Project Alternatives

5

Chapter 5 - Table of Contents

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5 Project Alternatives

5.1 Introduction

Since purchasing the site in 2012 White Horse Australia Lindeman Pty Ltd has consulted with key stakeholders and tourism industry experts to identify sustainable alternatives for the development site. This chapter of the EIS outlines the alternatives and options considered in preparation of the November 2016 Masterplan. It includes a discussion of the process for selecting the preferred options as they relate to the redevelopment of the resort, airstrip and a safe harbour. Consequences of not proceeding with the project or individual elements have also been addressed. Underlying the generation of all alternatives is the recognition that the site is an existing tourism node which has been used for that purpose since 1928.

Addendum: *This EIS was initially prepared assuming that the safe harbour was to be part of the Lindeman Great Barrier Reef Resort Project. With the commencement of the Great Barrier Reef Marine Park Authority's (GBRMPA) Dredging Coral Reef Habitat Policy (2016), further impacts on Great Barrier Reef coral reef habitats from yet more bleaching, and the recent impacts from Tropical Cyclone Debbie, the proponent no longer seeks assessment and approval to construct a safe harbour at Lindeman Island. Instead the proponent seeks assessment and approval for upgrades to the existing jetty and additional moorings in sheltered locations around the island to enable the resort's marine craft to obtain safe shelter under a range of wind and wave conditions. Accordingly, remaining references to, and images of, a safe harbour on various figures and maps in the EIS are no longer current.*

5.2 Resort Redevelopment Options

Three options were contemplated with regard to the overall redevelopment of the resort, being:

(a) Option 1: no action;

(b) Option 2: minor resort refurbishment; and

(c) Option 3: resort redevelopment in accordance with the DBI Masterplan (November 2016).

In determining the preferred resort redevelopment options, a triple bottom line approach was undertaken focusing on the following criteria:

- Maximise economic benefits to the region and State and revitalise the Whitsundays as a vibrant domestic and international tourist destination;
- Provide a tourism product that responds to identified needs; and
- Ensure the development is ecologically sustainable.

A summary of the results for each of the three options is presented in the following sections.

5.2.1 Resort Redevelopment: Option 1 – No Action

The existing resort is no longer operational and its buildings and infrastructure are in a deteriorated condition. Given the current condition of the existing facilities, the 'no action' Option 1 requires that the facilities either:

(a) Be made safe and secure from unauthorised occupation and vandalism and held in their current deteriorated condition pending future public and private decisions about use and development of the island in the longer term; or

(b) Be permanently abandoned, with buildings and infrastructure demolished or removed from the island, elements of the former resort site remediated where required (e.g. the sewage treatment plant) and the existing resort tenure surrendered.

Neither of these outcomes are consistent with the long-established pattern of use of the site for tourism purposes. Neither are they consistent with Commonwealth, State, regional and local plans which promote development of the tourism industry as a major pillar of economic activity and a key sector in diversifying economic activity and wealth creation beyond the resources sector.

The 'no action' option would fail to utilise previous capital investment on the island and the capacity of some of the existing resort infrastructure to be productively reused. The additional costs of abandoning and remediating the resort site would represent further expenditure for little environmental gain.

The 'no action' option also has significant opportunity costs associated with foregoing the social and economic contribution that the resort on Lindeman Island has previously made, and can continue to make, to the scale and diversity of tourism infrastructure in the Whitsunday Tourism Area. The opportunity cost considerations apply with respect to both the option of refurbishing and reopening the former resort and, to an even greater extent, the option of a major redevelopment and repositioning of the resort as proposed in this EIS.

The 'no action' option is undesirable due to the significant negative impacts associated with long-term or permanent resort closure. These impacts are summarised in **Table 5-1**.

Table 5-1. Consequences arising from Resort Redevelopment Option 1 – No Action.

Social Impacts	Economic Impacts	Environmental Impacts
• Foregoing potential jobs to be created during construction (average 300 persons FTE per year) and over 300 per annum when operational. • Reduced quality, safety and reliability of access to the island and the National Park for tourists, visitors, public environmental management agencies and emergency services. • Foregoing the opportunity for safe boat berthing facilities particular during bad weather conditions. • Reduced visual amenity and environmental quality of island and Marine Park landscape associated with abandoned	• Significant negative investment signals. • Foregoing a $620 million contribution to Gross State Product during construction and $195 million per annum (in gross terms) when operational ($125 million in net terms). • Foregoing a $480 million contribution to Gross Regional Product (Mackay Region) during construction and $140 million per annum (in gross terms) when operational ($100 million in net terms). • Loss of previous investment in resort buildings and	• Risk of proliferation of weeds, pests and other environmental hazards associated with continuing deterioration of resort buildings and infrastructure (pending site remediation). • Anticipated lack of funding to undertake localised rehabilitation and ongoing maintenance of currently degraded habitat on the island. • Potentially, marginal improvement in natural environment associated with removal of permanent human activity from land in and adjacent to National Park and Marine Park (following site remediation).

Social Impacts	Economic Impacts	Environmental Impacts
resort (pending site remediation). • Not consistent with lease conditions that state a lessee must provide and maintain tourist accommodation of an acceptable standard.	infrastructure, exacerbated by additional costs of abandoning and remediating the site. • Reduction in the number and diversity of tourist accommodation and facilities within the Whitsunday Tourism Area and the wider community.	

5.2.2 Resort Redevelopment: Option 2 – Minor Resort Refurbishment

Option 2 represents the reinstatement and refurbishment of the former resort, with no expansion beyond the current established footprint. This option is not preferred as a minor resort refurbishment is unlikely to provide the critical mass and quality of facilities and experiences necessary to attract tourists and sustain tourism operations. The closure of the former Club Med resort in 2012 and the failure of the resort to re-open since that time suggests that a facility of that type no longer meets the expectations of the tourism market.

This option would also result in a reduced contribution to employment opportunities and economic development at the Commonwealth, State, regional and local levels. Further, it carries with it the risk that a venture not well matched to the expectations of the tourist market will not be sustainable in the long term, raising the prospect of social and economic consequences associated with a further failure of the resort.

A summary of the consequences arising from this option is presented in **Table 5-2**.

Table 5-2. Consequences arising from Resort Redevelopment Option 2 – Minor Resort Refurbishment.

Social	Economic	Environment
• Reduced scale of employment in the construction and operational phases of a more modest resort refurbishment, compared to the proposed resort concept. • Re-establishment of holiday and recreation opportunities of a nature and scale formerly available on the island, but with doubtful long-term social and financial sustainability. • Loss of the opportunity for significant improvement in air and sea access to the island (frequency, safety, travel time and modes), with benefits for visitors, environmental management agencies and emergency services.	• Buildings have undergone substantial deterioration as a consequence of weather and environmental conditions to the point where restoration is not considered practical or economically feasible. • Reduced scale of contribution to Gross State and Regional Product, in construction and operational phases. • Not viable due to mismatch between the ability to provide quality and choice of accommodation, facilities and experiences and market expectations. • Advances the Queensland government objective to double annual tourism	• Less opportunity for funding of rehabilitation and management of habitat and weed/pest control beyond that required by current lease conditions. • Maintenance of visual presence and footprint of the resort within existing extent. • Provides a permanent presence and resourced programme for weed and pest management. • Localised rehabilitation of habitat through resort landscaping using local native species.

Social	Economic	Environment
• Inability to provide safe boat berthing facilities particular during bad weather conditions.	visitor expenditure to $30 billion by 2020; the Commonwealth's Tourism 2020 Strategy; and the Mackay Destination Tourism Plan which supports the revitalisation of key tourism sites, including Lindeman Island.	

5.2.3 Resort Redevelopment: Option 3 – Resort Redevelopment involving three resorts, upgrades to airstrip, ecotourism facilities and safe harbour

Option 3 reflects the redevelopment of the existing resort involving:

- Three new resorts;
- An upgraded runway;
- Ecotourism facilities; and
- A new safe harbour.

A summary of the key likely consequences arising from this option is outlined in the following **Table 5-3**. A key element of the redevelopment strategy is creation of a variety of accommodation options and a wide range of supporting amenities within the resort. This strategy responds to the demand by visitors for a greater choice of facilities and activities in one location. This strategy is of particular importance to an island resort because it will provide a critical mass of facilities and experiences needed to attract visitors. This is fundamental to establishing Lindeman Island's international profile and its competitiveness as a world class destination resort.

Option 3 represents the preferred option on which the project is based as it delivers the greatest combined social, economic and environmental benefits. It forms the basis of the preferred masterplan layout presented in **Appendix C – Masterplan Concept (DBI Design Pty Ltd)** (the DBI Masterplan, November 2016).

Table 5-3. Consequences arising from Resort Redevelopment Option 3 – November 2016 Masterplan.

