LINDEMAN

QUEENSLAND ▪ AUSTRALIA

GREAT BARRIER REEF RESORT AND SPA

INTIAL ADVICE STATEMENT

MAY 2015

WHITE HORSE

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DBI
DESIGN

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Executive Summary

White Horse Australia Lindeman Pty Ltd propose to redevelop the existing resort at Lindeman Island into a world class integrated tourist resort with a Spa, Tourist Villas and Safe Harbour. The proposed design incorporates environmental improvements to protect the values of the Great Barrier Reef World Heritage Area and set new international standards in environmental sustainability and integrated resort design.

The redevelopment will result in a world class experience, which will not only lift the marketability of the island but also reposition and revitalise the Whitsundays and Queensland as a vibrant domestic and international tourist destination. The proposal would contribute to achieving the Queensland Government initiatives to double annual tourism visitor expenditure to $30 billion by 2020 and would seek to increase the labour force and increase accommodation capacity in line with the Commonwealth's Tourism 2020 Strategy. The proposal is also consistent with the Mackay Destination Tourism Plan which supports the revitalisation of key tourism sites, including Lindeman Island.

While the location of buildings, density of development, infrastructure and the Safe Harbour, are to be refined through the EIS process, key aspects of the proposal comprise:

- Beach resort - redevelopment of existing resort to achieve a new 5 star beach resort with 136 suites, conference centre, beach club and a new central facilities building which includes restaurants, bars and lounges;
- Spa resort - on the headland adjacent to the existing resort a new 6 star Spa resort is proposed with 55 villas, central facilities, entry lounge, Spa, sea view restaurant, pool and signature rock bar. The signature rock bar is proposed to be located at the south-west corner of the headland and will provide spectacular alfresco dining close to the sea;
- Tourist villa precincts - two tourist precinct villa precincts accommodating 95 tourist villas are proposed to the north-east and the north-west of the existing resort;
- Eco resort - a new 5 Star Eco Resort is proposed at the northern end of the lake gently falling towards the western coastline and will consist of 49 villas, a central facility, a boathouse and a waterside restaurant;
- Village - a central village precinct is proposed that will accommodate a bar, night club, restaurant, conference facility buildings, arrival centre, shops, restaurants, sport and recreation centre and a staff village;
- Services infrastructure precinct - the existing services including power (solar arrays proposed), sewerage and water treatment plants will be replaced to increase capacity and reflect current best practice;
- Airstrip - the existing airstrip is proposed to be upgraded to provide for near all-weather status and capable of landing small jets and helicopters;
- Golf course - a four hole golf course is proposed adjacent to the tourist villa precinct (a reduction in size from the existing layout);

- Safe harbour - a new Safe Harbour is proposed to provide access for the transfer of guests via ferries, luxury vessels and private charters which offers greater protection from the prevailing wind directions; and
- Ecotourism and environmental enhancements - new ecotourism opportunities are proposed, including a coral planting program and a National Park and Great Barrier Reef Educational Centre (for guests and visitors). A vegetation replanting program is also proposed over previously disturbed/cleared areas.

The design process to date has identified a development layout that seeks to avoid, where possible, impacts on environmental values including the Great Barrier Reef World Heritage Area. Further, while the Masterplan Concept included in **Appendix 1** shows an indicative position for each building, it is proposed that the positions of all buildings will be better defined following detailed onsite investigations that take into account localised attributes such as slope, stormwater run-off, rocky outcrops, significant vegetation and views and visibility from the Great Barrier Reef World Heritage Area.

The proposal will require approval under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* and *Great Barrier Reef Marine Park Act 1975*. As part of the assessment under the Queensland Government's *State Development and Public Works Organisation Act 1971*, approval is also being sought under the *Coastal Protection and Management Act 1995, Land Act 1994, Marine Parks Act 2004, Nature Conservation Act 1992, Sustainable Planning Act 2009* and *Vegetation Management Act 1999.* It may also require approval under the State's *Aboriginal Cultural Heritage Act 2003, Environmental Protection Act 1994, Fisheries Act 1994, Native Title (Queensland) Act 1993, Transport Infrastructure Act 1994, Water Act 2000* and *Wet Tropics World Heritage Protection and Management Act 1993.*

The construction and operation of the proposed resort will have significant impact on Regional GDP with a final development cost of approximately $600 million and the creation of approximately 865 construction jobs (on-site and off-Island during the construction period) and 1,100 part time, full time and casual jobs once operational (including 300 staff on the Island).

In recognition of the significant economic benefits associated with the proposal and in order to better integrate and streamline the assessment process, the proponent is seeking that it be declared a "coordinated project" in accordance with section 26(1) and 27 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). This would also serve to streamline State and Commonwealth assessment requirements in accordance with the EPBC Act Bilateral Agreement.

1 Introduction

1.1 Background

Lindeman Island was one of the first islands in the 74 Whitsunday islands group to be used as a tourist resort, with tourist operations commencing in 1923 when Angus Nicholson established a camp for visitors. Prior to this time the Island was used for sheep grazing following the issue of a lease in 1905. The major tourist investment on the island occurred when Club Med established their first Australian resort in 1992. It was a 225 room 3 star resort with an emphasis on families, adventure and entertainment. Club Med spent in the order of $85 million in 1990 on the development of the Resort. Since the 1990s the resort has undergone only minor renovations and suffered significant damage during Cyclone Yasi in 2011. The resort was closed in January 2012 and purchased in the same year by White Horse Australia Lindeman Pty Ltd.

The Directors of White Horse Australia Lindeman Pty Ltd have investigated a wide range of potential development scenarios for the Island. The existing resort is in a very run down state and as it deteriorates further will become an eyesore and unattractive place to visit by passing boats and visitors to the National Park. The investment in the infrastructure and ownership of the island cannot tolerate a 'do nothing' scenario and is inconsistent with the Perpetual Lease conditions which state that the Lessee must 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). The loss of a 225 room resort has also had a deleterious impact on the local and regional economy resulting in job losses and suppliers incomes. It also extinguishes visitor capacity for the Whitsunday Region which has a flow-on effect to the available supply and marketable product for the local tourist industry.

The project has an estimated final development cost of $600 million and will create approximately 865 construction jobs (on-site and off-Island during the construction period). It is estimated that the resort will generate approximately 1,100 full time, part time and casual jobs in the region once operational (including 300 staff on the Island).

In recognition of the significant economic benefits associated with the proposal, the proponent is seeking that it be declared a "coordinated project" in accordance with section 26(1) of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). This would also serve to streamline State and Commonwealth assessment requirements in accordance with the EPBC Act Bilateral Agreement. The preparation of an Initial Advice Statement (IAS) is the first step in the coordinated project declaration process.

1.2 Purpose and Scope of the IAS

This IAS has been prepared to demonstrate that the proposed Lindeman Island Integrated Tourist Resort project is of local, regional and state significance on environmental, social and economic grounds, and that it is therefore worthy of declaration as a Coordinated Project under Section 26 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

The project has the following characteristics:

- it has complex local, State or Commonwealth government approval requirements;
- it is of strategic significance to the locality, region or the State, including for the infrastructure, economic and social benefits, capital investment or employment opportunities it may provide; and
- it has significant infrastructure requirements, including the proposed construction of a new Safe Harbour and upgrades to all existing services.

It is considered that due to the scale and the wide range of State Government interests triggered by the Project, an Environmental Impact Statement (EIS) under Part 4 of the SDPWO Act will be able to provide a process that will facilitate a whole-of-government assessment.

The purpose of this IAS is to:

- support an application to the Coordinator-General to declare the Lindeman Island Integrated Tourist Resort a “coordinated project” for which an EIS is required under the SDPWO Act;
- inform preparation of terms of reference for an EIS; and
- inform stakeholders and the general public of the proposal.

2 The proponent

2.1 Background

The project is to be undertaken by White Horse Australia Lindeman Pty Ltd. White Horse Australia Lindeman Pty Ltd was established in 2011 by Mr Han who has interests in iron ore mining in Western Australia, Gold Coast real estate development investments since in 2013 and is currently launching a significant import/export business involving high quality produce and products sourced from Australia into China. The Chief Executive Officer of White Horse Australia Lindeman Pty Ltd is Mr Paul Nyholt.

White Horse Australia Lindeman Pty Ltd is a subsidiary of the White Horse Group which was established in 1986 and is China's best known advertising, media and marketing company. In recent years White Horse has expanded into the property and tourism sector in China and overseas. With more than 2000 staff operating in 27 of China's biggest cities. White Horse Outdoor Media company generates over 1.6 billion RMB in revenue annually. Built on that success, the group owns China's exclusive Golf TV Channel which broadcasts to an increasingly affluent audience and a quality television and internet Shopping Channel, as well as an internet company.

White Horse Group in China (William Han) is also well known and respected by Ministers and officials from various departments in Local, State and Federal Governments as they have supported and assisted Government delegations (e.g. Trade, Immigration and Tourism) with their visits to China.

2.2 Relevant History

The project is being sponsored by Mr Jiangfeng Mao, one of the Shareholders of White Horse Australia Lindeman Pty Ltd. Mr Mao is a very successful Chinese entrepreneur in the hospitality industry. Mr Mao holds an Architecture Degree in China, and started as an Architectural Engineer in 1997. Mr Mao established his own Architectural design and engineering company in Sanya, China in 2001. He now has over 20 years experience in hotel and resort design, operation and management in China. Mr. Mao is the Zhejiang National Council President, and is also a representative on Sanya City's Chinese People's Political Consultative Conference (CPPCC) Standing Committee.

2.3 Partnerships, Corporate/Joint Venture Arrangements

Mr William Han is the Chairman of White Horse Capital Ltd and the Vice-Chairman of the White Horse Group. Mr Han will be partnering with Mr Mao on the project. Mr William William Han, 57, is the second oldest of the three Han brothers, founders of the White Horse Group. Han graduated from South China University of Technology in 1982 and came to Australia in 1988. In 1992, Han went to China as the Vice-Chairman of White Horse Group. In 1994, Han established a joint venture with Nutri-Metics in China. In 1995, Han became the soul distributor agent for Penfolds Wines in China. Mr Han received Australian citizenship in early 1995.

2.4 Relevant Project Experience

The following projects demonstrate Mr Mao and the White Horse Group's experience in tourism and resort projects.

Heaven and Earth Qixianling Baoting Tropical Resort, China

In 2003, Mr. Mao completed the development and construction of the Heaven and Earth Qixianling Baoting Tropical Resort. He was the Chairman and General Manager of this resort, and started planning the development of Sanya, Yalong Bay Tropical Paradise Forest National Park in the same year.

Yalong Bay Earthly Paradise Bird's Nest Resort in Sanya, Hainan, China

Mr Mao is well-known by the famous resort, the 5-star Yalong Bay Earthly Paradise Bird's Nest Resort in Sanya, Hainan China (Official Website: http://www.ylwpark.com/). Mr Mao, together with his family, holds 75% shares of the company and he is also the CEO of the company. The resort comprises two stages. The first stage has been completed and has been in operation since September 2009. It is 4.87 hectares in size (including the Sanya Yalong Bay Tropical Paradise Forest National Park) and comprises 210 resort rooms inside the National Park. The second stage is currently under development, with a size of 30 hectares, and construction is planned to start in 2015.

The ownership however is different from Australia, the National Park belongs to Mr Mao's company and as such, is managed and operated by Mr Mao at the same time. On average, the park has 2.3 million visitors annually. Thus, Mr Mao has significant experience in managing both a resort and a national park environmentally and economically. The resort has earned significant recognition, including:

- Continental Diamond Top Ten New Landmark Hotel by World Hotel Association;
- Hainan Top Ten Leisure Eco-Tourism Resort by Hainan State Government;
- The China Green Hotel;
- Circular Economy Demonstration Zone;
- Top ten energy-conservation meritorious enterprises; and
- Hainan new technology integrated tourism demonstration by the PRC government.

Spring Alpha Resort and Scenic Town, Anji, Zhejiang, China

Another resort developed by Mr Mao in China is the Spring Alpha Resort and Scenic Town in Anji, Zhejiang China. Anji is well-known for its lush green forest and the beautiful Jade River in China, and it is Mr. Mao's home town. Anji has forests and tea heritage and has earned the United Nations Habitat Award. The resort was developed in October 2012, and is expected to be operating fully by May 2015. Mr. Mao together with his family holds 98% shares of the resort. Investment into the resort and scenic town is over 1.2 billion Chinese Yuen (over $245 million Australian Dollars).

The development area of the scenic town is approximately 162 hectares with a total construction area of 193,000 square meters. The resort is inspired by the Ming and Qing Dynasty architecture. The overall design is an iconic fusion of ancient courtyard design and ancient building construction

complemented by contemporary architectural elements that fulfils the requirements of today's modern living. There are over 1500 rooms, comprised of a number of different types of villas. The resort also has a variety of restaurants, bars, commercial and other functional facilities with a total capacity of over 1000 pax. It is set to become Anji's new tourist attraction.

Mulan Bay World Golf Town, Asian Golf Culture Industry Center & China Golf Holiday Lifestyle Area, Wenchang, China

The Whitehorse Group are currently developing a World Golf Town at Wenchang, China. The site lies in the coastal area of Mulan Point, Fuqian Town, Wenchang City, North-East of Hainan Island and covers an area of 967 hectares, including a development footprint of 382 hectares. The proposed development has a gross floor area of approximately 2.6 million m^2, with total investment of 25.4 billion RMB. The master plan includes PGA Tour Golf Courses, Hall of Fame, Elite College, Golf Museum, Golf Exhibition Center, Golf Culture Center, International Art District; Bicycle Leisure Green Road, Coastal Leisure Walk Path, Artificial Beach, Diving Experience Zone, ATV Camp, Sea Fishing Center, International Sailing Boat Center, International Beach volleyball court, Water Sports Center, Fisherman's Wharf, International Surfing Base, as well as schools, markets and hospitals.

Simapo Island, Hainan, China

The Whitehorse Group are currently developing Simapo Island to create a world class tourism precinct. Simapo Island is surrounded by Nandu River and is located within close proximity of the main CBD (10mins) and the airport (15mins). The site has an area of 140.395 hectares (including 113.44 hectare of certified land-use right) and a 0.06 Floor-area Ratio. In order to take full advantage of its location White Horse plan to build an international competition level golf course, a five-star hotel (60,000m^2), resort villas (80,000m^2) and a yacht wharf etc, establishing a high-end holiday brand. Construction of temporary roads and a temporary bridge is scheduled to finish in August 2015.

It is the intention of Mr Mao to continue on his successful resort operation experiences in China and extend his exposure to Australia. Mr Mao was attracted by Lindeman Island's amazing natural reserve and breathtaking views on his first visit. It is believed that with his significant experience in ecological resort design and environmental management in the national resources reserve, Mr. Mao will continuously support the development of the Whitsunday Islands while preserving the natural resources of the Great Barrier Reef.

2.5 Principal Consultants

The Principal Consultants appointed to the project are:

- Project Manager - Eastview QLD (www.eastview.com.au). Eastview has extensive experience as a Project, Development and Construction Management Company. Eastview will provide Proponent Details, Resort Operation, Construction Methodology Operations and Logistics. The key designated Project Manager and Eastview Director is Graham Goldman; and
- EIS Study Lead Consultant – Cardno HRP (www.cardno.com.au). Cardno are a reputable, established and highly knowledgeable company with experience in project coordination including EIS preparation. The EIS Study Leader appointed to the project is Senior Principal, David Perkins.

2.6 Contact Details

The contact details for the project are:

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Cardno
Level 11
515 St Paul's Terrace
Fortitude Valley QLD 4006
David.Perkins@cardno.com.au

2.7 Environmental Record

The over-arching environmental philosophy of White Horse Australia Lindeman Pty Ltd is to ensure that the environmental values of Lindeman Island and the surrounding Great Barrier Reef are protected and enhanced through the development and implementation of an Environmental Management Plan to cover all facets of the development. The company has not been subject to any breaches or compliance actions.

2.8 Capability to complete IAS and EIS

White Horse Australia Lindeman Pty Ltd has the financial capacity to complete the IAS and EIS and has assembled a highly experienced project team to deliver these documents.

Whitehorse Australia through its affiliated companies in China has the financial capacity to finance all elements of the Lindeman Island integrated tourist resort. One of the partners in the development currently owns and operates a very successful resort in Sanya (China) and has modelled several aspects of this development from his property in Sanya. The partners in this development are financially sound and intend to retain the assets and to secure significant operators to run the resorts on their behalf.

3 The Nature of the proposal

3.1 Scope of the Project

The current proposal prepared by DBI Design has evolved through consultation with the project partners (White Horse Australia Lindeman Pty Ltd), tourism industry leaders, specialist environmental/engineering consultants and potential hotel operators. The design intent is to create a luxury resort which responds to World Heritage Values of the Great Barrier Reef and incorporate world's best practice in sustainable design and construction (refer to **Appendix 1 - DBI Masterplan Concept**). An extract of the Initial Concept Plan is included in the following **Figure A**.

While the location of buildings, density of development, infrastructure and the Safe Harbour, are to be refined through the EIS process, key aspects of the proposal prepared by DBI Design Pty Ltd includes:

- Beach resort - redevelopment of existing resort to achieve a new 5 star beach resort with 136 suites, conference centre, beach club and a new central facilities building which includes restaurants, bars and lounges;
- Spa resort - on the headland adjacent to the existing resort a new 6 star Spa resort is proposed with 55 villas, central facilities, entry lounge, Spa, sea view restaurant, pool and signature rock bar. The signature rock bar is proposed to be located at the south-west corner of the headland and will provide spectacular alfresco dining close to the sea;
- Tourist villa precincts - two tourist precinct villa precincts accommodating 95 tourist villas are proposed to the north-east and the north-west of the existing resort;
- Eco resort - a new 5 Star Eco Resort is proposed at the northern end of the lake gently falling towards the western coastline and will consist of 49 villas, a central facility, a boathouse and a waterside restaurant;
- Village - a central village precinct is proposed that will accommodate a bar, night club, restaurant, conference facility buildings, arrival centre, shops, restaurants, sport and recreation centre and a staff village;
- Services infrastructure precinct - the existing services including power (solar arrays proposed), sewerage and water treatment plants will be replaced to increase capacity and reflect current best practice;
- Airstrip - the existing airstrip is proposed to be upgraded to provide for near all-weather status and capable of landing small jets and helicopters;
- Golf course - a four hole golf course is proposed adjacent to the tourist villa precinct (a reduction in size from the existing layout);
- Safe harbour - a new Safe Harbour is proposed to provide access for the transfer of guests via ferries, luxury vessels and private charters which offers greater protection from the prevailing wind directions; and
- Ecotourism and environmental enhancements - new ecotourism opportunities are proposed, including a coral planting program and a National Park and Great Barrier Reef

Educational Centre (for guests and visitors). A vegetation replanting program is also proposed over previously disturbed/cleared areas.

The scope of the project also includes the rearrangement of lease boundaries and amendments to the existing National Park boundaries to allow for the creation of a more uniform boundary between the resort and National Park and provide for improved environmental management. White Horse Australia Lindeman Pty Ltd is currently in negotiations with the Department of National Parks, Sport and Racing and Department of Natural Resources and Mines and Department of Environment and Heritage Protection, to amend the existing lease boundaries. The total proposed site area is approximately 126.61 hectares, including an area of approximately 7.57 hectares for the Safe Harbour (this figure will be confirmed following the preparation of final layout plan) (refer to **Figure 3 - Proposed Tenure Arrangements**).

The development footprint is approximately 19 hectares covering the resort buildings, air strip, roads and service infrastructure (refer to **Figure A** and **Appendix 1 – DBI Masterplan Concept**).

1. 50 BERTH SAFE HARBOUR - INDICATIVE LAYOUT AND LOCATION
2. 5 STAR BEACHSIDE RESORT (APPROX 130 SUITES)
3. VILLAGE - RETAIL, CONFERENCE AND BUSINESS CENTRE
4. VILLAGE - SPORT CENTRE
5. VILLAGE - STAFF ACCOMMODATION AND AIRPORT LOUNGE
6. MAINTENANCE AND SERVICES
7. HANGERS
8. EXTENDED RUNWAY
9. GOLF COURSE
10. 6 STAR SPA RESORT (APPROX 54 VILLAS)
11. HEALTH RETREAT AND DAY SPA
12. TOURIST VILLA PRECINCT
13. 5 STAR ECO RESORT (APPROX 49 VILLAS)
14. "H20" RESTAURANT
15. ROCK BAR

KEYPLAN

0 50 150 250 400

25 100 200 300 500

FIGURE A. INITIAL CONCEPT MASTERPLAN (DBI DESIGN).

3.2 Land Use (proposed)

The project is proposal is for an integrated tourist resort that incorporates a resort, spa and tourist villas offering that will enjoy a diverse range of experiences centred on the Great Barrier Reef and World Heritage Values. The current resort has a gross floor area of approximately 21,500m^2, while the proposed resort will have a gross floor area of approximately 76,364m^2, with the exact areas to be determined following detailed design work. The master plan for the island has evolved from early concepts prepared by Hunt Design to the existing scheme conceived by DBI Design. **Table 3.2.1**. provides an overview of the key resort components.

Table 3.2.1. Overview of resort components (note: approximate areas subject to detailed design work).

Category	Precinct	Overview	Area/Number
A	Safe Harbour	Berths	50 Berths
A	Safe Harbour	Retail/Beach Club	200m^2
A	Safe Harbour	Visitor Centre	200m^2
B	5 Star Beach Resort	Suites including Day Spa	11,626m^2
C	Tourist Villas	Villas	19,000m^2
D	6 Star Spa Resort	Villas	8,460m^2
E	5 Star Eco Resort	Villas including Lakeside Restaurant	6,891m^2
F	Village	Mixed Use (Airport Lounge, Conference Centre, Retail, Sport Centre, Staff Accommodation and Maintenance)	23,737m^2
G	Airport	Hangars	5,250m^2
G	Airport	Airstrip	-
H	Lakeside Restaurant	Restaurant	200m^2
I	Day Spa	-	800m^2
TOTAL (indicative)			76,364m^2

3.3 Project need, justification and alternatives considered

Since purchasing the site in 2012 White Horse Australia Lindeman Pty Ltd has consulted with leading tourism industry experts and hotel operators to identify alternatives and define a sustainable tourism model for the redevelopment of Lindeman Island. White Horse Directors are also experienced resort owners and operators in China and recognise the importance of how the project is delivered and operated and have extensive planning strategies to ensure overall project feasibility.

Two other alternatives to taking the proposed action were considered but were not pursued for the reasons outlined below.

(a) Do Nothing

The existing resort is in a very run down state and as it deteriorates further will become an eyesore and unattractive place to visit by passing boats and visitors to the National Park. The investment in the infrastructure and ownership of the island cannot tolerate a 'do nothing' scenario and is inconsistent with the Perpetual Lease conditions which state that the Lessee must 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). The loss of a 225 room resort has had a deleterious impact on the local and regional economy resulting in job losses and suppliers incomes. This alternative would also extinguish visitor capacity for the Whitsunday Region which would have a flow-on effect to the available supply and marketable product for the local tourist industry.

(b) Rebuild as Existing

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 to embark on a brand new product inclusive of new facilities and the construction of a Safe Harbour which has benefits beyond an amenity solely for the Resort.

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. It is of particular importance to an island resort because it will provide a critical mass of facilities and experiences needed to attract visitors. This strategy is fundamental to establishing Lindeman Island's international profile and its competitiveness as a world class destination resort.

Alternative locations for a proposed Safe Harbour were investigated following an ecological and engineering assessment undertaken by BMT WBM in October 2013 (refer to **Appendix 4**). Since this time the location and design of the Safe Harbour has been refined to limit disturbance to the existing coral communities and ensure that technical requirements of the harbour code can be achieved.

3.4 Components, developments, activities and infrastructure that constitute the project to be declared coordinated

Key aspects of the proposed development that are likely to constitute the project to be declared coordinated include:

- Buildings – all proposed buildings including the proposed beach resort; spa resort; tourist villas; eco resort; staff accommodation and village buildings;
- Services – power generation, sewerage and water treatment plants;
- Airstrip – proposed upgrades to provide for near all-weather status and capable of landing small jets and helicopters;
- Safe harbour - a new Safe Harbour is proposed to provide access for the transfer of guests via ferries, luxury vessels and private charters which offers greater protection from the prevailing wind directions. The proposed Safe Harbour is located within the Great Barrier Reef World Heritage Area and Marine Park.

Refer to **Appendix 1 – DBI Masterplan Concept.**

3.5 Infrastructure requirements (proposed)

A preliminary assessment of the infrastructure services proposed to service the resort has been undertaken by Flanagan Consulting Group and will be updated as part of the EIS. External infrastructure requirements, including transport/access associated with the construction process, movement of staff and disposal of waste will be investigated in the EIS.

Key aspects of the proposal include:

- Water Supply - the water demand from the existing Gap Creek Dam will be reduced through rain water harvesting, water consumption minimisation fittings, high levels of environmental awareness and using filtered sea water for swimming pools. During the EIS a water supply management analysis will be carried out;
- Energy - installation of solar PV technology and improved high-efficiency diesel generators will lower power consumption requirements and result in lower emissions and improved air quality;
- Sewerage - a new Sewage Treatment Plant is proposed featuring a modular Bioreactor/Membrane Filtration system capable of treating the effluent to Class A or Class A+ quality standard. The upgrades to the sewerage will produce higher quality effluent compared to the existing plant;
- Stormwater - the stormwater drainage system will incorporate water sensitive urban design principles and a range of measures to ensure the removal of gross pollutants; and
- Waste - during the EIS process, a Waste Management Plan will be developed that follows the waste management strategy of 'Avoid, Reuse, Recycle, and Dispose'. For any materials that can be reused on the Island, it is proposed to dispose of waste at Mackay Regional Council's Materials Recycling Facility (MRF) to maximise recycling and reuse of materials;
- Telecommunications – an existing Telstra tower is located near the western boundary of the site; and

- Transportation – access to the Island is proposed by the new upgraded air strip and boats accessing the Island through the proposed Safe Harbour. Movement around the resort will be undertaken by golf carts.

The following sections provide further detail on the above points.

Water Supply

New distribution reservoirs will be carefully sited as the various precincts are developed. During preparation of the EIS, a detailed water supply management analysis will be undertaken to thoroughly investigate and identify the most appropriate water supply strategy for the proposed development

Efficiency

To assist Gap Creek Dam, the proposed development will adopt a policy of maximizing the rainwater it harvests.

Indoor Water Reduction Initiatives

The resort will incorporate a range of water efficient fixtures. The water efficient items include:

- water efficient showers, taps, toilets, smart appliances such as dishwashers and clothes washing machines; and
- Guests will be also encouraged to re-use towels and linen.

Outdoor Water Efficiency

Outdoor water demand will be reduced through the use of native plant species, drip irrigation and smart irrigation controls such as rain sensors. The efficiency of outdoor water use will be improved through the following features:

- The use of native species in landscaped areas;
- Divert filtered backwash from pools and spas for re-use on landscaping etc;
- Drip irrigation will be used for common irrigation systems where practical;
- The golf course will use irrigation practices that help conserve water;
- Automatic irrigation systems will be controlled using timers, wind speed gauges and soil moisture probes; and
- Irrigation timers will be used to ensure over-irrigation does not occur.

Energy

The resort will be powered by a hybrid energy generation system, combining diesel generation and solar PV technology/battery storage. The resultant change will be a vast improvement over current installations in terms of energy efficiency and environmental impact. The development will aim to minimise its use of energy by incorporating state-of-the-art Environmentally Sustainable Design (ESD) features such as:

- Building design to maximise natural flow ventilation and reduce the need for air conditioning;
- Building design to maximise natural light and reduce power requirements;
- Low energy usage appliances installed in all buildings;
- Transportation around the island to be predominantly by foot, bicycle or electric carts;
- Motion sensors to be installed in buildings to reduce energy use wastage;
- State-of-the-art energy metering to monitor and manage energy usage and efficiency.

Wastewater Management

Wastewater will be generated from the airstrip, Safe Harbour, pools, spa, restaurants, bars and the range of resort accommodation facilities. A range of treatment options will be thoroughly investigated including a significant upgrade of the current wastewater system. The new facilities will be designed, constructed and operated to ensure the most sustainable option with the least environmental impact is implemented.

Stormwater Drainage

Best practice stormwater and drainage design is critical to ensure the water quality is not adversely impacted by the proposed development. Conveyance of flows from new areas of development will be done in a way that is sympathetic to the existing drainage characteristics of the island and receiving environment. New drainage networks will also feature elements to remove gross pollutants prior to discharge.

Solid Waste Management

Waste will be generated during all phases of the proposed development including demolition of the old resort elements, construction of the new resort, operation and maintenance activities. During the EIS process, a Waste Management Plan will be developed that follows the waste management strategy of 'Avoid, Reuse, Recycle, and Dispose'. Waste avoidance, reuse and composting programs will minimise the amount of waste requiring transport from the Island (via barges), while recycling programs will facilitate the recovery of reusable materials that would otherwise go to landfill. The EIS process will also identify waste reception facilities to be provided at the proposed Safe Harbour.

Fuel Storage

Fuel storage facilities for the proposed development will be constructed and operated in accordance with the State's requirements for the applicable Environmentally Relevant Activities.

Transportation

Boats

It is proposed that guests and staff will primarily access the site from boats using the proposed new Safe Harbour. An indicative design of the harbour is shown in the attached plans and this is subject to further review and refinement to achieve a functional harbour that minimises environmental impacts. The primary intent of the Safe Harbour is for the transfer of guests and staff via ferries, luxury vessels and private charters, as well as providing berths for approximately 50 vessels of varying sizes. It is noted that construction work on both the Safe Harbour and tourist resort will lead to an increase in water borne activity.

This harbour, as existing and on completion of the project, is proposed to be serviced by a barge on the eastern side of the jetty discharging onto a concrete ramp. From this point small trucks can move supplies to the central receiving facility within the staff and maintenance precinct. The same operations will efficiently remove refuse and other materials from the island.

The operation of the Safe Harbour will be controlled by appropriately trained staff. To minimise impact on the harbour and surrounds, there will be no live-aboards and vessels will not be allowed to empty bilges or waste water within the harbour. There is no intention to provide fuel or maintenance facilities in the harbour precinct.

Airstrip

The existing airstrip consists of two runways. The main runway aligned 18/36 is a grass strip a nominal 1097m long. The secondary runway is aligned 13/31 and is also grass with a nominal length of 680m. Although well maintained the airstrip is not licensed and is not used by commercial aircraft apart from 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. The surface is too rough for many aircraft. It is proposed to upgrade the main runway to a sealed surface with upgraded storm water drainage to allow for operations during rainy periods. The main sealed runway will be extended within the existing leased areas to approximately 1200 metres which will open up the airfield to a wider variety of aircraft including small jets. Being within the Control Zone of Hamilton Island, aircraft operations at Lindeman Island require clearance from Hamilton Control Tower during periods when the Control Tower is operating. At other times the airstrip is within the special Whitsundays CTAF operation region. The smaller secondary runway will not be used for aircraft movements but will be used in part for aircraft parking and possible location of aircraft hangars.

In keeping with the new status of Lindeman Island as a premier tourist destination a custom designed arrivals and departure lounge is proposed on the edge of the airstrip for the comfort of guests. The lounge will be located adjacent to designated helicopter landing pads. A concierge

service at the lounge will transport guests to their accommodation or to the resort facilities. Amenities in the lounge will ensure the comfort of waiting guests.

Island

Transportation between the resort facilities will be undertaken by pedestrian access, golf carts and service vehicles. The pathways are designed for electric golf carts and as such will be narrow with discrete passing zones to minimise site disturbance. Guests arriving by sea or air will be met at the arrivals pavilions by golf carts to be transported directly to their rooms.

Cyclone Shelter

A dedicated cyclone shelter is proposed to offer safe refuge for staff and visitors should they be unable to evacuate the resort.

Mainland Impacts

Mainland impacts associated with the proposal (e.g. construction vehicle access and access from Mackay and Proserpine Airport) will be investigated during the EIS, including potential impact on state controlled road infrastructure. The EIS will provide details on the proposed haulage routes for construction and demolition material and equipment.

3.6 Timeframes for the Project

Subject to obtaining the necessary Commonwealth and State Government approvals, it is intended that site works commence in June 2017 with project completion December 2020. This timing assumes approval in approximately June 2016 for the EIS.

Table 3.6.1. Proposed Project Milestones.

Component	Dates	Description of Works
Approvals		
IAS	March 2015	Submission of IAS and Supporting Information
EIS	April 2015 – June 2016	EIS Process as a Co-ordinated Project
MCU	July 2016 – September 2016	MCU through Mackay Regional Council
Design		
Precinct Approvals	October 2016-January 2017	For each precinct
Detailed Design	February 2017 – July 2017	Detailed Design Development Documentation
Tender	May 2017 – June 2017	• Tender Documentation • Tender and Contract Documentation • Appoint Builder and Agree Contract
Construction		
Civil Works	June 2017 – July 2018	Entire Site
5 Star Resort	June 2017 – January 2019	136 Suites including Day Spa and Central Facilities
Village	July 2017 – December 2018	Mixed use including retail, function & convention facilities
Staff Accommodation	August 2017 – November 2018	Accommodation for Resort Staff

Component	Dates	Description of Works
Sports Centre and Facilities	September 2017 –October 2018	
Golf Course	November 2017 – August 2018	Upgrade and redevelopment of the Golf Course Holes
Airport Upgrade and Hangars	September 2017 – December 2018	Extension and Upgrade of existing airstrip, plus new arrivals lounge and hangars
Safe Harbour	August 2017 – December 2018	New Safe Harbour including 50 Marine Vessel Berths of varying sizes
Marina Retail and Facilities	May 2018 – December 2018	Arrivals Hut including Tourist Services
6 Star Resort	November 2018 – March 2020	59 Villas
Eco Resort	November 2018 – March 2019	49 Villas
Villa Construction	July 2018 – February 2020	95 Villas
FF & E Fit-out	October 2018 – December 2020	Full fit out of all FF & E to 5 Star, 6 Star, Eco Resort and Associated Facilities

Note: FF & E - Fixtures, Fittings and Equipment.

3.7 Construction and operational processes

The following construction and operational processes are likely to be followed:

- Due to the size and magnitude of the overall project, construction work will be undertaken in zones, with:
    - Zone 1 - Structure crew will work on the 5 Star, staff Accommodation and town centre initially;
    - Zone 2 - 6 Star Resort and Eco Resort;
    - Zone 3 – Marine;
    - Zone 4 – Airport;
    - The “finishes crew” would work on Zone 1 while the “structure crew” works on Zone 2. Once the finishes are completed in Zone 1 this crew would move onto Zone 2 to complete these works;
    - Separate crews would work on Zone 3 (Marine) and Zone 4 (Airport precinct) as this type of construction worker experience would differ to the hotel precincts;
- An accommodation camp will be established on site in the vicinity of existing accommodation area for the anticipated construction crew. The majority of the workforce will live in a “fly-in”/”fly-out” regime with some workers commuting to the Airlie Beach area;
- Existing buildings will be demolished down to the foundations to enable the new structure for the 5 Star resort to be constructed;
- Appropriate demolished material will be recycled to use as a road base and pathways on site for the new resort layouts;
- The resort would open at three different times, in the following order:
    - Five Star Resort, Village, Staff Accommodation, Marina and Airport Upgrade;
    - Eco Resort; and
    - 6 Star Spa Resort.

- The method of construction of the hotels would be typical concrete framed structures complying with cyclone codes with aluminium windows and roofing to architects details;
- A concrete batching plant is proposed to be constructed on site and the proponent will explore building any pre-cast elements on site to expedite construction and minimise shipping requirements;
- Formwork systems options will be explored to speed up the construction process;
- A shipping regime will be established to ascertain the ability to have customs clear the goods in the Whitsundays to avoid delays of going to Brisbane for clearing and then transporting back up to the Whitsundays;
- The head contractor will have an overall construction manager based on site full time with Zone project managers looking after each precinct;
- The project manager will have not only the responsibility of the delivery of the construction works but pay close attention to:
    - Safety;
    - Compliance with the proposed Environmental Management Plan (Terrestrial and Marine);
    - Materials Handling;
    - Worker Accommodation and transfers; and
    - Interface with all levels of authorities.
- The Developer proposes that the Project Manager will provide full time Supervision on site during the construction process to ensure that all obligations to all levels of government are met.

Key construction processes that will need to be addressed in the EIS process include:

- Access to water for civil works construction;
- Sourcing and transport of construction materials including quarry products, concrete and construction materials and the associated logistics of haulage to site (Laguna Quays or Shute Harbour options will be investigated);
- Island accommodation and mainland transport for the construction work force;
- Water Quality Management;
- Management of Acid Sulphate soils;
- Site management during cyclonic and heavy rainfall events;
- Waste management and disposal; and
- Emergency services access.

Key operational processes that will need to be considered include:

- Potable water supply and fire fighting;
- Sewerage and waste disposal;
- Power mains and back up supply;
- Water Quality and Stormwater Drainage Management;
- Transport and delivery of goods and produce;
- Daily transport and/or parking for the work force (where commuting from the mainland);

- Transport and parking for guests and visitors to the resort; and
- Emergency services access.

3.8 Workforce requirements during construction and operation

The project will generate demand for workforce accommodation during the construction phase and for permanent accommodation for the operational workforce. It is expected a portion of the workforce will be generated from the existing residents of the Mackay regional area (including Proserpine, Airlie Beach, Midge Point), whilst other parts of the workforce will move to the Mackay regional area (or be contracted FIFO workers) for the duration of construction and some will move permanently to gain employment in the new resort facilities.

Over the four year construction period a cycle of trades will be required, essentially moving from one precinct to the next as the construction progresses. The program will be formulated with the Principal contractor to ensure that labour is available when required to ensure the project remains on target for completion. Facilities on the island are proposed to be upgraded to allow for the project construction workers to be accommodated on the Island (approximately 400 per annum). The choice of workforce accommodation will be an early discussion with the Principal contractor together with a feasibility assessment to be done for the recommended strategy.

Table 3.8.1. Proposed workforce requirements (Note: Timing is assumed EIS is approved June 2016).

