Based Condition:** Stormwater quality improvement devices will be implemented to achieve at a minimum the pollutant load reduction identified through modelling outputs in the SQMP, being:

- 84% reduction in total suspended solids;
- 61% reduction in total phosphorus;
- 53% reduction in total nitrogen; and
- 100% reduction in gross pollutants.

These reductions exceed State and Local Government requirements.

**Acid Sulfate Soils**

Acid Sulfate Soils management strategies will be required for the site for the prevention and treatment of the following concerns:

- Prevention of pyrite oxidation.
- Management of the acid sulfate soils.
- Treatment of the acid sulfate soils as necessary.
- Control of acid leachate
- Neutralisation of acid leachate
- Prevention of acid leachate seepage to the surrounding environment.

All earthworks on site will be carried out in general accordance with the following procedures:

- QASSIT – Department of Science Information Technology Innovation and the Arts - Queensland Acid Sulfate Soil Technical Manual 'Soil Management Guidelines v4.0
- Gold Coast City Council - Policy 14 Management of Activities located within Acid Sulfate Soils Version1.0
- Queensland Government - State Planning Policy Guideline, December 2013, Acid Sulfate Soils

**Proposed Outcomes Based Condition:** Acid Sulfate Soils will be managed in accordance with the relevant State and Local guidelines so as not to impact on any ecological receptor outside of the site footprint.

**Weeds and Pest Species**

Weeds will be managed in accordance with the South East Queensland Ecological Restoration Framework Manual 2012. Relevant sections of the manual are included as **Attachment 7**. These techniques will be applied at the site level through specific rehabilitation and weed management plans that will require assessment and approval from GCCC through operational works permits.

Weeds will be removed by treating with herbicides and manual removal with all works carried out to ensure herbicides are not allowed to leave the site through runoff. All herbicides will be applied by qualified personnel who have undertaken accredited training programs and have experience with bush regeneration and native plant species identification.

During operation and occupation of the urban development areas it is likely an increase in domestic animals such as cats and dogs will occur increasing the risk of impact to wader birds and habitat in the adjacent wetlands. The wetlands are protected as part of the Coombabah Lakes Conservation Area which is managed by Gold Coast City Council. Chain fencing is located around most of the conservation area to protect wader bird habitat. No fence located along the boundary shared by the project site and the wetland however the wetland will be protected from domestic pets through natural physical barriers including dense riparian vegetation on both sides of Coombabah Creek that will be retained throughout the life of the development and the creek itself which is a minimum of 10m wide and up to 40m in areas adjacent to the project site. A typical cross section of the site has been included as **Figure 6** to illustrate the natural barriers between the site and wetland.

**Proposed Outcomes Based Condition:** All weed and pest species will be removed from site in accordance with the relevant State and Local guidelines so as to avoid any transportation to the adjacent Ramsar wetland. Existing riparian vegetation will be retained to provide a natural barrier to domestic pets entering the wetland.

**Other Management Measures**

Additional management measure that will be carried out at the site to minimise impacts on the adjacent wetland and its flora and fauna include:

- Lighting adjacent Coombabah Creek will be designed to be "bird friendly" including minimising upward and spill light by using external fixtures that effectively project light downwards;
- Using dust suppression methods such as covers on truck loads, tyre wash down at site entrances and exits, and wetting exposed areas to reduce the potential for particulates to leave the site;
- An open space and vegetated buffer zone ranging from 40m to 75m with an average width of approximately 70m along the length of the creek to reduce noise impacts during construction and operation; and
- Signage will be implemented within open space areas and contain educational information for the residents and general public. The signage will cover a range of subjects including: wetland features and functions, specific migratory bird species characteristics and lifecycle traits, and the importance of protecting the wetland from pests and domestic animals. The position and content of the signage will be addressed and agreed with GCCC through various operational works approvals.

# 6 Conclusion on the likelihood of significant impacts

## 6.1 Do you THINK your proposed action is a controlled action?

| | |
|---|---|
| X | No, complete section 5.2 |
| | Yes, complete section 5.3 |

## 6.2 Proposed action IS NOT a controlled action.

The proposed action is not expected to have any significant impact on Matters of National Environmental Significance. Assessment of the site against the EPBC Act can be summarised as follows:

- No world heritage properties occur on or near the proposed action;
- No national heritage places occur on or near the proposed action;
- The site is located adjacent to a small section of the Moreton Bay Ramsar site. The action will not be undertaken within the wetland itself and a number of management measures including a minimum 60m open space and vegetated buffer and stormwater runoff treatment and control will be implemented to minimise any potential to impact on the wetland. The action will not have a significant impact on a wetland of international importance;
- No listed threatened flora or fauna species were observed on site or identified as having the potential to occur at the site therefore the action will not have a significant impact on any of these species;
- No threatened ecological communities were identified on the site. The vulnerable Subtropical and Temperate Coastal saltmarsh TEC was identified in the wetlands adjacent to the site however no significant impacts will occur to the vegetation communities for the same reasons the Ramsar wetland will not be impacted.
- A number of migratory species were observed flying over the site and in the adjacent wetland however none were observed utilising the impact area. The action is not expected to have a significant impact on any populations of this species as long as impacts to the wetland are minimised.
- The action is not within or adjacent to a Commonwealth marine area or the Great Barrier Reef Marine Park
- The action does not include any nuclear actions (including uranium mines)
- The action is not related to a water resource, in relation to coal seam gas development and large coal mining development