Social	Economic	Environment
• Creates jobs during construction (average 300 persons FTE per year) and over 300 per annum when operational. • Broadens the choice of tourist accommodation options and recreational experiences and opportunities. • Provides improved air and sea access to the mainland (in terms of frequency, safety, travel time, options, cost, modes), with benefits for visitors, staff, environmental management	• Benefits associated with a $583 million capital investment. • Contribution of $620 million contribution to Gross State Product during construction and $195 million per annum when operational. • Contribution of $480 million contribution to Gross Regional Product (Mackay Region) during construction and $140 million per annum when operational. • Provides a wider range and higher quality of accommodation choices, tourist facilities and recreation experiences than can	• Facilitates technological improvements to ecological sustainability of island infrastructure, including wastewater treatment, water supply, telecommunications and electricity (solar/diesel hybrid system). • Provides a permanent presence and resourced programme for weed and pest management. • Localised rehabilitation of habitat through resort

Social	Economic	Environment
agencies and emergency services. • Provides safe boat berthing facilities particular during bad weather conditions, and provides an effective marine berthing facility for vessels providing tourism services, and private yacht visits.	be provided by Option 2, widening and deepening the tourist market for the resort. • Strengthens the national and international tourism 'profile' and 'exposure' of the Whitsunday Tourism Area specifically and the State and nation generally. • Advances the Queensland government objective to double annual tourism visitor expenditure to $30 billion by 2020; the Commonwealth's Tourism 2020 Strategy; and the Mackay Destination Tourism Plan which supports the revitalisation of key tourism sites, including Lindeman Island.	landscaping using local native species. • Provides for the establishment of a National Park and Great Barrier Reef Education Centre. • Results in some (managed and mitigated) environmental disturbance and modification associated with a greater disturbance area and requirements for vegetation clearing. • Will have limited additional visible presence from the Great Barrier Reef Marine Park, mitigated by quality of built form design and landscaping.

5.3 Airstrip Options

The increasingly competitive nature of the tourism industry and the time pressures faced by both domestic and international tourists means that quick and efficient access to a tourist resort is essential for a resort to attract guests. This has become more important for Australian resorts with the commencement of low-cost air travel options to South-East Asia. Four options were contemplated with regard to the redevelopment of the airstrip being:

- Option 1: no action;
- Option 2: upgrades to meet Aerodrome Landing Area (ALA) requirements;
- Option 3: upgrades to accommodate Code 1B aircraft; and
- Option 4: upgrades to accommodate larger aircraft (e.g. Dash 8).

The primary criteria in evaluating the airstrip options were:

(a) Ensure that the runway is safe and designed to meet Civil Aviation Safety Authority (CASA) safety standards;

(b) To the extent possible, while ensuring (a) is achieved minimise impact on the Commonwealth and State listed Broad Leaf Tea Tree Community (*Melaleuca viridiflora*) located to the east (Commonwealth and State) and west (State only) of the existing runway strip;

(c) Improve the island's accessibility by air particularly during the wet season; and

(d) Respond to likely demand in the type and class of aircraft likely to be required.

The results of this analysis are presented in the following sections.

5.3.1 Airstrip Option 1 – No Action

The existing airstrip consists of two runways, with the main runway aligned 18/36 being a grass strip a nominal 1,097 metres long which limits the type of aircraft that can access the island. The secondary runway is aligned 13/31 and is also a grass strip with a nominal length of 680 metres. During the wet season the lowest part of the main runway in the vicinity of the cross-runway intersection can be flooded which limits aircraft operations to helicopter only.

Table 5-4 provides a summary of the consequences associated with no work being undertaken to upgrade the current airstrip. This option is not considered to be desirable due to potential economic and social impacts with guests not being able to arrive or depart from the island during a wet weather event.

Table 5-4. Consequences arising from Airstrip Option 1 – No Action.

Social Impacts	Economic Impacts	Environmental Impacts
• Runway not consistent with CASA safety standards. • No improvement to the island's accessibility by air. • Limited opportunity to evacuate guests or access the island by air in the event of an emergency, especially if coinciding with wet weather.	• Potential reduced market appeal to tourists due to guests not being able to access the island by air. • Potential impact on guests not being able to get to the resort.	• No impact on Commonwealth and State listed Broad Leaf Tea Tree Community (*Melaleuca viridiflora*).

5.3.2 Airstrip Option 2 – Upgrades to meet Aerodrome Landing Area requirements (ALR)

Option 2 involves the upgrade of the existing airstrip to meet Aerodrome Landing Area requirements. This option involves sealing the runway and allows planes to take off and land and in either direction but also requires transitional surface area requirements to be met. A summary of the consequences arising from this option is presented in **Table 5-5**. This option is not preferred as it would require a significant level of investment but would not allow Code 1B or larger engine planes to land on the island.

Table 5-5. Consequences arising from Option 2 – Upgrades to meet Aerodrome Landing Area Requirements.

Social	Economic	Environment
• Enables flights to land and take-off during wet weather conditions, improving accessibility by air including capability to respond to emergency situations.	• Planes are able to take-off and land in either direction. • Only smaller propeller planes (maximum of nine seats) can use the airstrip at the discretion of the airline operator. • Better access and connection to the mainland.	• Disturbance to Commonwealth and State listed Broad Leaf Tea Tree Community (*Melaleuca viridiflora*) associated with runway width (18 metres) and graded surface (60 metres) and associated clearing necessary to achieve Obstacle Limitation Surface requirements.

5.3.3 Airstrip Option 3 – Code 1B Design Aircraft

Option 3 involves the upgrade of the existing airstrip by constructing a sealed runway of 966 metres in length and 18 metres in width (graded area of 60 metres required) to facilitate Code 1B non-instrument, day only flights. Code 1B aircraft such as Beechcraft 200 King Air, DHC-6 Twin Otter and Dornier 228-200 (maximum 19 seater) have been nominated for consideration in this option and are considered to represent the maximum size of aircraft potentially capable of using the aerodrome if it is constructed to comply with code 1B standards, subject to runway length, obstacles, runway slope and various other take-off performance planning considerations. Due to topographical constraints planes would be restricted to land and take-off in a southerly direction only. The maximum runway length that can be achieved (nominally 966 m for take-off and landing in a southerly direction or possibly up to 1,042 m subject to operational procedures acceptable to CASA) may still not enable the nominated aircraft to operate to their full payload/range capabilities. The smaller secondary runway to the west would be used for aircraft parking and aircraft hangars.

A summary of the consequences arising from this option is presented in **Table 5-6**. This option is preferred as it enables small commercial aircraft to land on the island during wet weather events during the day and provides and is considered to represent the maximum size of aircraft potentially capable of using the aerodrome (when landing and taking-off from the south) if it is constructed to comply with code 1B standards, subject to runway length, obstacles, runway slope and various other take-off performance planning considerations.

Table 5-6. Consequences arising from Option 3 – Code 1B Design Aircraft.

Social	Economic	Environment
• Enables flights to land and take-off during wet weather conditions, improving accessibility by air including capability to respond to emergency situations.	• Enhances the market appeal of the resort by enabling improved access to the island by air during the day (maximum 19 seater). • Take-off and landing limited to a southerly direction due to topographical considerations. • Limit on the maximum size of aircraft potentially capable of using the aerodrome if it is constructed to comply with code 1B standards, subject to runway length, obstacles, runway slope and various other take-off performance planning considerations.	• Disturbance to Commonwealth and State listed Broad Leaf Tea Tree Community (*Melaleuca viridiflora*) associated with runway width (18 metres) and graded surface (60 metres) and associated clearing necessary to achieve obstacle limitation or transitional surface requirements. • Possibility of more frequent aircraft noise and associated impacts. • Impacts on air quality arising from emissions. • Greater area of ground disturbance.

5.3.4 Airstrip Option 4 – Upgrade for Dash 8 and Similar Design Aircraft

Option 4 reflects the redevelopment of the airstrip to accommodate commercial passenger aircraft with a maximum capacity of 39 passengers (e.g. Dash 8). An analysis of this option has indicated that the required runway length and obstacle limitation surfaces cannot be achieved within the current or proposed site boundaries.

Table 5-7. Consequences arising from Option 4 – November 2016 Masterplan.

Social	Economic	Environment
• Dash 8 planes unable to land on island within the current and proposed site boundaries due to inadequate runway length and inability to achieve obstacle limitation surface requirements.	• High costs associated with required land tenure negotiations to achieve necessary runway length (off-site in National Park) and required earthworks and tree clearing to achieve obstacle limitation or transitional surfaces. • Greater accessibility to visitor markets.	• Significant disturbance to Commonwealth and State listed Broad Leaf Tea Tree Community (*Melaleuca viridiflora*) associated with greater runway width to achieve obstacle limitation or transitional surface requirements; • Clearing and earthwards required in National Park land to north of existing perpetual lease area.

