



Project Description

4

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4 Project Description

4.1 Project Title

The title of the project is the “*Lindeman Great Barrier Reef Resort project*”. Throughout the EIS it is referred to as “the project” and “proposed resort”.

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 Accordingly, remaining references to, and images of, a safe harbour on various figures and maps in the EIS are no longer current.*

4.2 Project Rationale

Lindeman Island was one of the first islands in the Whitsunday Island Group to be used for tourism purposes following the establishment of a camp at Home Beach by Angus Nicholson in 1923. Since this time further facilities have been constructed on the Island including an airstrip, resort rooms, dam, boat jetty and golf course, with a jetty, boat turning basin and boat channel constructed in 1966. The resort and jetty were redeveloped by Club Med in the 1980s and in 1992 when the existing 225-room resort was constructed. The resort operated successfully for many years as a 3-star facility, mostly targeting the family market but also targeted the singles market in its early years. Following damage by Cyclones Ului (2010) and Yasi in March (2011) and the tourism downturn suffered by Queensland resorts in the Global Financial Crisis period (post late 2008), Club Med closed its resort in January 2012 and sold it to the proponent, White Horse Australia Lindeman Pty Ltd, later that year.

The resort has remained closed for four years as the new owner has explored a range of development options and is now embarking upon obtaining necessary approvals to expand and upgrade the resort. The resort, suffering from cyclone damage at the time of its closure remains in a significant state of disrepair and requires a major refurbishment, as a minimum. 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 does not support 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. 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.

From a policy perspective the continuation of tourist development at Lindeman Island is supported by high level policy documents such as the State's Ecotourism Plan 2016 – 2020, the Draft Mackay Region Planning Scheme 2016 and the Whitsundays Plan of Management. The State's Ecotourism Plan 2016 – 2020 seeks to *"facilitate investment in tourism products that showcase the Reef and address issues with existing unoccupied island resorts"* (p8). The Draft Mackay Region Planning Scheme 2016 in its Strategic Framework states *"Tourism development that maintains sensitive environmental and landscape character values is encouraged on Lindeman, Brampton and Keswick Islands"* (p3-6). The GBRMPA Whitsundays Plan of Management also maps the surrounding marine park as a "Developed Setting". The "Developed" (Setting 1) areas are described by GBRMPA as *"Areas in this setting are immediately adjacent to urban areas and resorts. They are the access points to the Planning Area and a focus for intensive tourism and recreation. The areas are heavily used by a wide range of craft, and contain permanent facilities (for example, marinas, jetties and boat ramps)."* The project will lead to the rejuvenation and reopening of an existing unoccupied tourist resort which has been designed to maintain the sensitive environmental and landscape character values of Lindeman Island.

4.3 Project Objectives

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. The main objectives of the project are to:

- (a) Redevelop the existing resort at Lindeman Island into a world class tourist resort that sets new international standards in environmental sustainability and resort design;
- (b) Contribute to the further development of the Whitsundays as a vibrant domestic and international tourist destination;
- (c) Ensure the ecologically sustainable development of the Lindeman Island;
- (d) Respect and protect the outstanding universal values of the GBRWHA;
- (e) Provide for the protection of the environment, especially those aspects of the environment that are Matters of National and State Environmental Significance;
- (f) Protect the biodiversity, terrestrial and aquatic ecosystem function, of the island and surrounding marine environment;
- (g) Provide safe, reliable and convenient access to the island by air and by sea;
- (h) Ensure that the design is responsive to the effects of climate change, including sea level rise and storm surge impacts;
- (i) Promote a built form that integrates with and is subordinate to the natural environment in terms of scale, bulk, materials and colour;
- (j) Respect and enhance the island's existing landscape character and utilise endemic plant species where possible in revegetation and landscaping; and
- (k) Provide sensitively designed and located physical infrastructure commensurate with the intended scale and density of development.