Year	Description of Works	Anticipated Workforce Numbers per Year		
		Lindeman Island	Other[1]	Total
2017	Civil, 5 Star Resort, Village, Staff Accommodation, Sports Centre and Facilities, Golf Course, Airport Upgrade, Marina & Facilities	400	410	810
2018	Civil, 5 Star Resort, Village, Staff Accommodation, Sports Centre and Facilities, Golf Course, Airport Upgrade, Marina & Facilities, 6 Star Resort, Eco Resort, Villa Construction, FF&E Fitout	500	530	1,030
2019	Civil Works, 6 Star Resort, Eco Resort, Villa Construction, FF&E Fitout	400	410	810
2020	6 Star Resort, Eco Resort, Villa Construction, FF&E Fitout	400	410	810

[1] Consists of off island jobs such as manufacturing, fabrication and FF&E (Fixtures, Fittings and Equipment).

3.9 Economic Indicators

The redevelopment of Lindeman Island into a major tourist resort is forecast to provide the following significant economic benefits:

- an estimated final development cost of $600 million;
- creation of an average of 865 construction-related jobs each year on-site and off-site during the construction period;
- creation of around 300 full time equivalent jobs on the Island once operational plus additional employment created elsewhere in the region through flow-on or multiplier effects;
- privately funded infrastructure development project provided at no cost to the Government;
- an average of over 858 visitors and staff on the Island per day totalling around 313,000 person days per year;
- direct expenditure on Lindeman Island of about $30 million a year by Lindeman Island visitors and employees;
- a substantial increase in total visitor days in the regional Mackay area, generating income and business for not only the local area but also companies that offer commercial flights to the area;
- broadening of the regional Mackay economy through improved elevation of regional based tourism as an industry, through "destination" marketing and thus reducing the current reliance on the mining and agricultural industries; and
- significant increases in local and state government revenue through rates, property transaction duties, land tax and payroll tax.

The project will contribute significantly to the offering of Queensland's Great Barrier Reef and coastal island attractions. In turn, this will improve the economic diversity and social opportunities of the region whilst making a positive contribution to the ecological integrity of Lindeman Island.

3.10 Financing requirements and implications

Whitehorse Australia through its affiliated companies in China has the financial capacity to finance the precincts which form the total redevelopment of Lindeman Island. One of the partners in the development currently owns and operates a very successful resort in Sanya (China) and has modelled several aspects of this development from his property in Sanya. The partners in this development are financially sound and intend to retain the assets and to simply secure significant operators to run the resorts on their behalf.

4 Location of Key Project Elements

4.1 Location

Lindeman Island is located approximately 40 kilometres south-east from Shute Harbour on the mainland and some 15 kilometres from Hamilton Island (refer to **Figure 1**). Lindeman Island has a total area of approximately 637 hectares. The resort redevelopment occupies perpetual and term leases totalling approximately 137.8 hectares. The balance of Lindeman Island is declared National Park. Lindeman Island is within the jurisdiction of Mackay Regional Council.

4.2 Tenure

The proposed redevelopment is to be located on a range of land tenures, either currently leased by the proponent or new development land, including land administered by the Department of Natural Resources and Mines (DNRM) under the *Land Act 1994* and National Park administered by the Department of National Parks, Sport and Racing (NPSR).

The real property description for the leases are Lot 2 CP858366, B HR2029, C HR2029 and D HR2029. The tenure of these Lots is currently a mix of perpetual and term leases. Negotiations are currently being undertaken between the Applicant and the Department of Natural Resources and Mines ("DNRM") and the Department of National Parks, Recreation, Sport and Racing ("DNPSR") to address tenure matters, including the rationalisation of the boundaries of the National Park land and the resort leases. In relation to the components of the development involving National Park, the Applicant will seek approval of DNPSR in relation to the excision of the land from the National Park to enable consideration of further tenure amalgamations or development leases under the Land Act. Land Act tenure is also required for the proposed Safe Harbour and boat ramp.

The proposed realignment of the lease boundaries is based upon the topography, existing land uses, protection of areas of high ecological value and recognition of areas that have been previously cleared. The boundary realignment also seeks to create a more uniform boundary between the resort and National Park and provide for improved environmental management. The following table 4.2.1(a) provides an overview of the current lot descriptions (refer to **Figure 2**).

Table 4.2.1(a). Current Lot descriptions.

Lot on Plan	Lease Type	Lot Area
2 CP858366	Perpetual	71.5602 hectares (including 1.097 ha Road Easement and Lot 3 on CP858361 – 0.1012 ha)
Lot B HR2029	Term	3.28 hectares
Lot C HR2029	Term	22.27 hectares
Lot D HR2029	Term	40.73 hectares
Total area:	--	**137.8402 hectares**

The proposed site area and tenure arrangements are illustrated on **Figure 3**. The total proposed site area is approximately 126.61 hectares, including an area of approximately 7.57 hectares for the Safe Harbour (this figure will be confirmed following the preparation of final layout plan).

5 Description of the existing environment

5.1 Natural Environment (existing)

The area around the existing resort is bounded by striking rock formations to the east and west of the resort and on the lower undisturbed slopes the vegetation is generally of native species including some magnificent hoop pines. The upper slopes in the immediate area have been cleared in the past and currently consist of buildings, pathways, lawns and managed landscaped areas. Parts of the site have spectacular views of the Great Barrier Reef Marine Park and surrounding Islands (e.g. Seaforth Island).

5.1.1 Land

Lindeman Island was created after part of a volcanic mountain range was inundated by rising sea levels. The terrain generally slopes towards the coastline. The Land Zones contained within the site include tidal flats and beaches, coastal dunes, alluvium, hills and lowlands on metamorphic rocks. Vegetation ranges from eucalypt woodland and grasslands. Areas to the east and west of the airstrip have been previously cleared, perhaps for previous grazing activities. The site may contain acid sulfate soils and this will be investigated as part of the EIS process.

5.1.2 Water

Gap Creek Dam is the primary water supply source on the Island. With a full supply capacity of 200ML the dam has historically had the capability to supply the 225 room resort without having to revert to alternative supply sources. The existing 600KL primary receiving tank adjacent to the existing treatment plan requires replacement due to corrosion as does the existing Hilltop Distribution Reservoir east of the resort.

Overland flow of storm water in the existing resort area relies upon water running within a naturally occurring gully located beside an existing road alignment from the jetty to upper portions of the site. In significant storm events inundation of the Central Facilities building has occurred due to inadequate inlet structures adjacent to the existing resort reception which also are impacted by debris blockage. The current flow path for stormwater within the general resort catchment discharges water from under the Central Facilities building across the resort beach.

5.1.3 Air

The airshed is relatively un-developed with limited development occurring on surrounding Whitsunday Islands, apart from Hamilton Island located to the north of the site. Apart from the generator used to produce energy to service the demands of three Caretakers on the Island, there are no significant emission sources on the Island.

Lindeman Island enjoys a tropical climate. Maximum daytime temperatures experience in the region are typically 29-30 degrees during the summer/wet months and 21-25 degrees during the winter/dry months. Minimum overnight temperatures are typically around 23 degrees during the summer/wet months and 13-14 degrees during the winter/dry months.

A large proportion of rainfall occurs in the months December through to March with the driest months being August/September. The region lies in the trade wind belt for most of the year resulting in south to southeast winds. During the warmer months afternoon northeast sea breezes are common. Fresh south-easterlies can blow along the coast for lengthy periods during summer and autumn, but gale force winds are rare and normally only occur with a tropical cyclone (Source: Bureau of Meteorology – Climate of Mackay area, 2015).

The project will be designed to respond to impacts associated with climate change including potential for increases in sea-level and intensity of storm events.

5.1.4 Ecosystems

Marine

An initial assessment of the marine ecology was undertaken by BMT WBM (refer to **Appendix 4**). A desktop analysis was followed up with marine ecology field surveys at five study regions including the existing jetty location. A total of 167 spot dives were undertaken from which a bathymetric Digital Elevation Model (DEM) was produced and spatial distributions of hard and soft corals, seagrass and macro algae expressed as percentage benthic cover have been produced as individual maps for each of the five study regions.

The final layout and design details of the Safe Harbour is under review to minimise the effect on the coral communities while optimising the layout in terms of safety and utility. The majority of the seabed within the optimised Safe Harbour footprint contains corals with less than 25% cover except for a small area with higher density (greater than 50%) coral cover, located adjacent to proposed vessel berths. The previously dredged access channel, turning basin and jetty have low coral density. Any loss of these communities will require an offset. On completion of the Safe Harbour new coral communities can be expected to develop on the breakwater walls and piles.

5.1.5 Flora and Fauna

Flora

Existing Lease Areas

Northern Resource Consultants (NRC) was engaged by White Horse Australia Lindeman Pty Ltd in 2013 to undertake a detailed vegetation survey of the current leased areas. As part of their assessment NRC examined applicable Local, State and Federal legislation, policies and mapping. Field studies were undertaken by NRC Consultants over five days from 29 July to 2 August 2013 based on the current lease boundaries.

From initial inspection it became clear that the Regional Ecosystem mapping for the lease areas was flawed. Consequently, NRC proceeded with a field-based vegetation assessment to ground-truth the remnant and regrowth vegetation mapping in support of a detailed PMAV application. In December

2013 Queensland Department of Natural Resources and Mines accepted the submitted vegetation map corrections (PMAV 2013/005413). This PMAV indicates that the existing resort and ancillary facilities are in Category X area and not subject to Regional Ecosystem or High Value regrowth status. Within the lease area NRC have established that there are six vegetation communities with varying levels of conservation significance ranging from endangered to least concern.

A significant portion of the lease area is classified as non-remnant vegetation due to existing disturbance from previous land use activities. Interspersed throughout this area are patches of a native grassland, which has an 'Of Concern' status under the Queensland VMA. Areas of a eucalyptus woodland community and coastal vine thicket community are also present around the margins of the lease area, both of which have a 'Least Concern' VMA status. The areas of coastal vine thicket (shown as RE 8.12.11c) are consistent with the EPBC listed "littoral rainforest and coastal vine thickets of eastern Australia" TEC. There are also two areas (on either side of the existing airstrip) that are consistent with the EPBC listed "Broad leaf tea-tree (*Melaleuca viridflora*) woodlands in high rainfall coastal north Queensland" TEC. These areas are classified under Queensland legislation as RE 8.3.2, which is an endangered Regional Ecosystem (refer to **Appendix 2 – Regional Ecosystems as shown on PMAV**).

NRC's findings regarding conservation significant ecosystems for the current lease areas is as follows:

- **Regional Ecosystem 8.3.2** is endangered under the Queensland VMA and is consistent with the EPBC Broad Leaf Tea-Tree Woodland as noted above. There is no proposal to clear any of this Woodland under the proposed DBI Master Plan. The upgrading works are solely contained within the previously cleared airstrip area and therefore RE 8.3.2 is not impacted by the resort development;

- **Regional Ecosystem 8.12.13a** is a native grassland community occurring in patches primarily on moderate slopes with a southerly aspect. This community has an 'Of Concern' status under the Queensland VMA, but is not a listed community under the EPBC Act. Some of these patches are adjacent to the area proposed to be developed with discrete resort accommodation buildings. These buildings are likely to be constructed with concrete ground slabs in a cut to fill excavation with partial cantilevers on the front face. Current proposals contemplate tilt up slab construction of the superstructure. Whilst disturbance to the majority of the native grasslands will be avoided there are small areas that will be disturbed and may require an environmental offset under the *Queensland Environmental Offsets Framework;*

- Field observations indicate the greatest threat to this community is invasion by non-native grass species and other pasture weeds. With this threat in mind, it is the intention of the developer to implement a weed control program that focuses on reducing the threat of weed species on conservation significant vegetation communities. Gardens and other vegetated areas in the resort area will be planted with locally occurring native species and ornamental species that do not possess invasive qualities, and therefore do not represent a threat to native communities. It is also intended that wherever possible the grassland areas invaded by non-native species will be rehabilitated to increase the extent of the conservation significant native grassland community. Such works will improve connectivity between the patches of this community and ultimately increase its long-term viability on the island;

- NRC advised that the rehabilitation of native grasslands is challenging but achievable through expert guidance and the strict implementation of appropriate but flexible management practices, although the process may be gradual and require monitoring and adaptation. White Horse Australia Lindeman Pty Ltd is fully committed to this process and its successful execution. Accordingly, the nett area of RE 8.12.13a is intended to increase from that existing as mapped; and
- **Regional ecosystem 8.12.11c** is has a 'least concern' status under the Queensland VMA, but as discussed previously, this community is equivalent to the littoral rainforest and coastal vine thickets of eastern Australia TEC listed under the EPBC Act. The presence of this community and strategies to avoid impacts and ensure the maintenance of biodiversity values are described in section 3.1 (d).

Proposed Lease Areas

Since the vegetation assessments performed in 2013, there have be some modifications to the development design and proposed development areas. The new design incorporates an additional area to the west of the existing lease areas as well as a small extension at the northern end of the airstrip. These additional areas form the 'study area' for this desktop vegetation assessment (refer to **Appendix 3 – Desktop Vegetation Assessment**).

The full extent of the study areas is mapped as regional ecosystem 8.12.12d on the State regulated vegetation mapping. This community is defined as "*Eucalyptus tereticornis and/or Corymbia spp. and/or E. platyphylla and/or Lophostemon suaveolens woodland to open forest on hill slopes on Mesozoic to Proterozoic igneous rocks*". This community was identified in the adjacent lease area during the vegetation assessment in 2013. The presence of this eucalypt woodland community in the study areas is supported by the aerial imagery. There are substantial sparsely vegetated areas within the study area that appear to be dominated by eucalypt species. It is considered highly likely that the woodland areas within the section of the study area west of the existing lease area, as well as the area to the north of the airstrip, are comprised of regional ecosystem 8.12.12d or a similar eucalypt woodland community. The extent of eucalypt woodland identified in the desktop assessment is shown on the Desktop Vegetation Assessment Map in **Appendix 3**. However, the aerial imagery and results of the previous vegetation assessments indicate other distinct vegetation communities are also likely to be present within the study area. These additional vegetation communities are discussed below.

Regional ecosystem 8.12.11c is a semi-evergreen vine thicket community known to occur on headlands and gullies within the vicinity of the existing resort. This community has a dense canopy with a diverse range of species and includes emergent Hoop Pines (*Araucaria cunninghamii*). The dense canopy is readily identifiable on aerial imagery and is typically distinct from the more sparse communities known to occur in the area. The likely extent of this community within the study area has been mapped based on canopy characteristics identified from aerial imagery. Landform and geology characteristics have also been considered for determining the likely extent of this community. This community is identified as 'Coastal Rainforest' on the Desktop Vegetation Assessment Map in **Appendix 3**. This community is consistent with the 'littoral rainforest and coastal

vine thickets of eastern Australia' threatened ecological community listed under the EPBC Act, and is therefore a matter of national significance.

Regional ecosystem 8.12.13a is a grassland community known to occur in the areas surrounding the resort development, particularly on slopes and headlands with a southerly aspect. There is a small areas within the study are that contains steep slope with a southerly aspect and very sparse woody vegetation. The area appears to be dominated by grassland on the aerial imagery. This area is considered likely to be consistent with regional ecosystem 8.12.13a and is identified as 'Grassland' on the Desktop Vegetation Assessment Map in **Appendix 3**. However, it should be noted that many of the grassland areas assessed during the survey in 2013 were dominated by non-native species. The extent of exotic species invasion was such that the areas were considered non-remnant vegetation and were not incorporated into the regional ecosystem mapping for the Property Map of Assessable Vegetation. It is therefore possible that the grassland community identified in the study area does not satisfy condition thresholds for classification as remnant vegetation. This community has an 'of-concern' status under the VM Act and therefore disturbance should be avoided or minimised wherever possible. Any residual impacts to this community may require an environmental offset under the Queensland environmental offsets framework. This community is not consistent with any community listed under the EPBC Act.

The extent of the communities identified on the mapping in **Appendix 3** have been determined through desktop analysis techniques only. The outcomes of this desktop assessment will be ground-truthed in the field to validate regional ecosystem codes and community descriptions and refine the mapping of community boundaries. Groundtruthing would also facilitate the determination of developable areas that avoid or minimise impacts to matters of State and national environmental significance.

Fauna

The presence of threatened fauna species and species habitat will be subject to specific investigation during the preparation of the EIS. A systematic fauna survey will be conducted to identify fauna habitat attributes and fauna species assemblages present within the study area. Key survey techniques are likely to include Elliot style traps, Pitfall and funnel traps, Cage traps, Anabat detector, Active diurnal searches, Diurnal bird surveys and nocturnal surveys. Survey techniques will also be targeted at identifying the presence of State and Federal listed threatened species and their habitat and distribution within the project area.

5.1.5 Visual

Lindeman Island is unusual in that it is relatively close to the mainland, but not visible from any mainland vantage point except for the Conway Range National Park, and neither the existing resort nor its proposed expansion are visible from any town or from nearby island resorts. Whitsunday Passage, which passes between the Conway Peninsula and Lindeman Island, provides a spectacular tropical setting for the island, as well as opportunities for tourist vessels, bare-boat charter yachts and other recreational users and to see the western side of the island. In terms of landscape character, Lindeman Island is typical of the larger continental islands in the Whitsunday Group. The southern part of the island's topography and visual character is predominantly a flat to gently undulating plateau, with an airstrip, golf course and artificial lake. The island's vegetation varies from woodlands and vineforest gullies, to wind-swept shrubs, grassed slopes and headlands, with generally steep vegetated edges. Rocky outcrops and cliff edges make up a large percentage of the coastline and only a few sandy beaches are accessible for recreation. The existing resort buildings and jetty occupy a small node on a south-facing embayment, part of a larger waterway between Lindeman, Shaw and Seaforth Islands.

The most dominant visual impact of the existing resort is the accommodation buildings on the slopes running down to the main resort beach. The buildings are a series of discrete three and four storey accommodation buildings with highly visible pitched roofs, light coloured masonry elements and limited articulation and shadow lines. The Central Facilities building, although one storey high, has a very tall pyramidal shaped roof form which is a highly visible element. Similarly the reception building and Nicholson's Restaurant set further up the hill have the same dominant architectural forms.

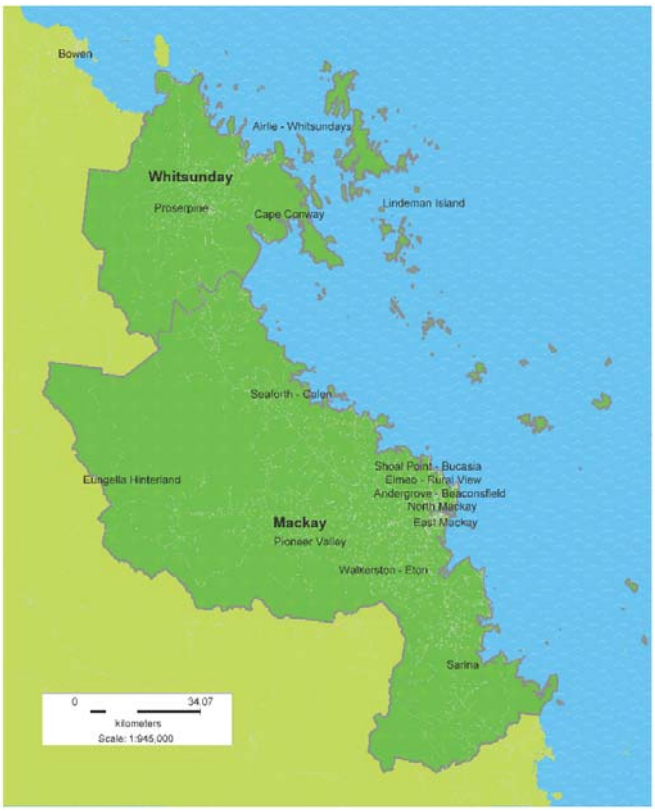
5.2 Social and economic environment (existing)

5.2.1 Economic and demographic characterisation

Regional Population

The analysis contained within this section is taken from census data based on the Australian Bureau of Statistics' (ABS) Statistical Area 3s (SA3s) of Mackay and Whitsundays as shown in **Figure 5.2.1**. These areas, forthwith referred to as the 'primary catchment' are deemed to be the most appropriate and relevant to the study with regards to the primary source of employees during both construction and operations. Detailed analysis will be undertaken in the proposed EIS.

Figure 5.2.1. ABS Whitsunday and Mackay SA3s.



The population as at 2011 was 131,331, split as follows:

Table 5.2.1. Population of Primary Catchment.

	Males	Females	Total
Mackay	58,237	54,561	112,798
Whitsundays	9,703	8,830	18,533
Total	67,940	63,391	**131,331**

These figures should be considered with caution as the 2011 census was undertaken in the peak of the mining boom, and significant migration occurred to the areas around Mackay to support resource projects in the Bowen Basin. In the last 18 months, mining growth has slowed significantly, and while some activity will continue, there may be major demographic changes in coming years as workers who relocated to the region for work may follow work elsewhere or return to points of origin.

Employment

At the time of the census, Lindeman Island was in operation but only employed 25 local people in addition to Club Med worldwide staff.

The census suggests that there is a spread of skills and employment across the primary study area, but accommodation and food services was the highest employer for the Whitsunday SA3, while the sixth highest industry for employer across both SA3s.

The weakening of the resources sector may serve the new development well in its construction phases, with many skillsets (such as those in construction and engineering) being present in newly retrenched workers from the Bowen Basin, as would be those that worked in accommodation, food services, transport and administrative roles in resources once operations start. With existing changing employment landscape in the region, it is believed that a majority of employees may be sourced from within the immediate region, however some specialists will be required from other regional and metropolitan centres.

Of note is the current significant weakening of the Australian dollar, and the likely rebound of domestic tourism in comparison to the time of the census (and the time of the Lindeman Island Club Med closure).

Existing

Apart from three Caretakers that maintain the resort's key facilities and airstrip, there are no current residents or guests residing on the site. As part of the EIS, a social impact assessment is proposed, which is likely to include a baseline study and preparation of a demographic profile of Lindeman Island and related communities (e.g. projected staff/FIFO/other source communities on mainland, proposed again to be based on ABS SA3s of Whitsundays and Mackay as a primary source community).

5.2.2 Accommodation and housing

The resort is currently closed with accommodation for the three Caretakers provided in the centre of the existing resort in the former villas/ staff accommodation located to the west of the Airstrip.

With no other housing on the island itself, besides existing caretaker/staff accommodation that is in poor condition, the primary study area would be the key catchment from which employees and contractors would initially travel. This involves a requirement for transport to and from the island, potentially in a FIFO/DIDO arrangement from the mainland or a direct ferry route.

The previously exceptionally high housing costs (both via purchase and rent) experienced by residents in Mackay and surrounds due to the recent resources boom have eased in recent years, and house prices in Mackay (central) are expected to weaken in price by approximately 10% over the next year (HIA 2014). This would ease pressure on people to remain in the area without the compensation of inflated resource wages during the construction phases.

As part of the planned development, the resort intends to build an on-site staff village with amenities to accommodate staff.

5.2.3 Social and recreational services

The resort is currently closed, however the Caretaker's regularly maintain key recreational services such as the existing Golf Course.

The current Masterplan concept proposes a range of social and recreational services for the resort visitors and guests once in operation comprising a range of social, physical, and recreational facilities and activities. A range of social and recreational services are proposed to be provided for both resort visitors and staff alike. Significantly, the staff accommodation is proposed to be located within the Village Precinct to both activate the precinct and enable staff access to a wide range of resort activities. Key social and recreational services proposed include:

- swimming pools;
- golf course;
- beach access;
- tennis courts;

- retail shops;
- restaurants;
- spa;
- ecotourism opportunities including coral planting and interpretation centres; and
- a range of bars and night club.

The staff village is proposed to also provide social and recreational services, with a central recreational area with kids' play equipment, bbq pavilions, amenities and a pool recreation zone.

5.2.4 Cultural heritage (Indigenous and non-Indigenous)

Indigenous Cultural Heritage

The Whitsundays and the neighbouring coastal fringe are the traditional home of the Ngaro Aboriginal people. Native title rights and interests are provided for under the *Native Title Act 2003*. The *Aboriginal Cultural Heritage Act 2003* provides for the recognition, protection and management of Indigenous cultural heritage. The 'duty of care' provisions of this Act requires those conducting activities in an area to take all reasonable and practical measures to avoid harming Indigenous cultural heritage. The Department of Aboriginal and Torres Strait Islander Partnerships manage a Cultural Heritage Register. A search of the Cultural Heritage Register has been submitted to identify whether there are known places, areas or objects of Indigenous or cultural significance occurring within the project area.

A Cultural Heritage Management Plan will be developed with the relevant Aboriginal parties in accordance with the *Aboriginal Cultural Heritage Act 2003*. The EIS process will also determine if any rights or interests of a native title party under the *Native Title Act 2003* will need to be addressed as part of the development of the project.

Non-Indigenous Cultural Heritage

Non-Indigenous cultural heritage is protected under the *Queensland Heritage Act 1992*. This legislation makes provision for those areas that are considered to be of state and local significance. For places registered on the Queensland Heritage Register, approval of the Department of Environment and Heritage Protection is required if any development is proposed. The Department may seek the advice of the Heritage Council. Searches of the state and local registers has identified that there are no heritage places of importance within the project area. It is envisaged that the proposed redevelopment of the resort poses a low risk to non-Indigenous cultural heritage. This will be determined as part of the EIS process.

5.3 Built environment (existing)

Since European settlement land uses on Lindeman Island have changed over time from a grazing property through to a Club Med Resort as currently existing on the island. P&O operated a small 48 room resort in the 1980's before being purchased by Adelstein Investments who increased the size of the resort by 104 rooms in 1988. Subsequently it was sold to Club Med in 1990 and with an investment in the order of $85M the current 225 room resort was opened for business. The resort was closed on 31 January 2012.

The existing resort is focussed on the south-west corner of Lindeman Island. The former accommodation is housed in 14 wings with a large central facilities building that housed the main restaurant, bars and entertainment facilities. The reception is further up the hill with Nicholson's Restaurant, conference rooms and staff accommodation on the plateau above the resort. All the services areas including power generation plant, sewerage treatment works, water filtration and general maintenance, fuel stores and Back of House facilities are also on the plateau. Architecturally the style of the resort accommodation buildings is typical of motel construction during the 90s. Construction is predominantly concrete blockwork with slab floor and a lightweight gable roof falling towards the sea. Many of the buildings were damaged to during Cyclone Yasi and none are of architectural significance worthy of retention.

The existing resort also has two existing dams, a golf course, quarry and cleared areas probably a consequence of remnants from land historically cleared for grazing use.

5.3.1 Infrastructure (existing)

The power generation plant, sewage plant, water treatment and general back of house structures are currently located on the higher portion of the Island adjacent to the airstrip. All services are in need of an upgrade due to cyclonic damage and ageing of plant equipment. A preliminary assessment of the proposed infrastructure services has been undertaken by Flanagan Consulting Group.

5.3.2 Traffic and Transport (existing)

Transportation to Lindeman Island is currently via boats and small aircraft. Sea access is currently gained from a jetty adjacent to the resort and a barge landing point to the immediate eastern side of the jetty. The jetty is located within a shallow basin and is exposed to the dominant South-East Trade winds. It is exposed and currently inaccessible during significant storm events or even during times when the dominant winds create an animated sea state which make embarkation and disembarkation difficult and potentially dangerous.

A grassed unlicensed airstrip (approximately 1000m long) is also situated on the plateau used by charter aircraft from the mainland and nearby Hamilton Island.

Access around the site is provided by Golf Carts.

5.3.3 Community amenities

The site is located adjacent to the Lindeman Island National Park which has a number of walking trails, one of which is accessed via the existing resort area.

In case of medical emergency, Mackay Base Hospital and Proserpine Hospital are both accessible by air and/or water from the Island. A medical centre and pharmacy are available at Hamilton Island (accessible by water and air from Lindeman), however the EIS will discuss plans for medical and other emergency amenities in the new Lindeman Resort development.

5.4 Land use and tenures (existing)

5.4.1 Key Local and Regional Land Uses

As can be seen in the Aerial Photograph and existing Master Plan diagram the existing resort is focussed on the southernmost beach on Lindeman Island. The accommodation is housed in 14 wings with a large central facilities building that housed the main restaurant, bars and entertainment facilities. The reception is further up the hill with Nicholson's Restaurant, conference rooms and staff accommodation on the plateau above the resort. All the services areas including power generation plant, sewerage treatment works, water filtration and general maintenance, fuel stores and Back of House facilities are also on the plateau. A grassed private airstrip approximately 800m long is also situated on the plateau used by charter aircraft from the mainland and Hamilton Island. Sea access is gained from a jetty adjacent to the resort.

Within the perpetual and term lease areas approximately 50% of the total area is used for a range of land uses as follows:

- Beachfront 210 room 3 star resort;
- Conference and recreation facilities;
- Staff accommodation, maintenance and back-of-house facilities;
- Dual runway unlicensed airstrip;
- Golf Course;
- Dam;
- Quarry;
- Services infrastructure; and
- Cleared areas (probably remnants from land historically cleared for prior grazing use).

Within these amended areas the existing vegetation includes non-native turf species for the golf course and aircraft landing strip, with numerous weed species in the areas immediately surrounding these structures. Across the resort area itself there are few remnant endemic species, most notably some large hoop pines. However, the majority of the garden areas surrounding the resort are dominated by introduced exotic species. Similarly, the recreation and staff accommodation precincts are dominated by pasture weeds and introduced exotic species.

5.4.2 Key Local and Regional Land Tenures

Refer to **section 4.2.**

5.4.3 Native Title

The EIS process will also determine if any rights or interests of a native title party under the *Native Title Act 2003* will need to be addressed as part of the development of the project. There are currently no native title claimant applications over the island.

The Whitsundays and the neighbouring coastal fringe are the traditional home of the Ngaro Aboriginal people. Native title rights and interests are provided for under the *Native Title Act 2003*. The *Aboriginal Cultural Heritage Act 2003* provides for the recognition, protection and management of Indigenous cultural heritage. The 'duty of care' provisions of this Act requires those conducting activities in an area to take all reasonable and practical measures to avoid harming Indigenous cultural heritage.

The Department of Aboriginal and Torres Strait Islander Partnerships manage a Cultural Heritage Register. A search of the Cultural Heritage Register has been submitted to identify whether there are known places, areas or objects of Indigenous or cultural significance occurring within the project area. A Cultural Heritage Management Plan will be developed with the relevant Aboriginal parties in accordance with the *Aboriginal Cultural Heritage Act 2003*. The EIS process will also determine if any rights or interests of a native title party under the *Native Title Act 2003* will need to be addressed as part of the development of the project.

5.5 Planning instruments, government policies

5.5.1 Local Government

Lindeman Island is included in the Off-Shore Islands Locality of the 2006 Consolidated Mackay City Planning Scheme. The site is included in the Special Activities (Tourism) Zone and Open Space Zone. A development application (material change of use and operational work) will be required for the proposed action, with Mackay Regional Council being the Assessment Manager.

The following codes are applicable to the assessment of the proposal:

- Off-Shore Islands Locality Code;
- Retail and Commercial Code;
- Tourist Accommodation Resorts Code;
- Environment and Infrastructure Code; and
- Bushfire Management Overlay Code.

The Mackay Regional Council has prepared the Draft Mackay Region Planning Scheme (the 'draft planning scheme') to provide a strategic and detailed direction for the whole of the Mackay region. The draft planning scheme, once adopted, will replace the existing planning schemes for Mackay, Sarina and Mirani, and will reflect current legislation, particularly the SPA and the Queensland

Planning Provisions. It is likely that this planning scheme will be in operation by the time a development application is lodged.

5.5.2 Previous Approvals

The current resort and ancillary facilities were approved by the Council on the 21st May 1991.

An Application for a Permissible Change to the existing Development Approval for a previous design was lodged with the Mackay Regional Council early in April 2014. The Mackay Regional Council approved the application for a Resort reconstruction fundamentally in the same area as the existing resort in June 2014.

The current DBI Master Plan indicates a revised version of the original approved Hunt Design concept that remains in the same location and is substantially similar in terms of scale and building mass to the approved plans although the adopted architectural solution indicates a different approach.

5.5.3 State Government Legislation and Policies

Table 5.5.3.1 provides a summary of the key State (Queensland) legislation and policies that will be addressed in the assessment process.

Table 5.5.3.1. Key State Legislation and Policies.

Legislation and Policies	Description
Legislation	***Aboriginal Cultural Heritage Act 2003*** The *Aboriginal Cultural Heritage Act 2003* recognises the existing right of ownership of cultural heritage by Aboriginal people ensuring native title is not affected. The legislation seeks to protect areas of significance to Aboriginal people. The 'duty of care' provisions includes a legal responsibility or statutory 'duty of care' requiring those conducting activities in areas of significance to take all reasonable and practical measures to avoid harming cultural heritage. The traditional Aboriginal owners of Lindeman Island are the Ngaro People. ***Coastal Protection and Management Act 1995*** The principal objectives of the Coastal Protection and Management Act 1995 are the protection, conservation, rehabilitation and management of the state's coastal resources and biodiversity by the provision, in conjunction with other legislation, of a coordinated and integrated management and administrative framework for the ecologically sustainable development of the coastal zone. Future development applications for the proposed development will be referred to the State for assessment. Subsequent approvals for operational works within a tidal area may also be required. ***Environmental Protection Act 1994*** Approval for Environmentally Relevant Activities ('ERAs'), including but not necessarily limited to sewage treatment, water treatment and fuel storage may be required under the *Environmental Protection Act 1994* and the *Environmental Protection Regulation 2008*.

Legislation and Policies	Description
	Land Act 1994 The land holding contains State-owned land. The *Land Act 1994* deals with the allocation of tenure and other dealings involving State land, including through the granting of leases. ***Marine Parks Act 2004*** The *Marine Parks Act 2004* and the *Marine Parks Regulation 2006* provided the legislative framework in Queensland for establishing and managing marine parks. The Great Barrier Reef Coast Marine Park (GBR Coast MP) is a State marine park that runs the full length of the Great Barrier Reef Marine Park (GBRMP) from just north of Baffle Creek (north of Bundaberg) to Cape York. It provides protection for Queensland tidal lands and tidal waters. The GBR Coast MP complements the GBRMP through adopting similar zone objectives, and entry and use provisions. The Marine Parks (Great Barrier Reef Coast) Zoning Plan 2004 complements the Great Barrier Reef Marine Park Zoning Plan 2003 and both instruments use a common set of zoning maps. Zoning Plan Map 10 to area the surrounding Lindeman Island. This Zoning Plan Map identifies that the foreshore and waters that surround the existing resort lie within the Conservation Park Zone. ***Nature Conservation Act 1992*** The *Nature Conservation Act 1992* ('NCA') protects areas that have been dedicated for conservation as well as individual specimens of plants and animals, and seeks to achieve "…*an integrated and comprehensive conservation strategy for the whole of the State*…" (section 5 of the NCA). The most relevant portions of the NCA to the proposed development are the sections relating to Wildlife and Habitat Conservation. The NCA provides the framework for the protection of wildlife listed under the Nature Conservation (Wildlife) Regulation 2006 ('NCWR'). The NCWR prescribes wildlife as one of the following classes: - Extinct in the wild; - Endangered; - Vulnerable; - Near threatened; and - Least concern. Threatened wildlife under the NCA is wildlife that is prescribed under the Act as extinct in the wild, endangered or vulnerable. The NCA goes on to define a 'threatening processes' as any process that is capable of: a) Threatening the survival of any protected area, area of major interest, protected wildlife, community of native wildlife or native wildlife habitat; or b) Affecting the capacity of any protected area, area of major interest, protected wildlife, community of native wildlife or native wildlife habitat to sustain natural processes. The NCA is pertinent to the proposed redevelopment should any protected flora or fauna species (as detailed in the NCWR) be found, or any threatening process be observed, on site. Threatened flora species require DEHP approval for removal and should be considered for retention as part of the planning process.

Legislation and Policies	Description
	Vegetation Management Act 1999 Clearing of native vegetation is regulated by the *Vegetation Management Act 1999* ('VMA'). Clearing remnant vegetation on a regulated vegetation management map, if not exempt, can only be done under a permit. Common exemptions include clearing for necessary fence lines, necessary road or vehicular tracks, fire management lines and fire breaks. A development application that includes vegetation clearing will require referral and assessment by the Department of Natural Resources and Mines (DNRM). A property map of assessable vegetation (PMAV) is a property scale map produced through an agreement with DNRM that shows the boundaries of different vegetation categories on the property. Where a PMAV exists for a property, it replaces the regulated vegetation management map for identifying areas of regulated vegetation. A PMAV that encompasses the majority of the project area was certified in 2013 and therefore no clearing permit or notification is required for clearing in any areas marked as Category X on the PMAV, regardless of what is shown on the DNRM regulated vegetation map. ***Sustainable Planning Act 2009*** The *Sustainable Planning Act 2009* ('SPA') and the *Sustainable Planning Regulation 2009* ('SPR') provide the statutory framework for the making and assessment of development applications. The SPA delivers an Integrated Development Assessment System ('IDAS') for integrating State and local government assessment and approval processes for development.
State Planning Policy A State Planning Policy is an instrument made by the Minister about matters of State interest.	The Queensland Government established the State Planning Policy (SPP) in December 2013 to simplify and clarify matters of state interest in land use planning and development. The SPP provides clarity to local governments when making and amending local planning instruments and assessing development applications and assists developers in preparing development applications. The SPP Interactive Mapping for development assessment indicates that the site or part of the site is subject to the following attributes: • Matters of State Environmental Significance - Protected Area – National Park; • Matters of State Environmental Significance - Wildlife Habitat; • Matters of State Environmental Significance - Regulated Vegetation; • Coastal management district; • Climatic regions – stormwater management design – Central Coast (North); • Flood Hazard area – Local Government flood mapping area; • Bushfire hazard area – Very high (potential intensity) and High (potential intensity); • Potential bushfire impact buffer; • Coastal hazard area – erosion prone area; • Coastal hazard area – medium storm tide inundation area; and • Coastal hazard area – high storm tide inundation area. The above triggers each have their respective policy or assessment requirements.

Regional Planning

The Mackay, Isaac and Whitsunday Regional Plan (the 'MIW Regional Plan') was endorsed by the Queensland Government on 8 February 2012, and is intended to guide future planning decisions for the region over the next two decades. It provides a framework to guide the long-term sustainability of the region's communities, strengthen its economy, inform the delivery of social services and infrastructure, and protect its environment.