5.4 Marine Access Options – Preferred Arrangement, Location and Design

Addendum: *This EIS was initially prepared assuming that the safe harbour was to be part of the Lindeman Great Barrier Reef Resort Project. With the commencement of the Great Barrier Reef Marine Park Authority's (GBRMPA) Dredging Coral Reef Habitat Policy (2016), further impacts on Great Barrier Reef coral reef habitats from yet more bleaching, and the recent impacts from Tropical Cyclone Debbie, the proponent no longer seeks assessment and approval to construct a safe harbour at Lindeman Island. Instead the proponent seeks assessment and approval for upgrades to the existing jetty and additional moorings in sheltered locations around the island to enable the resort's marine craft to obtain safe shelter under a range of wind and wave conditions. Accordingly, remaining references to, and images of, a safe harbour on various figures and maps in the EIS are no longer current.*

Marine access to Lindeman Island is currently available via a south-east facing jetty, which is exposed to the prevailing south-easterly winds, based on recorded data for Hamilton Island Airport (refer to **Figure 5-1**). Wave conditions at the jetty exceed the "good wave" climate for vessels defined by *AS3962 Guidelines for design of marinas* for oblique seas of wave period (Tp) greater than 2s (Hs ≥0.3m) over 30% of the time (109 equivalent days per year – see Table 4-1 and Figure 6.14 of **Appendix H**). Therefore, based on the criteria contained in this code, on-site conditions would mean that it may not be safe for people to embark or disembark for 109 equivalent days per year, on average year (Hs ≥0.3m). However, larger vessels (>20m), such as a barge, are able to tolerate slightly higher waves and hence be affected by wave conditions less frequently. The smaller ferries that operate in this region are 25m long and the bigger catamaran is 35m long. For these vessels one can adopt Hs ≥0.4m as the limiting safe operation wave height. These conditions are equalled or exceeded for 18% of the time, about 66 equivalent days per year, on average.

More reliable and safe access to the island is important for the ongoing safe and reliable operation (delivery of goods/staff and guests) and marketability of the resort. This section of the EIS provides an assessment of the preferred marine access options, alternative locations for access and design that addresses the social, economic, biophysical and policy framework applying to the various sites across the island. The assessment considers impact on coral and seagrass communities, hydrological, met-ocean and water quality issues, landside access, safety and construction and operation processes.

In identifying the marine access options the following have been identified as the key criteria for consideration:

(a) Provide a safe access point for the transfer of staff, guests and goods, including provision of an emergency evacuation point during storm conditions;

(b) Greater protection from the prevailing wind and wave conditions. The importance of safe and reliable water access is illustrated by the following:

   i. the previous resort operator (Club Med) identified unreliable water access as a major shortcoming of the resort when they were operating the resort. Passenger ferries (200-300 capacity) were unable to berth on many occasions;

   ii. without the safe harbour there is:

   - no certainty that connecting flights can be made by departing guests;
   - no certainty that boats can pick up guests for reef activities or drop guests off when returning from reef activities;

iii. no routine servicing of the island in terms of delivery of goods and removal of wastes etc.; and

iv. greater reliance on increased aircraft movements.

(c) Protection for the wider boating community during rough weather (but not for cyclone events);

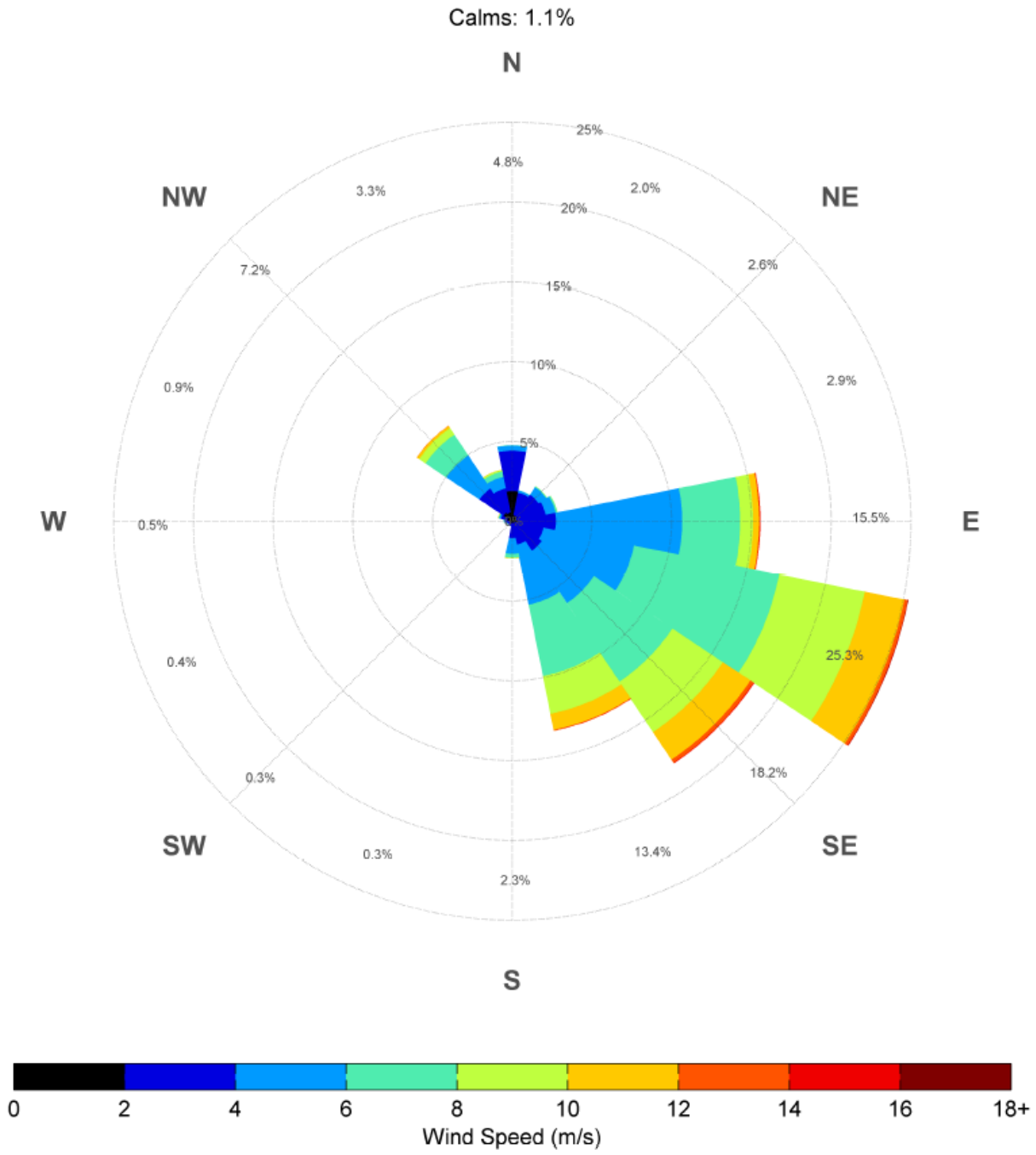
(d) Provision of berths for a limited number of private craft (50 – 60) consistent with the "high end" positioning of the resort which will also provide partial financial support to defray the infrastructure cost necessary to achieve the other purposes; and

(e) Provision of berths for craft operated by the resort, regulatory authorities, and charter companies.

In determining the preferred location and design of the safe harbour, the following criteria were considered:

- Consistency with the statutory framework including the Great Barrier Reef Marine Park Zoning Plan and the Whitsundays Plan of Management. In this regard Lindeman Island is surrounded by two Commonwealth and State Marine Park Zones being:
  i. **Marine National Park Zone** – The Marine National Park (Green) Zone affords a higher level of protection than the Conservation Park Zone with greater restrictions on the types of uses which are restricted or require permits; and
  ii. **Conservation Park Zone** – The Conservation Park Zone allows for increased protection and conservation of areas of the Marine Park, while providing opportunities for reasonable use and enjoyment including limited extractive use. Shipping and tourist programs require permits to be undertaken.
- Minimisation of impact on high density coral communities noting that Lindeman Island is fringed with coral reefs and as such all options will result in some disturbance to coral communities. While this disturbance is not consistent with GBRMPA's *Dredging coral reef habitat – operating a facility or carrying out works for the development of marine infrastructure policy*, this policy is only one of a number of matters which requires consideration in the assessment of applications under 88R(d) of the GBRMP Regulations;
- Efficiency and safety of the access point for the transfer of arriving and departing guests, day trips to reef, staff, equipment, materials, goods and waste via ferries, barges and private vessels;
- Sufficient land-side access to provide for trucks, an arrivals lounge and the transfer of goods and people;
- Proposed civil works required to construct and maintain the safe harbour including the breakwater design (including quantity of rock required), on-going dredging and costs of construction;
- Visual sensitivity of the surrounding environment;
- Any requirements for ongoing maintenance dredging;
- Appropriate tidal flushing; and
- Terrestrial impacts including vegetation clearing.