4.4 Project description

The current proposal prepared by DBI Design Pty Ltd has evolved through consultation with the project partners (White Horse Australia Lindeman Pty Ltd), tourism industry leaders, specialist consultants and potential hotel operators. The design intent is to create a luxury resort which responds to the World Heritage Values of the Great Barrier Reef and incorporate best practice in sustainable design and construction (refer to **Appendix C - Masterplan Concept**). The masterplan concept is presented in **Figure 4-1** with key aspects of the proposal described in the following sections. The project includes a total gross floor area of approximately 79,792m² and provides for an estimated maximum daily population of 858 people, including 300 staff.

Key aspects of the project are:

- Beach Resort - redevelopment of the existing resort to achieve a new 5 star Beach Resort with 136 suites, conference centre, beach club and a central facilities building with restaurants, bars and lounges;
- Spa Resort - a new 6 star Spa Resort with 59 villas, central facilities, entry lounge, spa, sea view restaurant, pool and a signature rock bar providing spectacular alfresco dining close to the sea;
- Eco Resort - a new 5 star Eco Resort near the existing lake consisting of 41 villas, a central facility, boathouse and a waterside restaurant;
- Tourist Villa Precincts - two precincts accommodating 89 tourist villas located to the north-east and north-west of the existing resort;
- Village - a central village precinct comprising restaurants, bar, night club, conference facility buildings, arrival centre, shops, sport and recreation centre and a staff village;
- Services infrastructure precinct – an expansion of the current services area providing for power generation (solar with diesel back-up), sewage treatment and water treatment;
- Airstrip - the existing airstrip is proposed to be upgraded to provide for near all-weather status and for the landing of light aircraft and helicopters;
- Marine access - the proponent seeks approval for upgrades to the existing jetty and additional moorings in sheltered locations around the island to enable the resort's marine craft to obtain safe shelter under a range of wind and wave conditions;
- Golf course – upgrades to the existing recreational golf course are proposed;
- Ecotourism facilities - a National Park and Great Barrier Reef Education Centre and 30 "glamping" facilities are proposed in consultation with the State Government; and
- Environmental enhancements - native vegetation replanting, improvements to stormwater management and a shift towards renewable energy sources are proposed.

The scope of the project also includes the rearrangement of lease boundaries, changes to the terms of some existing leases, new leases 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 (refer to **Chapter 6 – Land Tenure**).



KEY PLAN

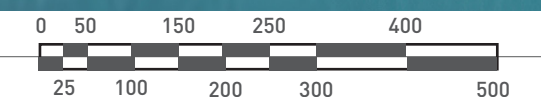


Figure 4-1. Masterplan layout (DBI Design, November 2016).

Table 4-1 provides an overview of the resort components with the following sections of the EIS providing additional information on each of these.

Table 4-1. Overview of proposed resort components.

Precinct	Type	Storeys	Bed-rooms per product	No. Of	No. of beds	Approximate Total Gross Floor Area (GFA) m ²	Approximate Site Cover m ²
Jetty/Marine Access	Retail/Beach Club	1	0	1		200	400
	National Park and Great Barrier Reef Education Centre	1	0	1		200	300
Sub-Total						400	700
5 Star Beach Resort	Pool Bar	1	0	1		100	200
	Central Facilities	3	0	1		3850	1,483
	Hilltop Suites	3	1	49	49	2726	1,203
	Pool Suites	3	1	87	87	4950	2,158
Sub-Total				138	136	11626	5,044
Village + Maintenance	Airport Lounge	1	N/A	1		610.72	783
	Conference Centre	2	N/A	1		1055.43	1,188
	Retail	1	N/A	1		2828.89	3,615
	Sport Centre	1	N/A	1		1038.64	3,182
	Staff Accommodation	3	N/A	1	400	13500	5,000
	Maintenance	1	N/A	1		6881	19,281
Sub-Total					400	25,914	33,048
Future Tourist Villas	Villas - West Precinct	2	3	18	54	3600	2,250
	Villas - East Precinct	2	3	71	213	14200	8,875
Sub-Total				89	267	17,800	11,125
Spa Resort	Central Facilities	2	0	1		1600	1,075
	Type 'A' Courtyard/Villa	1	1	12	12	1080	1,800
	Type 'B' Hilltop Villa	1	1	15	15	1620	1,810
	Type 'C' Cliffside Villa	1	1	8	8	800	1,280
	Type 'C2' Cliffside Villa	2	2	14	28	2100	1,575
	Type 'D' Exclusive Villa	1	3	10	30	2000	2,900
Sub-Total				60	93	9,200	10,440
Future resort expansion	-	-	-	-	-	-	-
5 Star Eco Resort	Eco Butterfly Villa	1	1	21	21	1890	3,528
	Eco Butterfly Villa	2	2	8	16	1280	952
	Eco Treetop Villa	2	3	12	36	2448	1,644
	Lake	-	-	-	-	-	-