The Regional Plan recognises that the region's environment and natural resources underpin its major economic activities, such as tourism:

> "*The tourism industry in the subregion is predominantly focused on the business and drive markets, with the major accommodation precincts located within Mackay City, near Mackay Harbour, or on Brampton and Lindeman islands".*

The MIW Regional Plan indicates that additional tourism-oriented accommodation and associated facilities across the Whitsunday Islands may be supported where the type and extent of development is suitable, taking into account environmental values, infrastructure capacity and costs of servicing. On this basis, and to the extent that the proposal is for the redevelopment of the existing resort, the proposed development is supported by the Regional Plan.

Queensland Government Tourism Strategies (non-statutory)

DestinationQ

DestinationQ is a partnership between the Queensland Government and the tourism industry, recognising tourism as one of the four pillars of our economy. The main goals of DestinationQ are to make Queensland Australia's number one tourist destination and achieve our share of the national target by reaching $30 billion in overnight visitor expenditure per annum by 2020. A 20 year vision and strategic plan has been developed which involves directing effort across six key themes:

- build strong partnerships;
- preserve our nature and culture;
- deliver quality, great service and innovation;
- target a balanced portfolio of markets;
- offer iconic experiences; and
- grow investment and access.

The redevelopment of the existing Lindeman Island resort will contribute to an increase in tourism, and visitor expenditure, in the Whitsunday region while persevering the area's nature and culture.

Mackay Destination Tourism Plan 2014 - 2020

The Mackay Destination Tourism Plan has been prepared to provide the direction for tourism and events in the Mackay region towards 2020, highlighting the resources required to achieve the Queensland 2020 target, and create a sustainable and competitive tourism and events destination (p2).

Product 6.7 of the Destination Tourism Plan seeks to "*support the revitalisation of key tourism sites including Brampton Island, Lindeman Island, Keswick Island and Laguna Quays*". The timing is listed for "Year 4" with partner agencies being DSDIP; MTL and MRC (p44).

The redevelopment of the existing Lindeman Island resort positively responds to the outcomes sought by the Destination Tourism Plan.

The Whitsundays Destination Tourism Strategy 2012-2016

The Whitsundays Destination Tourism Strategy 2012-2016 provides the framework to guide tourism industry development in the Whitsundays by coordinating stakeholders in a common direction to maximise the tourism potential of the destination so as to achieve a balance of economic, social and environmental outcomes. It includes the following vision:

"In 2016 the Whitsundays will be: Globally recognised as one of the world's leading tropical island and marine leisure holiday destinations" (p2).

It acknowledges that for the Whitsundays to achieve its aspiration for 2016 it is critical that there is:

- a coordinated approach to destination Marketing and Promotion;
- innovative Product and Infrastructure Development across the region that delivers on the marketing promise; and
- a tourism industry that is operating at the highest standards of service, safety and sustainability through effective Industry Development programs.

The redevelopment of the existing Lindeman Island resort responds to the outcomes sought by the Whitsundays Destination Tourism Strategy 2012-2016.

5.5.4 Commonwealth Legislation and Policies

Table 5.5.4.1 provides a summary of the key Commonwealth statues that will be addressed in the assessment process.

Table 5.5.4.1. Commonwealth Legislation.

Legislation	Relevance to the Project
Environment Protection and Biodiversity Conservation Act 1999	The *Environment Protection and Biodiversity Conservation Act* 1999 ('EPBC Act') establishes a Commonwealth process for assessment of proposed actions that have the potential to have an impact on matters of national environmental significance or on Commonwealth land. The EPBC Act requires that actions, which have the potential to have an environmental impact on Commonwealth land, be assessed for the purpose of Commonwealth decision making. The Australian Government Environment Minister will whether approval is necessary under the EPBC Act and, if so, the type of assessment that will be undertaken.

Legislation	Relevance to the Project
	The proposed action has been referred to the Commonwealth for determination as to whether approval under the Act is required. If it is declared a controlled action the State EIS process is an accredited process under the Bilateral Agreement between the Commonwealth Government and the State of Queensland. This process involves public consultation of the draft Terms of Reference as well as the EIS, once it has been prepared. The Terms of Reference will dictate the scope of the EIS once it has been finalised.
Great Barrier Reef Marine Park Act 1975	The *Great Barrier Reef Marine Park Act 1975* ('GBRMP Act') established the Great Barrier Reef Marine Park and the Great Barrier Reef Marine Park Authority, providing it with a framework for planning and management of the Marine Park through zoning plans, plans of management and permits. Referral of an action under the EPBC Act is deemed to be an application under the GBRMP Act (see section 37AB, GBRMP Act). This referral will be forwarded to the Great Barrier Reef Marine Park Authority (the Authority) for the Authority to commence its permit processes as required under the *Great Barrier Reef Marine Park Regulations 1983*. The Authority is responsible for assessing applications for permissions under the GBRMP Act, GBRMP Regulations and Zoning Plan. Where assessment and approval is also required under the EPBC Act, a single integrated assessment for the purposes of both Acts will apply in most cases. Zoning Plan Map 10 - Whitsunday identifies that the waters surrounding the existing resort lie within the Conservation Park Zone.

Reef 2050 Long-Term Sustainability Plan

The Reef 2050 Long-Term Sustainability Plan ("Sustainability Plan") is the overarching framework prepared by the Commonwealth and Queensland Government to improve the Great Barrier Reef's Outstanding Universal Value every decade between now and 2050. The Plan was prepared in response to the UNESCO World Heritage Committee and the Great Barrier Reef's Outlook Report 2014.

The Sustainability Plan (p10) identifies the highest risks to the Reef as:

- climate change – future predictions indicate sea level rise and temperature increases will continue, the pH of the ocean will gradually decline and weather will be more severe;
- land-based run-off – nutrients, pesticides and sediment from run-off (link to the frequency of crown-of-thorns starfish outbreaks) and marine debris;
- coastal land-use change – clearing and modifying coastal habitats and artificial barriers to flow; and
- direct use – impacts associated with illegal fishing/collection marine debris, incompatible activities, dredge material disposal etc.

A key policy direction arising from the Sustainability Plan is to place a permanent ban on the disposal of material from capital dredging projects within the Great Barrier Reef.

The proposed Safe Harbour will be designed, constructed and operated to comply with this requirement.

6.0 Potential impacts of the project

6.1 Natural Environment

The proposed Master Plan seeks to minimise impacts to the natural environment by focussing concentrating development within areas of existing disturbance or locations where there is little (if any) native vegetation. Additionally, the proponent proposes a coral planting program, National Park and Great Barrier Reef educational centre (for guests and visitors), management of key areas under a Nature Refuge and a native grass and vegetation replanting program over previously disturbed/cleared areas.

Terrestrial

Disturbance to the two vegetation communities listed under the EPBC Act has been avoided by design. The littoral rainforest and vine thicket community occurs on steep slopes around the margins of the previously cleared areas, and therefore will be present in close proximity to the tourist villas. Impacts to this community will be avoided by implementing appropriate buffers to avoid direct disturbance. Furthermore, the relevant threats outlined in the Commonwealth listing advice for this community will be addressed by controlling weeds within the community and surrounding areas, excluding the community from any controlled burning that may occur, and restricting visitor access to these areas. The other conservation significant vegetation community in close proximity to the development is the native grassland community. Field observations indicate the greatest threat to this community is invasion by non-native grass species and other pasture weeds. With this threat in mind, it is the intention of the developer to implement a weed control program that focuses on reducing the threat of weed species on conservation significant vegetation communities. Gardens and other vegetated areas in the resort area will be planted with locally occurring native species and ornamental species that do not possess invasive qualities, and therefore do not represent a threat to native communities. It is also intended that wherever possible the grassland areas invaded by non-native species will be rehabilitated to increase the extent of the conservation significant native grassland community. Such works will improve connectivity between the patches of this community and ultimately increase its long-term viability on the island.

An impact assessment for threatened fauna species will be subsequent to the field assessments. However, the use of areas of significant pre-existing disturbance in the development design reduces the likelihood of significant impacts. These disturbed areas are likely to have low habitat value for locally occurring threatened fauna species.

Marine

The construction and operation of the Safe Harbour, including initial dredging may impact coral communities and marine fauna. The final layout of the Safe Harbour is under review to minimise the effect on the coral communities while optimising the layout in terms of safety and utility. The majority of the seabed within the optimised Safe Harbour footprint contains corals with less than 25% cover except for a small area with higher density (greater than 50%) coral cover, located

adjacent to proposed vessel berths. The previously dredged access channel, turning basin and jetty have low coral density. Any loss of these communities will require an offset.

On completion of the Safe Harbour new coral communities can be expected to develop on the breakwater walls and piles. Corals within the Safe Harbour could be impacted by changes in water quality associated with harbour activities. Accordingly, mitigation measures including operational constraints on fuelling and pump-outs will be implemented. The resulting increased boating traffic will also need to be considered in the EIS.

During the operation of the Safe Harbour minimisation of possible impacts on the maritime ecology, including potential noise impacts, will be achieved by management and operation strategies. The berths are for guests and resort visitors and live-aboard vessels will not be allowed. Further, the discharge of holding tanks and bilges and maintenance activities will not be permitted. Fuels and oils are not intended to be available in the harbour so vessels wishing to take on fuel will need to voyage to Hamilton Island or the Mainland.

The proposed Safe Harbour will have potentially beneficial impacts associated with being able to provide all weather sea access to the Island shelter during significant storm events.

A comprehensive Environmental Management Program is also proposed to be developed as part of the EIS.

6.2 Amenity

The natural landform and vegetation of Lindeman Island display a variety of character, from rocky headlands and quiet sandy bays to steep hills, vineforest gullies, boulder outcrops and grassy slopes, surrounded by the beautiful waters, reefs and islands of the Whitsunday Islands. This combination is part of an internationally-renowned series of islands and waters with exceptional aesthetic values within the Great Barrier Reef World Heritage Area. The island's history of land use and resort development has added to this diversity, with an attractive lake, golf course, air strip, jetty and a network of roads, plus a compact node of resort buildings (now abandoned) in the south-west corner. The existing resort crowds the south facing hillsides and narrow foreshore with spectacular views across a broad bay bordered by Shaw and Seaforth islands.

Increased boat/vehicle movements, noise from construction activities and potential dust and light spillage have the potential to cause impacts on amenity during construction. Operationally, key amenity impacts associated with noise (generators/boat/aircraft/buggy movements and key land uses), lighting, vibration and visual impacts, will also be investigated. These matters will be addressed in the proposed Environmental Management Plan which will address both construction and operational issues.

6.3 Social environment

A range of social and recreational services are proposed to be provided for both resort visitors and staff. Significantly, the staff accommodation is proposed to be located within the Village Precinct to both activate the precinct and enable staff access to a wide range of resort activities.

A detailed Social Impact Assessment and Mitigation Strategy is proposed as part of the preparation of an EIS should the project be declared 'coordinated'. This process will include:

- comprehensive stakeholder and community engagement;
- a baseline assessment;
- an analysis of direct, indirect, and cumulative impacts (both positive and negative) and corresponding benefit realisation and impact mitigation measures; and
- a monitoring and reporting framework to manage and communicate to stakeholders progress on benefits realisation and impact mitigation measures.

A non-exhaustive list of some potential impacts are described in the following table under very broad categories.

Table 6.3.1. Social Environment Potential Impacts for investigation in SIA/EIS for Lindeman Island Integrated Tourist Resort.

Category	Potential Positive Impacts		Potential Negative Impacts	
	Construction	Operations	Construction	Operations
Workforce	• Jobs for newly retrenched ex-resource industry workers • Increased employment for region during construction phase	• 200 resort jobs in hospitality and resort operations • Opportunity for potential partnerships with local training providers	• Competing for skill sets with resources and other industries • Potential FIFO impacts on source and mainland communities	• Potential short-term gap in education and training for required skill sets • Competition with other Whitsunday region resorts for quality staff • Potential high turnover in staff living in village • Balance between local and non-local staff
Housing and accommodation			• Challenge to accommodate and transport workers in construction phase • Potential additional pressure on local rental market if required skills not found locally • Cost of accommodation on mainland may be restrictive	

Category	Potential Positive Impacts		Potential Negative Impacts	
	Construction	Operations	Construction	Operations
Local business and industry content	• Increased use of local businesses for accommodation and/or transport • Potential supply chain contributions by local suppliers	• Potential supply chain contributions by local suppliers • Cumulative impacts to increase tourism to region	• Increased competition for international and domestic tourists among existing hotel/resort and hospitality businesses	• Non-use of local suppliers
Health and community wellbeing		• Building of social capital among staff living in staff village	• Potential lack of recreation and social outlets prior to infrastructure being built • Lack of immediately accessible medical and other emergency services and infrastructure • Potential FIFO lifestyle impacts on workers, families, and source communities	• Risks to family and community cohesion of staff source communities • Living on site - mental health and personal relationships • Economic and social differentiation between staff and guests • Potential lack of services

6.4 Economic effects

The project will contribute significantly to the offering of Queensland's Great Barrier Reef and coastal island attractions. In turn, this will improve the economic diversity and social opportunities of the region whilst making a positive contribution to the ecological integrity of Lindeman Island. The redevelopment of Lindeman Island into a major tourist resort is forecast to provide the following significant economic benefits:

- an estimated final development cost of $600 million;
- creation of an average of 865 construction-related jobs each year on-site and off-site during the four year construction period;
- creation of around 300 full-time equivalent jobs on the Island once operational, with associated additional employment elsewhere in the region through flow-on or multiplier effects;
- privately funded infrastructure development project provided at no cost to the Government;
- an average of over 858 people on the Island per day totalling around 313,000 person days per year;
- direct expenditure on Lindeman Island of about $30 million a year by Lindeman Island visitors and employees;

- a substantial increase in total visitor days in the regional Mackay area, generating income and business for not only the local area but also companies that offer commercial flights to the area;
- broadening of the regional Mackay economy through improved elevation of regional based tourism as an industry, through "destination" marketing and thus reducing the current reliance on the mining and agricultural industries; and
- significant increases in local and state government revenue through rates, property transaction duties, land tax and payroll tax.

Potential adverse economic effects are expected to be limited mainly to the resort's construction period. Substantial demand for labour could increase some labour costs and reduce housing availability in the Mackay region during periods of peak construction activity. It will also place increased demand on transport infrastructure, with potential for short term increases in costs of materials transport and passenger air services to and from the Mackay region.

When fully operational, Lindeman Island Resort is likely to capture patronage that otherwise would have gone to other visitor destinations in Queensland and elsewhere in Australia. However, resulting adverse impacts on other tourist venues are forecast to be minor and widely dispersed. In subsequent years, any initial impacts are likely to be more than offset by continuing growth in the Queensland visitor market and significant net increases in visitation to the Mackay region generated by Lindeman Island Resort.

6.5 Built environment

The main objective of the DBI Master Plan is to ensure that building and landscape designs respond to the visual and tropical character of the Island and achieve a sustainable outcome, while also providing a high quality resort in an outstanding location, to design and construction standards which are internationally-expected in sensitive sites. Existing resort buildings, roads and infrastructure will be re-developed and incorporated to the maximum extent possible, consistent with these objectives.

The proposed Master Plan by DBI includes three resorts with iconic and innovative central facility buildings. The form of each building integrates with the surrounding topography rather than competing and has soft sloping edges, stepping down to the surrounding low rise pavilions. The low rise pavilion style buildings will allow a human scale of built form, with separate elements separated by tropical vegetation between and surrounding the buildings, thereby providing an appropriate 'indoor/outdoor' visitor experience as well as reducing the visual impact. Colour palettes are derived from the surrounding landscapes and allow the buildings to blend into their surroundings. Large overhangs, recessed terraces, and dark tinted low reflectivity glass will assist with the feel of depth and reduce the visual bulk of buildings and the overall development. The existing central facilities building on the hillslope will be transformed into a conference centre and have a new and less dominant roof form than at present.

White Horse Australia Lindeman Pty Ltd will be able to offer guests an authentic experience where the resort pavilions are immersed within a beautiful natural Australian landscape, evocative of the tropical Whitsunday Islands. Importantly this design approach complements the scenic attributes of the island as viewed from the surrounding sea or air above. The new resort proposes to revegetate areas which are currently disturbed, with an overall greater coverage of native vegetation and habitat, linking back to the undisturbed portions of the island. Through the extensive use of vegetation and built form design controls it is envisages that the proposed built forms will be sensitively integrated.

The Master Planners, DBI, have proposed that the main Spa Resort guest accommodation comprises a series of sensitively scaled individual pavilions of varying sizes on the headland site, in preference to a few larger, bulkier and more impactful buildings as would be the case with a conventional hotel model. The concept is that each small building can be individually located on site to optimise screening opportunities and minimise impact on important existing natural features such as rocky outcrops and significant trees and vegetation. Most of the Spa Resort area is open non-native grassland through its previous use as a golf course, and is relatively bare and visually exposed as seen from a distance. However the main resort centre building has been sited below the ridge hill-top, the built form has been designed to 'hug' the ridgeline and complement the landform, and additional landscape integration will be provided by planted vegetation.

The proposed development will reactivate and upgrade the resort, maintaining the footprint and built form height of the existing facilities but also extending to adjacent more elevated areas, with a modern high-quality centre on the adjacent ridge, accommodation villas by the lake and along hillslopes and ridge crests to the west and south of the airstrip, with views across the Whitsunday Passage to the Conway Range and other islands. The signature building will be an iconic but site-sensitive structure on the south-western ridge, with a wave-like roof form in natural 'island' colours sited slightly below the hilltop, and with an open air (roof-less) "Rock Bar' on the rocky headland. These facilities, and some of the hillside villas, will be visible from nearby Great Barrier Reef waters but will be designed, constructed and landscaped to the highest standards of resort built form in sensitive natural locations, such that they will be visually integrated with their landscape setting, and consistent with a compact tourism node in the island's south-western sector.

6.6 MNES under the EPBC Act

A referral under the EPBC Act has been made to the Commonwealth to address potential impacts on Matters of National Environmental Significance ("MNES").

6.6.1 Great Barrier Reef World Heritage Area and Marine Park

The proponent recognises that the Great Barrier Reef's World Heritage Values must be protected against the potential for deleterious impacts associated with the proposed Safe Harbour and resort development.

Safe Harbour

The existing jetty is subject to unprotected exposure to the south-east as a result of its location and orientation and is currently unsafe during storm events. Accordingly, a new Safe Harbour is proposed incorporating the existing jetty and two breakwaters profiled to provide benign waters within the harbour and safe access in strong southerly trade winds. This site offers the best protection in a cyclone when compared to other possible locations around the island. Apart from providing access to the Island, the proposed Safe Harbour will also provide berths for visiting craft and the tourist's vessels in a similar manner to that as seen at nearby Hamilton, Daydream and Hayman Islands.

The design (which is currently being refined) has a breakwater on the western side of the jetty which also acts as the pedestrian and buggy access to the finger berths. At the head of the breakwater, adjacent to the jetty, is an arrivals lounge and cafe for guests arriving from vessels at the jetty or breakwater berths. The eastern breakwater continues in a curve to create a barrier to the south-east trade winds. An entrance to the Safe Harbour has been formed with an eastern breakwater projecting towards the end of the western barrier. This creates an entry point that is protected from the prevailing dominant wave action.

The breakwater profiles will be determined by Cardno after an analysis of cyclonic computer models and wave heights in the waters adjacent to the jetty.

The primary intent of the harbour is for the safe transfer of guests via ferries, luxury vessels, private charters and also to provide barge access for the movement of supplies and removal of waste from the Island. In addition, the Safe Harbour proposes berths for approximately 50 vessels of varying sizes to cater for visiting craft. At the head of the breakwater, adjacent to the jetty, an arrivals lounge and cafe for guests arriving from vessels at the jetty or breakwater berths is proposed. The operation of the Safe Harbour would be controlled by appropriately trained staff.

Water Quality

Best practice stormwater and drainage design is critical to ensure the natural hydrology is not adversely impacted by the proposed development. Conveyance of flows from new areas of development will be done in a way that is sympathetic to the existing drainage characteristics of the island and receiving environment. New drainage networks will also feature elements to remove gross pollutants, sediments and nutrients prior to discharge.

It is expected that potential water quality impacts to the Great Barrier Reef World Heritage Area can be appropriately managed by a combination of appropriate design and the adoption of a range of mitigation measures. Mitigation measures to be implemented for the project to address these potential impacts will be investigated during the EIS process.

Visual

The need to create an iconic, world class tourist resort, which respects its visually sensitive location in the World Heritage Listed Great Barrier Reef Marine Park will necessitate a considered approach to the end design and siting of resort elements. The DBI Design has considered building and building colours and reflectivity to limit visual impacts. During the EIS the following will be done:

- location of proposed roads will be ground truthed;
- approximate locations of each building will be ground truthed; and
- soil depths will be determined to identify appropriate building, road construction approaches and to identify appropriate landscaping species.

The refined design will achieve the following design outcomes:

- buildings, unless iconic in design and function, will avoid "skylining" or the appearance of vertical "stacking";
- the appearance of all other buildings will be softened and integrated with the existing landscaping through siting and further landscaping.

6.6.2 Threatened Ecological Communities

Two threatened ecological communities occur on the site, including the Broad Leaf Tea-tree (*Melaleuca viridiflora*) which is characterised by a canopy dominated by *M. viridiflora* and a ground cover comprising a diversity of grasses, sedges and forbs (DoE, 2015). Secondly, the Littoral Rainforest and Coastal Vine Thickets of Eastern Australia, which comprises a complex of rainforest and vine thickets and naturally occurs in disjunct and localised stands and can occur on a variety of geological substrata (DoE, 2015). Preliminary assessments undertaken by NRC have identified that these communities should not be impacted on by the proposal.

6.6.3 Listed Species (Threatened and Migratory)

The EPBC Act Protected Matters Report (based on 5 km buffer surrounding the Site) identified 14 listed threatened species, 64 Marine species and 24 migratory species as having potential to occur within a 1.5km radius of the site. Further detailed ecological assessment (terrestrial and marine) will be carried out as part of the EIS will refine the likelihood of these species and the potential for the development to have a significant impact. Specific mitigation and management strategies will also be detailed within the EIS.

7.0 Environmental Management and Mitigation Measures

The design process to date has identified a development layout that seeks to avoid, where possible, impacts on Matters of National Environmental Significance including the Great Barrier Reef World Heritage Area based on the EPBC Act Referral Guidelines for the Outstanding Universal Value of the Great Barrier Reef World Heritage Area (May 2014). Further, while the Masterplan Concept included in **Appendix 1** shows proposed building positions, it is proposed that all buildings will be located on site following detailed onsite investigations that take into account localised attributes such as slope, rocky outcrops, significant vegetation, views and visibility from the Great Barrier Reef World Heritage Area.

Visual Impacts and Mitigation Measures

The project will be designed to limit impacts on aesthetic values of the GBRWHA by mitigating visual impacts of development through the siting of infrastructure, roads and buildings, use of appropriate building design, colour, texture, natural screening and landscaping (refer to **Appendix 1 - Preliminary Landscape Design Commentary - section 4**).

Run-off/water quality and Mitigation Measures

The project will be designed to respond to requirements identified in:

- an erosion sediment control plan that reduces the risk of soil erosion and to control sediments close to their source; and
- a stormwater management strategy that protects sensitive areas (e.g. marine aquatic flora and fauna, and fringing corals, seagrass beds and reefs) from the potential effects of runoff, erosion, sedimentation or contamination based on the principles of water sensitive urban design.

Species management and Mitigation Measures

The project will be designed to limit impacts on key ecological communities, by:

- avoiding development in areas containing Threatened Ecological Communities and providing buffers to such areas to avoid disturbance and restricting visitor access to these areas; and
- revegetating grasslands or areas invaded by non-native species to increase the extent of the conservation significant native grassland community and improve connectivity between the patches of this community.

Off-set requirements will also be investigated as part of the EIS process.

Shipping

During construction a range of management measures will be implemented to minimise potential impacts, including:

- sediment containment measures to minimise reduction in light and smothering of biota and habitats is required.
- protecting water quality from fuel spills, tail water and sediments; and
- mechanisms to lower the potential for turtle entrapment, although not a recognised turtle nesting area.

During operation the following measures will be investigated to mitigate potential impacts including:

- protecting water quality by not allowing vessels to empty bilges or wastewater and not allowing refuelling facilities potential spills and toxicity will be minimised. (Refuelling available at Hamilton Island approximately 9 nautical miles distant). Similarly, maintenance of vessels is intended to be banned to further minimise chemical/hydrocarbon spills;
- ensuring lighting is designed to minimise disturbance to fauna navigating in the area;
- not permitting freshwater release into the harbour through appropriate infrastructure design to protect corals; and
- implementing a coral planting program for resort guests.

Invasive Species

The project will incorporate:

- a weed control program that focuses on reducing the threat of weed species (e.g. lantana) on conservation significant vegetation communities;
- measures to prevent introducing/spreading pest flora species within the site; and
- planting gardens and other vegetated areas in the resort area with locally occurring native species and ornamental species that do not possess invasive qualities.

Changes to the physical environment

The project will be designed to:

- concentrate development primarily within areas that have been previously disturbed or cleared; and
- ensure all buildings will be located on site following detailed onsite investigations that take into account localised attributes such as slope, rocky outcrops, views and significant vegetation.

Sustainability

A broad range of other sustainability measures will be incorporated into the project, including:

- providing a National Park and Great Barrier Reef Educational Centre (for guests and visitors);
- ensuring sustainable building design to reduce energy and water demand;
- power generation using Solar Photo Voltaics and diesel generation back up; and
- improving sewage treatment to Class A or Class + quality standard.

Environmental Management Plan

The over-arching philosophy of White Horse Australia Lindeman Pty Ltd and the consultancy team is the development and implementation of an Environmental Management Plan to cover all facets of the development (refurbishment and operation) to ensure the stewardship of Lindeman's environmental values are holistically protected and enhanced through a mechanism of monitoring, continual review and improvement.

The development and implementation of a Terrestrial Environmental Management Plan and a Marine Environmental Management Plan is proposed in order to cover all facets of the development (refurbishment and operation) to ensure the stewardship of Lindeman's environmental values are holistically protected and enhanced through a mechanism of monitoring, continual review and improvement.

Prior to commencement of construction, these two Environmental Management Plans will be prepared. This Plans will be informed by the contents of the EIS, which will be prepared pursuant to the Terms of Reference. The Plans will identify all elements of work that have a potential for adverse impacts and will specify for each element:

- Performance requirement – what limits of impact shall apply;
- Reporting – what reports will be prepared and who they shall be addressed to;
- Monitoring – what monitoring or measurements shall be undertaken to ascertain whether this is a problem, what the magnitude of problem is and how effective the corrective action is; and
- Corrective Action – what action shall be taken to alleviate any adverse impacts.

Items to be addressed in the Terrestrial Environmental Management Plan are likely to include:

- Erosion and Sediment Control;
- Water Quality (including stormwater, groundwater and spill management);
- Potable Water Management;
- Sewage Disposal;
- Irrigation Management;
- Waste management;
- Site Contamination;
- Hazards, risk and safety;

- Flora Management (including Rehabilitation/Regeneration; Pest Plant Control; Bushfire Management; and Landscaping);
- Fauna Management;
- Pest Animal Control;
- Noise and Vibration;
- Air Quality;
- Emergency Response and Risk Management;
- Heritage Management (including Visual Amenity and Cultural Heritage);
- State controlled road infrastructure; and
- Visitor Management.

Items to be addressed in the Marine Environmental Management Plan are likely to include:

- Marine Ecology;
- Water Quality;
- Hazards, risk and safety;
- Harbour construction and maintenance (including barge access, noise and vibration; and dredge management); and
- Relevant aspects of a number of the matters covered in the terrestrial environmental management plan.

8.0 Approvals required for the project

8.1 Commonwealth

The *Environment Protection and Biodiversity Conservation Act 1999* ("EPBC Act") provides for the protection of the environment, especially matters of national environmental significance (MNES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of MNES without approval from the Commonwealth Minister for the Environment or the Minister's delegate. The purpose of a referral is to obtain a decision on whether a proposed action will need formal assessment and approval under the EPBC Act and if so the type of assessment required.

The Matters of National Environmental Significance (MNES) relevant to the project are:

- World Heritage Properties (Great Barrier Reef);
- National Heritage Places (Great Barrier Reef);
- Great Barrier Reef Marine Park;
- Listed Threatened Ecological Communities;
- Listed Threatened Species;
- Listed Migratory Species;
- Listed Marine Species;
- Whales and other cetaceans;
- Places on the Register National Estate (Greater Barrier Reef Region);
- State and Territory Reserves (Lindeman Island National Park);
- Nationally Important Wetlands (Great Barrier Reef Marine Park).

The site adjoins the Great Barrier Reef and may contain other MNES. As such, the potential impacts of the Project on MNES will be investigated fully as part of the EIS. A referral has been made to the Commonwealth Minister for the Environment to determine whether the project will be determined to be a controlled action under the EPBC Act.

8.2 State

This IAS has been prepared to determine whether the Coordinator-General will declare the proposed Lindeman Island Integrated Tourist Resort a 'coordinated project for which an environmental impact statement (EIS) is required under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the Act, which would require the proponent to prepare an EIS for the project.

The proposed action will be referred to the Commonwealth for determination as to whether approval under the EPBC Act is required. If it is declared "a controlled action" the State EIS process is an accredited process under the Bilateral Agreement between the Commonwealth Government and the State of Queensland. This process involves public consultation of the draft Terms of Reference as well as the EIS, once it has been prepared. The Terms of Reference will dictate the scope of the EIS and will be finalised by the Coordinator-General and Commonwealth Minister for the Environment.

The following list provides an overview of the likely approvals being sought as part of the assessment under the SDPWO Act:

- *Coastal Protection and Management Act 1995 – assessable development in the coastal zone, including operational work;*
- *Land Act 1994 – land tenure;*
- *Marine Parks Act 2004 – Safe Harbour;*
- *Nature Conservation Act 1992 – issues regarding the National Park leases;*
- *Sustainable Planning Act 2009 – material change of use and operational work approval;*
- *Vegetation Management Act 1999 – permit for clearing native vegetation and offsets.*

Additionally, pending the findings of the EIS, approvals may also be sought under the following legislation:

- *Aboriginal Cultural Heritage Act 2003;*
- *Environmental Protection Act 1994;*
- *Fisheries Act 1994;*
- *Native Title (Queensland) Act 1993;*
- *Transport Infrastructure Act;*
- *Water Act 2000; and*
- *Wet Tropics World Heritage Protection and Management Act 1993.*

8.3 Local Government

Lindeman Island is included in the Off-Shore Islands Locality of the 2006 Consolidated Mackay City Planning Scheme. The site is included in the Special Activities (Tourism) Zone and Open Space Zone. A development application will be required for the proposed material change of use, with Mackay Regional Council being the Assessment Manager. Due to the zoning of part of the site as Open Space, that part of the application will be impact assessable and as such public notification will be required in accordance with the *Sustainable Planning Act 2009* (SPA).

9.0 Costs and benefits summary

9.1 Local, state and national economies

The redevelopment of Lindeman Island into a major tourist resort is forecast to provide the following significant economic benefits:

- an estimated final development cost of $600 million;
- creation of an average of 865 construction-related jobs each year during the four year construction period;
- creation of around 300 full-time equivalent jobs on the Island once operational, plus additional jobs created elsewhere in the region through associated through flow-on or multiplier effects;
- privately funded infrastructure development project provided at no cost to the Government;
- an average of more than 858 people on the Island per day totalling around 313,000 person days per year;
- direct expenditure on Lindeman Island of about $30 million a year by Lindeman Island visitors and employees;
- a substantial increase in total visitor days in the regional Mackay area, generating income and business for not only the local area but also companies that offer commercial flights to the area;
- broadening of the regional Mackay economy through improved elevation of regional based tourism as an industry, through "destination" marketing and thus reducing the current reliance on the mining and agricultural industries; and
- significant increases in local and state government revenue through rates, property transaction duties, land tax and payroll tax.

As the project is privately funded, it is not considered that the proposal will have any significant adverse impacts on local, state and national economies.

9.2 Natural and social environments

The redevelopment of Lindeman Island into a major tourist resort is forecast to provide the following natural and social benefits:

- the integrated Resort will provide a new signature project for tourism for the Whitsunday Islands, showcasing the natural values of the Region;
- the project will contribute significantly to the offering of Queensland's Great Barrier Reef and coastal island attractions. In turn, this will improve the social opportunities of the region whilst making a positive contribution to the ecological integrity of Lindeman Island;
- a number of environmental initiatives are proposed as part of the project including opportunities for coral planting, National Park and Great Barrier Reef Education Centre and designation of land for nature refuges. The proponent also proposes a vegetation replanting program over previously disturbed/cleared areas;

- a new resort and Spa for domestic and international tourism provides additional opportunities for recreation, leisure and relaxation; and
- well-appointed staff accommodation that is integrated within the village precinct will support a mentally and physically healthy employee community.

Natural/social costs associated with the project including a potential lack of emergency services and issued associated with a FIFO workforce are proposed to be investigated during the EIS process and will be addressed where possible through appropriate mitigation measures.

10.0 Community and stakeholder consultation

The Proponent also proposes to develop a comprehensive public consultation strategy as part of the EIS. The objectives of the consultation strategy will be to:

- engage communities and local stakeholder groups (including local advisory groups and Indigenous stakeholders) to inform them about the proposal;
- utilise feedback and information from the community and stakeholder consultation to inform the proposal;
- outline the project EIS process (and the approvals required) to the community and stakeholders;
- be available to respond to queries and reasonable requests for information in a timely manner; and
- provide a range of accessible opportunities for community participation, taking into consideration different ways in which people may choose to engage.