Figure 5-1. Hamilton Island Wind Rose 2002 − 2007 (Source: Bureau of Meteorology).



The following section provides an assessment of the alternative access arrangements, locations and designs based on the above criteria. It builds on an initial desktop analysis prepared by BMT WBM in 2013 (refer to **Appendix X**).

5.4.1 Marine Access Arrangements Assessment

The following section provides an assessment of marine access options to the proposed Lindeman Island Great Barrier Reef Resort.

5.4.1.1 Marine Access Arrangement – No Change to Existing Marine Access Facilities

Existing marine access to the resort is via a jetty located at Home Beach which is currently permitted to the Department of Transport and Main Roads. **Table 5-8** provides a summary of the consequences associated with no changes to the existing marine access facilities. This option is not considered desirable due to problems accessing the resort during extreme wind conditions.

Table 5-8. Consequences arising from no change to existing marine facilities.

Social Impacts	Economic Impacts	Environmental Impacts
• Safety concerns associated with the disembarkation and departure of staff and guests during strong winds.	• Guests, staff and goods unable to disembark or depart the island during strong winds which will impact on the marketability and operation of the resort; • Minor economic expenditure required; • Significantly curtail the range of marine activities that can be offered to resort guests; • Resort unable to attract tourist market associated with high end positioning of the resort without greater reliance on aircraft to transfer resort guests.	• Difficult to contain and monitor potential environmental impacts associated with increase in boating activities.

5.4.1.2 Marine Access Arrangement – Upgrades to Jetty and Additional Moorings

Table 5-9 provides a summary of the consequences associated with minor changes to the existing marine access facilities associated with an upgrade to the existing jetty and provision of additional moorings in sheltered locations around the island to enable the resort's marine craft to obtain safe shelter under a range of wind and wave conditions. Similar to the above option, this option does not address problems with accessing the resort during extreme wind conditions.

Table 5-9. Consequences arising from minor upgrade to existing marine facilities.

Social Impacts	Economic Impacts	Environmental Impacts
• Safety concerns associated with the disembarkation and departure of staff and guests during strong winds.	• Guests, staff and goods unable to disembark or depart the island at the jetty during strong winds which will impact on the marketability and operation of the resort; • Minor economic expenditure required;	• Difficult to contain and monitor potential environmental impacts associated with increase in boating activities.

Social Impacts	Economic Impacts	Environmental Impacts
	• Significantly curtail the range of marine activities that can be offered to resort guests; • Resort unable to attract tourist market associated with high end positioning of the resort without greater reliance on aircraft to transfer resort guests.	

5.4.1.3 Marine Access Arrangement – New Harbour (incorporating jetty at the same site) Marine Access Facilities

Table 5-10 provides a summary of the consequences associated with a new harbour (incorporating jetty at the same site) designed to achieve protection against strong winds (but not cyclones).

Table 5-10. Consequences arising from a new harbour (incorporating a jetty).

Social Impacts	Economic Impacts	Environmental Impacts
• Provides for the safe access to the resort for staff and guests, except during cyclone events.	• Guests, staff and goods able to disembark or depart the island during strong winds which will increase the marketability and operation of the resort; • Provides opportunities for a range of marine activities that can be offered to resort guests; • Resort able to attract tourist market associated with high end positioning of the resort without greater reliance on aircraft to transfer the resort guests.	• Impacts on coral communities associated with construction of the safe harbour. • Jetty and harbour impacts can be contained at the same site.

5.4.1.4 Marine Access Arrangement – New Harbour and Jetty (different site) Marine Access Facilities

Table 5-11 provides a summary of the consequences associated with a new harbour independently located from the existing jetty designed to achieve protection against strong winds (but not cyclones).

Table 5-11. Consequences arising from a new harbour and jetty (different site).

Social Impacts	Economic Impacts	Environmental Impacts
• Provides for the safe access to the resort for staff and guests, except during cyclone events.	• Guests, staff and goods able to disembark or depart the island during strong winds which will increase the marketability and operation of the resort;	• Impacts on coral communities associated with construction of the safe harbour. • Distribution of potential environmental impacts across two marine sites.

Social Impacts	Economic Impacts	Environmental Impacts
	• Provides opportunities for a range of marine activities that can be offered to resort guests; • Resort able to attract tourist market associated with high end positioning of the resort without greater reliance on aircraft to transfer the resort guests.	

In summary, an assessment of the above marine access arrangements has identified that the preferred option which will enable the safe disembarkation and departure of staff, guests and goods is the construction of a new harbour (incorporating a jetty). This option will provide a structure to ensure the impacts of the prevailing winds are appropriately mitigated and utilise infrastructure in the most efficient manner. The following sections provide an assessment of potential locations and identifies the preferred location and design of such a structure.

5.4.2 Safe Harbour – Location Options

In 2013 BMT WBM undertook site evaluations to determine the suitability of a number of sites around Lindeman island as potential safe harbour locations (refer to **Appendix X**). BMT WBM modelled extreme weather events to determine preliminary design wave heights, provided cost implications of safe harbour designs, and described legislative and marine ecology constraints to safe harbour development. As part of this assessment marine ecology field surveys were conducted at four locations, Gap Beach, Boat Port, Billy Goat Point and the site around the existing jetty (refer to **Map 5-1**).

The alternative sites, located at Gap Beach, Boat Port and Billy Goat Point, all rely on a new access road being created through a National Park. The *Nature Conservation Act 1992* (NCA) does not allow for the creation of easements for roads or infrastructure on national parks. Development can only occur in national parks through an authorisation sanctioned under section 35 of the NCA, and the use under the authority must be for a service facility or ecotourism facility. In addition, the activity must also serve the public interest, be ecologically sustainable, have no practicable alternative and recognise the cardinal management principles of national parks outlined in section 17 of the NCA.

An access road through the national park linking the proposed safe harbour and resort would not be categorised as either a service facility or ecotourism facility, and therefore could not be authorised under the NCA. The only way the access road could be constructed would be by revoking the road corridor from Lindeman Islands National Park, under section 32 of the NCA. Decisions on revocation are ultimately the responsibility of the Minister, and require the approval of Cabinet and Governor-in-Council and are viewed as the sale of State assets. Revocation would also involve appropriate compensation and due to the impacts on the integrity of the National Park, offsets may apply in addition to the revocation.

Revocation for a private access road through the national park could prove difficult as revocations are usually reserved for local and state owned public roads only. As the access road would primarily be used for transportation between the safe harbour and the resort, it is unlikely that it could be categorised as public infrastructure. In addition, it would fragment the existing National Park boundary, and there is a high likelihood

of impacts on the natural values and ecological integrity of the National Park. Justification for the development could be challenging as the existing jetty already provides a practicable alternative for access to the resort.

The breakwater cross section is largely influenced by the depth of water and wave height (BMT WBM, 2013 – Engineering Aspects). A cost estimate of $250/m^3 of breakwater was applied to all calculations and the dredging cost was calculated at $20/m^3.

The following sub-sections provide further commentary on each of the options identified for investigation.

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Alternative Safe Harbours

- Alternative Safe Harbour Locations
- Indicative Seawall

Great Barrier Reef Marine Park Authority

Reefs

- Major coral cay, other coral reef structures or tidal, drying or emergent reef areas

Settings

- Developed (70 metres, no limits)
- Moderate Use (35 metres, 40 passengers)
- Natural (35 metres, 15 passengers)

Zoning

- Conservation Park
- Marine National Park

Other

- Proposed Site Boundary

N, W, E, S

0 150 300 450 600 750

1:15,000 (metres)

original map compiled at A3 size

DRAWING TITLE	Map 5-1: Alternative Safe Harbour Locations
DRAWING DATE	05 December 2016
DRAWING VERSION	2.0
COORDINATE SYSTEM	GDA94; MGA Zone 55
MAP PRODUCED BY	Cardno QLD Pty Ltd
JOB NUMBER	HRP15078

DATA SOURCE

Data courtesy of the Great Barreir Reef Marine Park Authority:
Great Barreir Reef Marine Park Features (Reefs); Publication Date: October 2007.
Great Barreir Reef Marine Park Setting Areas; Publication Date: 27/11/2008.
Great Barreir Reef Marine Park Zoning; Publication Date: 01/07/2014.

Google Earth: Date of Photography 07/03/2008.