Precinct	Type	Storeys	Bed-rooms per product	No. Of	No. of beds	Approximate Total Gross Floor Area (GFA) m ²	Approximate Site Cover m ²
	Central Facilities, Boathouse and Waterfront Restaurant	1.5	0	1		1155	1,055
	Glamping Facilities	1	0	1		136.1	136
	Glamping Tent	1	1	30	30	981.3	990
Sub-Total				73	103	7,890	8,305
Airport	Runway	N/A	N/A	1		N/A	51,600
	Hangars	1	N/A	6		5,304	5,304
	Helipad	N/A	N/A	1		N/A	1,156
	Aircraft Parking	N/A	N/A	1		N/A	12,814
Sub-Total						5,304	5,304
Lakeside Restaurant		1	N/A	1		307	571
Sub-Total						307	571
Day Spa	Reception & Amenities	1	N/A	1		350	450
	Treatment Rooms (x14)	1	N/A	14		840	1,050
Sub-Total						1,190	1,500
Others	Roads (8km@3.5M wide)	N/A	N/A	N/A		N/A	28,300
	Chapel	1	N/A	4		160	220
	Rock Bar - 6 Star	1	N/A	1		20	100
Total (approximate)					999	79,792	76,257

4.4.1 Beach Resort

It is proposed to redevelop the existing 225 room resort (7,392m² gross floor area) to achieve a new 5 star Beach Resort with 136 suites, conference centre, beach club and a central facilities building with restaurants, bars and lounges (refer to **Figure 4-2** and **Figure 4-3**). The existing footings, columns and ground floor slabs are to be utilised as part of the revitalisation works to minimise land disturbance in this part of the site.

The resort will also be connected to the jetty, arrival and National Park and Great Barrier Reef Education Centre through a new Beach Club facility, which provides for educational and retail opportunities. The private rooms of the resort are setback from the Beach Resort which increases the opportunities for a landscaped vegetation buffer, protecting the residents from the service road and activity.

The existing central facilities building has a gross floor area of approximately 3,610m². 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 will generally be arranged around the internal beach and lagoon pool (refer to **section 4.4.12** for further information regarding the proposed lagoon). Additional hillside suites will be located on the north western slope, facing Home Beach. Approximately 136 suites are proposed, consisting of a majority of studio type rooms, and some exclusive 2 bedroom beach side and hillside villas. The central facilities building features an iconic copper clad roof and would accommodate a number of restaurants and bars, with alfresco dining and lounge terraces (refer to **Figure 4-4**). The Beach Resort will provide for buggy parking, improved circulation and storage facilities.

The Beach Resort has been designed to blend in with the surrounding landscape with a colour palette that reflects the existing environment and buildings with soft edges stepping down the slope (refer to **Figure 4-5**).

Figure 4-2. Existing aerial photograph of Beach Resort locality.



Figure 4-3. Proposed Masterplan for the Beach Resort Precinct (safe harbour no longer proposed).