11.0 References and data sources

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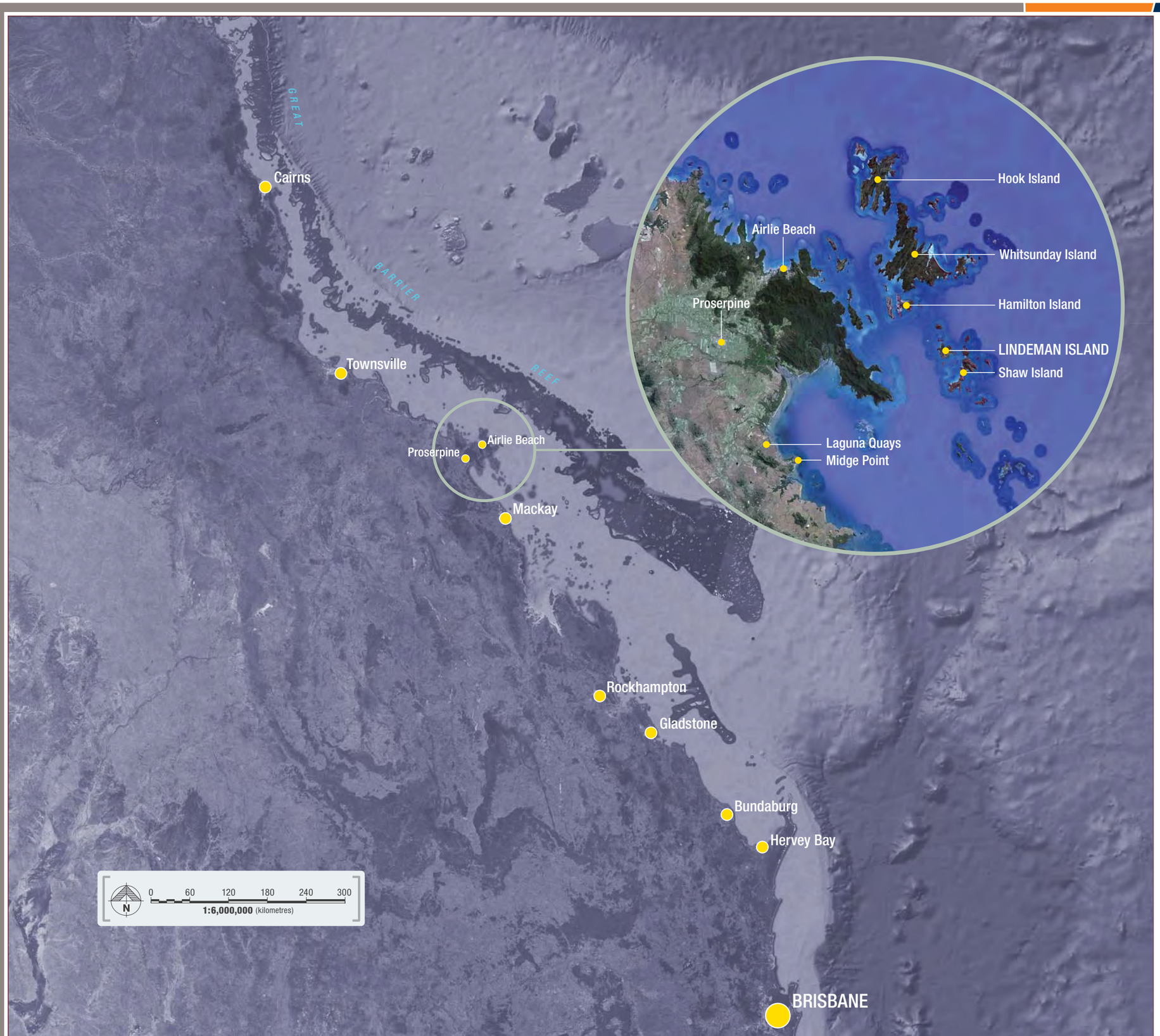
12.0 Glossary, acronyms and abbreviations

MNES – Matters of National Environmental Significance

Figures



Cardno HRP

LINDEMAN ISLAND
EPBC Act and IAS Referral

Regional Context

FILENAME >	REGIONAL CONTEXT	DATE >	21 APRIL 2015
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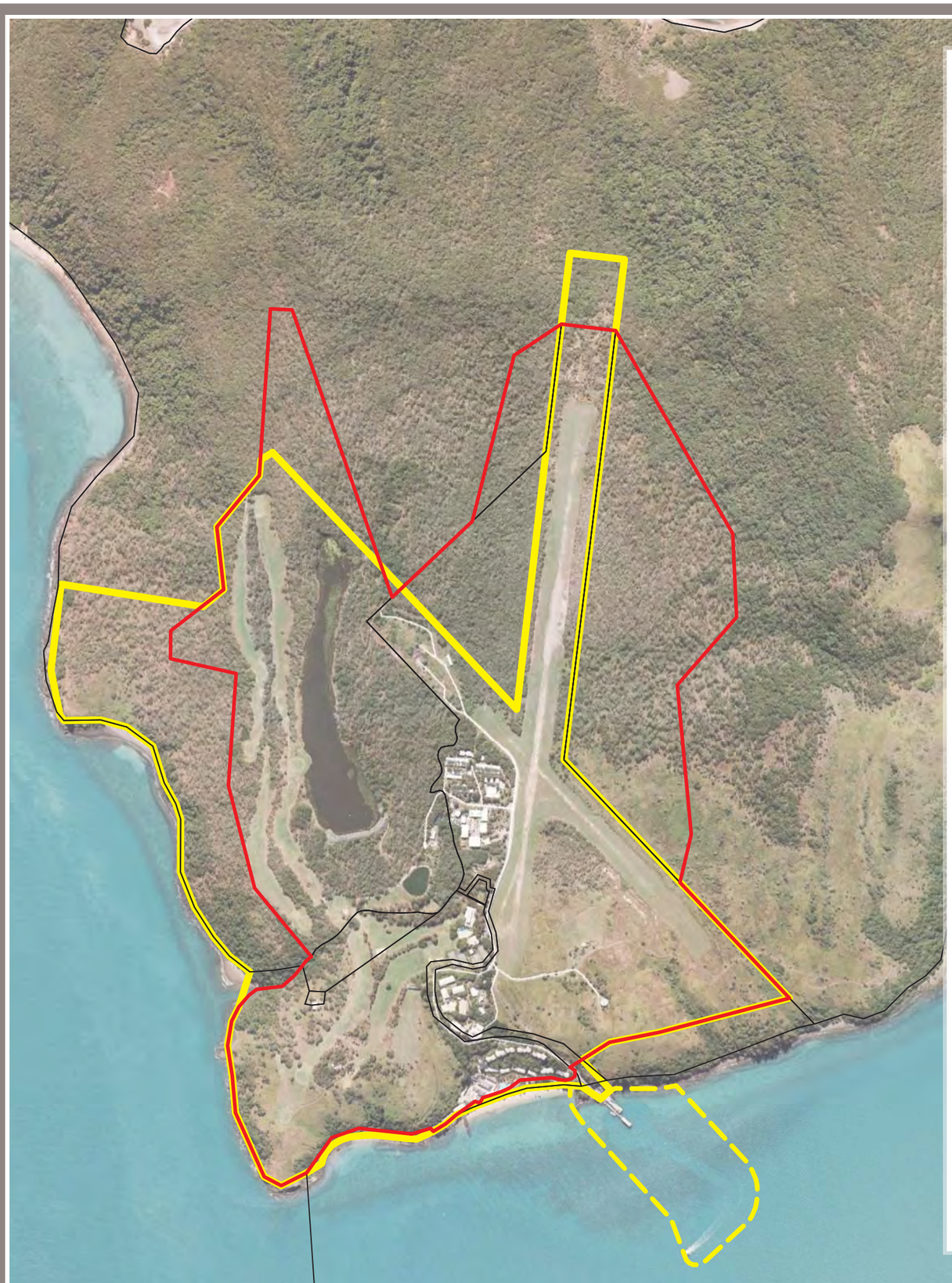
SCALE >	1:6,000,000	VERSION >	2
SOURCE >	GOOGLE EARTH		

FIGURE 1



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-20.459448	149.040339
-20.459244	149.040305

2

LEGEND

- Proposed Site Boundary
- Proposed Safe Harbour Lease Boundary
- Existing Site Boundary
- Existingf Cadastral Boundary

N

0 100 200 300 400 500

1:10,000 (metres)

Cardno HRP

LINDEMAN ISLAND

EPBC Act and IAS Referral

Site Location

FILENAME >	SITE LOCATION	**DATE >**	02 APRIL 2015
JOB No. >	HRP15078	**AMENDED >**	04 MAY 2015
SCALE >	1:10,000	**VERSION >**	4

FIGURE 2

3

LEGEND

- Proposed Site Boundary
- Proposed Safe Harbour Lease Boundary
- Existing Site Boundary
- Existing Cadastral Boundaries

LAND TO BE 'ADDED' TO NATIONAL PARK

- A — Perpetual Lease land to be surrendered ____ **7.18ha**
- B — National Park land (subject to current term lease) to be surrendered ____ **30.65ha**
- Approximate extent of land to be managed as a Nature Refuge

LAND TO BE 'REMOVED' FROM NATIONAL PARK

- C — Land proposed to be removed from National Park (not subject to a current term lease) ____ **18.01ha**
- D — Land proposed to be removed from National Park (subject to a current term lease) ____ **35.72ha**

OTHER LAND

- E — Existing Perpetual Lease to remain ____ **65.31ha**
- F — Area proposed to be subject to a sea bed lease ____ **7.57ha**

N

0 80 160 240 320 400

1:8,000 (metres)

Cardno® HRP

LINDEMAN ISLAND
EPBC Act and IAS Referral

Proposed Tenure Arrangements

FILENAME >	PROPOSED TENURE	**DATE >**	15 APRIL 2015
JOB No. >	HRP15078	**AMENDED >**	04 MAY 2015
SCALE >	1:8,000	**VERSION >**	5

FIGURE 3

Appendix 1: DBI Masterplan Concept

LINDEMAN

GREAT BARRIER REEF RESORT & SPA

QUEENSLAND ■ AUSTRALIA

MASTERPLAN CONCEPT

1 MAY 2015

JOB NO: 155020

LINDEMAN

GREAT BARRIER REEF RESORT & SPA

QUEENSLAND ■ AUSTRALIA

1.0 EXECUTIVE SUMMARY

2.0 PROPOSAL OUTLINE
- 2.1 GENERAL DESCRIPTION
- 2.2 LOCATION AND TENURE
- 2.3 BOUNDARIES
- 2.4 SITE BOUNDARY RE-ALIGNMENT
- 2.5 INITIAL CONCEPT MASTERPLAN OVERALL
- 2.6 INITIAL CONCEPT MASTERPLAN

3.0 DETAILED DESCRIPTION

- 3.1 BEACH RESORT / EXISTING RESORT - RECONSTRUCTION
  - DESCRIPTION
  - AERIAL VIEW
  - PROPOSED MASTERPLAN
- 3.2 PROPOSED NEW SPA RESORT
  - EXISTING AERIAL VIEW
  - PROPOSED MASTERPLAN DESCRIPTION
  - PROPOSED MASTERPLAN
  - 3D MONTAGE ELEVATION
- 3.3 TOURIST VILLA PRECINCTS
  - EXISTING AERIAL VIEW
  - PROPOSED MASTERPLAN DESCRIPTION
  - PROPOSED MASTERPLAN
- 3.4 ECO RESORT
  - EXISTING AERIAL VIEW
  - PROPOSED MASTERPLAN DESCRIPTION
  - PROPOSED MASTERPLAN
- 3.5 VILLAGE
  - EXISTING AERIAL VIEW
  - PROPOSED MASTERPLAN DESCRIPTION
  - PROPOSED MASTERPLAN
- 3.6 SERVICES INFRASTRUCTURE PRECINCT
- 3.7 AIRSTRIP
- 3.8 SAFE HARBOUR
- 3.9 LANDSCAPE ARCHITECTURE
- 3.10 VISUAL CHARACTER

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5.0 CONTACTS

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1.0

EXECUTIVE SUMMARY

1.0 EXECUTIVE SUMMARY

The reincarnation of Lindeman Island is a coup for the Australian Tourism Industry.

White Horse Australia purchased Lindeman Island late in 2012 from the previous owners, Club Med, who operated the resort as a three star family oriented tourist facility.

After the devastation of Cyclone Yasi the resort was closed.

The Directors of White Horse Australia were enamoured with the beauty of the Whitsunday Islands and the Great Barrier Reef. They saw the intrinsic beauty of Lindeman Island as the perfect location to create a new benchmark in Australian island resorts.

Their intention is simple.

Conceive, create and operate the best Resort and Spa in Australia that will have cosmopolitan appeal on an International level. They wish to ensure that Australians and International guests will experience a Resort, Spa and Residential product aimed at regular visitors and first time guests in an integrated development that captures the essence of the Whitsundays in elegant and understated luxury.

A Resort, Spa and Tourist Villas offering that will enjoy a diverse range of experiences centred on the Great Barrier Reef and World Heritage Values.

The master plan for the island has evolved from early concepts prepared by Hunt Design to the existing scheme conceived by DBI Design.

The existing resort will be replaced with a brand new 5 Star Beach Resort with the new suites in the same general location as the existing run down buildings.

A completely new central facility building with restaurants, bars and lounge areas cascading over 4 levels will replace the old run down buildings and small pool.

On the headland adjacent to the existing resort WHA wish to build an uber exclusive six star Spa Resort with a spectacular Central Facilities, entry lounge, sea view signature restaurant and a stunning pool looking to the sunset. DBI have designed a “rock bar” nestled in amongst the rocks at the south west corner of the island to offer guests an extraordinary alfresco experience close to the sea.

A destination spa carefully sited amongst the trees and rocky outcrops with superb sea views is a stellar part of the resort experience.

The new master plan also incorporates a 5 Star Eco Resort at the northern end of the lake gently falling towards the western island coastline. This products aimed at stimulating guests appreciation of the elements of Water, Nature, Air and Earth.

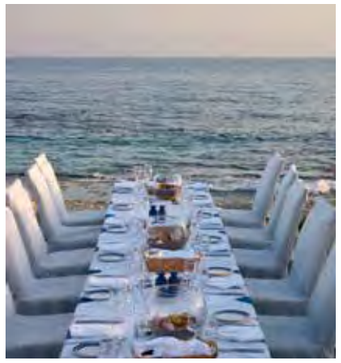
Tourist Villa precincts are carefully integrated with the three resorts to offer families a chance to savour the tropical lifestyle on Lindeman.
A Safe Harbour is an integral component in the concept to create a tourist destination capable of attracting clientele from all over the world. The existing jetty is dangerous in a storm and uncomfortable in strong winds and is not acceptable for a resort of this calibre.

Similarly the airport will be upgraded to near all weather status and be capable of landing small jets and a wide range of aircraft and helicopters.

Great care has been taken by the owners and designers to minimise environmental impact and in many ways provide a superior outcome when compared with the existing resort and current state of the vegetation and natural values.

Ultimately Lindeman Island will be seen as the new benchmark in Australian tourism - an indelible imprint with a character that is quintessentially tropical Queensland but a standard of style, amenity and service that is recognised at the highest International level.

The purpose of this document is to provide an overview of the proposed Masterplan for the island.



2.0

PROPOSAL OUTLINE

2.1 GENERAL DESCRIPTION

Lindeman Island was one of the first islands in the 74 Whitsunday Islands to be used as a tourist resort.

Although in 1905 the island was initially a sheep grazing lease it was not long after in 1923 when Angus Nicholson established a camp for visitors making it the oldest of all the resort islands in the Whitsundays.

The major investment on the island occurred after Club Med established their first Australian resort in 1992. It was a 225 room 3 star resort with an emphasis on families, adventure and entertainment. Club Med spent in the order of $85M in 1990 on the redevelopment of the Resort.

It had a somewhat troubled history and following substantial damage from Cyclone Yasi and the fact that the resort no longer reflected the evolving Club Med brand, the Company elected to sell the island which was purchased by an Australian company, White Horse Australia, late in 2011.

Since then White Horse Australia has been exploring a wide range of potential development scenarios for the island.

A driving principle behind the purchase of the island by the family owned company is a desire to create a resort that is in empathy with the intrinsic beauty of the Whitsundays which captivated the new owners from their very first visit to the islands.

2.1 GENERAL DESCRIPTION CONT'D

Whilst the development strategy is to create a resort that will compete at the highest International level, White Horse Australia recognise the provenance of the region, and the over-riding tenet to ensure that the architecture, landscaping and operation of the facility pay homage to the natural attributes of the island and its surroundings.

The core features of the resort have evolved through careful consideration by the partners in the project coupled with advice gleaned from tourism industry leaders, specialist consultants and potential hotel operators.

The end result is that there are three key initiatives.

The first initiative is a wholesale revamp of the badly damaged existing beachfront resort from a 218 room 3 star resort to a stellar 5 star resort immediately adjacent to the beach. This will include removal of damaged buildings and construction of a new central facilities over 4 levels inclusive of two stellar restaurants, expansive lagoon pools and hotel suites designed to an international standard.

The second initiative involves a completely new product on the higher portions of the currently leased land. White Horse Australia wish to establish a new pinnacle in Australian tourism - a true six-star boutique resort and spa. The company also wishes to offer a wider choice in accommodation styles and intend to develop residential enclaves flanking the resort.

The new 6 star Resort and Spa is carefully set amongst trees and natural rocky outcrops in the general location of the old Club Med Golf Course which is currently maintained as areas cleared of natural grasses and woodland.

The third initiative is the installation of an environmentally friendly 5 star Eco Resort generally in the area of the northern end of the existing run down golf course.

Wherever possible White Horse Australia intend to revegetate and rehabilitate the cleared areas.

2.2 LOCATION & TENURE

Lindeman Island is one of 74 islands in the Whitsunday Group. Only eight of the islands have been developed with resorts or associated tourist facilities.

Lindeman is located approximately 40 kilometres south east from Shute Harbour on the mainland and some 15 kilometres from Hamilton Island.

The Whitsundays are located off the Queensland coastline north of Mackay, south of Bowen and east of Airlie Beach.

The Whitsundays have regular air transport access via Whitsunday Coast Airport at Proserpine and Hamilton Island Airport. Both airports are capable of handling jet aircraft as used by the domestic airlines. International connections are from Cairns and the Capital Cities.

Road access to Airlie Beach via coach or private vehicle plug into a comprehensive water ferry network servicing all resort islands as well as tourist reef and island destinations.

The Whitsundays also have a large number of day maritime operators, extended voyage vessels, charter boats and private craft.

White Horse Australia are currently in negotiations with National Parks to amend the perpetual lease boundaries.

The existing resort has all the accommodation wings on the southern end of the island adjacent to a small beach. The current central facilities building is also on the lower portion of the site.

Staff accommodation and facilities, workshops, power generation plant, sewerage plant, water treatment, and general Back of House structures are located on the higher portion of the island adjacent to the airstrip.

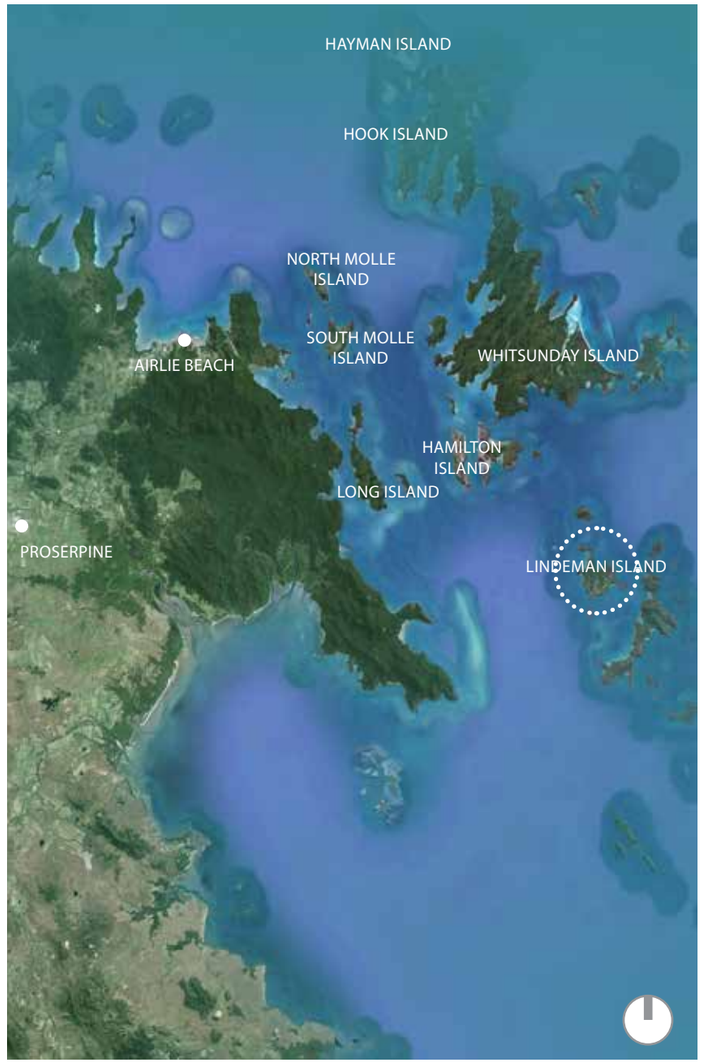
Lindeman Island is located within the Mackay Regional Council Local Government jurisdiction.

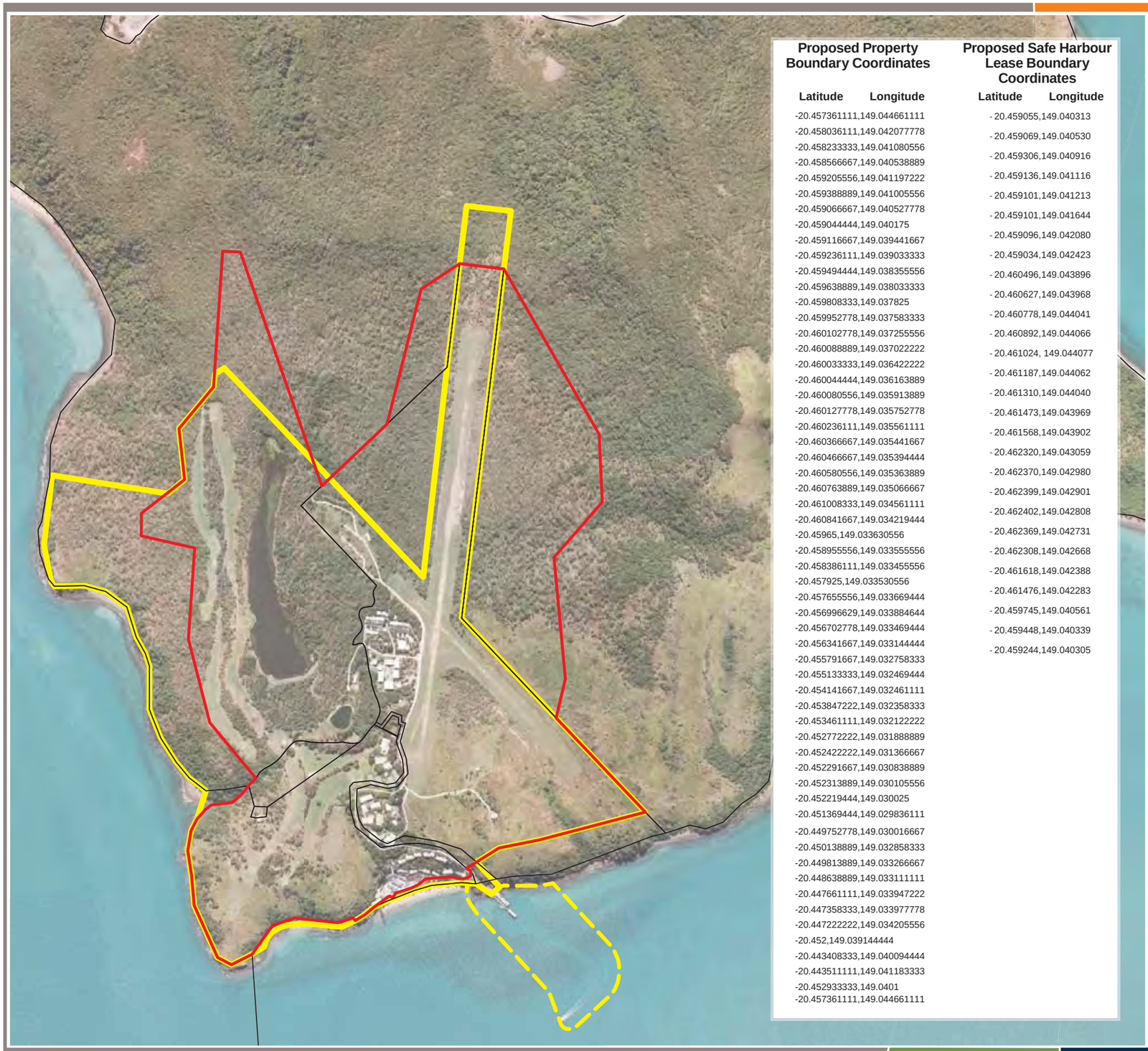
The real property description for the leases are :

Lot 2 CP858366, B HR2029, C HR2029 and D HR 2029

The lots are zoned Special Activities (Tourism) and Open Space.

The leaseholder is White Horse Australia Lindeman Pty Limited.





Proposed Property Boundary Coordinates

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Proposed Safe Harbour Lease Boundary Coordinates

Latitude	Longitude
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- 20.461476	149.042283
- 20.459745	149.040561
- 20.459448	149.040339
- 20.459244	149.040305

2

LEGEND

- Proposed Site Boundary
- Proposed Safe Harbour Lease Boundary
- Existing Site Boundary
- Existingf Cadastral Boundary

N

0 100 200 300 400 500

1:10,000 (metres)

Cardno HRP

LINDEMAN ISLAND

EPBC Act and IAS Referral

Site Location

FILENAME >	SITE LOCATION	**DATE >**	02 APRIL 2015
JOB No. >	HRP15078	**AMENDED >**	04 MAY 2015
SCALE >	1:10,000	**VERSION >**	4

FIGURE 2

2.4 SITE BOUNDARY RE-ALIGNMENT

LINDEMAN ISLAND

1. 50 BERTH SAFE HARBOUR - INDICATIVE LAYOUT AND LOCATION
2. 5 STAR BEACHSIDE RESORT
3. VILLAGE
4. TOURIST VILLA PRECINCT
5. 6 STAR SPA RESORT
6. DAY SPA
7. FUTURE RESORT EXPANSION
8. DAM AND RESTAURANT
9. 5 STAR ECO RESORT
10. EXTENDED RUNWAY
11. MAINTENANCE AND SERVICES
12. HANGERS
13. GOLF COURSE

0 100 300 500
50 200 400 1000

2.5 INITIAL CONCEPT MASTERPLAN OVERALL

1. 50 BERTH SAFE HARBOUR - INDICATIVE LAYOUT AND LOCATION
2. 5 STAR BEACHSIDE RESORT (APPROX 130 SUITES)
3. VILLAGE - RETAIL, CONFERENCE AND BUSINESS CENTRE
4. VILLAGE - SPORT CENTRE
5. VILLAGE - STAFF ACCOMMODATION AND AIRPORT LOUNGE
6. MAINTENANCE AND SERVICES
7. HANGERS
8. EXTENDED RUNWAY
9. GOLF COURSE
10. 6 STAR SPA RESORT (APPROX 54 VILLAS)
11. HEALTH RETREAT AND DAY SPA
12. TOURIST VILLA PRECINCT
13. 5 STAR ECO RESORT (APPROX 49 VILLAS)
14. "H20" RESTAURANT
15. ROCK BAR

KEYPLAN

0 50 150 250 400

25 100 200 300 500

3.0

3.1

DETAILED DESCRIPTION

BEACH RESORT

3.1 BEACH RESORT / EXISTING RESORT RECONSTRUCTION

EXISTING

As can be seen in the Aerial Photographs the existing resort is focussed on the south-western corner of Lindeman Island.

The accommodation is housed in 14 wings with a large central facilities building that housed the main restaurant, bars and entertainment facilities. The reception is further up the hill with Nicholson's Restaurant, conference rooms and staff accommodation on the plateau above the resort.

All the services areas including power generation plant, sewerage treatment works, water filtration and general maintenance, fuel stores and Back of House facilities are also on the plateau.

A grassed unlicensed airstrip (approximately 1000m long) is also situated on the plateau used by charter aircraft from the mainland and nearby Hamilton Island.

Sea access is gained from a jetty adjacent to the resort. This jetty is a Queensland Government asset and White Horse Australia are currently exploring the possibility of acquiring and maintaining the jetty from the State.

3.1 BEACH RESORT / EXISTING RESORT RECONSTRUCTION (CONT'D)

The jetty is located within a shallow basin in the surrounding coral flats and is exposed to the dominant South-East Trade Winds.

Damage from Cyclone Yasi is evident throughout the resort and ongoing deterioration of the buildings from continual water ingress is causing further damage.

All services are in need of an upgrade due to cyclonic damage, lack of continuing maintenance since the resort was shut down and ageing of plant and equipment.

WHA decided to reconstruct the existing resort as one phase of the redevelopment of Lindeman Island as a premium Australian integrated island resort.

A visual assessment of the existing buildings and resort infrastructure has been conducted by Structural and Civil Engineers from Flanagan Consultant Group.

The report indicates that despite the general degradation and damage to the resort, certain building elements remain structurally sound and are considered suitable for integration/reuse within the new development.

The Structural Engineers have assessed the substructure, consisting of the elevated ground floor slabs, associated columns and footings as being in sound condition and worthy of being retained. Accordingly they have recommended the removal and replacement of the existing superstructure with new building shells located on top of the existing ground floor slabs. Building services can be re-run under the elevated slabs and integrated into the new building fabric.

Preliminary investigations by specialist sub-consultants have revealed that storm surge has potential to inundate the existing resort site if the existing site levels are preserved. Subject to detailed modelling, it is

3.1 BEACH RESORT / EXISTING RESORT RECONSTRUCTION (CONT'D)

likely that the floor levels of all buildings near sea level will need to be raised in the order of 1.2 to 1.5 metres above existing levels to deliver the necessary immunity in the design storm event.
The Central Facilities building has also been subject to extensive water damage and the engineer's recommendation is to remove the existing structure and where possible retain and preserve the major sound structural timber elements.

The main design objectives of the concept are for the resort to respect, improve and complement the existing location and its natural setting. Each room or building is located to take advantage of its beach, ocean or island views. The new lagoon pool is edged by a private internal facing beach, protected from the prevailing winds.

The heights of the new buildings are similar or lower than the existing structures and any proposed height increases are limited to a small number of locations. In these locations, proposed organic building forms will compliment, integrate and form part of the natural topography.

The resort will also be connected with the Safe Harbour, arrival and visitor centre through a new Beach Club facility, which provides for educational and retail opportunities. The private rooms of the resort are pulled away from the north eastern edges and increases the opportunities for a landscaped vegetation buffer, protecting the residents from the service road and activation surrounding the marina precinct.
The proposed replacement of the Central Facilities building will be similar in location and height to the existing buildings.
The replacement of the existing hotel rooms with the new hotel suites or pavilion type buildings will vary in form and height (2 to 4 storeys), and are generally arranged around the internal beach and lagoon pool.
Additional hillside suites will be located on the north western slope, facing back towards the marina. Approximately 140 suites are proposed, consisting of a majority of studio type rooms, and some exclusive 2 bedroom beach side and hillside villas.

The central facilities accommodates a number of restaurants and bars, spilling out onto alfresco dining and lounge terraces.

Buggy usage and numbers are expected to increase on the island, with provisional planning undertaken to allow for parking, improved circulation and storage facilities.

BEACH RESORT // EXISTING AERIAL VIEW

BEACH RESORT

1. ARRIVAL AND ACCESS BUGGY PATH
2. RESORT (BUGGY) PORTE COCHERE
3. RE-USE EXISTING RECEPTION BUILDING (NEW ROOF)
4. NEW 4 LEVEL CENTRAL FACILITIES
5. CASCADING WATER FEATURE
6. RESORT POOL
7. POOL TERRACE
8. POOL PAVILION
9. INTERNAL BEACH
10. WATER DETENTION/ STORAGE TANKS
11. HILLTOP- HOTEL SUITES
12. RESORT POOL- HOTEL SUITES
13. PRIVATE POOL- HOTEL SUITES
14. BEACH CLUB BAR & RETAIL
15. BUGGY PARKING
16. SAFE HARBOUR - INDICATIVE LAYOUT AND LOCATION
17. CONFERENCE CENTRE (INDICATIVE)
18. STAFF ACCOMMODATION / VILLAGE

KEYPLAN

0 25 50 100 150

3.0

3.2

DETAILED DESCRIPTION

PROPOSED NEW SPA RESORT

0 25 50 100 150

3.2 PROPOSED NEW SPA RESORT

The new Resort and Spa is located upon the southwest headland and hillside adjacent to the existing resort.

The flatter portions of this precinct have been historically used as a golf course with the majority of the cleared area populated by exotic grasslands with small remnant patches of ecologically important native grasslands with areas of littoral rainforest and coastal vine thickets occurring on the steep slopes close to the coastline.

WHA wish to set a new benchmark for an exclusive, but environmental sensitive, 6 star resort within the Whitsunday Island chain.

The DBI masterplan concept focuses towards more small scale pavilion like structures (villas) sitting gently and sympathetically integrated within the landscape, rather than traditional bulky hotel type buildings.

This approach would not only assist with the provision of more private style retreats and court yards, but also help improve the ecological network via an extended green chain of vegetation throughout the development.

The only major and potentially visual sensitive building will be the iconic central facilities with a signature restaurant, club and bar. The organic form of the building will work with the topography and integrate with the hillside and in most cases will then only be seen in silhouette when on a boat (arriving) or viewed from the marina and beach resort below.

Whilst the masterplan indicates a road network layout and position for each villa, in reality each pavilion will be individually located on site. Final decision on location will take into account localised attributes such as slope, rocky outcrops, significant trees and valuable vegetation parcels. Similarly the precise alignment of the buggy paths will also be ground truthed to provide optimum routes with minmal impacts.

The buggy paths are designed for electric 'golf carts' and as such are narrow with discrete passing zones located to minimise site disturbance.

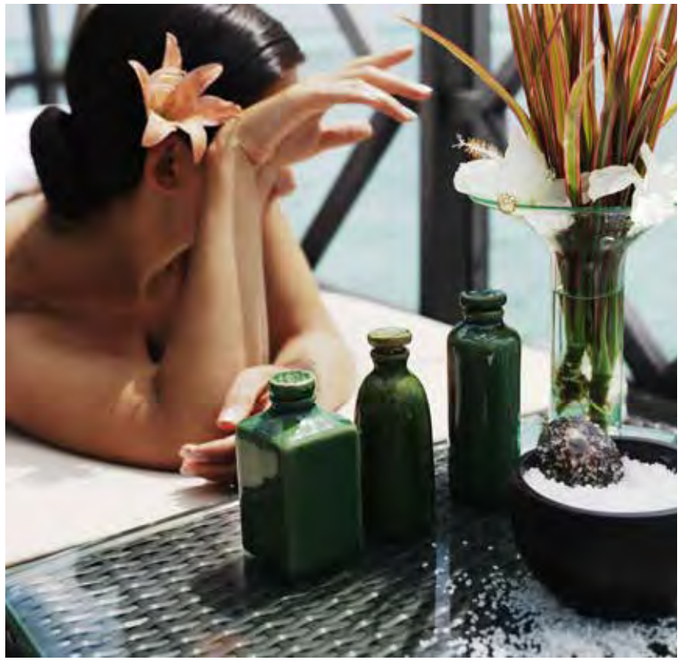
Approx. 54 villas (1, 2 and 3 bedroom options) will be strategically located and four types of villa designs, with different floor planning objectives and roof forms which respond to their context, orientation and exposure to prevailing winds and climatic conditions.

The 1 storey suspended health and day spa pavilions are located on the southern hillside and are part of this exclusive and sensitive 5 star resort atmosphere.

On the western hillside, a signature cliff side `rock bar` is proposed to sit close to the edge, overlooking the ocean to the distant mainland.

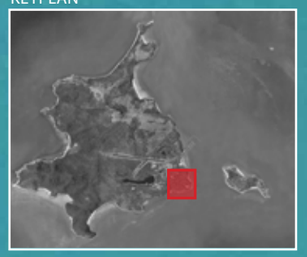
The overall objective of this precinct is to not just develop, but to carefully manage and protect, the sensitive ecological communities and enhance the environmental values and qualities of the headland. This exclusive resort development, operated by a top tier hotel operator, will be an addition to Australia and The Whitsunday Islands' tourism offerings on an international stage.

Landscaping to the resort precinct provides a powerful opportunity to rehabilitate the existing cleared areas with native trees and grasslands and provide multiple benefits and positive outcomes. Guests will experience individual suites set within an authentic Australian landscape. Vistas from the sea to the island will revert back to a more naturalistic view shed with occasional glimpses of roof lines set amongst the trees. Vegetation communities will be extended and networked to provide healthier and more resilient natural system which substantial environmental benefits.



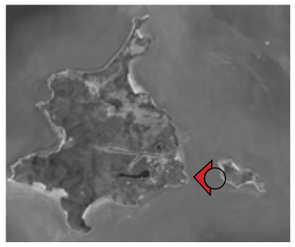
1. ACCESS ROAD
2. LANDSCAPE ARRIVAL EXPERIENCE
3. HEALTH RETREAT/ DAY SPA
4. CENTRAL FACILITIES
5. SUNSET DECK AND POOL TERRACE
6. ROCK BAR
7. TYPE A - COURT YARD VILLAS X 16
8. TYPE B - CLIFFSIDE VILLAS X 15
9. TYPE C - HILLTOP VILLAS X 10
10. TYPE D- EXCLUSIVE CLIFFSIDE VILLAS X 5
11. TYPE D- EXCLUSIVE HILLTOP VILLAS X 9
12. GOLF COURSE

KEYPLAN



0 25 50 100 150

KEYPLAN



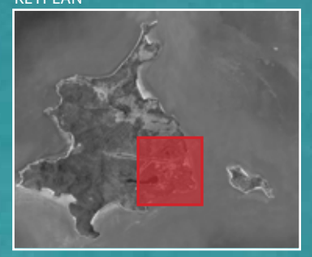
V ZOOM-IN

PROPOSED NEW SPA RESORT // 3D MONTAGE ELEVATION

3.0 DETAILED DESCRIPTION

3.3 TOURIST VILLA PRECINCTS

KEYPLAN



0 25 50 100 150 200

TOURIST VILLA PRECINCTS // EXISTING AERIAL VIEW

3.3 TOURIST VILLA PRECINCTS

There are THREE proposed Tourist Villa precincts;

The first (A) is on a gently sloping plateau north east of the existing resort, the second (B), is north of the village overlooking the dam. The third (C) is north west, embedded amongst the existing golf fairways adjacent to the man-made dam.

All precincts will be master planned and developed as 'enviro lots' whereupon access is proved by narrow electric buggy tracks generally following the natural contours to minimise environmental impact.

House locations will be managed by a building envelope plan that limits the footprint of each individual residence. Residences would be constrained by strict building covenants that will limit height of residences to a maximum of two stories, and in some sensitive locations to only one.

The covenants will also control style, form, colours, materials, size (gross floor areas), roof designs, glazing, thermal performance, services utilisation and general resort objectives in terms of quality and neighbourly co-existence.

In addition, all residences will need to comply with the usual requirements of the Mackay Regional Council and relevant Australian Building Codes.


A
B
TOURIST VILLA PRECINCTS
PRECINCT A
PRECINCT B
KEYPLAN
0 25 50 100 150 200

3.0 DETAILED DESCRIPTION

3.4 ECO RESORT

ECO RESORT // EXISTING AERIAL VIEW

3.4 ECO RESORT

The proposed new Eco Resort is located on the north western side of the island redevelopment and consist of approximately 49 villas, a central facility, a boathouse and an exclusive waterside restaurant.

The masterplanning approach in locating the central facility is different to that of the spa resort which has a prominent iconic building on a hill at the end of the entry road and is a focus of the arrival experience. The central facility building of the eco resort becomes the first point of contact and sits within the natural setting with a potential green roof treatment to provide that first and obvious glimpse of an environmental friendly eco focused resort.

The “butterfly” villas, with their organic roof forms, will be strategically positioned to optimise their sensitive integration with the setting. Although the masterplan generally indicates a road network layout and villa sites, in reality, each pavilion will be individually located on site to best deliver the objective above. Final decision on the location of each villa will take into account localised attributes such as views, slope, geomorphological features and significant trees.

Similarly, the precise alignment of the buggy paths will also be ground truthed to deliver the same objective.

Part of the eco experience will be the provision of a variety of low impact, nature based activities, such as the nature walks, canoeing on the dam, private beach access and snorkling on the reef.

1. "H2O" RESTAURANT
2. EXISTING DAM
3. LANDSCAPE ARRIVAL EXPERIENCE
4. TOURIST VILLA PRECINCT
5. CENTRAL FACILITIES
6. "BOATHOUSE" HEALTH AND REC CENTRE
7. SUNSET DECK / WEDDING VENUE
8. ECO 'TREE TOP' VILLAS / x 9 VILLAS
9. ECO 'BUTTERFLY' VILLAS / X 40 VILLAS
10. PROPOSED BOUNDARY ALIGNMENT
11. PRIVATE BEACH & BBQ PAVILIONS

KEYPLAN

0 25 50 100 150 200

3.0 DETAILED DESCRIPTION

3.5 VILLAGE

VILLAGE // EXISTING AERIAL VIEW

3.5 VILLAGE

With an increase and distribution of development on the island, a central and activated village centre is proposed.