Lindeman Great Barrier Reef Resort & Spa
ENVIRONMENTAL IMPACT STATEMENT

Alternative Safe Harbour Locations

MAP 5-1

5.4.2.1 Safe Harbour Location 1 – Gap Beach

Table 5-12 provides a summary of the consequences associated with the proposed Gap Beach location. This option is not considered desirable due to inconsistencies with the Whitsundays Plan of Management, being in a remote location necessitating a new road access through the National Park, extreme wind conditions and high cost associated with the construction of rock seawalls.

Table 5-12. Consequences arising from Gap Beach Location.

Social Impacts	Economic Impacts	Environmental Impacts
• Inefficient access point for the transfer of guests and staff; • Significant visual disturbance to an undeveloped setting.	• Gap Beach is too geographically distant from the existing resort and would result in inefficiencies associated with travel time for staff, resort visitors and service vehicles; • Significant breakwater construction costs to protect against extreme northerly fetches, with breakwater construction costs estimated to be approximately $47,400,000 (BMT WBM, 2013); • Dredging cost estimate approximately $1,200,000 (BMT WBM, 2013).	• Option would require a new access road through a National Park which may not be possible under the *Nature Conservation Act*; • Estimated impact of 0.14 ha of reef (including some coral) using aerial photography and review of AP and charts (BMT WBM, 2013) which is inconsistent with the *Dredging coral reef habitat – operating a facility or carrying out works for the development of marine infrastructure* policy. This policy is a discretionary consideration in the assessment of applications under 88R(d) of the GBRMP Regulations; • Seagrass communities are generally sparse (BMT WBM, 2013); • Site is located within a Marine National Park Zone which affords a higher level of protection than the Conservation Park Zone; and • Site is not supported by the Whitsundays Plan of Management as it is not included in a “Developed area” setting.

5.4.2.2 Safe Harbour Location 2 – Boat Port

The Boat Port location is not considered to be desirable or viable due to inconsistencies with the Whitsundays Plan of Management, being in a remote location necessitating a new road access through the National Park, and very high cost associated with the construction of rock seawalls (**Table 5-13**).

Table 5-13. Consequences arising from Boat Port Location.

Social Impacts	Economic Impacts	Environmental Impacts
• Inefficient access point for the transfer of guests and staff. • Significant visual disturbance to an undeveloped setting.	• Boat Port is too geographically distant from the existing resort and would result in inefficiencies associated with travel time for staff, resort visitors and service vehicles. • Significant breakwater construction costs to protect against extreme northerly fetches, with breakwater construction costs estimated to be approximately $93,600,000 (BMT WBM, 2013). • Dredging cost estimate approximately $6,000,000 (BMT WBM, 2013)	• Option would require a new access road through a National Park which may not be possible under the *Nature Conservation Act*; • Estimated impact of 8.86 ha of reef (including some coral) using aerial photography and review of AP and charts (BMT WBM, 2013) which is inconsistent with the *Dredging coral reef habitat – operating a facility or carrying out works for the development of marine infrastructure* policy. This policy is a discretionary consideration in the assessment of applications under 88R(d) of the GBRMP Regulations; • Seagrass communities are generally sparse (BMT WBM, 2013); • Site is located within a Conservation Park Zone which provides a greater range of permitted uses than the Marine National Park Zone; and • Site is not supported by the Whitsundays Plan of Management as it is not included in a “Developed area” setting.

5.4.2.3 Safe Harbour Location 3 – Billy Goat Point

Table 5-14 provides a summary of the consequences associated with the proposed Billy Goat Point location. This option is not considered to be desirable or viable due to the depth of water necessitating extensive construction works including extensive and deep rock seawalls.

Table 5-14. Consequences arising from Billy Goat Point Location.

Social Impacts	Economic Impacts	Environmental Impacts
• Site located closer to existing resort but new infrastructure required to construct a road. • Significant visual disturbance to an undeveloped setting.	• Extreme cost associated with breakwater construction, approximately $286,000,000 due to deeper water at the site and exposure to extreme wave conditions (BMT WBM, 2013); and • Nil dredging costs due to water depth (BMT WBM, 2013)	• Option would require a new access road through a National Park which cannot be authorised under the *Nature Conservation Act*; • Estimated impact of 0.3 ha of reef (including some coral) using aerial photography and review of AP and charts (BMT WBM, 2013) based on GBRMPA Layer (aerial imagery) which is consistent with the *Dredging coral reef habitat – operating a facility or carrying out works for the development of marine infrastructure* policy. This policy is a discretionary consideration in the assessment of applications under 88R(d) of the GBRMP Regulations; • Seagrass communities are generally sparse (BMT WBM, 2013); • Site is located within a Conservation Park Zone which provides a greater range of permitted uses than the Marine National Park Zone; and • Site is not supported by the Whitsundays Plan of Management as it is not included in a “Developed area” setting.

5.4.2.4 Safe Harbour Location 4 – Home Beach (East)

The Home Beach (East) location was considered to be the most desirable due to consistency with the Whitsundays Plan of Management – Setting 1 Area and the ability to limit impact on coral communities. **Table 5-15** provides a summary of the consequences associated with this option.

Table 5-15. Consequences arising from Home Beach (East) Location.

Social Impacts	Economic Impacts	Environmental Impacts
• Site located close to existing resort and provides for the most efficient transfer of resort guests and visitors. • Site located within a visually disturbed setting,	• Site reuses the existing channel and turning basin; • Most economical breakwater construction and associated costs. • Cost associated with breakwater construction (rock revetment and armour rock), approximately $15,390,000. • Dredging cost estimate approximately $1,560,000.	• Does not require the construction of a new road; • Estimated impact on an aggregate of 0.23 ha of coral within 5.19 hectare development footprint (Cardno, 2016). This is inconsistent with the *Dredging coral reef habitat – operating a facility or carrying out works for the development of marine infrastructure* policy. This policy is a discretionary consideration in the assessment of applications under 88R(d) of the GBRMP Regulations; • Seagrass communities are generally sparse (BMT WBM, 2013); • Focused on area which has already been disturbed to create the channel and turning basin; • Site is located within Conservation Park Zone which provides for the reasonable use and enjoyment of the Marine Park; • Site supported by the Whitsundays Plan of Management which includes waters located in front of the Lindeman Island resort in a 'Setting 1' area. Setting 1 areas are described in the Whitsunday Plan of Management as "*the access points to the Planning Area and a focus for intensive tourism and recreation*".

5.4.2.5 Safe Harbour Location 5 – Home Beach (West)

The Home Beach (west) location while consistent with the Whitsundays Plan of Management – Setting 1 Area and the ability to limit impact on coral communities will require access through the proposed Beach Resort with noise/traffic disturbances. **Table 5-16** provides a summary of the consequences associated with this option.

Table 5-16. Consequences arising from Home Beach (West) Location.

Social Impacts	Economic Impacts	Environmental Impacts
• Site located close to existing resort; • Access to the safe harbour would be through the proposed Beach Resort which would cause potential for noise/traffic disturbances; and • Site located within a visually disturbed setting.	• Site doesn't reuse the existing channel and turning basin and as such further dredging would be required; • Cost associated with breakwater construction (rock revetment and armour rock), approximately $14,140,000.00. • Dredging cost estimate approximately $1,560,000.	• Does not require the construction of a new road; • Estimated impact on an aggregate of 0.6 ha of coral within 5.19 hectare development footprint (Cardno, 2016). This is inconsistent with the *Dredging coral reef habitat – operating a facility or carrying out works for the development of marine infrastructure* policy. This policy is a discretionary consideration in the assessment of applications under 88R(d) of the GBRMP Regulations; • Seagrass communities are generally sparse (BMT WBM, 2013); • Focused on area in front of the existing resort; • Site is located within Conservation Park Zone which provides for the reasonable use and enjoyment of the Marine Park; and • Site supported by the Whitsundays Plan of Management which includes waters located in front of the Lindeman Island resort in a 'Setting 1' area. Setting 1 areas are described in the Whitsunday Plan of Management as "*the access points to the Planning Area and a focus for intensive tourism and recreation*".

5.4.3 Preferred Option

The following table provides a summary of the key parameters associated with the safe harbour across the five locations.

Table 5-17. Assessment of Safe Harbour Location – Key Variables.

Safe Harbour - Location Option	Located within a Conservation Park Zone	Consistency with Whitsunday Plan of Management – Developed Area Setting	Access limited by National Park Designation	Aggregate Area of Coral Directly Impacted	Dredging Cost (Estimate)	Breakwater Cost (Estimate)
Option 1: Gap Beach	No	No	Yes	0.14 ha[1]	$1,200,000	$47,400,000
Option 2: Boat Port	Yes	No	Yes	8.86 ha[1]	$6,000,000	$93,600,000
Option 3: Billy Goat Point	Yes	No	Yes	0.3 ha[1]	$0	$286,000,000
Option 4: Home Beach East	Yes	Yes	No	0.23 ha	$1,560,000	$15,390,000
Option 5: Home Beach West	Yes	Yes	No	0.6 ha	$1,560,000	$14,140,000

[1] Value includes total reef area affected. Aggregate area of coral on reef not known.