## 6.3 Proposed action IS a controlled action

Not applicable

# 7 Environmental record of the responsible party

| | | Yes | No |
|---|---|---|---|
| **7.1** | **Does the party taking the action have a satisfactory record of responsible environmental management?**<br><br>**Provide details**<br><br>The Villawood Properties Group have been in operation for over 25 years, delivering some of Australia's largest urban communities. Villawood is passionate about sustainability and healthy living, along with the development of environmentally friendly and sustainable projects. A major initiative introduced by Villawood Properties is the "Positive Change" program, which includes the EnviroSTAR and ForestSTAR program which look to create sustainable homes and giving back land for forestry offsets. | **X** | |
| **7.2** | **Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?**<br><br>**If yes, provide details** | | **X** |
| **7.3** | **If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?**<br><br>**If yes, provide details of environmental policy and planning framework**<br><br>The Villawood Properties Group does not have an environmental policy. Development applications for all works include the preparation of site specific Fauna, Flora and Environmental Management Plans by independent professionals (appointed by Villawood) in accordance with applicable legislative and regulatory requirements as well as best practices.<br><br>Contracts let by Villawood for the execution of works:<br><br>▪ stipulate the supervision of the works by independent professionals (superintendents);<br>▪ oblige contractors to comply with all applicable legislative and regulatory requirements;<br>▪ call for the preparation of necessary management plans by the contractor and the approval thereof by the relevant superintendents prior to the commencement of the work. These Contractor Management Plans must as a minimum include the requirements set in the management plans submitted / approved as part of the development applications. | **X** | |
| **7.4** | **Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?**<br><br>**Provide name of proposal and EPBC reference number (if known)**<br><br>N/A | | **X** |

# 8 Information sources and attachments

## 8.1 References

ANZECC (2000) Australian and New Zealand guidelines for fresh and marine water quality

Department of Environment Species Profile and Threats Database (SPRAT) http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Department of Environment and Heritage Protection (2009) Queensland Water Quality Guidelines, Version 3

Department of State Development and Infrastructure Planning (2014) State Planning Policy Water Quality

International Erosion Control Association (2008) Best Practice Erosion and Sediment Control

## 8.2 Reliability and date of information

- All information provided and data referenced is the most current available.
- All site specific reports and information attached or used in the development of the referral document were developed by relevant specialists and is the most accurate available at the time of writing.

## 8.3 Attachments

| | | ✓ attached | Title of attachment(s) |
|---|---|---|---|
| **You must attach** | figures, maps or aerial photographs showing the project locality (section 1) | ✓ | Attachment 1 – Referral Plans |
| | GIS file delineating the boundary of the referral area (section 1) | | |
| | figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3) | ✓ | |
| **If relevant, attach** | copies of any state or local government approvals and consent conditions (section 2.5) | ✓ | Attachment 2 – State and Local Approvals |
| | copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6) | ✓ | |
| | copies of any flora and fauna investigations and surveys (section 3) | ✓ | Attachment 4 – Ecological Assessment Report |
| | technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4) | ✓ | Attachment 3 – Stormwater Quantity Assessment<br>Attachment 5 – Sediment and Erosion Plan<br>Attachment 6 – Stormwater Quality management Plan<br>Attachment 7 – SEQ Ecological Restoration Framework |
| | report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3) | - | |

# 9 Contacts, signatures and declarations

**Project title:** Country Club Drive Urban Development, Helensvale

## 9.1 Person proposing to take action

| | |
|---|---|
| 1. Name and Title: | Anthony Johnson – Executive Director |
| 2. Organisation: | Helensvale Property Development Pty Ltd |
| | Organisation name should match entity identified in ABN/ACN search |
| 3. EPBC Referral Number: | **NA** |
| 4: ACN / ABN: | 166 213 305 / 83 166 213 305 |
| 5. Postal address | Level 6, 64 Marine Parade Southport QLD 4215 |
| 6. Telephone: | 07 5588 3200 |
| 7. Email: | michaelw@villawoodproperties.com |
| 8. Name of designated proponent (if not the same person at item 1 above: | **NA** |
| 9. ACN/ABN of designated proponent (if not the same person named at item 1 above): | **NA** |
| Declaration | I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.<br>I understand that giving false or misleading information is a serious offence.<br>I agree to be the proponent for this action.<br>I declare that I am not taking the action on behalf of or for the benefit of any other person or entity. |
| Signature | Date 02/12/15 |

## 9.2 Person preparing the referral information (if different from 8.1)

| | |
|---|---|
| Name | **Sam Maynard** |
| Title | **Senior Environmental Scientist** |
| | Organisation name should match entity identified in ABN/ACN search |
| Organisation | **Saunders Havill Group Pty Ltd** |
| ACN / ABN (if applicable) | **ACN: 144 972 949** |
| Postal address | **9 Thompson Street, Bowen Hills, 4006** |
| Telephone | **(07) 3251 9434** |
| Email | **sammaynard@saundershavill.com** |
| Declaration | I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.<br>I understand that giving false or misleading information is a serious offence. |
| Signature | Date 2/12/15 |