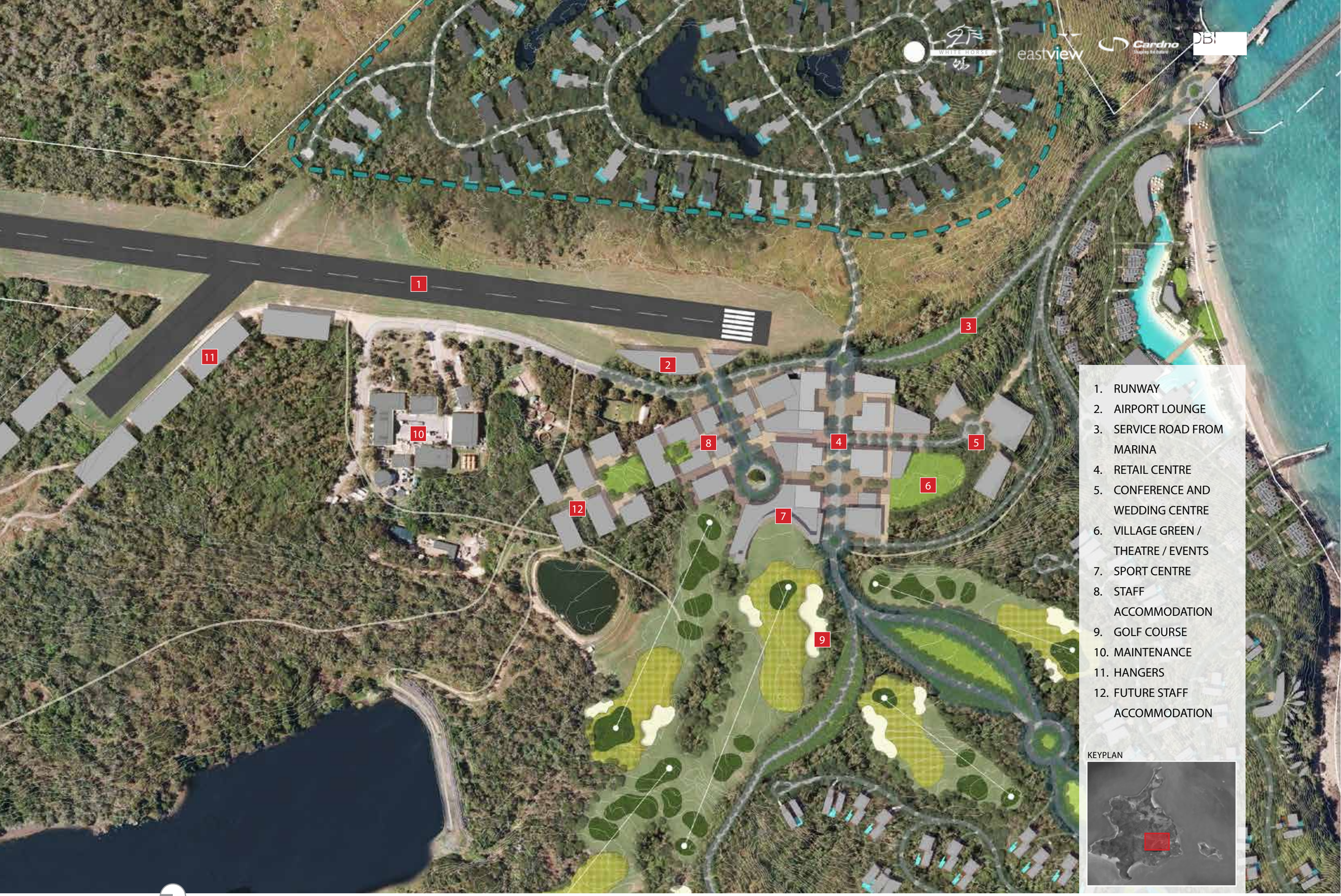
The new village will accommodate a variety of uses and aim to have a constant role of activation and be referred to as the 'entertainment and meeting place" for all island residents and guests.

The proposed village will contain the refurbished bar, night club, restaurant and conference facility buildings. It is adjacent to the airstrip and a new arrival centre or airport building will become the entry gateway to the village and broader island development.

The village main street (promenade) will be activated with pedestrians, golf buggy's, new bars, active shop fronts and restaurants. Leading off this main street will be the conference facilities, events park, a sport and recreation centre, and the staff village.

The staff village will consist of 2 to 3 storey buildings and have private landscape court yards, a central recreational area with kids play equipment, bbq pavilions, amenities and a pool recreation zone.

Around 200 staff will live on the island at any time, and it is proposed to integrate staff accommodation within the village. The village will become the commercial centre and will be a social and active hub for residents, visitors and staff.



1. RUNWAY
2. AIRPORT LOUNGE
3. SERVICE ROAD FROM MARINA
4. RETAIL CENTRE
5. CONFERENCE AND WEDDING CENTRE
6. VILLAGE GREEN / THEATRE / EVENTS
7. SPORT CENTRE
8. STAFF ACCOMMODATION
9. GOLF COURSE
10. MAINTENANCE
11. HANGERS
12. FUTURE STAFF ACCOMMODATION

KEYPLAN

0 25 50 100 150 200

3.6

SERVICES INFRASTRUCTURE PRECINCT

The existing services infrastructure core elements of power generation, sewerage and water treatment plants will also be upgraded to state of the art installations with significantly higher standards than the existing equipment. (For a more detailed understanding of the initiatives for vastly improved service provisions see Appendix A)

The power generation is likely to be a hybrid system using a combination of high efficiency / low pollutant diesel generation plant coupled under an advanced computer controlled optimisation management system with a Solar Photo Voltaic /Battery Storage installation.

Monitoring systems will ensure optimum operation and protection of quality of all forms of discharge to ensure no detrimental environmental impacts.

The buildings housing the services plant will also be refurbished at the time of the plant upgrades.

Furthermore, the whole precinct will be completely re-landscaped befitting the standard of the resort and include new strategically located pedestrian and vehicular pathways.

3.7

AIR STRIP

The existing airstrip consists of two runways. The main runway aligned 18/36 is a grass strip a nominal 1097m long. The secondary runway is aligned 13/31 and is also grass with a nominal length of 680m.

Although well maintained the airstrip is not licensed and is not used by commercial aircraft apart from 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.

The surface is too rough for many aircraft.

WHA intend to upgrade the both existing runways to a sealed surface with upgraded storm water drainage to allow for operations during rainy periods.

The main sealed runway will be extended within the existing leased areas to approximately 1200 metres which will open up the airfield to a wider variety of aircraft including small jets.

Being within the Control Zone of Hamilton Island, aircraft operations at Lindeman Island require clearance from Hamilton Control Tower during periods when the Control Tower is operating.

At other times the airstrip is within the special Whitsundays CTAF operation region.

In addition to improving the operational characteristics of the main runway the secondary runway will be also upgraded. The smaller secondary runway will be used in part for aircraft parking and possible location of aircraft hangars.

In keeping with the new status of Lindeman Island as a premier tourist destination a custom designed arrivals and departure lounge will be constructed on the edge of the airstrip for the comfort of guests. The lounge will be located adjacent to designated helicopter landing pads. A concierge service at the lounge will transport guests to their accommodation or to the resort facilities. Amenities in the lounge will ensure the comfort of waiting guests.

3.8 SAFE HARBOUR

As mentioned previously the proposed safe harbour is located in the area surrounding the existing jetty.

The jetty has an existing deepwater access channel. The proposed breakwaters and associated harbour works are contained with an area of approximately 7.57 ha.

This harbour, as existing and on completion of the project, is serviced by a barge on the eastern side of the jetty discharging onto a concrete ramp. From this point small trucks can move supplies to the central receiving facility within the staff and maintenance precinct. The same operations will efficiently remove refuse etc from the island.

Primary operation of the harbour is for the transfer of guests via ferries, luxury vessels and private charters. In addition, the safe harbour is proposed to have berths for approximately 50 vessels of varying sizes to cater for visiting craft and residents' private vessels.

The design (which is currently being refined) has a breakwater on the western side of the jetty which also acts as the pedestrian and buggy access to the finger berths. At the head of the breakwater, adjacent to the jetty, is an arrivals lounge and cafe for guests arriving from vessels at the jetty or breakwater berths. The eastern breakwater continues in a curve to create a barrier to the south-east trade winds.

An entrance to the safe harbour has been formed with an eastern breakwater projecting towards the end of the western barrier. This creates an entry point that is protected from the prevailing dominant wave action.

The operation of the safe harbour will be controlled by appropriately trained staff.

To minimise impact on the harbour and surrounds, live-aboards and vessels will not be allowed to empty bilges or waste water within the harbour. There is no intention to provide fuel or maintenance facilities in the harbour precinct and stormwater will not be discharged marina area.

UNDER REVIEW: INDICATIVE LAYOUT ONLY

0 25 50 100 150 200

3.9 LANDSCAPE ARCHITECTURE

The landscape architecture proposed for the rebirth of the existing resort will embrace the framework of existing soft landscaping through the retention of quality material. As a result of minimal maintenance since Cyclone Yasi it will be necessary to do a thorough audit of the vegetation to put a plan in place to remove weeds and other undesirable growth.

New landscape design initiatives will build upon the existing material supplemented with new plantings which take references from the island setting and the endemic vegetation communities that exist.

The matrix of soft and hard landscaping elements inclusive of striking water features and pools will provide "a sophisticated yet understated elegance" (See Appendix C - Preliminary Landscape Design Commentary).

3.10 VISUAL CHARACTER

The southern part of the island's topography and visual character is predominantly flat with steep vegetated edges. Rocky outcrops and cliff edges make up for a large percentage of the coastline and only a few sandy beaches are accessable for private recreation. The northern part of the island has more gentle edges and sandy beaches.

The southern part of the island is also the only area available for re-development, and with its raised natural 'platform' or headland, buildings are generally more exposed when viewed from a distance.

The existing 3 storey beach resort consists of over 12 individual apartment buildings and a pyramid shaped central facilities building on top of the hill. These buildings are also light in colour (walls and roofs) and in contrast to the surrounding green landscape.

The main objective of the master plan and building designs is to achieve a sustainable outcome and therefore, all building forms should respond to the local tropical context. Buildings are proposed to be more organic, broken down into pavilions, suspended and with floating roof forms.

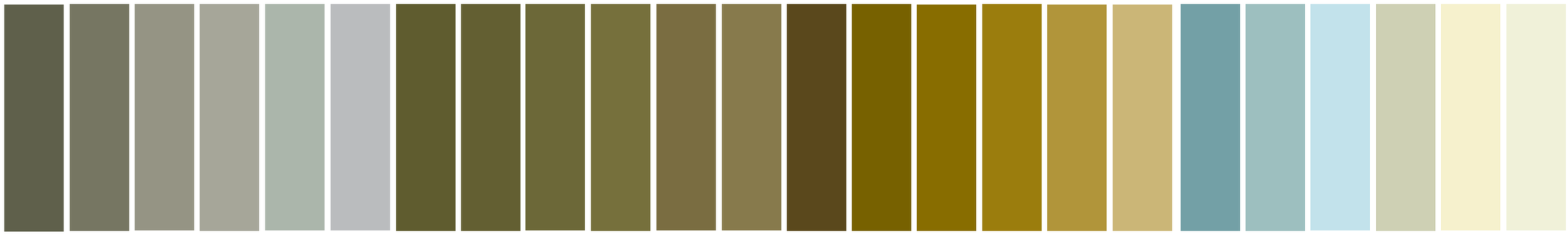
The proposed master plan by DBI includes two resorts with iconic and innovative central facility buildings. The form of each building integrates with the surrounding topography rather than competing and has soft sloping edges, stepping down to the surrounding low rise pavilions.

The pavilion style buildings will be smaller in scale, articulated with human scale elements.

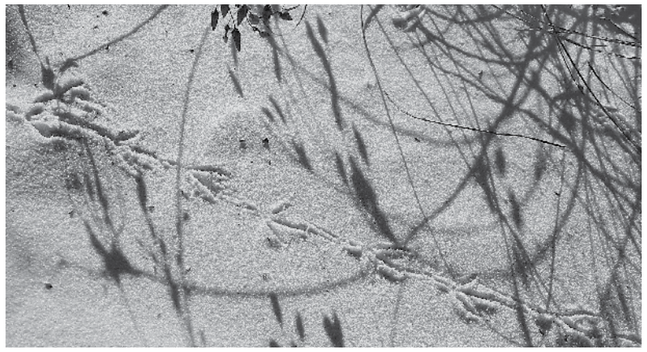
A series of low rise buildings or pavilions allows for an increase in vegetation between and surrounding the buildings, and reduce the visual impact.

Colour palettes are derived from the surrounding landscapes and allows the buildings to blend into their surroundings. Large overhangs, recessed terraces, and dark tinted low reflectivity glass will assist with the feel of depth and reduce the visual bulk of buildings and the overall development.

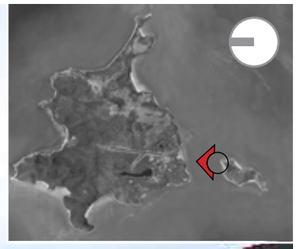
The existing central facilities building on the hill will be transformed into a conference centre and have a new less dominant roof form.



COLOUR PALETTE DERIVED FROM THE SURROUNDING LANDSCAPE ^

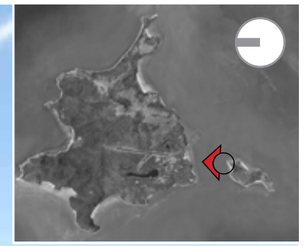


KEYPLAN



^ EXISTING BEACH FRONT RESORT

KEYPLAN



^ PROPOSED BEACH FRONT RESORT (PHASES ONE & TWO) VIEWED FROM THE SEA

^ EXISTING BEACH FRONT RESORT / ZOOM IN

^ PROPOSED BEACH FRONT RESORT (PHASE ONE ONLY) / ZOOM IN

4.0

DBI DESIGN
PRELIMINARY LANDSCAPE DESIGN COMMENTARY

INTRODUCTION

The proposed Lindeman Island redevelopment project offers unparalleled opportunities to set exemplar standards in environmentally sustainable and integrated resort based design. The landscape design will be sympathetically and respectfully developed to be in harmony with the setting. It will not try to dominate it, but instead complement and reinforce the Island's natural beauty and environmental qualities. The design will embrace the site's natural assets, work with the topography and promote its tropical ambience to provide a relaxed, intimate and contextually appropriate experience for the island's guests and residents.

DESIGN RATIONALE

The physical nature of Lindeman Island will provide unique opportunities and challenges during the design process. The proposal will be conscientiously designed and sympathetically integrated to negate any adverse environmental and visual impacts and it will preserve and enhance the natural integrity of the Island. The design will acknowledge the site's contextual location and appropriately integrate with its surrounds.

To protect and promote the site's core intrinsic values, the design will acknowledge and respect Island's natural assets and its sensitive location within the Whitsunday Island chain and Great Barrier Reef Marine Park. The design will support the Island's ecological processes and carefully responds to its topographical and landscape references to negate any adverse environmental or visual impacts. Degraded areas surrounding the existing resort facilities will be carefully rehabilitated to their original natural state in order to provide sustainable landscape outcomes that further promote the key ecological and visual qualities of the Island environment.

The qualities of the tropical island setting will be embraced and complemented through the design approach, reinforcing its uniqueness and a `sense of place` experience for its visitors. The proposed core island facilities, hotels and guest suites will be immersed into the setting with the vegetation used to provide privacy and intimacy and blur the boundaries between nature and the built forms. The design will aim to provide a sense of sanctuary with relaxed leisure and lifestyle opportunities.

The detailing and material selections will have a sophisticated yet understated elegance which will take references from the Island setting and the proposed architectural aesthetic.

Water elements will be a major landscape tool used to provide interest, recreational opportunities and a refreshing ambience to the tropical island setting. Pool areas will be carefully integrated into the design and respond to their functional application from large lagoon resort pools to more intimate and private plunge pools or water features.

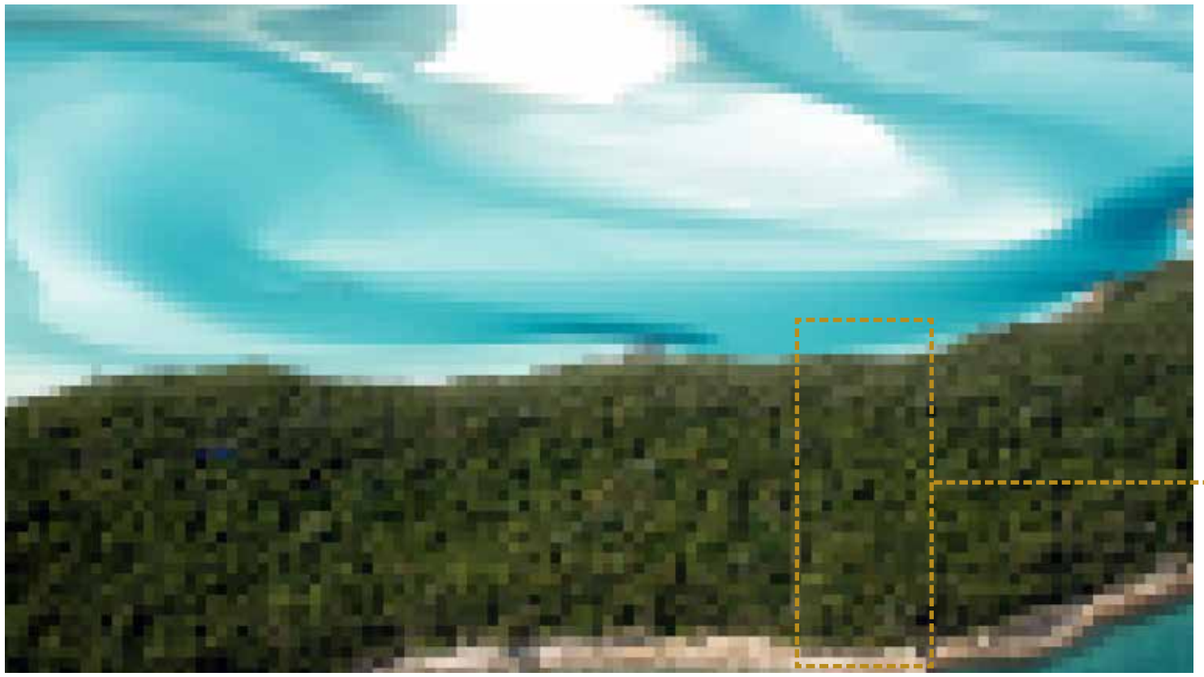
The scale of the landscape design elements and spaces will be consciously varied to provide a richness to the resort experience. The landscape design will appropriately respond to its setting as the design will embrace the site's natural assets, preserving key vistas whilst also creating more intimate internally focusing spaces where required. The tropical ambience of the setting will be reinforced through the careful selection of appropriate plant species and will combine with the previously mentioned design philosophies to provide a unique experience for the Island's patrons and guests

SUMMARY

Respectful of the site's context and its environmental, visual and social responsibilities, the landscape concepts for the proposed Lindeman Island development will be carefully and sympathetically designed in response to these challenges. The perceived constraints will be embraced as opportunities, and the environmental challenges will be enthusiastically engaged in order to provide an exemplar, sustainable resort development model.

This exceptional site, combined with a well considered resort concept, provides a unique opportunity to deliver a high quality, world class environment in which to holiday, recreate and rejuvenate in. The landscape design will enthusiastically embraced the settings natural tropical island character. It will complement the proposed architectural style and reinforce the relaxed, leisure ethos proposed for the resort. The design philosophies, themes, treatments and spatial arrangements will be strategically used in order to promote these design concepts and most importantly to protect and enhance the core environmental values of the Island.

^ Figure 1 ORIGINAL AERIAL PHOTO



^ Figure 2 PIXELATED AERIAL PHOTO

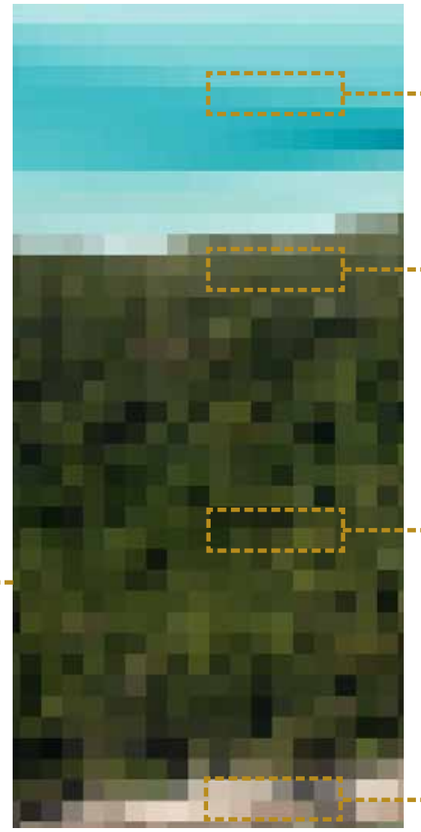
After these above-mentioned measures are implemented; it is anticipated that only portions of the built form areas may remain visible from certain points surrounding the proposed Lindeman Island redevelopment.

Particularly visually sensitive building locations will be required to adhere to more stringent development controls than the majority of the Lindeman Island development.

An architectural colour range referenced below has been generated by extracting the subtle colour palettes existing within the surrounding marine environments and vegetation canopies which form the foreground and backdrop to the site. Utilising a colour range that mimics its surrounding will assist the Lindeman Island development will visually integrate and blend into its natural surroundings; thus ensuring that the integrity of its rich and iconic scenic amenity is retained.

The colour selection methods use a high resolution image (Figure 1) of the site, then pixelates this image (Figure 2) to extract the natural colours and hues to provide an appropriate, site specific colour palette (Figure 3 & Figure 4). This palette, combined with additional treatment methodologies can then be applied to any built forms proposed for the site in order to minimise any potential negative visual outcomes. The colour application will help the built forms recede and merge into their setting and negate any adverse visual impacts that they may have.

Strategic, location specific landscaping with endemic species will further improve the proposed redevelopments visual integration and extend existing habitat into the resort precinct.



PIXELATED VEGETATION COLOUR RANGE

^ Figure 3

^ Figure 4

Figure 5 ^

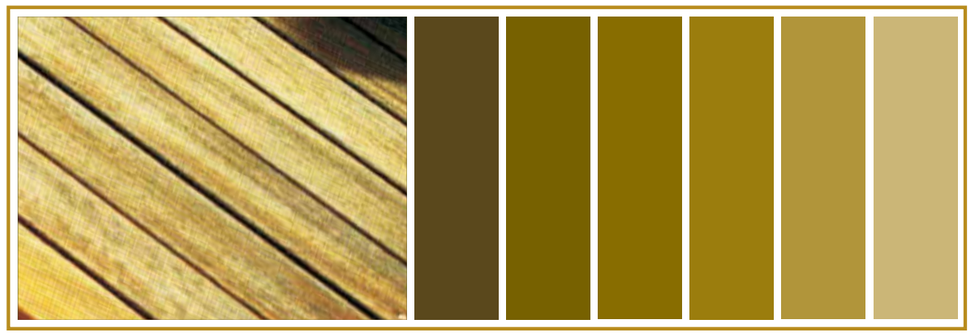


Figure 6 ^

Figure 7 ^

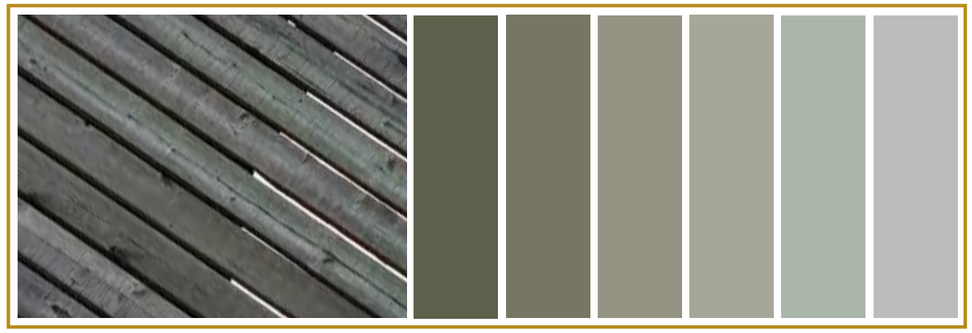


Figure 8 ^

VISUAL AMENITY CONTROLS

The Lindeman Island site is situated within close proximity to the Great Barrier Reef World Heritage Area (GBRWHA). A primary goal for the proposed Lindeman Island redevelopment will be to protect the integrity of its visual amenity and character by ensuring that development is either inevident in the viewed landscape, or only temporarily apparent as the site extensive revegetation works mature. The development is committed to enhancing the scenic values through extensive revegetation & sensitive built form design.

The proximity and impacts of the proposal on existing pristine and sensitive natural environments will require careful consideration. The need to manage the visual interaction between the built form and natural environment both from within the site, and as viewed from outside the site, is of critical importance.

Large swathes of planned conservation zone revegetation and rehabilitation will screen the majority of the development with only the upper portions of buildings and rooflines being visible prior to the vegetation achieving maturity. In time, no building will be greater in height than surrounding native vegetation. External finishes will be selected from the settings natural tones; selected to match and blend with the existing natural landscape aesthetics.

All buildings and structures need to be predominately constructed of natural materials and/or exhibiting a natural appearance so as to blend with, and compliment, the natural environment. To assist the management of visual interaction between the built form & natural environment an indicative colour palette has been developed by extracting natural colours and hues from Lindeman Island landscape and fringing water environments. Any colours utilised in the design process should be based on this methodology of selection.

This palette will negate any potential negative visual outcomes when combined with the additional treatment methodologies for the proposed site's built forms. The colour application controls will help the built forms recede and merge into their setting, and negate any adverse visual impacts.

Materials need to be in keeping with the Lindeman Island visual character and borrow textures, tones and colours from the surrounding natural environment, including:

- Encourage the use of recycled timber,
- Natural stone,
- Timber or fibre cement weatherboards,
- Rendered or painted brickwork,
- Face brick,
- Pre-finished metal sheeting,
- No mass material should cover more than 50% of any external wall area,

Figure 9 ^

‘TESTING THE VISUAL AMENITY DESIGN PHILOSOPHY’

BUILT FORM TREATMENTS TO AVOID IN ORDER TO MINIMIZE VISUAL IMPACTS ON A NATURAL SETTING

Λ Figure 10 POOR VISUAL INTEGRATION

A LIMITED OVER HANGS AND SHADOWING INCREASES POTENTIAL REFLECTIVITY

B STANDARD GLAZING AND REDUCED SHADOWING INCREASES POTENTIAL REFLECTIVITY

C HIGH ROOF PITCHES IN A SITE CONTRASTING COLOUR, INCREASES A BUILT FORM’S VISUAL PRESENCE

D THE USE OF COLOURS THAT CONTRAST TO THE SITE’S NATURAL PALETTE, VISUALLY INCREASES A BUILDING’S PRESENCE

'TESTING THE VISUAL AMENITY DESIGN PHILOSOPHY'

METHODOLOGIES USED TO NEGATE VISUAL IMPACTS

REFERENCE IMAGERY : EXAMPLES OF APPROPRIATE TYPOLOGIES

Λ Figure 11 GOOD VISUAL INTEGRATION

NOTE: THE BASIC FORMS OF 2 HOMES DEPICTED IN FIGURES 10 & 11 ARE THE SAME. ONLY THE TREATMENTS AND LANDSCAPE COLOUR APPLICATIONS DIFFER

E ADDITIONAL PLANTINGS OF ENDEMIC TREES IMPROVES VISUAL INTEGRATION

F USE OF RECESSED DARK GLAZING WITH REDUCED REFLECTIVITY MINIMIZES VISUAL IMPACTS

G EXTENDED OVERHANGS AND FACADE ARTICULATION INCREASES SHADOWING AND VISUALLY REDUCES BUILDING MASS

H REDUCED ROOF MASS MINIMIZES VISUAL IMPACTS BY USING FLAT OR LOW PITCHED OPEN GABLES

I COLOURS SELECTED FROM THE NATURAL LANDSCAPE PALETTE - REFER COLOUR SELECTION METHODOLOGY OUTLINED IN FIGURES 1-4

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ACKNOWLEDGEMENT: HUNT DESIGN CONTRIBUTED TOWARDS THE CONTENT OF THIS SUBMISSION.

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DBI REFERENCES

Note: Reference images included in this presentation are intended for in-house discussions only.

DBI Design does not claim authorship or intend to adopt architectural character. These images have been sourced from various publications.

Appendix 2: Regional Ecosystem as shown on PMAV

711500 712000 712500 713000 713500

7738000 7737500 7737000 7736500 7736000

8.12.12d
8.12.14c
8.12.12d
BHR2029
8.12.14c
8.3.2
8.12.12d
8.3.2
8.3.2
8.12.12d
8.3.2
8.12.12d
CHR2029
8.12.12d
DHR2029
2CP858366
8.12.13a
8.12.13a
2CP858366
8.12.11c
2CP858366
8.12.13a
3CP858361
8.12.11c
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8.12.12d
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8.12.11c
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8.12.13a
8.12.11c

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WHITE HORSE AUSTRALIA

REGIONAL ECOSYSTEMS AS SHOWN ON PMAV

Legend

- Lot On Plan

Vegetation Community

- Endangered
- Least Concern
- Of Concern

100 50 0 100
Metres

Scale: 1:8,000

N

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994
Date: 31/03/2015

nrc
northern resource consultants

Appendix 3: Desktop Vegetation Assessment

711500 712000 712500 713000 713500

7738000 7737500 7737000 7736500 7736000

8.12.12d
8.12.14c
8.12.12d
8.12.14c
8.3.2
8.12.12d
8.3.2
8.3.2
8.12.12d
8.3.2
8.12.12d
8.12.12d
8.12.13a
8.12.13a
8.12.13a
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8.12.12d
8.12.13a
8.12.11c
8.12.12d
8.12.13a

Document Path: D:\GIS Projects\White Horse Australia\maps_mxd\150330 - Veg Communities Additional Lease.mxd

WHITE HORSE AUSTRALIA

DESKTOP VEGETATION ASSESSMENT

Legend

- Desktop Assessment Study Area

Lease Area

- Proposed Development Area
- Surrendered Lease Area

Vegetation Communities Desktop STudy Area

- Coastal Rainforest
- Eucalypt Woodland
- Grassland

Regional Ecosystems as shown on PMAV

- Endangered
- Least Concern
- Of Concern

100 50 0 100
Metres

Scale: 1:8,000

N

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994
Date: 31/03/2015

nrc
northern resource consultants

Appendix 4: BMT WBM Safe Harbour and Temporary Barge Access: Marine Ecology Survey (2013)

BMT WBM

Lindeman Island Resort Safe Harbour and Temporary Barge Access: Marine Ecology Survey

Reference:
R.B20346.002.00.Marine Ecology.docx
Date: October 2013
Confidential

Lindeman Island Resort Safe Harbour and Temporary Barge Access: Marine Ecology Survey

Prepared for:	White Horse Australia
Prepared by:	BMT WBM Pty Ltd (Member of the BMT group of companies)

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Document:	R.B20346.002.00.Marine Ecology.docx
Title:	Lindeman Island Resort Safe Harbour and Temporary Barge Access: Marine Ecology Survey
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Client:	White Horse Australia
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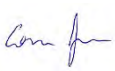
Client Reference:	Contract 4th July 2013

Synopsis: **This report provides a constraint-based site-selection for the development of a safe harbour and temporary barge access associated with the redevelopment of Lindeman Island. The marine ecology, habitat characteristics, and potential impacts of development at these sites are described.**

REVISION/CHECKING HISTORY

Revision Number	Date	Checked by		Issued by	
0	25/10/2013		Darren Richardson		Conor Jones

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Executive Summary

White Horse Australia (WHA) purchased Lindeman Island Resort and intends to develop it and integrate the resort with a residential community. The proposed development includes an upgrade to the marine facilities and establishment of a safe harbour and temporary barge access for movement of materials and equipment during the construction phase.

Maritime access is currently *via* a south-east facing fixed jetty which is difficult and unsafe to use in an animated sea state. Establishment of a safe harbour is critical for emergency evacuation scenarios. Based on environmental and engineering constraint investigations, the existing jetty area was considered the least constrained location from the perspectives of required approvals, finance, and based on engineering design to the extreme weather events. After investigating potential locations for the safe harbour, three design options were proposed that utilised existing infrastructure and attempted to reduce the footprint of the harbour and the costs of construction.

Desktop-based marine ecology, legislative, and marine ecology constraint mapping was performed to evaluate the relative suitability of a range locations around Lindeman Island as potential safe harbour locations. These studies modelled extreme weather events to determine preliminary design heights, provided cost implications of safe harbour designs, and described legislative and marine ecology constraints to safe harbour development. All assessment criteria suggested that the area surrounding the existing jetty was best site for safe harbour development, while temporary barge access would be possible at a range of potential locations.

Preliminary marine ecology field surveys were conducted at five study regions which included the existing jetty location, Boat Port and at range of other potential barge landing sites on the northern, western and eastern sides of the island. Rapid assessment methods were used to map and quantify benthic habitats and communities at each site. A total of 167 spot dives were undertaken across the five study regions. Bathymetry data were collected and interpolated to give a Digital Elevation Model (DEM), as were spatial distributions for per cent cover values of hard corals, soft corals, seagrass, and macroalgae to give “heat maps” of benthic cover.

The highest density living coral communities were found on the reef directly south of the jetty and surrounding the existing dredged channel. Other reef areas generally had sparse living coral communities consisting of coral skeletons dominated by macroalgae or sand and rubble substrates.

Following the field assessment, three safe harbour design options were created at the jetty location to utilise existing infrastructure and minimise impacts to corals. Direct loss of macroalgal and seagrass communities within and adjacent to the proposed design option footprints will not be likely to constitute a major impact due to the small extent of seagrass to be affected, and the extreme abundance of macroalgae elsewhere.

The extent of significant living coral communities present within the proposed design option footprints at the jetty site will likely represent a point of concern for GBRMPA given their emphasis on the preservation of corals and other habitats of biodiversity significance. Of the three layouts considered, Options 1 and 2 had the advantage of affecting areas already disturbed by the existing dredged channel, jetty, and ramp infrastructure. While the footprint of Option 3 had lower coral cover that at Options 1 and 2, this area was in a largely undisturbed condition.

Seagrass and coral communities of Boat Port (and Gap Beach to a lesser degree) are situated offshore from beach landing site and would not likely be degraded by a regular high-tide barge service. While there will need to be management of impacts to turtle nesting and human users of the site, the distribution of seagrasses and corals, and the derived bathymetry at Boat Port are not prohibitive to the establishment of the high-tide barge access. Depending on where the road access point meets the beach, there may be some marine plant disturbances (mangroves) required.

It is recommended that consultation with GBRMPA occur prior to any further re-configuration or field work to determine their preferences for design modification, mitigation, or offsetting within the realised limitations of the project. Other construction and operational impacts can foreseeably be mitigated and are not likely to represent significant challenges to the project.

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1 Introduction

1.1 Background

White Horse Australia (WHA) purchased Lindeman Island Resort in August 2012 and intends to develop the island as a premium tourist resort and integrated residential community. As part of this development, an upgrade to the marine facilities is proposed through the establishment of a safe harbour.

Maritime access is currently *via* a south-east facing fixed jetty which is difficult to access in an animated sea state and this is unacceptable on comfort and safety grounds, even for large ferries. There are concerns regarding the use of this access in cyclones or other emergency evacuation scenarios. For these reasons, establishment of a safe harbour is critical.

Barge access is also required for movement of materials and equipment during the construction phase, away from the reconstructed resort area. Depending on the final location of the barge loading site, unloaded material is proposed to be transported along existing roads, the golf course, and potentially via an access track (to be developed from an existing hiking track).

Landing of the barge at high tide along the beach allows for operations to be undertaken without any need to construct infrastructure or for blasting/dredging of the fringing reef. The only construction activities would be associated with the development of access tracks linking the beach to the golf course. These terrestrial activities are outside the scope of this report.

BMT WBM performed an initial desktop constraints study that investigated the engineering, legislative, and likely marine ecology constraints to the development of a safe harbour and temporary barge landing at a range of locations around Lindeman Island (Figure 1-1). The full details of the marine engineering components are provided in BMT WBM (2013; ref. R.B20346.003.00Engineering.docx), and a summary of the legislative and marine ecology constraints are provided in Section 2. All assessment criteria suggested that the area surrounding the existing jetty was the best site for safe harbour development, while temporary barge access would be possible at a range of potential locations.

These locations were then surveyed in greater detail to describe marine habitats and potential impacts of various aspects of development. After investigating potential sites for the safe harbour, a design was proposed that utilised existing infrastructure and attempted to reduce the footprint of the harbour (Figure 1-2). This design was modified subsequently into three different options to investigate how re-configuration might reduce footprint impacts.

This report presents the results of preliminary marine ecology survey that was conducted at Lindeman Island in relation to the proposed safe harbour development at the existing jetty location (Figure 1-2), and potential temporary barge access sites at Boat Port and at range of other potential barge landing sites on the northern, western and eastern sides of the island. Recommendations on the location and design of the proposed safe harbour and temporary barge landing site have been presented based on potential impacts to the marine environment.