From the examination of alternative locations around the Island, it was determined that the site around the existing jetty at Home Beach – East (Option 4) was the preferred location for the safe harbour as:

- The site is located within a Conservation Park Zone which provides for the reasonable use and enjoyment of the Marine Park rather than the Marine Park Zone which provides for a higher level of protection;
- The waters located in front of the Lindeman Island resort are identified in the Whitsunday Plan of Management as a 'Setting 1' area. Setting 1 areas are described in the Whitsunday Plan of Management as "*the access points to the Planning Area and a focus for **intensive** tourism and recreation*".
- The location of the safe harbour would not necessitate the construction of a new access road through topographically challenging land and through a National Park which is not supported under the *Nature Conservation Act 1992*;
- The site is located in an area where due to the depth of the ocean sea walls can be located without the need for massive and uneconomic seawalls;
- The site has existing maritime infrastructure with the jetty, access channel and turning basin located in this immediate area;
- The site is in a developed setting with the existing resort infrastructure located in this area.

5.4.4 Safe Harbour - Design Options

In October 2015 and January 2016 Cardno's marine ecologists examined the Home Beach location and updated the extent of mapping of the coral communities beyond the boundaries of the 2013 BMT WBM investigations. The resulting map dated 12 February 2016 is reproduced below as **Figure 5-1.** This map indicates the characteristics of the coral reef in the study area around the existing jetty on the southern side of Lindeman Island. In the middle of the site the reef extends about 300m from the shore and only about 100m from the shore on the eastern and western sides of the study area. There are large areas of live coral covering more than 25% (and up to 100%) of the reef in the middle of the study area (indicated by the red and purple areas on the figure) beginning at a distance of about 100m from the shore and extending to the edge of the reef. Most of the coral cover in these areas consists of fragile branching coral growth forms. The existing man-made channel runs through the middle of this area of reef. Coral cover close (i.e. <100m) to the shore is generally <25% coverage, and typically much less than this (as indicated by green, yellow and orange colours on the figure), and consists of isolated small colonies of various growth forms. In the area of reef adjacent to the beach in front of the existing resort, low coral cover occurs from the shore all the way to the reef edge. The hatched area indicates where slow-growing, massive growth form colonies were observed, of a size between 0.75m – 3m diameter. These colonies were mostly observed on the outer edge of the reef in the study area.

The design of the safe harbour wall considered different construction techniques such as metal sheeting. Metal sheeting was not feasible due to the depth of water and difficulties in bracing the structure to withstand cyclones. Rock armour walls were preferred due to the stability and longevity of the structure and while the conditions inside the safe harbour would not be safe during a cyclone event, there should be no damage to the rock armour wall associated with such events.

Five alternative safe harbour design options were evaluated based on the refined mapping of the coral communities and GBRMPA coral surveys undertaken prior to Cyclone Debbie. These alternative layouts are presented in **Map 5-2** and summarised in the following **Table 5-18**.

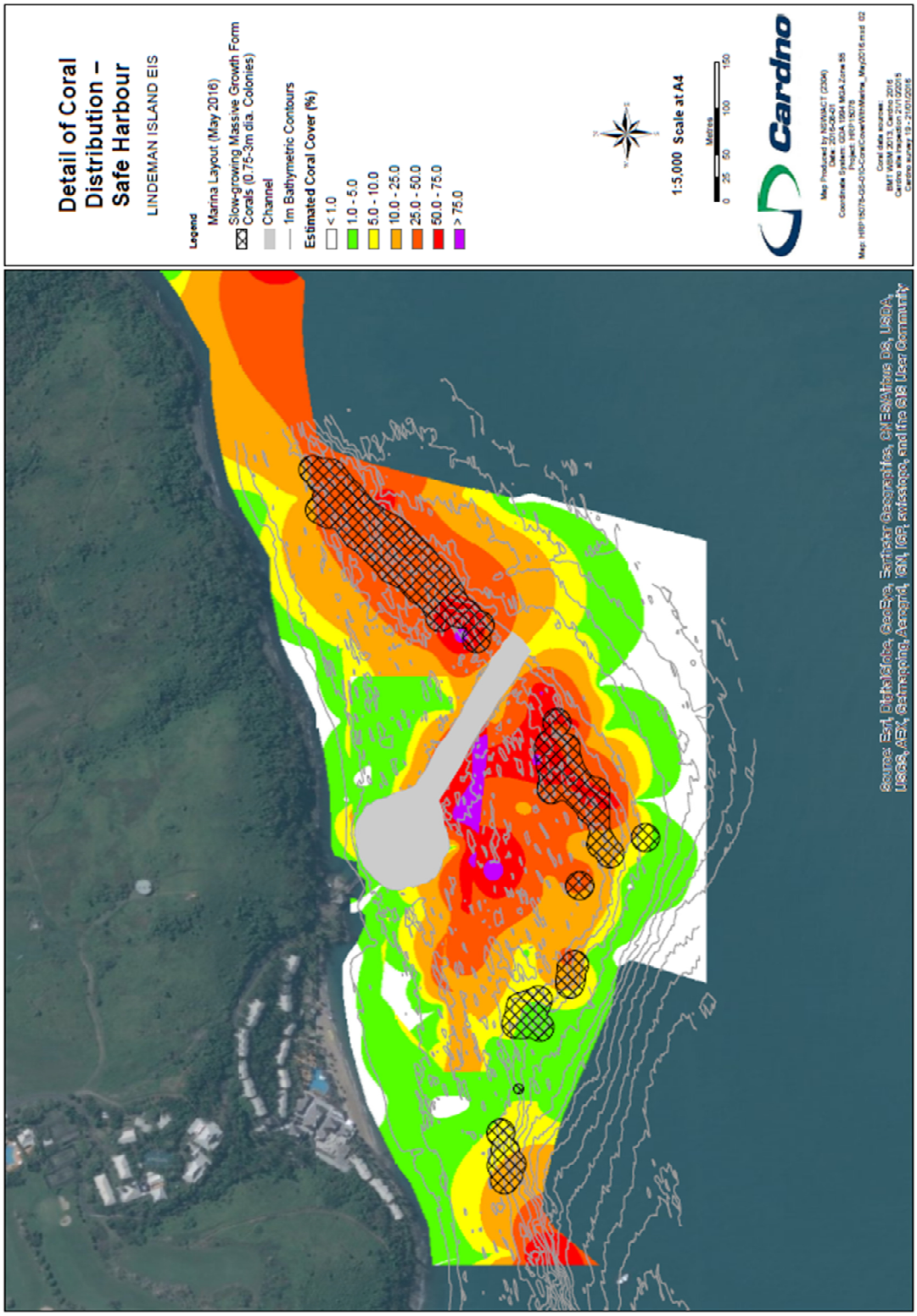
Table 5-18. Alternative safe harbour design layout options.

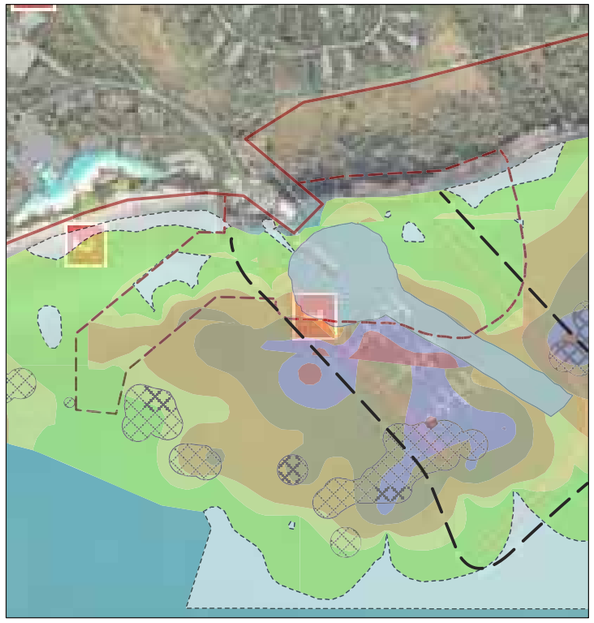
Safe Harbour Design Option	Layout Reference	Approximate Footprint Area	Berths[1]	Aggregate Area of Coral Directly Affected	Estimated % of high density (>50%) coral within footprint
Option 1: Safe Harbour Layout Submitted with Initial Advice Statement 2015	IAS Option 1	7.57 hectares	50	1.8 hectares	16.3%
Option 2: Safe Harbour Layout discussed with GBRMPA at meeting on 16/12/2015	HRP15078-004-SK005	5.55 hectares	84	1 hectare	9.2%
Option 3: Safe Harbour Layout dated February 2016	HRP15078-004-SK007	5.19 hectares	54	0.9 hectares	10.2%
Option 4: Safe Harbour Layout dated May 2016	HRP15078-004-SK009	5.19 hectares	50-60	0.23 hectares	0.9%
Option 5: Safe Harbour Layout dated December 2016 (in front of Beach Resort)	HRP15078-004-SK010	5.19 hectares	50-60	0.6 hectares	0.9%