LEGEND

Approximate Locations of Seawalls

Title:

Lindeman Island Locality Plan and Study Locations

Figure: 1-1

Rev: A

N

0 0.5 1km

Approx. Scale

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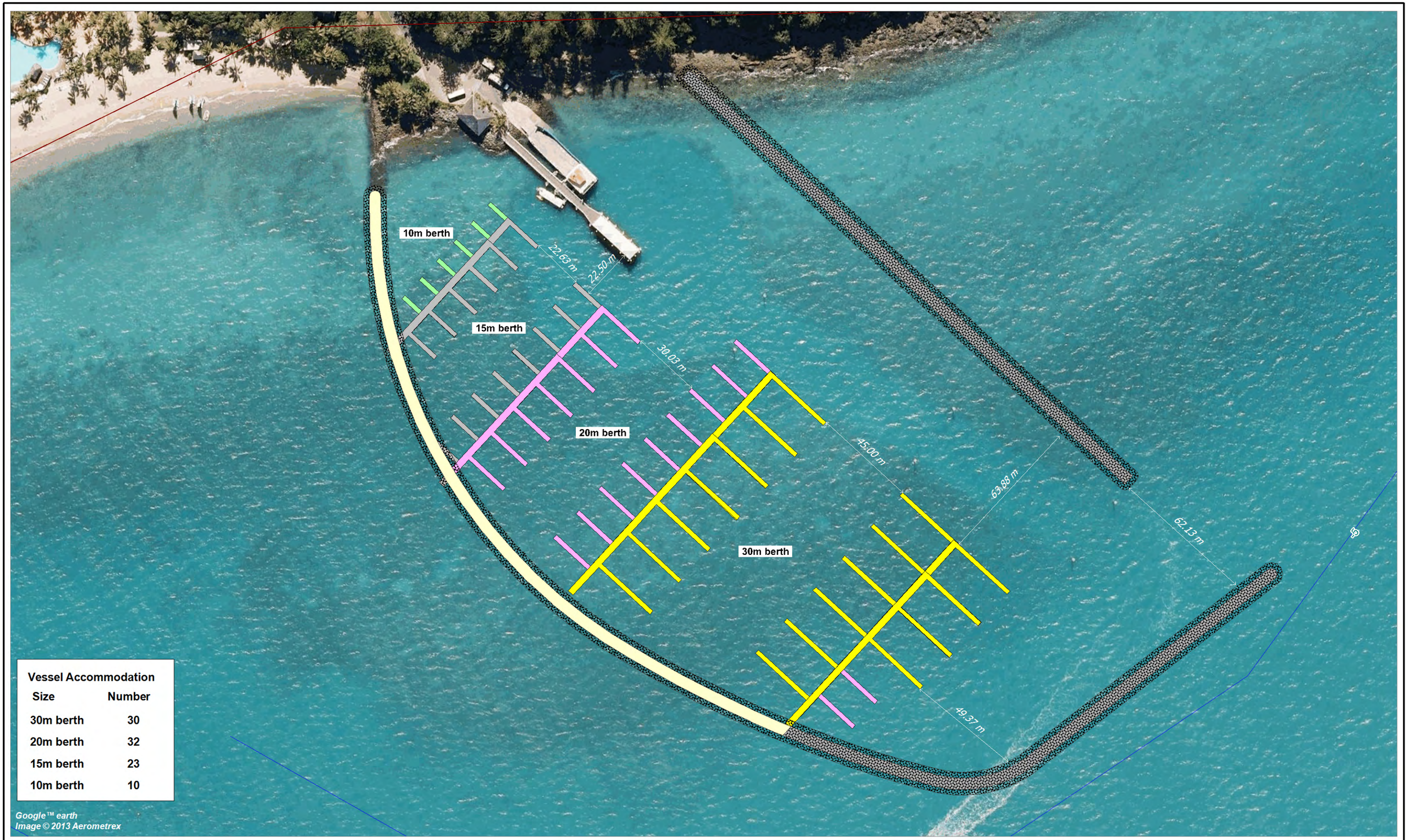

LEGEND

Berth Fingers

- 30m
- 20m
- 15m
- 10m

- Seawall
- Walkway

Contours

- Land
- Bathymetry

Title:

Proposed Safe Harbour Development at the Existing Jetty Site, Option 1

Figure: 1-2

Rev: D

N

0 25 50m

Approx. Scale

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1.2 Study Aims and Objectives

The study was undertaken in two stages:

- A preliminary desk-top assessment of environmental and legislative constraints; and
- A more detailed ecological assessment and field investigtation.

The aim of the desktop constraint mapping exercise was to identify and assess environmental and legislative constraints that need to be considered in the selection of a safe harbour and temporary barge landing site.

The aim of the ecological assessment was to characterise and map marine communities and habitats at and adjacent to the proposed safe harbour and potential temporary barge landing locations, in order to refine the initial desk-top based constraints assessment. The specific objectives of this component were to:

- Undertake mapping of marine habitats and communities to ground-truth the findings of the desk-top constraints assessment.
- Provide supplementary information that will be required to support preliminary development approval documentation (i.e. maps and other information required for EPBC Act Referral).
- Provide input to the design team for the safe harbour and temporary barge access in order to minimise environmental impacts.

Note that while the information collected in this field assessment is sufficient to inform (for example) a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), it has not been scoped to provide a comprehensive baseline as would be required for EIS reporting purposes. In this regard, it would be expected that more detailed analysis of collected data and possibly additional (seasonal) surveys would be required to satisfy EIS reporting requirements.

1.3 Study Area Context

Lindeman Island is an island in the Lindeman Island Group of the Whitsunday Islands off the central coast of Queensland. It is an area of high ecological value and is of recognised conservation significance.

Areas of high conservation significance that occur in the study area include:

- Great Barrier Reef Marine Park (GBRMP) Conservation Zone and Public Appreciation areas (the latter having site specific management requirements).
- GBR World Heritage Area (WHA) and National Heritage Place.
- The terrestrial area of Lindeman Island is also protected as part of the Lindeman Islands National Park, with the exception of the excised area of the resort.

2 Desktop Constraints Assessment

2.1 Marine Engineering Constraint Summary

BMT WBM (2013) modelled ambient winds at gale forces (40 knot from 8 major directions) and 3 cyclones (approx. 1:100 ARI) with outputs at each of the potential safe harbour locations shown in Figure 1-1. Existing data (storm tide levels, bathymetry, winds and waves) were used to set up models to determine wave climates at each location. Marina designs considered the height of breakwaters to resist cyclonic conditions, given macro-tidal conditions environment and significant storm surge. The ability to provide safe passage in storm conditions was also considered. Some designs provided berths for larger vessels (in the order of 50m length, which require around 4.2m of clear water depth). The volume of rock required to build marina infrastructure above and below -5 m LAT contours, and the volume of dredging required for these berths and access channels and fairways, were also calculated. Preliminary estimates of breakwater arrangements, armour size and volumes were made. A cost estimate of $250/m^3 of breakwater was applied to all calculations.

The existing jetty location was relatively well protected from gale-force and cyclonic conditions and had with a preliminary estimate of breakwater and dredging costs of $25M. The location south of Billy Goat Point could be developed without reef dredging but the breakwater costs may be in the order of $200-300M because of the deeper water at the site and exposure to extreme wave conditions. Boat Port and Gap Beach would both require significant breakwaters to protect against extreme northerly fetches, and dredging with development costs are in the order of $100M and $50M, respectively.

2.2 Legislative and Marine Ecology Constraints

2.2.1 Approach

The basic approach of the marine approvals and ecology constraint mapping was to collate relevant spatial information describing environmental features and legislative tenure and overlay these layers to show areas of highest and lowest constraint to safe harbour/barge access site development. Constraints were also tabulated in a 'traffic light' approach to show the detail behind the assessment. The review considered the ecological character of the study area, including the distribution, extent and abundance of marine flora and fauna species, and their habitats. The following datasets were analysed:

- Historical seagrass survey data carried out by Hyland et al (1988) and coarse spatial layers available from the Federal Government (CAMRIS);
- Reef habitat included in GBRMPA Reef Gazetteer;
- Historic shipwrecks (Historic shipwrecks database) or otherwise;
- Other existing spatial data mapping (bathymetry, regional ecosystem mapping, conservation zone/area mapping etc.);
- Marine flora and fauna database records (protected matters search, DEHP database); and
- High ecological value habitats such as coral reefs, seagrass and mangroves;
- Associated foreshore vegetation, including threatened vegetation communities

- Habitats and features of high amenity and social value, including reefs and beaches;
- Marine park and World Heritage Area boundaries;
- Marine park management areas;
- Known or likely habitat for threatened or migratory marine species;
- Known or likely habitat for marine species of fisheries significance;
- Protected area boundaries;
- Any other matters of State Environmental Significance (MSES) or National Environmental Significance (MNES) available from Government databases;
- Native Title mapping by Commonwealth Native Title Tribunal;
- Local government overlays.

Spatial data analysed were used to derive a constraints map (covering all proposed safe harbour/barge access sites), and provide broad definition of suitable and unsuitable areas for development of a safe harbour and/or temporary barge access along the coastline of Lindeman Island. Hectares of coral reef beneath the footprint of each of the safe harbour arrangements shown in Figure 1-1 were calculated using GBRMPA coral reef polygons, navigation charts and visible reef areas from available aerial photography. Hectares of seagrass were not calculated due to the unreliability and poor temporal currency of the available data.

2.2.2 Constraint Maps

Figure 2-1 to Figure 2-5 provide the available environmental and planning spatial data layers for the study area, illustrating the key marine ecological and associated legislative constraints. A summary map based on this preliminary constraints assessment is provided in Figure 2-6, demonstrating that the least constrained area for the marine development is the nearshore area along the south of Lindeman Island, near the existing jetty. This conclusion was reached prior to any field surveys.

Key constraints identified were the Whitsundays Plan of Management zoning (for vessel and aircraft restrictions) and the GBR Marine Park zoning plan (Conservation Park zone and Marine National Park zones). This effectively prohibits the establishment of a safe harbour within these areas, as legislative changes and other approvals would be required.

Lindeman Island

Gaibirra Island

Shaw Island

Google™ earth
Image © 2013 TerraMetrics
Image Landsat
Image © 2013 Aerometrex

LEGEND

- Seawall
- Reef (GBRMPA)
- Developed (70m, no limits)
- Moderate Use (35m, 40 pax)
- Natural (35m, 15pax)

Contours

- Land
- Reef
- Bathymetry

Title:
Lindeman Island - Whitsunday Planning Area

Figure: 2-1

Rev: A

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Approx. Scale

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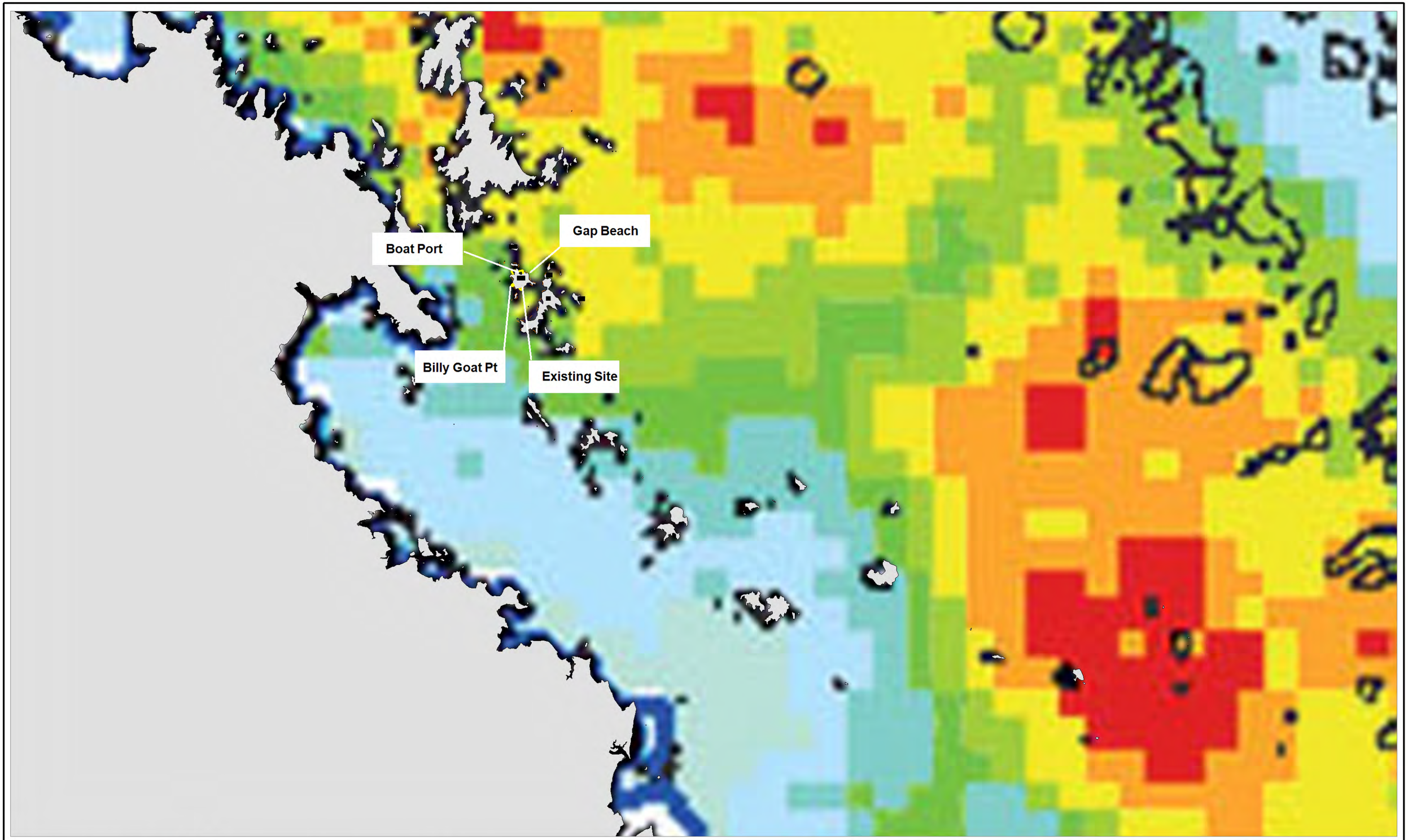

LEGEND

Seawall

Land

Contours

Reef

Environmental suitability

- 0.7 - 0.82
- 0.6 - 0.7
- 0.5 - 0.6
- 0.4 - 0.5
- 0.3 - 0.4
- 0.2 - 0.3
- 0.1 - 0.2
- 0 - 0.1

Title:

Lindeman Island - Humpback Whale Habitat (Smith et al. 2012)

Figure: **2-2**

Rev: **A**

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Approx. Scale

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Lindeman Island

Gaibirra Island

Shaw Island

LEGEND

- Seawall
- Reef
- Land
- National Park
- Conservation Park
- Marine National Park

Remnant Vegetation

- Remnant with Endangered REs
- Remnant with "of Concern" REs
- Remnant with "least concern" REs

Title:

Lindeman Island - GBRMPA Zones (Marine) and Remnant Vegetation (Terrestrial)

Figure: 2-3

Rev: A

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Approx. Scale

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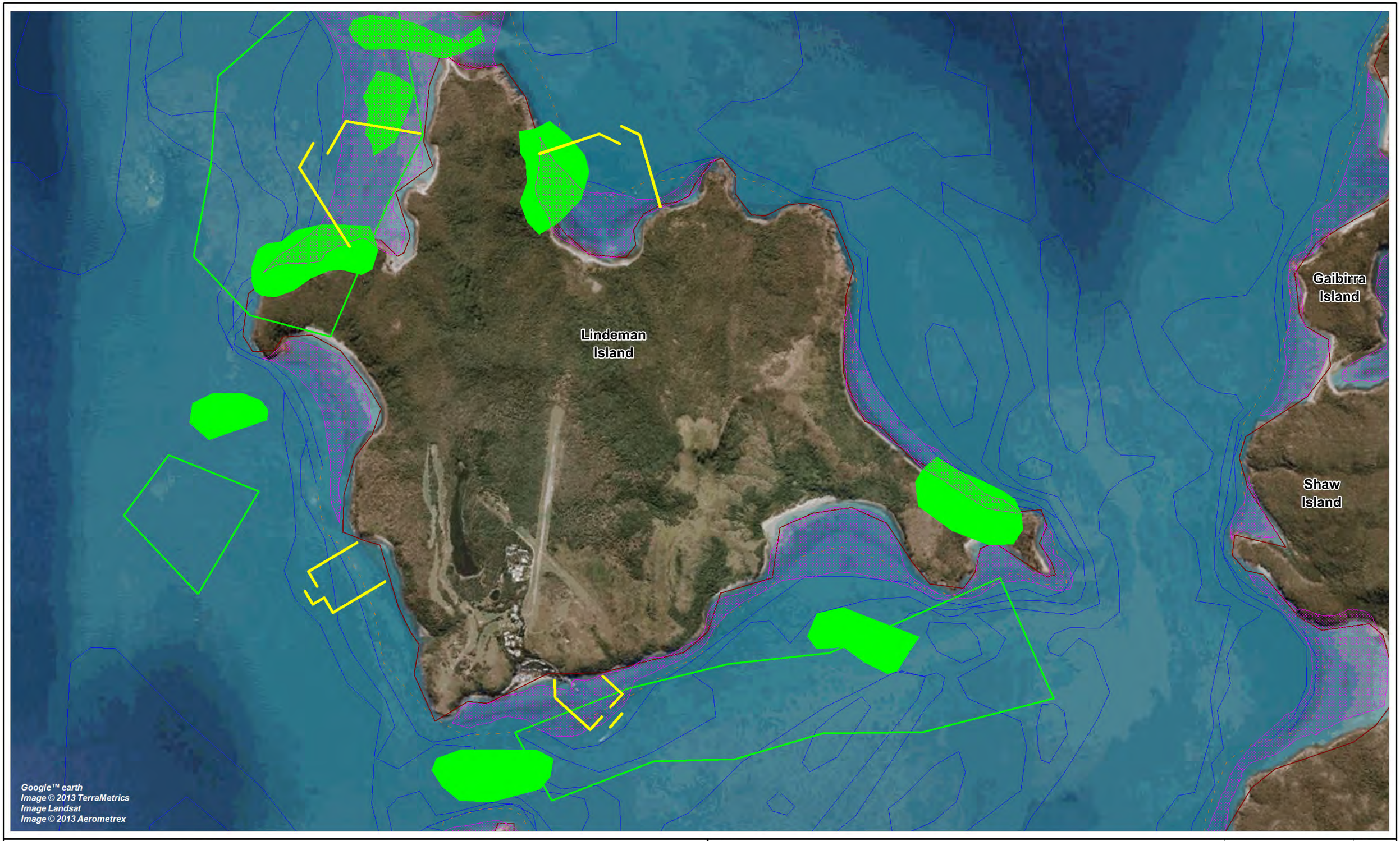

LEGEND

- Seawall
- Reef (GBRMPA)
- Seagrass (Hyland 1988)
- Seagrass (CAMRIS 1984)

Contours

- Land
- Reef
- Bathymetry

Title:
Lindeman Island - Seagrass and Reef

Figure: **2-4**

Rev: **A**

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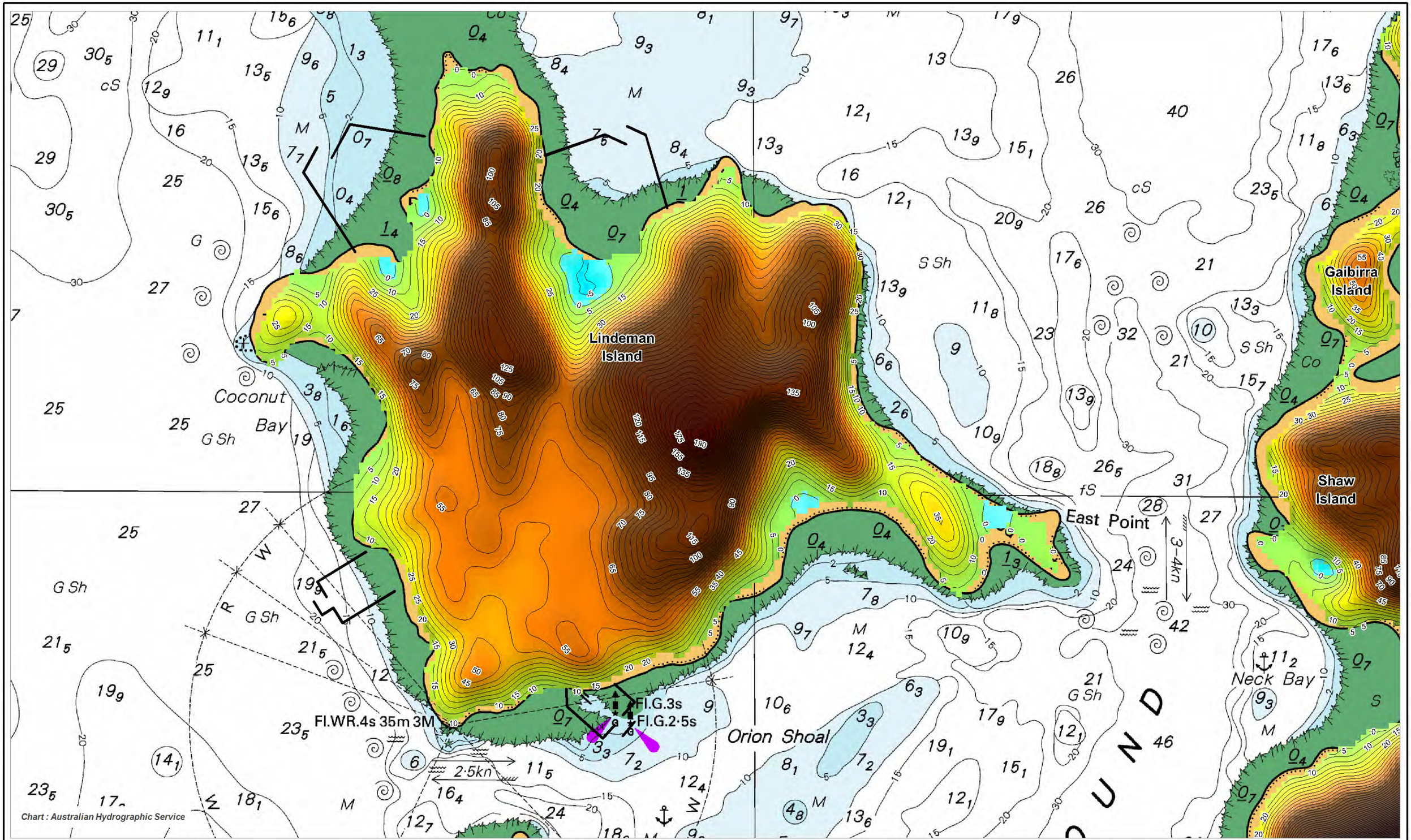

LEGEND

Seawall

0 20 40 60 80 100 120 140 160 180 200

Elevation (mAHD)

Title:

Lindeman Island - Digital elevation Model

Figure: **2-5**

Rev: **A**

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Approx. Scale

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Lindeman Island

Gaibirra Island

Shaw Island

Google™ earth
Image © 2013 TerraMetrics
Image Landsat
Image © 2013 Aerometrex

LEGEND

- Seawall
- Coral Reef
- Least constrained
- Moderately constrained
- Heavily constrained

Title:

Lindeman Island - Constraint Layer Summary

Figure: **2-6**

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2.2.3 Assessment Table

The preliminary constraints assessment summarised in Table 2-1 shows the detail of the each of the spatial layers considered in the overall constraints map. Table 2-1 shows the colour-coded performance of each of the potential locations against a range of key criteria. Red refers to direct constraint, where extensive negotiation with Government or prohibitive capital expenditure is required. Orange requires high expenditure and/or time investment and some negotiation with Government. Yellow requires moderate-to-low expenditure and/or time investment and negotiation with Government. Green represents low existing constraint, (comparatively) low associated costs, and white is not applicable or data deficient.

Marine engineering, legislative tenure, and marine ecology criteria are as follows:

- Engineering:
  - Exposure to extreme conditions (day to day strong winds, waves, and tides as well as cyclonic conditions including storm surge)
  - Breakwater cost
  - Dredging cost
- Marine Ecology
  - Habitat directly impacted (within each marina arrangement):
    - Area (ha) of mapped reef (based on desk-top information)
    - Existing condition (completed after field survey)
  - Habitat indirectly impacted (shoreward of each marina arrangement)
    - Area (ha) of mapped reef (based on desk-top information)
    - Existing condition
  - Threatened species
  - Shipwrecks
- Marine Approvals and Legal Constraints[1]
  - Federal
    - EPBC Act referral and approval requirements
    - Sea installations permit
    - GBRMP construction and operations permits
    - Whitsunday Plan of Management constraints
    - Offset requirements/negotiation
    - Native Title
  - State

[1] This is based on the current cost, timing and rigour required for each approval application and ongoing conditions/constraints. Criteria do not include land-based approvals or staging of applications.

    - Protected Area permit
    - Single Assessment Referral Agency (SARA)/Coordinator-General project assessment
    - Offset requirements/negotiation
    - Native Title
  - Local
    - Operational works permit
    - Material change of use permit
    - Local government planning
- Terrestrial (for access considerations- not part of the present scope)
  - Area (ha) of habitat which supports one or more of the following ecological features:
    - remnant vegetation (Endangered/Of Concern/Not Of Concern RE's)
    - Threatened Ecological Community (EPBC Act)
    - Protected Area
    - known/potential habitat for EPBC Act listed threatened species
    - Essential Habitat for *Nature Conservation Act 1992* listed threatened species
  - Significance of impact to 'aesthetics' and visual amenity
  - Tenure arrangements
  - Approvals for accessing rock from the island
  - Approval for bringing dredged material onto the island
  - Native Title.

Table 2-1 shows that on the basis of this preliminary assessment that the existing jetty location is the most preferable location for safe harbour development because it:

- will be the least expensive to construct;
- has the least exposure to the full range of extreme weather conditions; and
- will require the least number of approvals or effort/time to gain approvals.

Additionally, all locations except the existing jetty will require changes to both the Whitsundays Plan of Management and the GBR Marine Park zoning plan. These legislative amendments would require extensive negotiation with Government, and there is no guarantee that negotiations would be successful.

Boat Port and Gap Beach were identified for potential temporary barge access sites for further investigation during field studies.

Table 2-1 Constraints Assessment Table for Safe Harbour Development at Four Locations

Criteria	Existing Jetty[2]	South of Billy Goat Point	Boat Port	Gap Beach
Engineering				
Exposure to day-to-day 40-kt wind max. significant wave height (Hs) at 5m	1.4	1.7	1.6	2.3
Extreme conditions (Cyclone maximum significant wave height including storm surge)	5m	6m	6m	6m
Breakwater cost (AUD)	22,250,000	266,000,000	93,600,000	47,400,000
Dredging cost (AUD)	3,700,000	nil	6,000,000	1,200,000
Marine Ecology				
Direct loss- reef ha based on GBRMPA Layer (based on aerial imagery)	6.14 ha (4.7 ha)	0 ha (0.3 ha)	10.16 ha (8.86 ha)	5 ha (0.14 ha)
Direct loss (existing condition)	Very good	Fair	Fair	Fair
Direct loss of seagrass (based on desktop information)	Data deficient	Data deficient	Data deficient	Data deficient
Indirectly impacted- ha reef	2.77	1.13	7.71	11.18
Indirectly impacted- existing condition	Fair	Very good	Good	Very good
Threatened species (likelihood of turtle nesting)	Fair	Fair	Good	Good
Shipwrecks	None	None	None	None
Humpback Whale Habitat	Low	Low	Low	Low

[2] For each criterion, squares have been shaded to indicate the following: red – direct constraint, requires extensive negotiation with Government or prohibitive capital expenditure; orange – high cost and/or time investment required, some negotiation with Government required; yellow – medium-to-low cost and/or time investment required, negotiation with Government required; green – low-to-no existing constraints, low costs; and white – not applicable

Criteria	Existing Jetty[2]	South of Billy Goat Point	Boat Port	Gap Beach
Marine Approvals[3]				
Federal				
EPBC Act (including World Heritage values, GBRMP, threatened species, migratory species)	Works will be 'controlled activity' requiring EPBC Act Referral and Approval; approval application likely to involve PER or EIS	Works may be 'controlled activity' requiring EPBC Act Referral and Approval; application may involve PER or EIS	Works may be 'controlled activity' requiring EPBC Act Referral and Approval; application may involve PER or EIS	Works may be 'controlled activity' requiring EPBC Act Referral and Approval; application may involve PER or EIS
Marine Park Permit	Permit application likely to involve PER or EIS	Permit application likely to involve PER or EIS	Permit application likely to involve PER or EIS	Permit application likely to involve PER or EIS
Whitsundays Plan of Management	No limit on group size 70m limit on vessel length	No new moorings Limit on group size of 15 35m limit on vessel length	No new moorings Limit on group size of 15 35m limit on vessel length	No new moorings Limit on group size of 15 35m limit on vessel length
Sea Installations Permit	Permit required; limited application requirements	Permit required; limited application requirements	Permit required; limited application requirements	Permit required; limited application requirements
Offset requirements	Offsetting required for destroyed coral reef	Offsetting required for impact in Conservation Park zone	Offsetting required for impact in Conservation Park zone	Offsetting required for impact in Marine National Park zone
Native Title	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification
State				
Protected Area permit	n/a	Protected Area permit	Protected Area permit	Protected Area permit required

[3] Includes costing, timing and application requirements, as well as any necessary negotiation to secure the approval.

Criteria	Existing Jetty[2]	South of Billy Goat Point	Boat Port	Gap Beach
		required	required	
SARA/Coordinator-General project assessment[4]	No State Interests likely to constrain project	No State Interests likely to constrain project	No State Interests likely to constrain project	No State Interests likely to constrain project
Offset requirements	Offsetting required for destroyed coral reef	Only small-scale offsetting required	Offsetting required for impact in Marine National Park zone	Offsetting required for impact in Marine National Park zone
Native Title	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification
Local[5]				
Material change of use permit	n/a	Impact assessment[6]	Impact assessment	Impact assessment
Operational works permit	Code assessable	Code assessment	Code assessment	Code assessment
Local government planning	No applicable policy	No applicable policy	No applicable policy	No applicable policy
Terrestrial (for access considerations)				
Remnant vegetation	n/a	Vegetation approval required	Vegetation approval required	Vegetation approval required
Threatened ecological community	n/a	Unlikely	Unlikely	Unlikely
Protected Area	n/a	Protected Area permit	Protected Area permit	Protected Area permit
Known/potential habitat for listed threatened/migratory species	Low impact to habitat	Low impact to habitat	Medium impact to habitat of threatened/ migratory species; unlikely to be 'controlled action' with mitigation	Medium impact to habitat of threatened/ migratory species; unlikely to be 'controlled action' with mitigation
Essential Habitat for NC act listed	Low impact to habitat	Low impact to habitat	Clearing permit	Clearing permit

[4] Includes all consideration of works above and below HAT, including development approval for operational works and material change of use
[5] Applies only to works above HAT
[6] Assessment levels are based off the current *Mackay City Plan 2006* but may change with the introduction of the *Mackay Regional Plan* in 2013/2014

Desktop Constraints Assessment

Criteria	Existing Jetty[2]	South of Billy Goat Point	Boat Port	Gap Beach
threatened species				
Aesthetics and visual amenity associated with new track	n/a	High impact to amenity from access roads; 'controlled action' requiring EPBC Act Referral and Approval	High impact to amenity from access roads; 'controlled action' requiring EPBC Act Referral and Approval	Medium impact to amenity from access roads; unlikely to be 'controlled action' through mitigation
Tenure arrangements	n/a	New tenure to be negotiated	New tenure to be negotiated	New tenure to be negotiated
Approvals for accessing rock from the island (ERA)	Significant volumes of rock required	Significant volumes of rock required	Significant volumes of rock required	Significant volumes of rock required
Approval for dredging material disposal on the island	Medium levels of material produced	Low levels of material produced	Medium levels of material produced	Medium levels of material produced
Native Title	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification	No current Native Title claim over area; may require notification

3 Field Methodology

3.1 Survey Timing

Field surveys were conducted between the 21st and 24th of August 2013 at Lindeman Island. Benthic cover surveys in the jetty area were undertaken on foot at low tide on the afternoon of the 21st of August while the resort tender *N.B.O.* was used subsequently on the 22nd and 23rd of August. The survey vessel had a draft of 40 cm; hence, was able to survey very shallow and deep areas alike.

3.2 Survey Approach

3.2.1 Benthic Habitats

Rapid assessment methods were used to characterise benthic habitats and communities. Sampling focused on potential marine infrastructure development areas for the project, hereafter referred to as study regions. Five study regions were sampled (Figure 3-1, Figure 3-2):

- existing jetty area;
- Plantation Beach;
- Gap Beach;
- Boat Point; and
- Coconut Beach and Billy Goat Beach.

A total of 167 sites were sampled across the five study regions.

At each site, a five metre transect was positioned on the substrate, and the start position was recorded using a Garmin handheld GPS (with realised accuracy of ±3 m). A diver swam along the transect line and visually estimated the percentage cover of the following benthic categories: hard and soft corals, seagrasses, macroalgae, sand, rubble, and other features such as oyster beds and sponges. The survey location, site details, depth, and time were also recorded.

The diver also used a dual high definition camera system to record the substrate along each transect line. The system had one camera recording stills on two second intervals and another camera recording a continuous image of the substrate[7]. At deeper sites, underwater lights were used to provide additional lighting.

Per cent cover estimates by the diver were cross-checked to recorded footage at regular intervals to ensure consistent estimation between study team members. Visibility conditions were at times less than 1 m but this did not prevent accurate estimations of cover, as photo transects were taken approximately 0.2 m above the sea floor.

3.2.2 Bathymetry Assessment

Bathymetry data was collected opportunistically during the surveys the 22nd and 23rd of August using a Trimble differential GPS (dGPS) and Navman echo sounder, with vertical accuracy of 10 cm and sub-metre horizontal accuracy. The echo sounder transducer was fitted (23 cm below

[7] video and photographs have been archived for future more detailed analysis if required

the waterline) on the survey vessel at the start of the survey period, the dGPS and echo sounder was then activated whenever the vessel was operating at low speeds within each of the survey areas but not during transit between these areas. The extent of soundings is shown in Figure 3-1.

Subsequently, there was extensive coverage coinciding with coral cover survey lines and throughout each of the coral survey areas more generally. No bathymetry data was collected at Plantation Beach or Gap Beach due to technical issues with the dGPS in the afternoon of the 22nd of August but this issue was resolved and a full day of data collection occurred on the 23rd of August. The bathymetry data was corrected post-survey to give values relative to Lowest Astronomical Tide (LAT) and offset against the recording depth of the transducer.

Variation in water depth due to the tidal cycle was recorded throughout the survey period (from 18:30 on the 21st August to 07:30 on the 24th August 2013) using a Greenspan tide gauge (accurate to ± 1mm). All data were corrected to LAT using a Permanent Survey Mark (102646), located 4.255 m above LAT on the boat ramp (Latitude -20.45925; Longitude 149.0409722). The datum of the tide gauge established by measuring the water level below this permanent survey mark at 21:15 on the 21st August 2013, using a spirit level and tape measure.

3.3 Data Analysis

All bathymetry and coral survey data were interpolated using Vertical Mapper 3.7 in MapInfo Professional 11.5 to give a Digital Elevation Model (DEM) and spatial distribution for per cent cover values of hard corals, soft corals, seagrass, and macroalgae for each survey area. Grid interpolations were converted to polygons and adjusted against the derived DEM.

The DEM was used to check maximum depths of corals, seagrass and algae at known points as inference for mapping where ground truthing data was limited. Generally interpolated boundaries agreed very well with field observations, but in some cases, interpolated benthic cover boundaries were adjusted to particular depth contours, based on other known data points within the DEM.