[1] The number of berths is indicatively only with the final number to be determined based on:

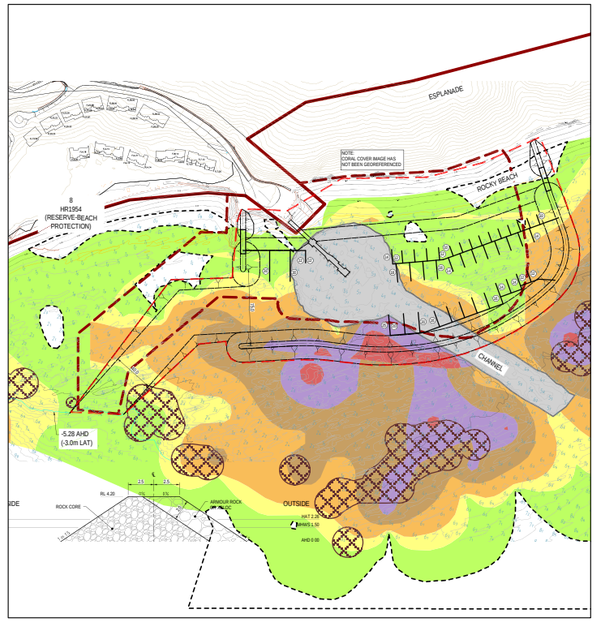
- Available area;
- Length of individual berths; and
- Configuration of walkways and pontoons.

Figure 5-2. Map of Extent of Living Coral (Cardno, 2016) (Note: Survey work undertaken prior to Cyclone Debbie).

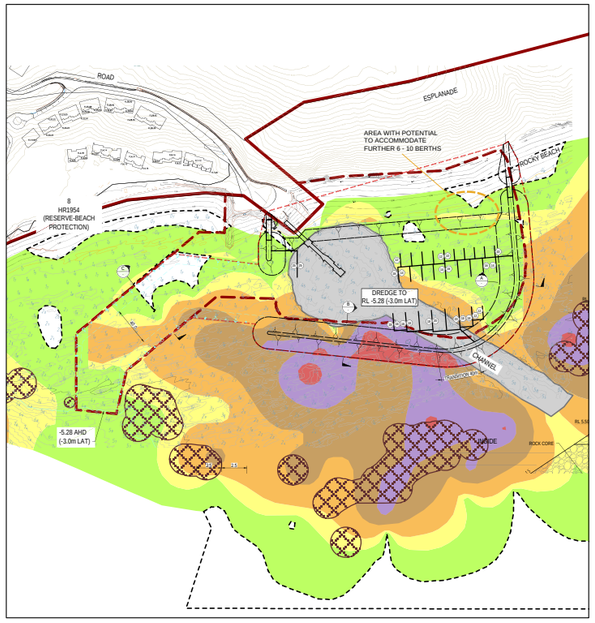




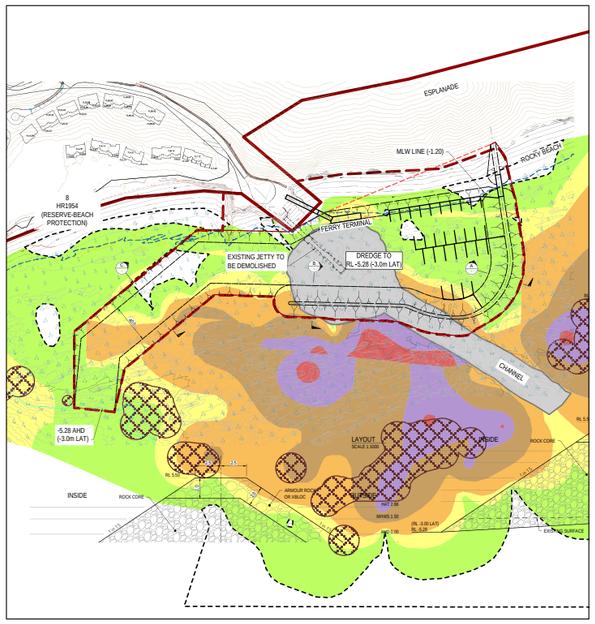
option 1: Safe Harbour Layout submitted with Initial Advice Statement 2015



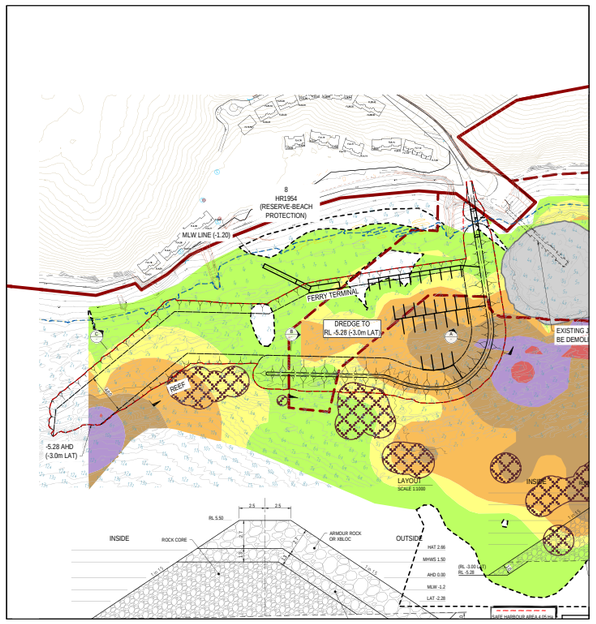
option 2: Safe Harbour Layout discussed with GBRMPA meeting on 16 December 2015



option 3: Safe Harbour Layout dated February 2016



option 4: Safe Harbour Layout dated May 2016



option 5: Safe Harbour Layout dated May 2016 (in front of Beach Resort)

Cardno
Shaping the Future

LEGEND

Coral Distribution

- Channel
- Slow-growing Massive Growth Form Corals (0.75 - 3.0m diameter colonies)

Estimated Coral Cover (%)

- < 1.0
- 1.0 - 5.0
- 5.0 - 10.0
- 10.0 - 25.0
- 25.0 - 50.0
- 50.0 - 75.0
- > 75.0

Other

- Proposed Site Boundary
- Proposed Sea Bed Lease Boundary

N
W E
S

0 60 120 180 240 320

1:6,000 (metres)

original map compiled at A3 size

DRAWING TITLE	Map 5-2: Safe Harbour Layout Options
DRAWING DATE	12 June 2017
DRAWING VERSION	2.0
COORDINATE SYSTEM	Unprojected Geographics
MAP PRODUCED BY	Cardno QLD Pty Ltd
JOB NUMBER	HRP15078

DATA SOURCE

Coral Distribution data: Cardno NSW/ACT (2015) using various sources; Publication date: 12/12/2016.

NOTE: **This map has NOT been compiled in gis and is for illustration purposes only**

Lindeman Great Barrier Reef Resort & Spa

ENVIRONMENTAL IMPACT STATEMENT

Safe Harbour Layout Options

MAP 5-2

5.4.4.1 Safe Harbour Layout - Option 1

Option 1 was proposed as part of the Initial Advice Statement submitted to the State in 2015, prior to the finalisation of the updated coral mapping. The Initial Advice Statement noted that this layout would be subject to change following the preparation of more detailed studies throughout the course of the EIS. An analysis of this option has indicated that is the least sustainable as it:

- Proposes the largest development footprint at 7.57 hectares;
- Proposes a location that will impact on approximately 1.8 hectares of aggregate coral;
- Proposes a location that has 16.3% of the coral being high density; and
- Design would not necessitate changes to the State/Commonwealth Marine Park Boundary

This option was not pursued due to the potential impacts on coral communities.

5.4.4.2 Safe Harbour Layout - Option 2

Option 2 was generated following the first marine ecology survey undertaken by Cardno in 2015. An analysis of this option has indicated that it:

- Proposes a development footprint of 5.55 hectares;
- Proposes a location that will impact on 1 hectare of aggregate coral;
- Proposes a location that has 9.2% of the coral being high density;
- Proposes a location that will re-use the existing channel and turning basin area; and
- Design would not necessitate changes to the State/Commonwealth Marine Park Boundary

This option was not pursued due to potential impacts on coral communities.

5.4.4.3 Safe Harbour Layout - Option 3

Option 3 was generated following the second marine ecology survey undertaken by Cardno in 2016. An analysis of this option has indicated that it:

- Proposes a development footprint of 5.19 hectares;
- Proposes a location that will impact on 0.9 hectares of aggregate coral;
- Proposes a location that has 10.2% of the coral being high density;
- Proposes a location that re-uses the existing channel and turning basin area; and
- Design would not necessitate changes to the State/Commonwealth Marine Park Boundary.

This option was not pursued due to potential impacts on coral communities.

5.4.4.4 Safe Harbour Layout - Option 4

Option 4 represents the culmination of an iterative process involving consultation with key stakeholders and design revisions responsive to increasing levels of site specific information. This option was assessed as having the following impacts/implications::

- Proposing a development footprint of 5.19 hectares;
- Proposing a location that will impact on 0.23 hectares of aggregate coral - the lowest of all options;
- Proposes a location that has the lowest impacts on estimated high density coral communities at 0.9%;
- Re-using the existing channel and turning basin area, with the greatest impact arising from this option caused by navigation widths; and
- Design would necessitate changes to the State/Commonwealth Marine Park boundary to enable the harbour to be located closer inshore to avoid higher density coral communities

This option was preferred as it represents the lowest impact on high density coral communities and has the lowest aggregate area of coral directly affected by the proposed footprint, notwithstanding that this option would also require potential changes to the State/Commonwealth Marine Park boundary to enable the harbour to be located closer inshore to avoid higher density coral communities.

5.4.4.5 Safe Harbour Layout - Option 5

The proponent was requested to assess a layout option involving positioning of the safe harbour directly in front of the existing resort. This option was assessed as having the following impacts/implications:

- Proposes a development footprint of 5.19 hectares;
- The same entrance channel as indicated on Option 4 would be required in order to avoid impact on various slow growing massive growth form corals;
- Proposes a location that will impact on 0.6 hectares of aggregate coral;
- Proposes a location that has 0.9% of the coral being high density;
- Design would not necessitate changes to the State/Commonwealth Marine Park Boundary; and
- The impact on the ability of the resort to operate would be very significant due to:
  - land access to the resort having to be located in front of the resort;
  - amenity and safety concerns due to the mixing of service and resort vehicles; and
  - the beach in front of the resort being compromised by vessels.

This option was not pursued due to the potential impact on high density coral communities.

5.5 Summary

Resort Alternatives

The existing resort is in a very run down state and as it further deteriorates it will become an eyesore and unattractive place for passing boats and visitors to the National Park. An analysis of the various options has identified that a 'do nothing' option is inconsistent with the perpetual lease conditions which requires the Lessee to provide and maintain tourist accommodation of an acceptable standard and conduct a tourist resort on the land (Queensland Department of Land Vol 7713 Fol. 246). Further, the continued loss of a 225 room resort has also had a deleterious impact on visitor capacity in the Whitsunday Region and the local and regional economy resulting in job losses and suppliers incomes.

The rebuilding of the existing resort was assessed as an option but this was not considered viable as the existing buildings have substantially deteriorated from the extreme weather and environmental conditions, lack of maintenance and general wear associated with their age. The buildings are exhibiting finishes deterioration, services failures and water damage to a point where restoration is not considered practical or economically feasible. Furthermore the accommodation offering is limited (all rooms offering essentially the same layout) and the tourist market profile has changed as evidenced by non-financial viability of the previous resort. The alternative to rebuild as existing is not tenable and also underlines the rationale for White Horse Australia Lindeman Pty Ltd seeking to develop a brand new product inclusive of new facilities.

The preferred option is the redevelopment of the existing resort to create a variety of accommodation options and a wide range of supporting amenities within the resort. It is of particular importance to an island resort because it is needed to provide a critical mass of facilities and experiences to attract visitors. This strategy is fundamental to establishing Lindeman Island's international profile and its competitiveness as a world class destination resort.

Airstrip Alternatives

Although well maintained the existing private airstrip is not used by commercial aircraft with the exception of authorised charters. During the wet season the lowest part of the main runway - in the vicinity of the runways intersection - can be flooded and boggy which limits aircraft operations to helicopter only. In addition, the surface is also too rough for many aircraft. As such it is necessary to upgrade the main runway to a sealed surface with upgraded storm water drainage to allow for operations during rainy periods. The preferred option is for the main sealed runway to be extended within the existing lease areas to approximately 966 metres to provide for Code 1B design aircraft (with take-off and landing required in a southerly direction). While this option will necessitate some clearing and disturbance to Commonwealth and State listed Broad Leaf Tea Tree Community (*Melaleuca viridiflora*), this clearing is necessary to achieve required safety transitional surfaces. Larger planes (e.g. Dash 8) were considered but not pursued due to the length of the runway required and consequent impacts on the land tenure and the Commonwealth and State vegetation community located to the east of the runway.

Safe Harbour Alternatives

Five alternative locations for a safe harbour were investigated across the island by BMT WBM (2013), with refinement of the Home Beach location following ecological and planning assessments undertaken by Cardno (2015 and 2016). The sites located at Gap Beach, Boat Port and Billy Goat Point were not considered feasible as they are remote from existing resort infrastructure, rely on a new access road being created through the National Park, have extreme costs associated with dredging/breakwater construction and are inconsistent with the Whitsundays Plan of Management – Setting 1 designation. Further, the Home Beach West option while consistent with the Whitsundays Plan of Management Setting 1 designation, was not considered to be desirable due to aggregate area of coral affected being 0.6 hectares while Home Beach East affecting an aggregate area of coral of 0.23 hectares. An analysis the costs associated with the proposed safe harbour at the various locations found that the site of the existing jetty at Home Beach East had a preliminary cost estimate for dredging and breakwater construction at around $17M, with the Home Beach West location (in front of existing resort) estimated to be in the order of $16M. The location south of Billy Goat Point could be developed without reef dredging but the breakwater costs would be in the order of $286M because of the deeper water at the site. Boat Port and Gap Beach would both require significant breakwaters and dredging with development costs in the order of $100M and $50M respectively (BMT WBM, 2013). Based on an assessment of the alternative locations Home Beach East was identified as the preferred location for the safe harbour.

The assessment of the safe harbour also involved the identification of various designs at Home Beach to seek to limit disturbance to the existing coral communities, resulting in an overall reduction of the aggregate area of coral habitat to be disturbed from 1.8 hectares from the initial design proposed in the EPBC Act referral documents to 0.23 hectares for the preferred Safe Harbour Option 4. Safe Harbour Option 4 was preferred over all designs as it limited the aggregate impact on coral directly affected to 0.23 hectares, with all other options affecting a greater aggregate area of coral. It also proposed one of the smallest development footprints at 5.19 hectares and re-used the existing channel and turning basin area.

With the commencement of the Great Barrier Reef Marine Park Authority's (GBRMPA) Dredging Coral Reef Habitat Policy (2016), further impacts on Great Barrier Reef coral reef habitats from yet more bleaching, and the recent impacts from Tropical Cyclone Debbie, the proponent no longer seeks assessment and approval to construct a safe harbour at Lindeman Island. Instead the proponent seeks assessment and approval for upgrades to the existing jetty and additional moorings in sheltered locations around the island to enable the resort's marine craft to obtain safe shelter under a range of wind and wave conditions.

The proponent will now need to rely on a greater number of aircraft movements using an upgraded airstrip (as per airstrip option 3 detailed in **section 5.3.3**).

Information on the current proposed marine access is included in **Chapter 4 – Project Description** and **Chapter 25 – Transport** (section **25.5.1**).

The expression of the preferred project alternatives are identified in the Masterplan presented in **Figure 5-3 (noting that the safe harbour is no longer proposed).**

Note: A safe harbour is no longer proposed.

1. SAFE HARBOUR - INDICATIVE LAYOUT AND LOCATION
2. 5 STAR BEACHSIDE RESORT (136 SUITES)
3. VILLAGE - RETAIL, CONFERENCE AND BUSINESS CENTRE
4. VILLAGE - SPORT CENTRE
5. VILLAGE - STAFF ACCOMMODATION AND AIRPORT LOUNGE
6. MAINTENANCE AND SERVICES
7. HANGARS
8. RUNWAY
9. GOLF COURSE
10. 6 STAR SPA RESORT (59 VILLAS)
11. HEALTH RETREAT AND DAY SPA
12. TOURIST VILLA PRECINCT
13. 5 STAR ECO RESORT (41 VILLAS)
14. GLAMPING PRECINCT (30 TENTS)
15. ROCK BAR
16. POTENTIAL SOLAR PV PANEL AREAS
17. MAPPED VEGETATION COMMUNITIES

KEY PLAN

0 50 150 250 400

25 100 200 300 500

Figure 5-3. Preferred Project Alternatives (DBI Masterplan, November 2016).