Google™ earth
Image © 2013 Aerometrex

LEGEND

▼ **Benthic Survey Point (dive transect)**

• **Sounding Data Point**

Title:

Location of Survey Points and Soundings at the Jetty

Figure: **3-1**

Rev: **A**

N

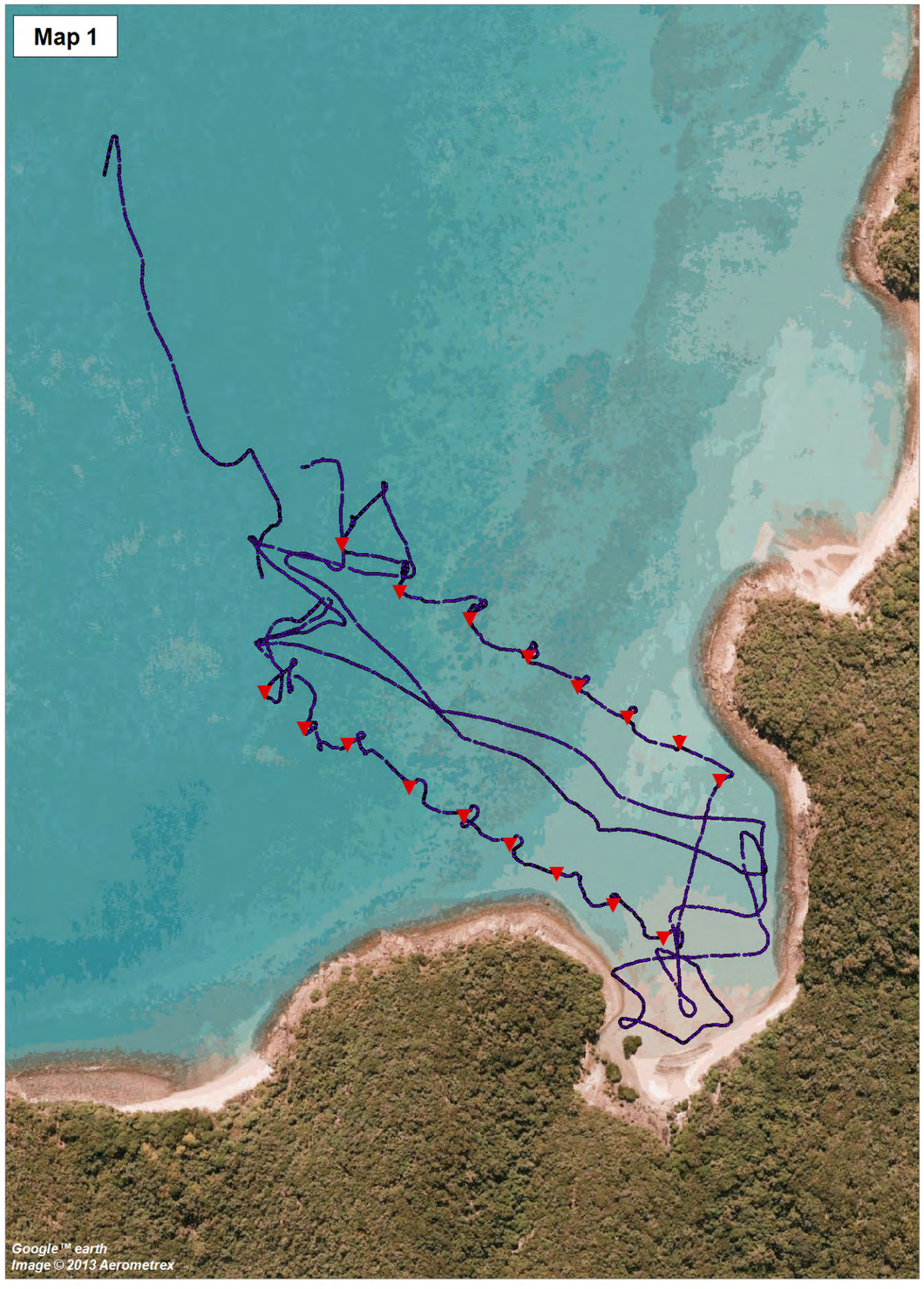
0 100 200m

Approx. Scale

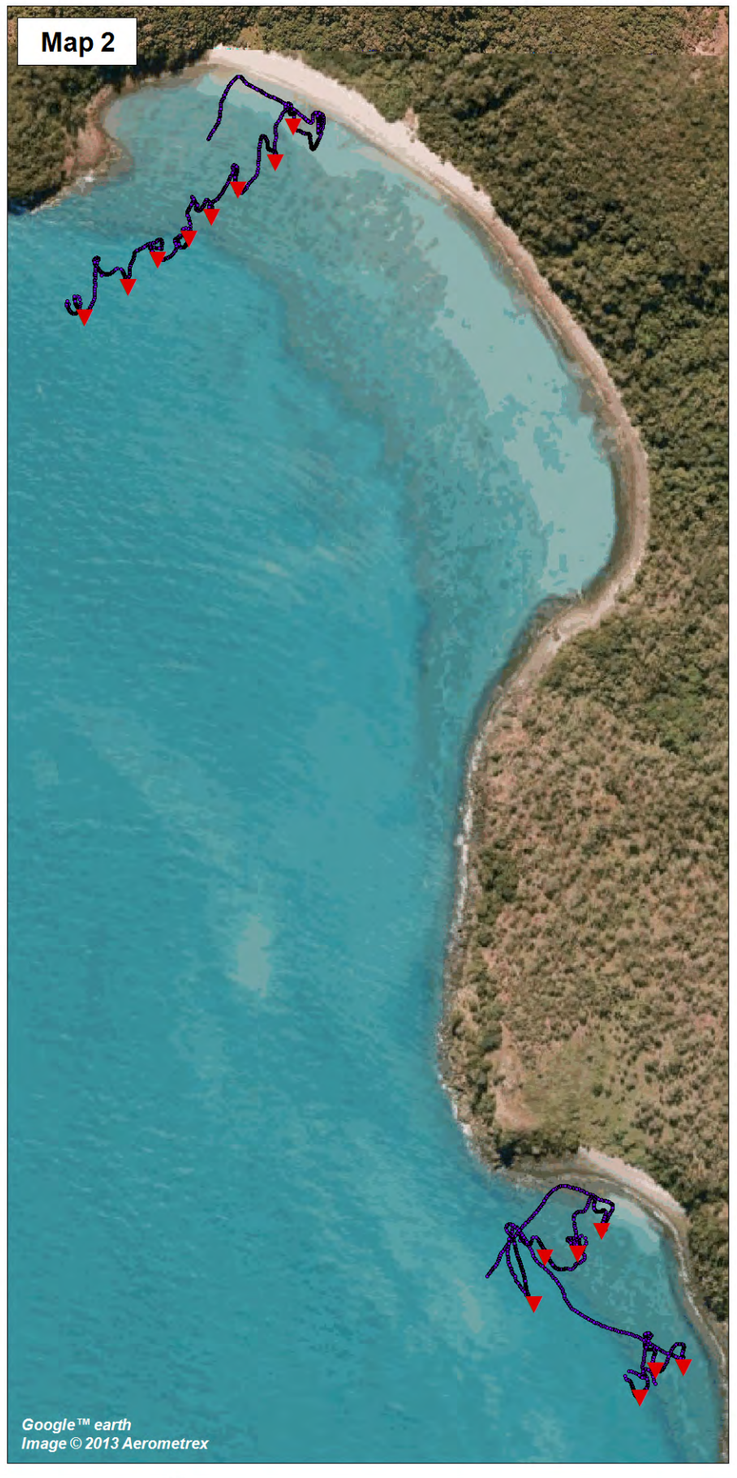
BMT WBM
www.bmtwbm.com.au

Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_009_130903_survey_points_resort.wor

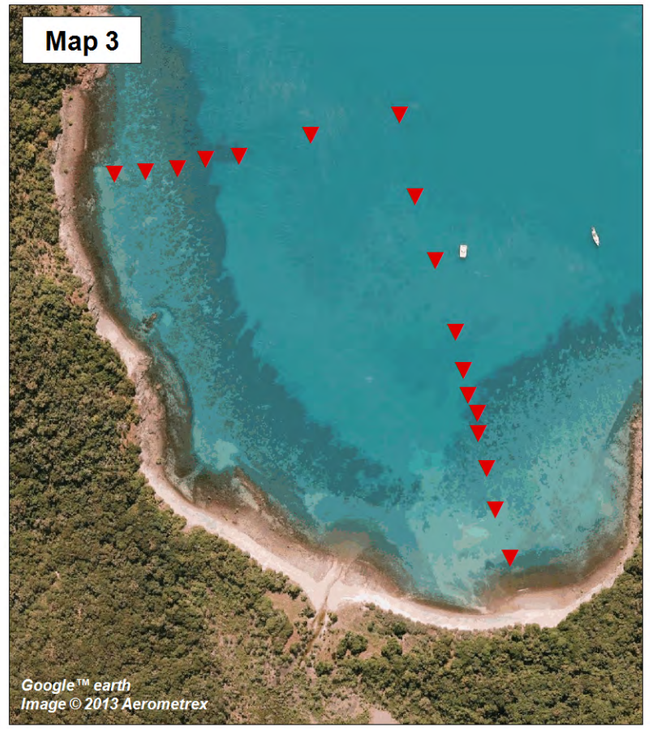
Map 1



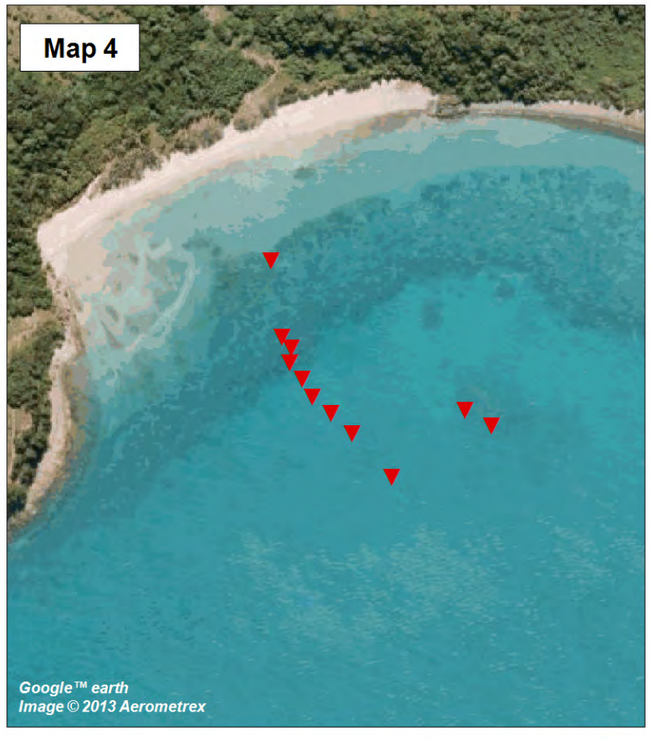
Map 2

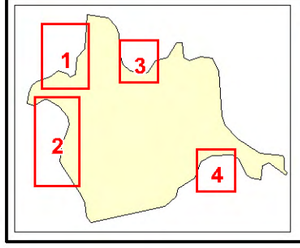


Map 3



Map 4





LEGEND

▼ **Benthic Survey Point (dive transect)**

• **Sounding Data Point**

Title:

Location of Survey Points and Soundings Surrounding Lindeman Island

Figure: **3-2**

Rev: **A**

N

0 100 200m

Scale - Map 1

0 150 300m

Scale - Maps 2,3 and 4

BMT WBM
www.bmtwbm.com.au

Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_009b_130903_survey_points_other.wor

4 Results

4.1 Bathymetry

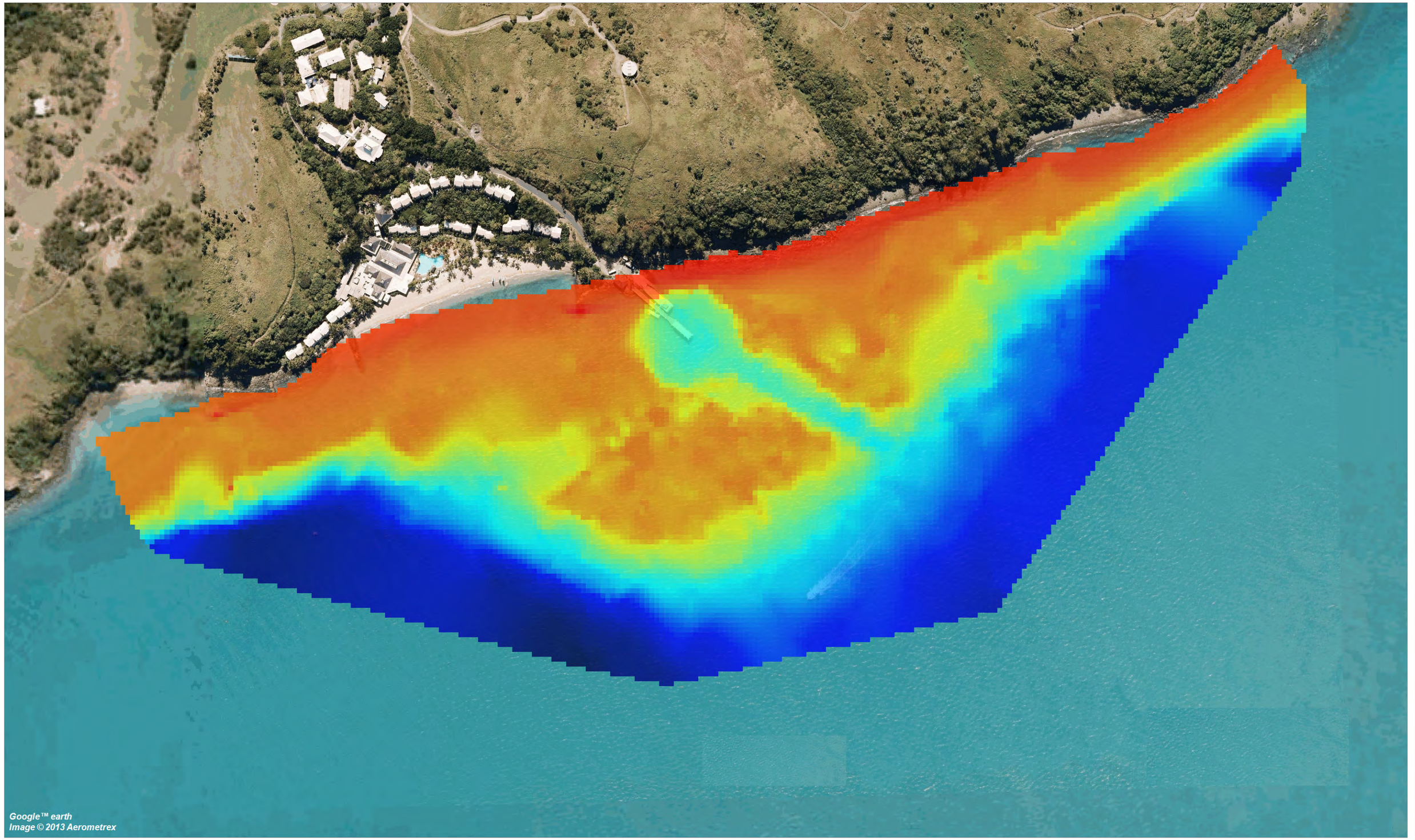
The bathymetry of the jetty area recorded in the present study was consistent to that depicted in navigation chart AUS 254, but provided greater resolution over the reef, particularly at its margin (Figure 4-1).

The western part of the reef edge (directly south of the resort) had a steeper profile than the eastern part of the reef edge (south of the jetty, and eastwards). The reef surrounding the existing dredged channel was the widest section of continuous fringing reef on the southern shore of Lindeman Island. While a wide section of coral reef had been mapped by GBRMPA at Plantation Beach, this area was non-continuous, and composed of sandy/mud sea floor interspersed with soft corals and coral bomboras.

There is a large degree of variability in depth on the outer part of the reef surrounding the existing jetty. This section of the reef slope also had high coral cover, and therefore, micro-habitat complexity (see section 4.2). The shoreward part of the reef flat had a lower gradient (Figure 4-1) and also had less live coral cover (see section 4.2).

Coconut Beach and Billy Goat Point had a well-developed, steep, reef slope and relatively narrow reef flats. At Boat Port, there was a large deep sediment bank occurring at -3 m LAT that did not consist of consolidated reef or coral structures. The bed profile of the seabed shoreward of this bank had a gentle gradient. Reefs at Boat Port were not structurally complex, but isolated soft and hard corals were present in places (see section 4.2).

None of the locations appeared to have a defined reef crest area. With the exception of Gap Beach, most reefs were without spur-and groove formations that are typical of high wave energy environments. At Gap Beach, some spur and groove formations were present along the reef edge.



LEGEND

-9.0 -8.0 -7.0 -6.0 -5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0

Depth (m LAT)

Title:

Detailed Bathymetry at the Existing Jetty Site

Figure: **4-1**

Rev: **A**

N

0 100 200m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

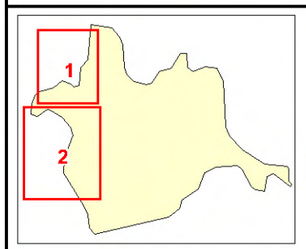
Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_008_130902_bathymetry_resort.wor

Map 1

Google™ earth
Image © 2013 Aerometrex

Map 2

Google™ earth
Image © 2013 Aerometrex



LEGEND

-9.0 -8.0 -7.0 -6.0 -5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0

Depth (m LAT)

Title:

Detailed Bathymetry at Boat Port, Coconut Beach and Billy Goat Point

Figure: **4-2**

Rev: **A**

N

0 100 200m

Scale - Map 1

0 150 300m

Scale - Map 2

BMT WBM
www.bmtwbm.com.au

Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_008b_130902_bathymetry_other.wor

4.2 Live Hard and Soft Coral Cover

The highest density of living coral communities were found directly south of the jetty and existing dredged channel (Figure 4-3). These communities typically ranged in cover between 75% and 100% over the 3-5 m transect length. These were some of the highest coral cover measurements made across the study area. Only the large bombora offshore from Plantation Beach (Figure 4-4) had coral cover approaching 100% in places and was comparable to parts of the reef surrounding the existing channel. All other locations surveyed had living coral cover estimates less than 25% with most of the reef area consisting of 5-10% living coral cover.

4.2.1 Existing Jetty and Dredged Channel

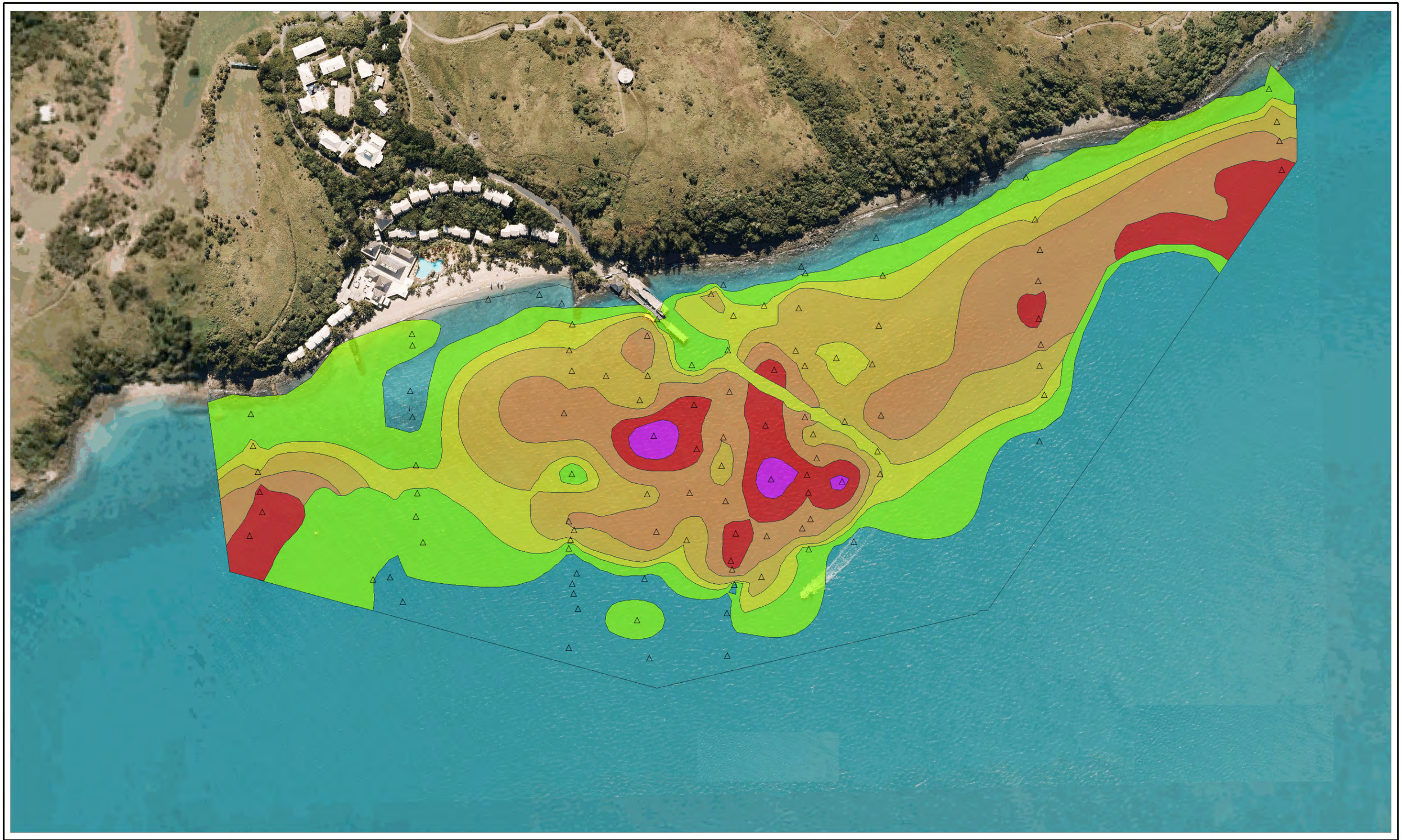
The highest density communities south of the jetty usually consisted of large stands of staghorn coral (*Acropora* spp.) occasionally interspersed with other corals such as needle corals (*Seriatophora* spp.), soft corals (*Sinularia*) or massive corals (*Porites, Galaxea*) (Figure 4-5 A, B, C). There were also large areas that were dominated by macroalgae living on dead coral fragments (Figure 4-5 E; section 4.3).

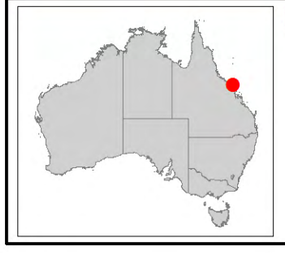
The near shore upper intertidal area was mostly devoid of corals but below the beach sands in front of the resort, there were frequently small fragments of *Porites latistella*, a small branching poritid. With increasing distance from the shore, the density of soft corals increased, predominantly consisting of *Sinularia, Sarcophyton, Lobophytum* and *Cladiella*. Sponges were also reasonably common, existing as large separate colonies (Figure 4-5 D) or interwoven into the base of acroporid coral colonies as *Ceratodictyon spongiosum* (the algal sponge symbiosis, Figure 4-5 G).

The reef slope was composed of a mixture of species and had a variable morphological and ecological character. Towards the bottom of the reef slope, growing in between patches of sand and mud were occasional large colonies of the daytime coral (*Goniopora* spp. Figure 4-5 H) and sea whips (*Junceella* sp.), with occasional other soft corals such as *Nephthya* sp. The dredged channel supported a low cover community of hard and soft corals, mostly *Goniopora, Junceella*, with occasional small poritids and acroporids. The metal I-beam structure of the jetty supports numerous very large soft coral colonies, mostly *Sarcophyton*.

4.2.2 Other Study Regions

Live coral cover was sparse at most other study regions. Soft corals numerically dominated at Gap Beach and Boat Port (Figure 4-6 D, F, G), despite the former location having a well-developed calcium carbonate reef slope. The high coral cover bombora at Plantation Beach consisted of large colonies of *Porites cylindrica* (Figure 4-5 C), *Pavona* sp. and the fire coral *Millepora* (Figure 4-5 E).





LEGEND

△ Survey Point

Coral Cover %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- 10.00 to 25.00
- 25.00 to 50.00
- 50.00 to 75.00
- > 75.00

Title:

Living Coral Cover at the Existing Jetty Site

Figure: **4-3**

Rev: **A**

N

0 100 200m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_010_130903_coral cover_resort.wor

Map 1

Google™ earth
Image © 2013 Aerometrex

Map 2

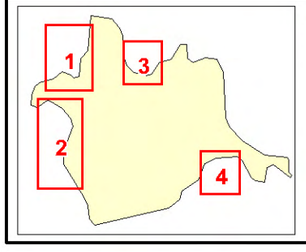
Google™ earth
Image © 2013 Aerometrex

Map 3

Google™ earth
Image © 2013 Aerometrex

Map 4

Google™ earth
Image © 2013 Aerometrex



LEGEND

△ Survey Point

Coral Cover %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- 10.00 to 25.00
- 25.00 to 50.00
- 50.00 to 75.00
- > 75.00

Title:

Living Coral Cover Surrounding Lndeman Island

Figure: **4-4**

Rev: **A**

N

0 100 200m

Scale - Map 1

BMT WBM
www.bmtwbm.com.au

Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_010b_130905_coral cover_other.wor

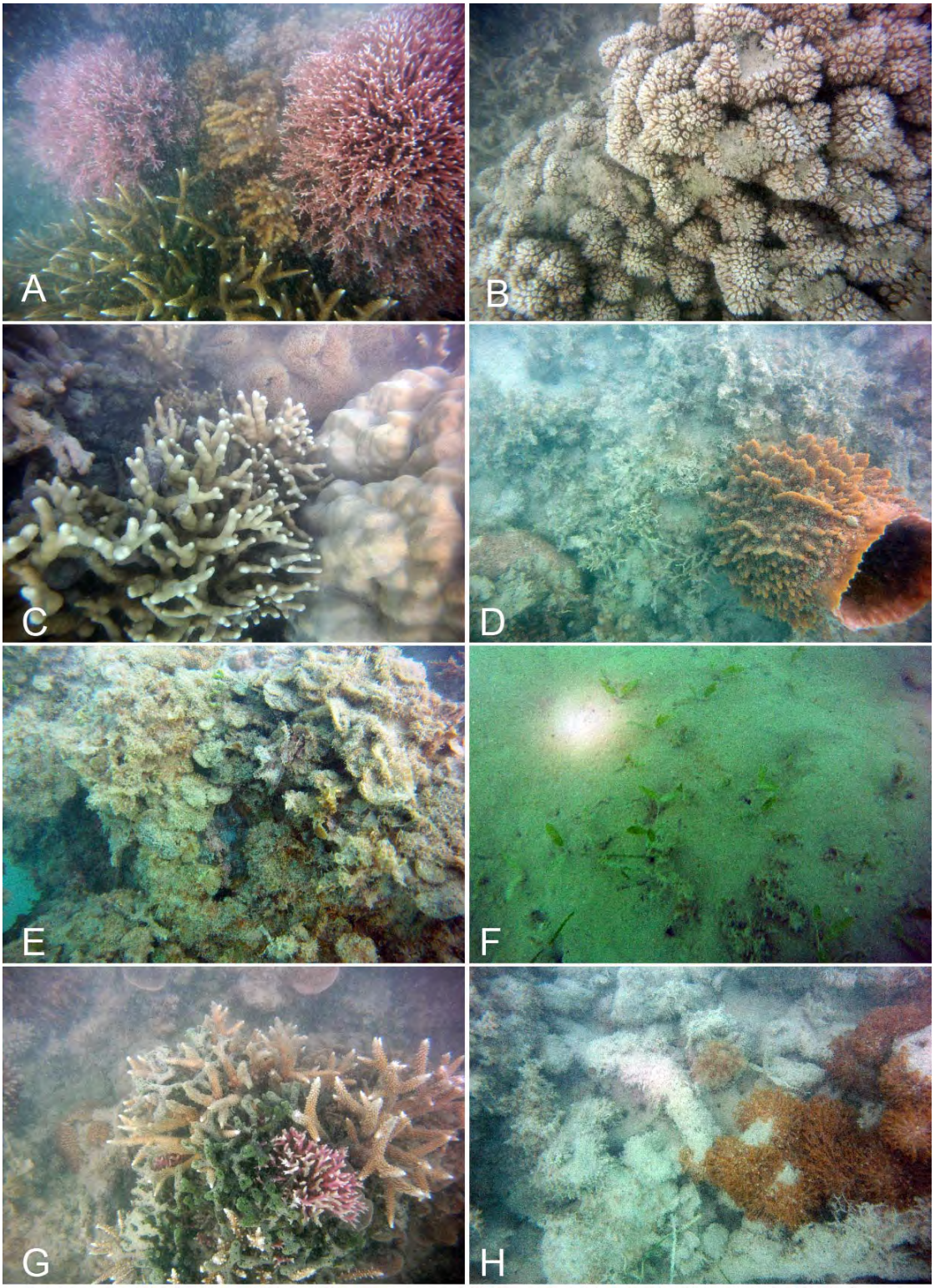


Figure 4-5 Examples of benthos surrounding the existing jetty: high-density *Acropora* and *Seriatopora* (A); *Galaxea* sp. (B); branching poritid *Porites cylindrica* and massive poritid *P. lobata* (C); vase sponge (D); dense macroalgae *Lobophora* sp. (E); sparse seagrass *Halophila* sp. at the base of the reef slope (F); *Acropora* and the sponge-algal symbiont *Ceratodictyon spongiosum* (G); and daytime coral *Goniopora* at the base of the reef slope (H)

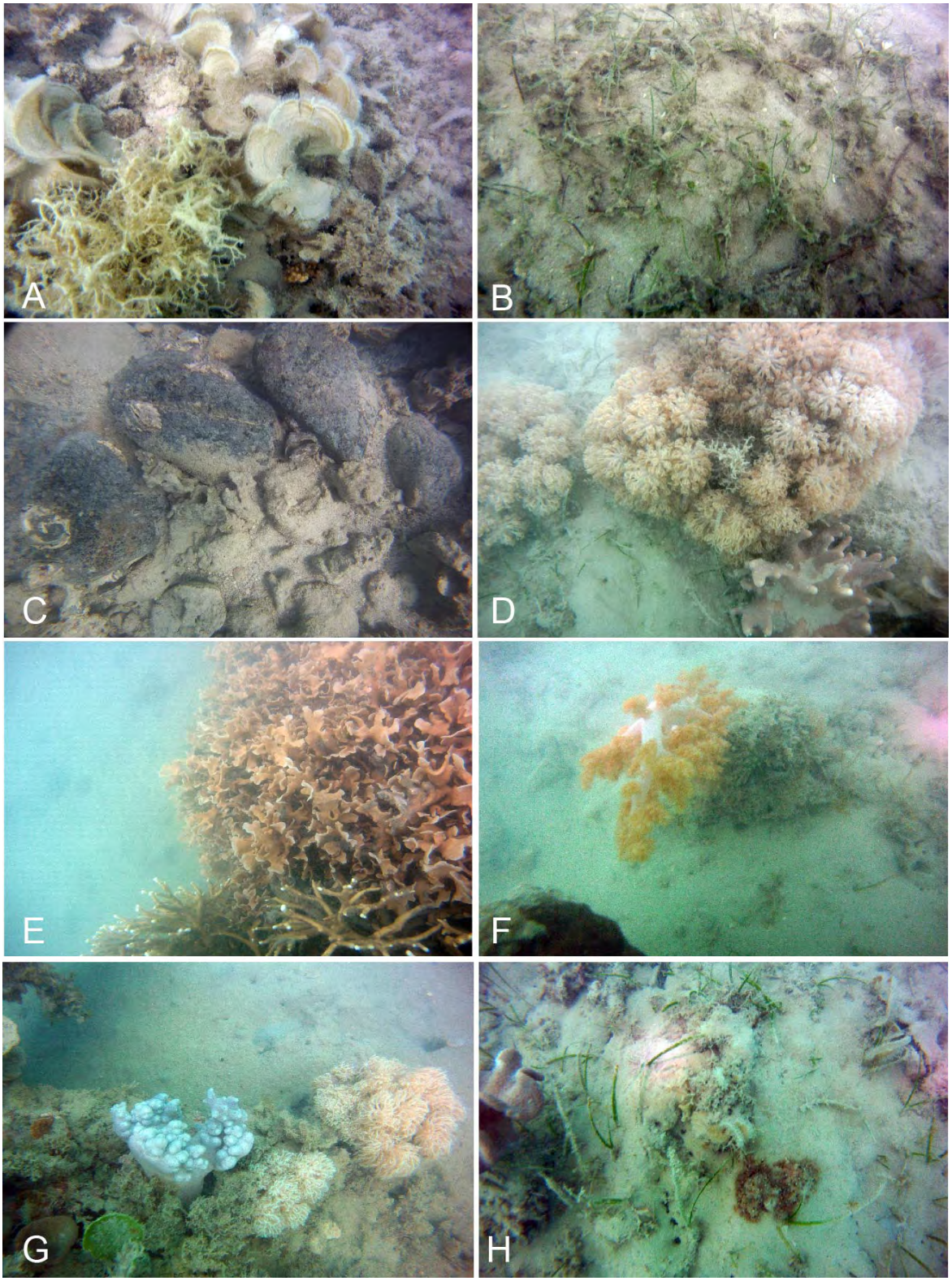


Figure 4-6 Examples of benthos from other locations around Lindeman Island: Dense macroalgae *Padina* and *Dictyota* (A); up to 30% cover seagrass *Halodule uninervis* at Boat Port (B); rocks and oysters in the upper intertidal (C); *Goniopora* and seagrass *H. uninervis* (D); *Pavona* sp. and fire coral *Millepora* sp. (E); *Nephthya* sp. soft coral (F); *Sinularia* and *Goniopora* at Gap Beach (G); and sparse seagrass, macroalgae and zooanthids (H)

4.3 Macroalgae

Macroalgae communities really dominated all locations apart from the reef surrounding the jetty (Figure 4-7, Figure 4-8). Even the jetty site had moderately high macroalgae cover in and amongst the living coral. In many cases it was difficult to identify species because of a dense epiphyte cover on the algae. Some of the dominant forms were *Padina* (Figure 4-6 A), *Sargassum, Dictyota* (Figure 4-6 A), *Laurencia,* and *Lobophora* (Figure 4-5 E).

4.4 Seagrass

Seagrass communities were generally sparse throughout the study regions. The densest seagrass meadows were located offshore from Boat Port, at the base of the reef at the jetty site, and at Coconut Beach (Figure 4-9, Figure 4-10).

Seagrass was primarily composed of two morpho-types: *Halophila* spp[8]. (Figure 4-5 F) and *Halodule uninervis* (Figure 4-6 B). Seagrass meadows were generally sparse, of low biomass, and often intermingled with soft and hard corals. A small amount of *Halophila spinulosa* was present inside the dredged channel at the jetty site. The observed distribution was closest to that mapped by Hyland *et al.* (1988), assuming a slight south-eastly rectification error the Hyland *et al.* layer.

4.5 Fauna Observations

4.5.1 Marine Turtles

Six immature marine turtles were observed during the field survey. These appeared to be green turtles (*Chelonia mydas*), but several could also have been hawksbill turtles (*Eretmochelys imbricata*), which can be difficult to discriminate from green turtles at distance. No adult marine turtles were observed.

The local Mackay and District Turtle Watch Association (2013) estimate that most mainland beaches are visited by between 30 and 100 adult flatback (*Natador depressus*) females per year. In the Whitsunday Islands, low-density nesting by green and flatback turtles occurs at a range of beaches that have the appropriate temperature, height above sea level, moisture content and salinity.

4.5.2 Marine Mammals

No dolphins or whales were sighted during the field trip but whale song was loud and continuous during diving. The central GBR lagoon area southeast of the Whitsundays has been ranked the highest value humpback whale habitat within the GBR (Smith *et al.* 2012); refer to Section 2.2.2.

No dugong or feeding trails were observed during the field studies. Meadows at each of the locations surveyed were generally too sparse to support large numbers of dugong at the time of survey, but these meadows may be visited by dugong from time to time.

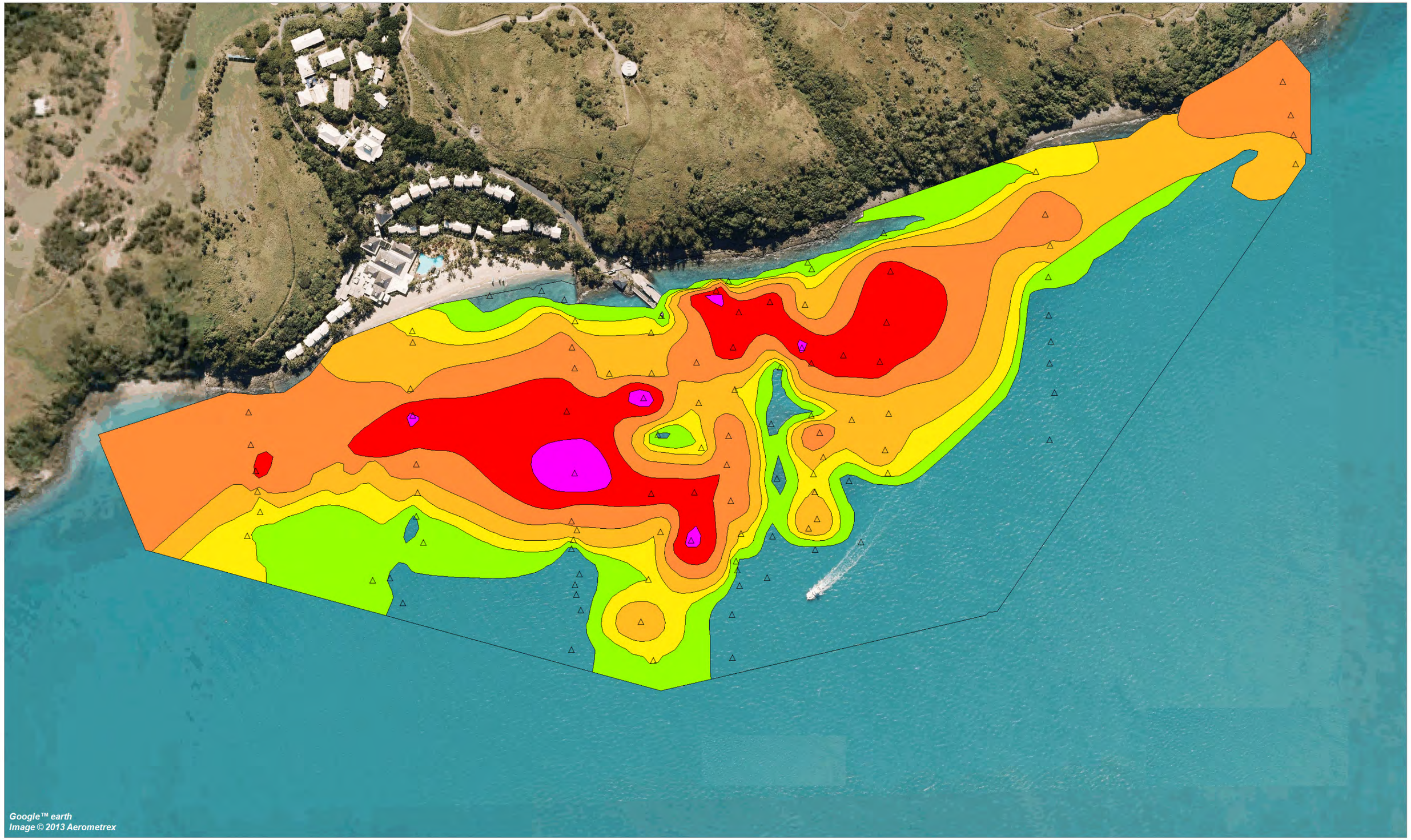
4.5.3 Wader Birds

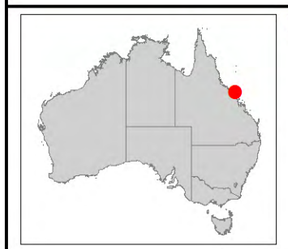
Based on incidental observations made during field surveys, very few wader birds were observed during the field study. Ruddy turnstones (*Arenaria interpres*), sooty oystercatchers (*Haematopus*

[8] Included *Halophila ovalis, H. decipens and H. spinulosa*

fuliginosus) and reef herons (*Egretta sacra*) were observed feeding on the dry exposed reef flat at low tide. Numerous other waders, including migratory shorebirds and residents may be present throughout the study area at different times of the year.

It should be noted that birds were not targeted in the present study, and that a dedicated bird survey would be required to determine the values of the study regions as a bird habitat.





LEGEND

△ Survey Point

Macroalgae Cover %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- 10.00 to 25.00
- 25.00 to 50.00
- 50.00 to 75.00
- > 75.00

Title:

Macroalgal Cover at the Existing Jetty Site

Figure: **4-7**

Rev: **A**

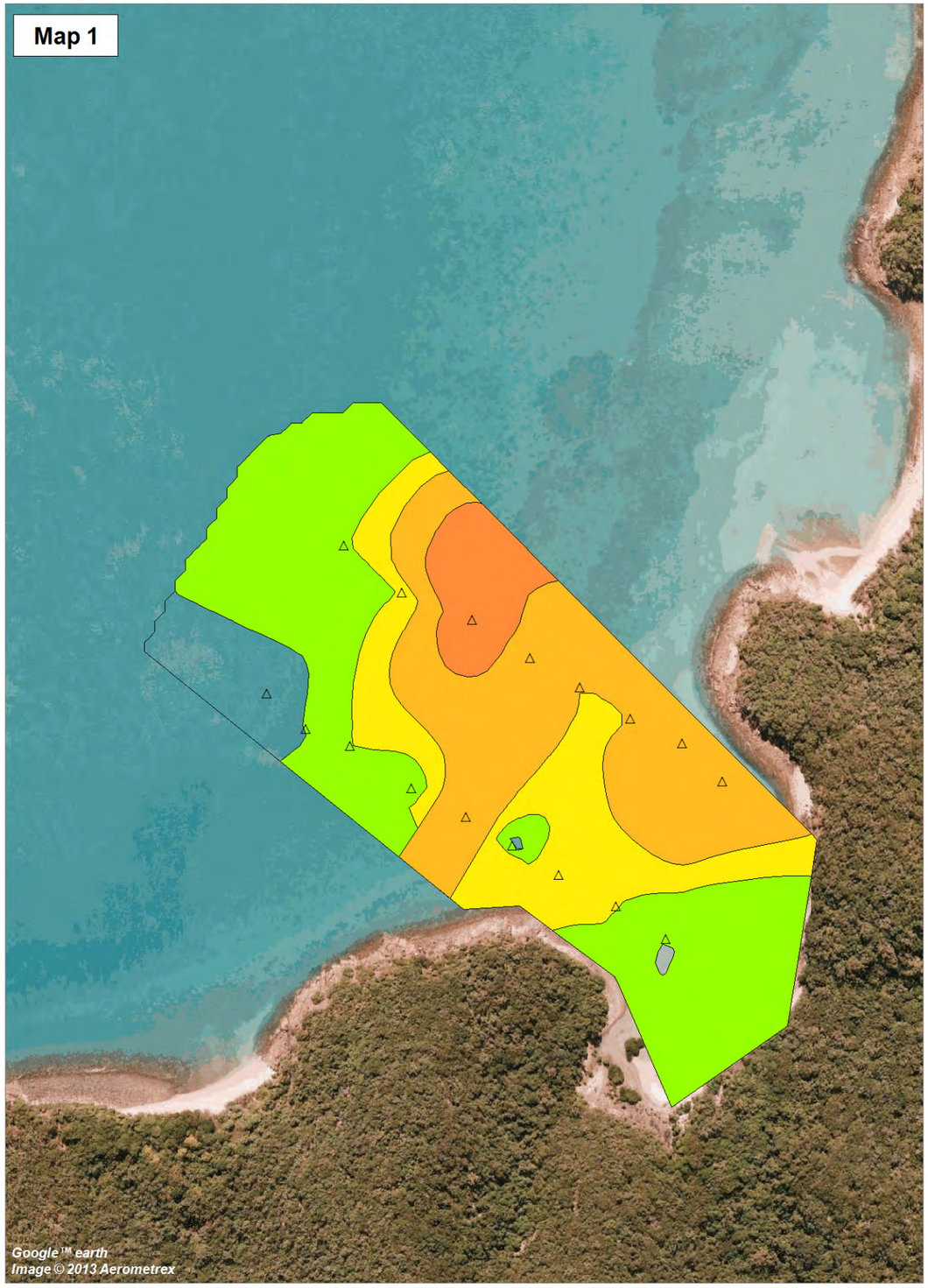
N

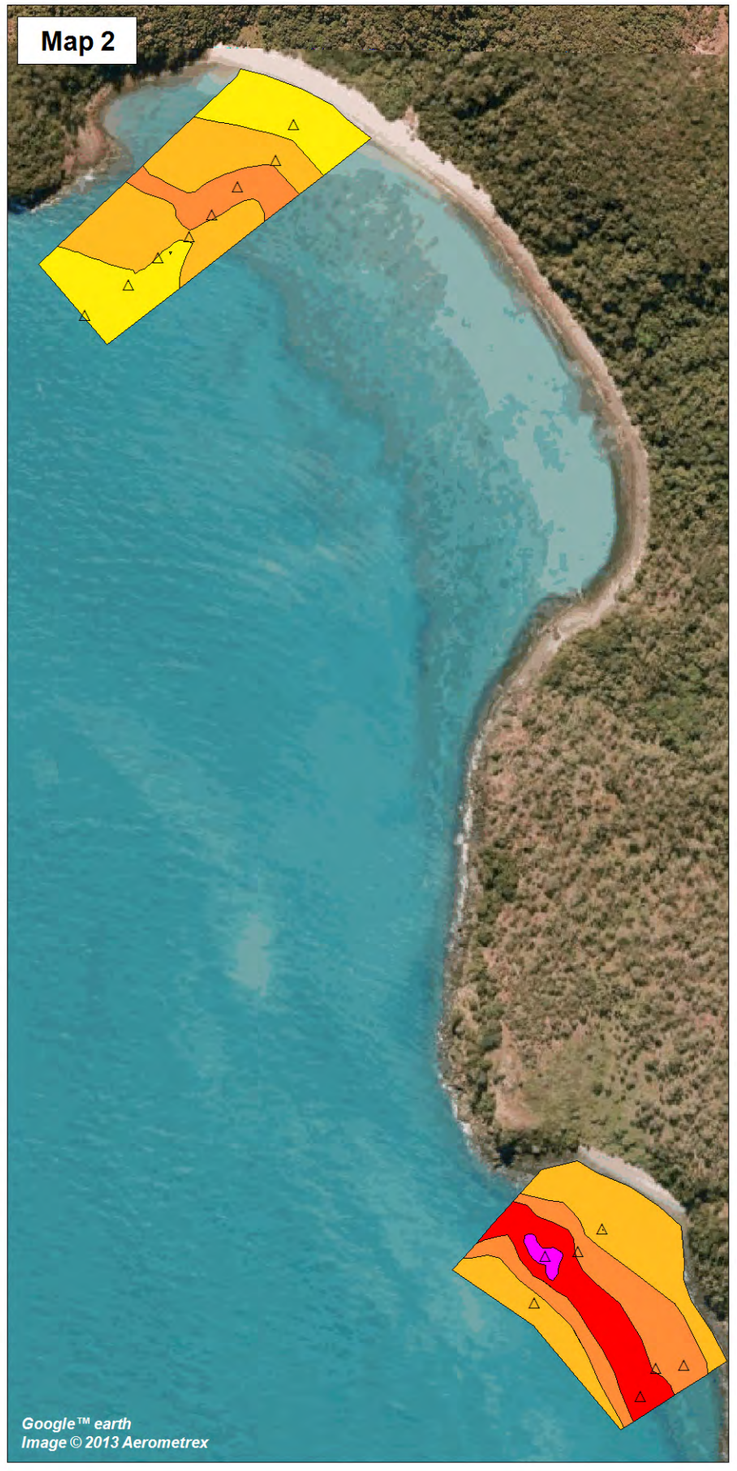
0 100 200m

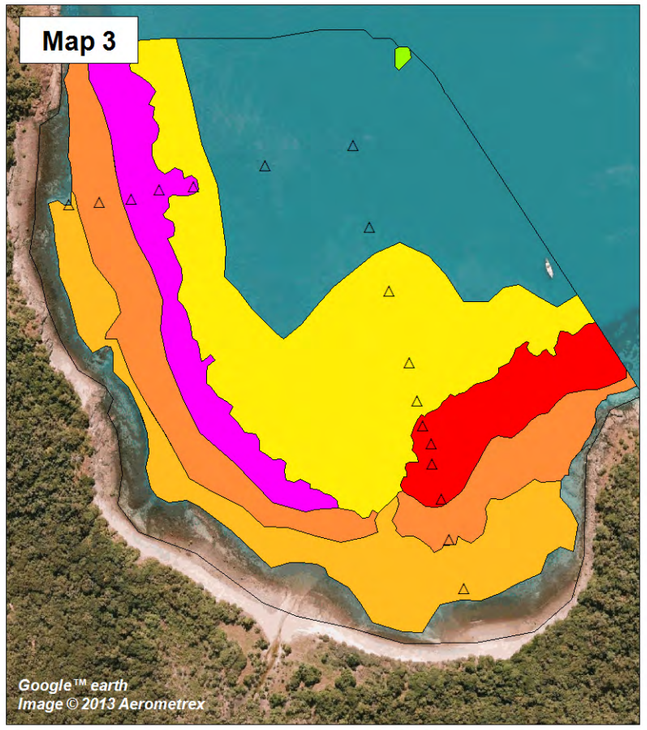
Approx. Scale

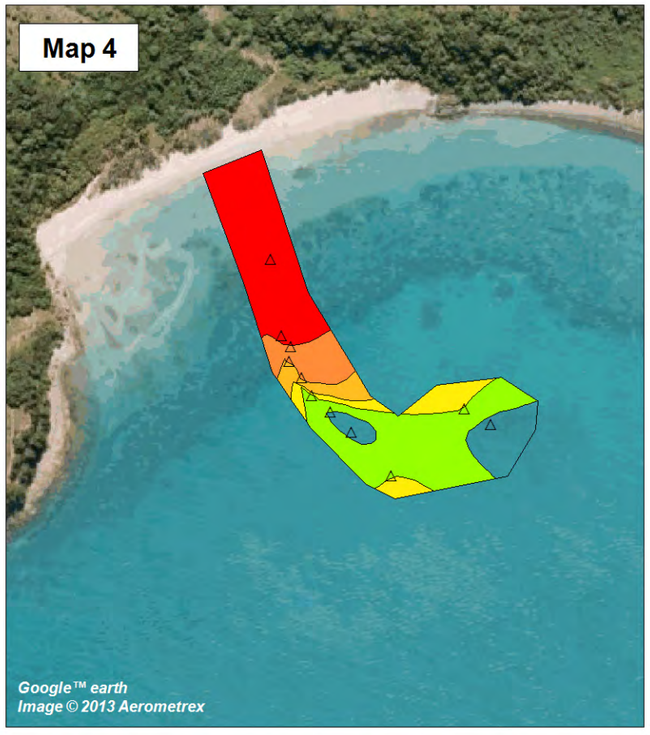
BMT WBM
www.bmtwbm.com.au

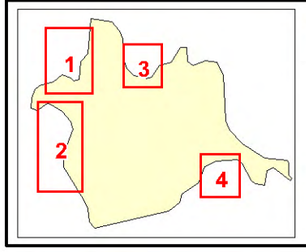
Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_011_130902_algae cover_resort.wor











LEGEND

△ Survey Point

Macroalgae Cover %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- 10.00 to 25.00
- 25.00 to 50.00
- 10.00 to 75.00
- > 75.00

Title:

Macroalgal Cover at Other Sites Around Lindeman Island

Figure: 4-8

Rev: A

N

0 100 200m

Scale - Map 1

0 150 300m

Scale - Maps 2,3 and 4

BMT WBM

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Google™ earth
Image © 2013 Aerometrex

LEGEND

Survey Point

Seagrass %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- > 10.00

Title:

Seagrass Cover at the Existing Jetty Site

Figure: 4-9

Rev: A

N

0 100 200m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

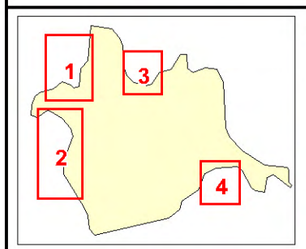
Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_012_130904_seagrass cover_resort.wor

Map 1

Map 2

Map 3

Map 4



LEGEND

△ Survey Point

Seagrass %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- > 10.00

Title:

Seagrass Cover at other Sites Around Lindeman Island

Figure: **4-10**

Rev: **A**

N

0 100 200m

Scale - Map 1

0 150 300m

Scale - Maps 2,3 and 4

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5 Potential Impacts

5.1 Safe Harbour

A range of direct and indirect impacts to marine life can be expected from the construction and operation of the safe harbour site. The following is a summary of the key forms of impact associated with the proposal for each of the three optional designs presented in Figure 5-1 to Figure 5-3.

5.1.1 Potential Construction Impacts

5.1.1.1 Direct Habitat Loss

The construction of the harbour would result in the direct and permanent loss of seabed habitat. Table 5-1 shows that harbour construction would lead to the direct loss of 5.029 to 6.671 ha of coral reef, depending on which design option is selected (see Figure 5-1 to Figure 5-3). These estimates are based on the total area of coral reef habitat within each breakwater. They do not however include any additional dredging that may be required outside of breakwaters, particularly for Option 1.

Overall, design option 3 had the smallest footprint, with the majority of the area consisting of low (1-5% coral cover) or bare sediment. However it should be noted that survey effort/intensity (and therefore mapping accuracy) in the Option 3 footprint was lower than it was for options 1 and 2.

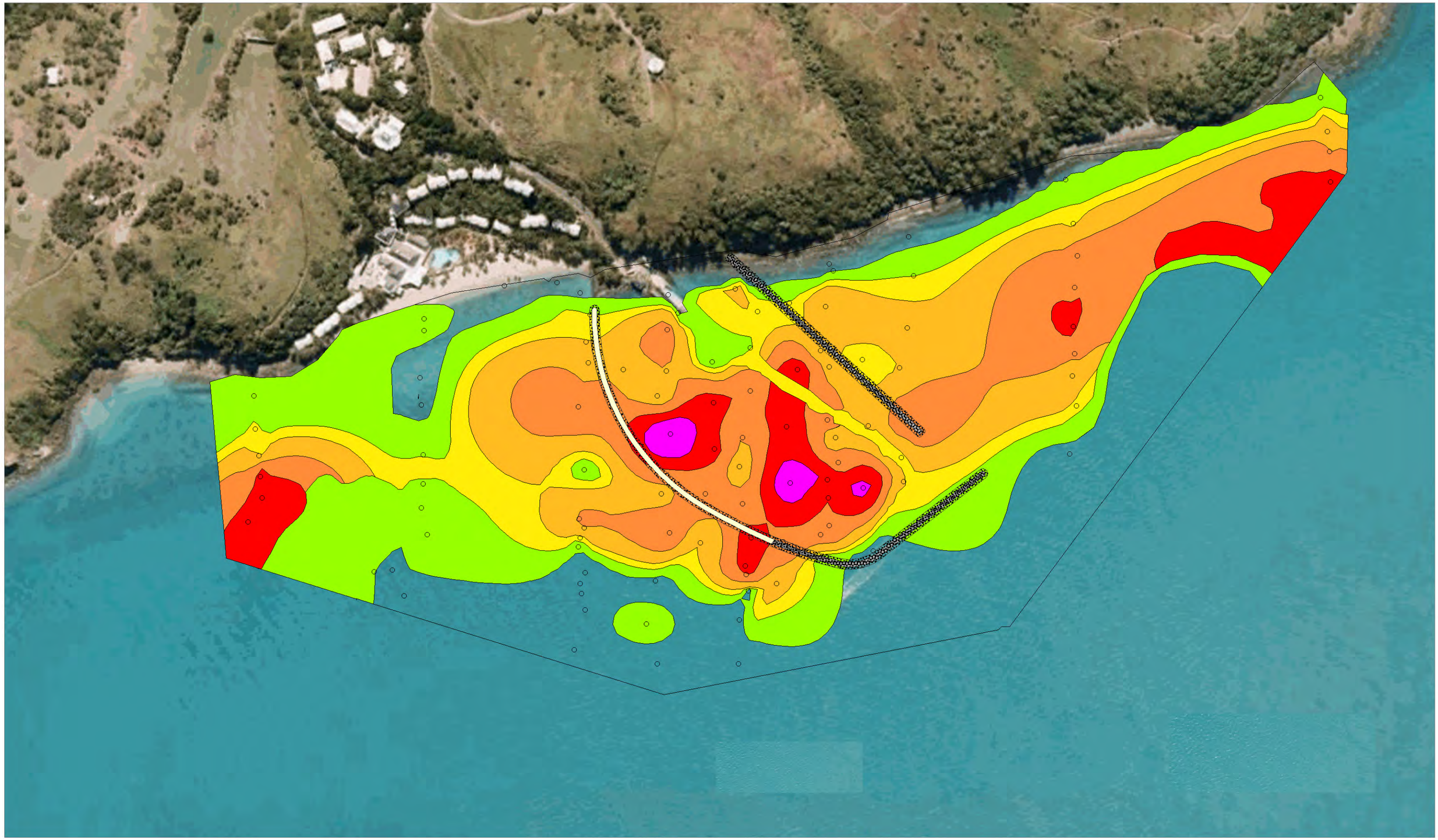
Coral loss represents the most significant impact of the project, given the size of the footprint and the regional significance of the reef surrounding the jetty. It is noted that fringing reefs elsewhere around Lindeman Island are less extensive an have lower cover (generally <10% cover) than around the existing jetty area.

Table 5-1 Area of Coral (ha) within Each Safe Harbour Design Option

Coral cover	Option 1	Option 2	Option 3
>75%	0.31	0.04	0
50-75%	1.19	0.55	0.62
25-50%	1.93	1.21	0.37
10-25%	1.55	2.23	0.36
5-10%	1.01	1.28	0.36
1-5%	0.68	1.24	3.31
Total	**6.67**	**6.55**	**5.02**

Direct loss of macroalgal within and adjacent to the proposed marina footprint is not likely to constitute major impacts considering the dominance of this habitat elsewhere on Lindeman Island, and that this habitat represents a disturbed state, signifying the absence of living coral.

Seagrass communities mostly fall outside of the proposed footprint, and those encompassed by it had relatively low biomass, and were composed of early colonising species. Given the low-biomass and cover, they are unlikely to represent significant foraging habitat for marine turtles and dugong at the jetty site. The only substantial meadows observed during this study were located at Boat Port.



LEGEND

Survey Point

Coral Cover %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- 10.00 to 25.00
- 25.00 to 50.00
- 50.00 to 75.00
- > 75.00

Title:

Extent of Living Coral within Option 1 at the Potential Safe Harbour Site

Figure: **5-1**

Rev: **A**

N

0 100 200m

Approx. Scale

BMT WBM
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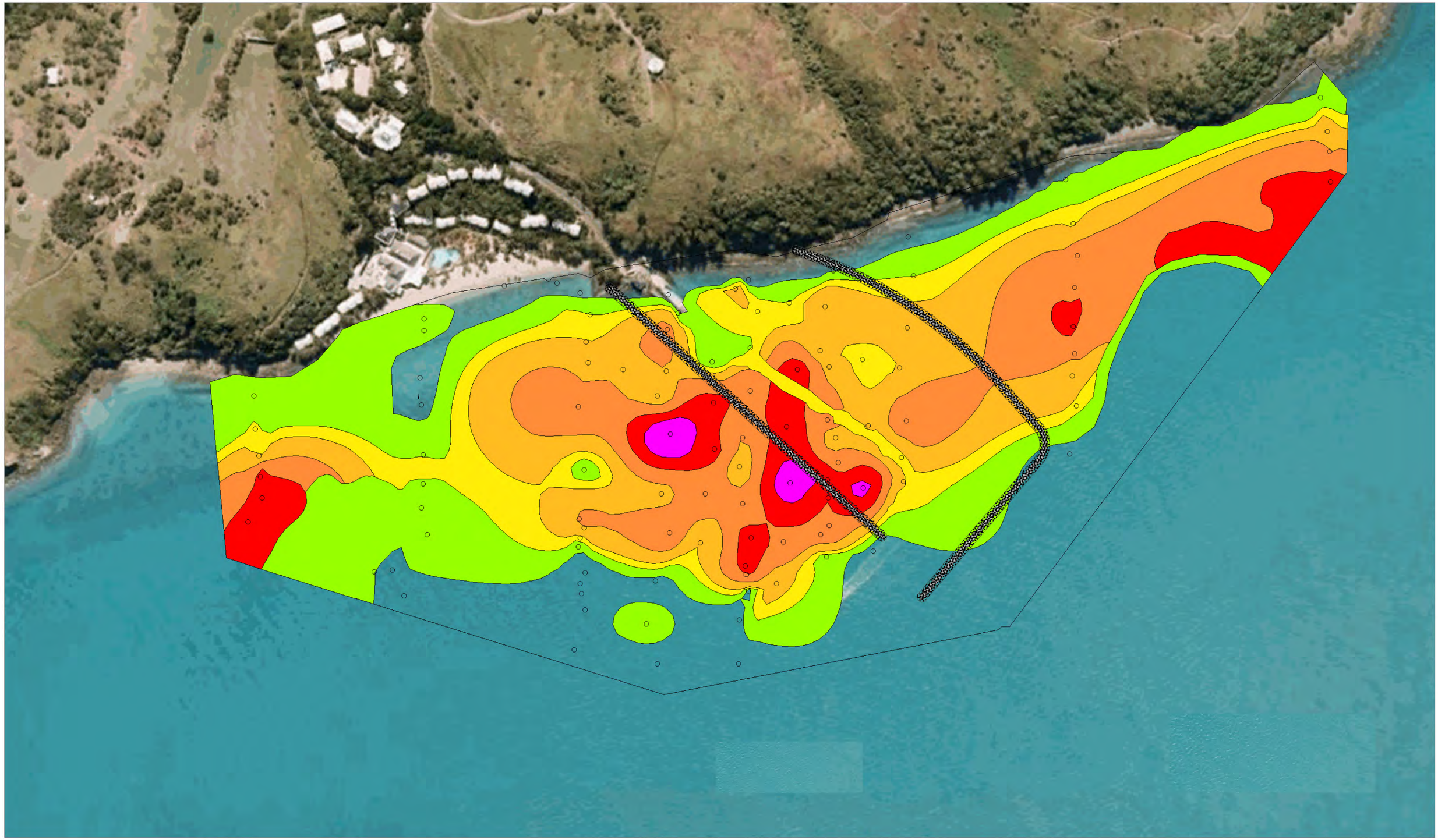


LEGEND

Survey Point

Coral Cover %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- 10.00 to 25.00
- 25.00 to 50.00
- 50.00 to 75.00
- > 75.00

Title:

Extent of Living Coral within Option 2 at the Potential Safe Harbour Site

N

0 100 200m

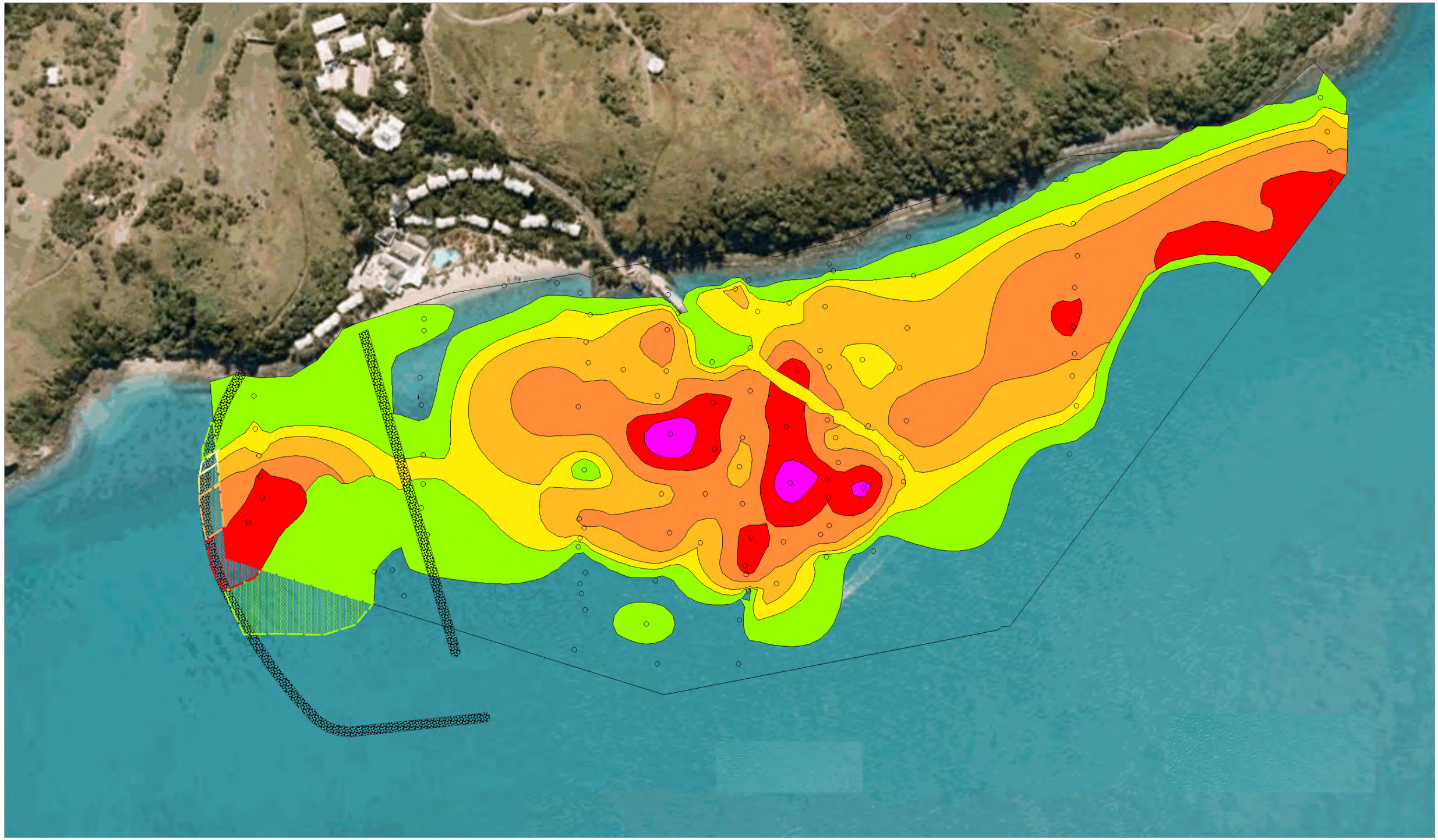
Approx. Scale

Figure: **5-2**

Rev: **A**

BMT WBM
www.bmtwbm.com.au

Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_015_131004_coral cover_Option2_footprint.wor



LEGEND

- Survey Point

Coral Cover %

- < 1.00
- 1.00 to 5.00
- 5.00 to 10.00
- 10.00 to 25.00
- 25.00 to 50.00
- 50.00 to 75.00
- > 75.00

Title:

Extent of Living Coral within Option 3 at the Potential Safe Harbour Site

Figure: **5-3**

Rev: **A**

N

0 100 200m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

Filepath : I:\B20346_I_BRH Lindeman LBL\DRG\ECO_013_131004_coral cover_Option1_footprint.wor

5.1.1.2 Indirect Construction Impacts

Indirect impacts (i.e. loss or degradation of habitat outside of the harbour) would be expected as a result of marina construction. Indirect effects of breakwater construction include:

- Reductions in light and smothering of biota and habitats due to the remobilisation of sediments (e.g. by rock wall placement, construction craft, dredging). It is expected that even with the application of management measures (e.g. containing sediments within the harbour), localised short-term impacts to benthic communities would occur immediately adjacent to the construction footprint.
- Noise impacts to fauna. Noise created by either dredging or construction activities (i.e. from vessels, pile driving, or other machinery operation) has the potential to affect marine megafauna, particularly dolphins or dugongs. For example, noise emitted from dredge operation, vessel manoeuvring or sonar equipment could be beyond the tolerance limits of these animals, mask their vocalisations, interfere with dolphin sonar signals or alter their behaviour (i.e. noise avoidance). Piling could also cause physiological damage if inappropriately managed. This is not considered to be a key risk issue given: (i) low abundance of fauna in the area; (ii) management strategies could effectively manage this risk.
- Other water quality impacts. Fuel spills from construction vessels and plant could lead to water quality impacts. Depending on the construction methodology used, tail-water discharges could also lead to impacts (particularly smothering) to receiving environments. Appropriate management strategies will need to be developed to manage these impacting processes.
- Marine turtle entrapment within the harbour during dredging is likely given the number of turtles residing on the reef at the jetty (> 6 individuals observed during field work) and rates of entrapment that have occurred in other similar seawall constructions at the Port of Brisbane and Gladstone. The potential for entrapment will depend largely on construction techniques. None of the beaches surrounding Lindeman Island are especially noted as turtle nesting sites; however, the Mackay and District Turtle Watch (2013) suggest that some nesting occurs in low numbers at a range of mainland beaches and throughout the Whitsundays. Construction of the safe harbour will not likely present a significant impact to turtle nesting on the beach in front of the resort.
- Habitat fragmentation. The harbour walls will partially impede the transit of fauna between the eastern and western sides of the remaining reef flat. The dredged channel currently acts as a partial barrier, as many reef-associated fish will not venture more than several metres onto open substrates away from coral habitat. The harbour walls will require large fauna such as turtles to transit around the front of the harbour opening. Habitat fragmentation is not expected to be a significant impact compared to direct loss of habitat.
- The direct loss of reef flat will reduce the intertidal foraging area for birds, potentially including threatened migratory birds. The potential for significant impact to migratory waders is low considering the type of intertidal habitat to be lost (reef flat). This may require further assessment.

5.1.2 Potential Operational Impacts

Other indirect effects at the jetty site relate mostly to water quality impacts. Safe harbour infrastructure will likely include fuelling facilities, and the increased vessel presence will increase the likelihood that toxicants and nutrients will enter the water. These include copper-based antifoulants passively releasing from vessel hulls inside the harbour, faecal coliforms and nutrient from accidental or incidental sewage release, and minor chemical/ hydrocarbon spills associated with vessel maintenance inside the harbour.

Depending on local hydrodynamics, there is also the potential for sediment accumulation on either side of the breakwaters, which may increase the area of reef indirectly affected by the safe harbour structure. Sediment will also accrete within the safe harbour and require occasional maintenance dredging.

Operation of the harbour will increase vessel traffic in the vicinity of Lindeman Island, in increase the risk of vessel strike for megafauna. Most vessel movements in the area will be relatively slow moving, associated with berthing and docking, and are unlikely to significantly increase vessel strikes. However, the rapid movements of vessel tenders may increase the risk of vessel interactions with turtles.

Increased vessels traffic can also increase the amount of debris entering the water. Litter (e.g. plastic bags or rubbish from vessels) can entangle marine megafauna, resulting in injuries and possible drowning. Turtles, in particular, can also ingest foreign objects that are mistaken as food, which can lead to stomach or intestinal blockages.

Operation of the safe harbour will increase the amount of light emitted into the natural environment. Additional lighting from the resort redevelopment and the safe harbour may affect the navigation of adult turtles attempting to nest, or the emergence of hatchling turtles.

International and interstate vessels transiting to the safe harbour have the potential to introduce exotic species, which can become pests in the marine environment. This can occur through the introduction of sedentary organisms fouling vessel hulls, or in dredging and marine construction equipment. Introducing exotic marine species into new environments can threaten the integrity of natural communities, the existence of threatened species, and the viability of industries based on living industries (e.g. fisheries, tourism) (CSIRO 2008).

Freshwater point-source release into, or adjacent to, the harbour represents the other potential major operational impact. Sudden freshwater release into corals can be lethal and freshwater point-sources are often devoid of corals. Operational impacts of point source freshwater can be mitigated through effective design.

5.2 Temporary Barge Access

Boat Port and Gap Beach are both suitable potential locations for temporary barge access. Both locations already have an access track to the site, which would need to be widened for vehicular access. Sensitive marine communities are set back further from the shore at Boat Port, perhaps making this location less prone to propeller wash disturbance.

Because barge access will only occur during high-tides, construction impacts will consist only of impacts associated with road creation (e.g. potential loss of marine plants dependent on where the

road access point meets the beach, stormwater/ sedimentation impacts of road construction). Most impacts at the barge loading site would be operational only. The primary forms of marine impact at the barge loading site would include the impact of propeller wash on coral and seagrass communities, potential vessel interaction with dugong, and vehicular impact to the beach community.

At Boat Port, coral and seagrass communities are set well back from the beach; hence, high tide landings would not likely have a significant effect on these communities. Because the seagrass beds here were the densest of any located during the present study (generally <30% cover), the potential for interaction with dugong and turtle (to a lesser degree) is perhaps highest at Boat Port. Given relatively slow barge approach speeds, sparse cover of the seagrass, vessel interaction in not considered likely to be a significant impact.

At Gap Beach, coral and seagrass communities are closer to shore but still relatively far back from the high tide mark from the beach; hence, high tide landings would not likely have a significant effect on these communities. Given relatively slow barge approach speeds, daily transfer rates, and sparse seagrass meadows at Gap Beach, vessel interaction with megafauna in not considered likely to be a significant risk issue.

Vehicle access to the beach will be required for loading and unloading of the barge, including potentially a set-down area for transported goods. Vehicles accessing the beach have the potential to disturb wader birds, turtle nests, and can reduce the abundance of macroinvertebrates, which in turn provide forage for wader birds, fishes, sharks and rays. Reducing the footprint of the set-down area in the beach and minimising the length of beach transited by vehicles will reduce these impacts as far as practicable. Given proper management of the road construction, beach landing and set down areas, significant impacts to the marine ecology of Boat Port area not expected.

Other impacts of regular barge landing include visual amenity and noise impacts to campers utilising the campground. This is not considered part of the marine ecology scope, but is noted nonetheless.

6 Recommendations

While it is recognised that legislative, engineering, and other constraints make the jetty location the only viable option for safe harbour development, the present design will impact one of the highest-density hard coral communities on Lindeman Island. The most significant impact of safe harbour creation is this habitat loss. The extent of significant living coral communities present within the proposed footprint at the jetty location (Figure 5-1) will likely represent a point of concern for GBRMPA given their emphasis on the preservation of significant/ sensitive habitats (GBRMPA 2010).

Impacts will need to be addressed through an environmental management framework of avoid, mitigate, and offset. Close consultation will be required with the Australian and Queensland Government agencies to determine the appropriate framework to be adopted for the project and to ensure approvals can be obtained.

6.1 Avoidance of Impacts

Some direct impacts of habitat loss can be avoided through re-configuration of the safe harbour design, in liaison with government departments. Options 1 and 2 are advantageous, in that, the disturbance created by the existing dredged channel, jetty, and ramp infrastructure fall within their footprints. To not utilise at least part of the existing disturbance footprint will increase the amount of disturbance to previously undisturbed benthos. It is recommended that consultation with GBRMPA should occur prior to any further re-configuration or field work to determine their preferences for design modification, mitigation, or offsetting within the realised limitations of the project (prohibitive construction costs and restricted available locations).

6.2 Mitigation of Impacts

Apart from direct habitat loss, other construction and operational impacts can foreseeably be mitigated and are not likely to represent significant challenges to the project. Some forms of construction impact mitigation include:

- Development and implementation of Environmental Management Plans (EMPs) for harbour construction and operation, maintenance and capital dredging.
- Minimising the area of impact through construction methodologies, including:
  - building seawalls prior to commencement of dredging;
  - using sediment fencing or bunding;
  - using a mechanical bucket or grab dredge where possible to minimise plume generation; and
  - onshore placement of material.
- Minimising the severity of impacts through monitoring:
  - Marine megafauna presence during dredging and construction;
  - Water quality via a monitoring program developed and implemented in accordance with a Long Term Dredging and Disposal Management Plan (LTDDMP); and

- Noise emissions if pile driving.

The effects of harbour operation on water quality, marine debris, and introduced marine pests can be mitigated by ensuring that operational procedures follow appropriate EMPs and best management practices for septic discharge, ballast and rubbish management. Lighting impacts on nesting turtles can be mitigated by restricting the intensity, height, direction, and timing of lighting (seasonally). The effects of sedimentation and coastal processes should be investigated using coastal process modelling. Mitigation of coastal process impacts will depend on the nature of predicted changes, and these should be considered within the LTDDMP. Impacts of point-source stormwater discharges on coral communities can be mitigated by effective stormwater retention and design, which should consider the proximity of release point to coral communities and diffusive potential of surrounding seawater.

6.3 Offsets for Residual Impacts

Residual impacts of habitat loss may be offset in a variety of ways, by using habitat forming construction materials, by creating new reef habitats elsewhere, and by relocating structural elements of habitat away from the intended footprint. Harbour construction materials consisting of pre-fabricated armour structures such as “x-bloc” can increase the rugosity of the seawall structure and provide additional habitat. Structures such as x-bloc and “reef balls” (Figure 6-1) can be used to form new areas of reef over adjacent bare sand habitat. Corals from the footprint area could be transplanted onto these structures, or used to increase coral cover over the surrounding reef outside of the footprint. The appropriateness of these measures as offsets will need to be discussed with GBRMPA.

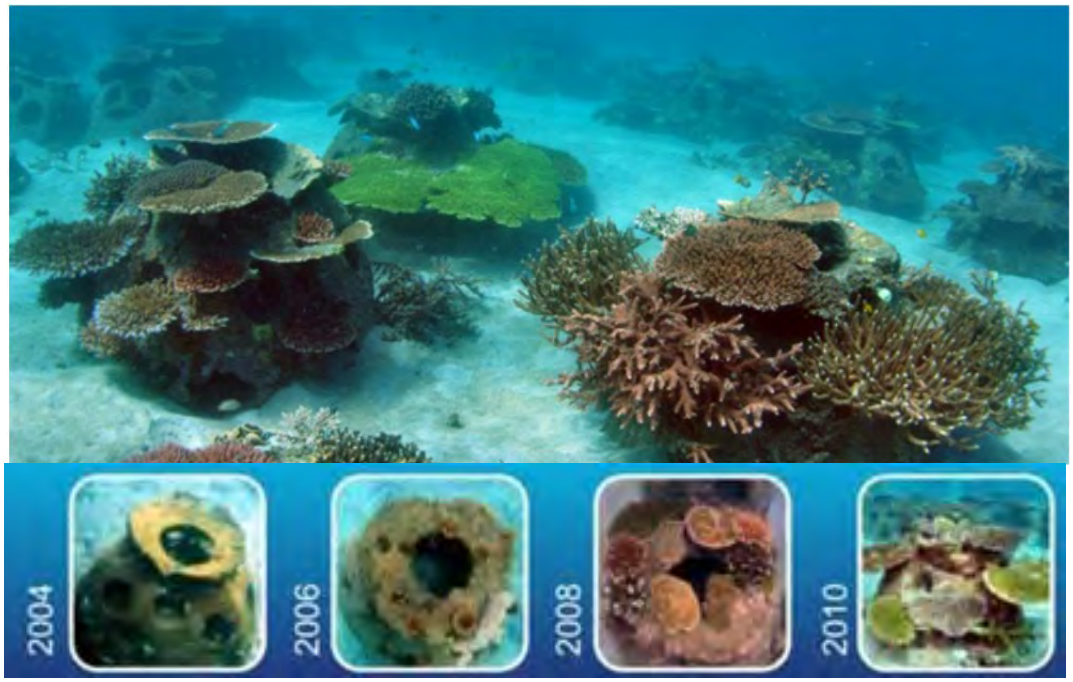


Figure 6-1 Example of “Reef Balls” used as artificial reefs

Seagrass and coral communities of Boat Port (and Gap Beach to a lesser degree) are situated offshore from beach landing sites and would not likely be degraded by a regular high-tide barge service. While there will need to be management of impacts to turtle nesting and human users of the site, the distribution of seagrasses and corals, and the derived bathymetry at Boat Port are not prohibitive to the establishment of the high-tide barge access. Depending on where the road access point meets the beach, there may be some marine plant disturbances (mangroves) required. If marine plant disturbances are relatively minor, financial offsetting or rehabilitation may the most appropriate offsets.

7 References

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Smith JN, Grantham HS, Gales N, Double MC, Noad MJ, Paton D (2012) Identification of humpback whale breeding and calving habitat in the Great Barrier Reef. Marine Ecology Progress Series 447: 259-272.

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