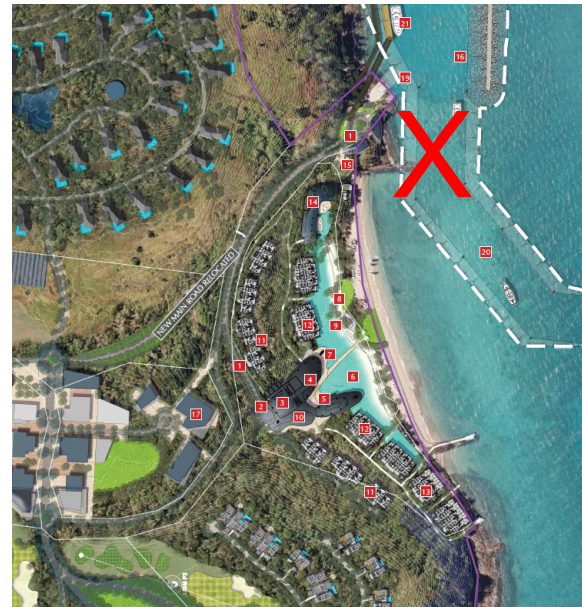


Figure 4-4. Proposed 5 Star Resort Central Facilities Building Elevation (DBI Design, 2016).



Figure 4-5. Proposed 5 Star Beach Resort Elevation viewed from the ocean (DBI Design, 2016).



4.4.2 Spa Resort

The Spa Resort is proposed to be located on the southwest headland and hillside adjacent to the existing resort (refer to **Figure 4-6**) and comprise 59 villas, central facilities, entry lounge, spa, sea view restaurant, pool and a signature rock bar providing spectacular alfresco dining close to the sea (refer to **Figure 4-7**).

The masterplan concept for this precinct focuses on the provision of small scale pavilion like structures (villas) sympathetically integrated within the landscape. This approach assists with the provision of more private style retreats, with each villa to have its own pool. The 59 villas (1, 2 and 3 bedroom options) will comprise four types of villa designs, with different floor planning objectives and roof forms which respond to their context, orientation, visual elements and exposure to prevailing winds and climatic conditions.

The Spa Resort proposes central facilities with a signature restaurant, club and bar. The one storey suspended health and day spa would be located on the southern hillside while 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 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 jetty and beach resort below (refer to **Figure 4-8**). The location and design of each villa and buggy pathway considers site features such as slope, rocky outcrops, views and significant vegetation. The buggy paths are designed for electric 'golf carts' and as such are narrow with discrete passing zones located to minimise site disturbance.

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. 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 State listed grasslands and the Commonwealth listed Littoral Rainforest and Coastal Vine Thickets of Eastern Australia. The proposed development footprint avoids this Threatened Ecological Community.

Figure 4-6. Existing aerial photograph of Spa Resort locality.



Figure 4-7. Proposed Masterplan - Spa Resort Precinct.



Figure 4-8. Proposed Elevation Treatment – 6 Star Spa Resort.



4.4.3 Eco Resort

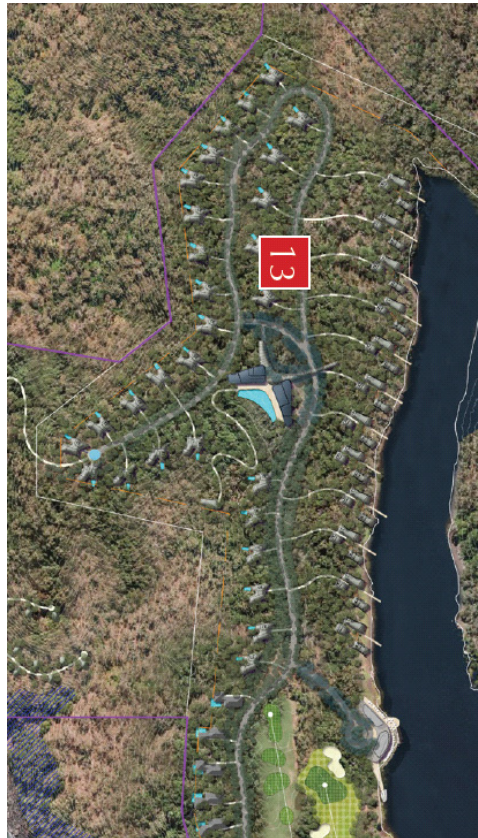
The proposed five star Eco Resort is located on the north western side of the island in the location of the existing golf course and adjacent to Gap Creek Dam (refer to **Figure 4-9**). This precinct incorporates 41 villas, a central facility building, a boathouse and a waterside restaurant (refer to **Figure 4-10**). The central facility building of the Eco Resort 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. Areas previously cleared for the golf course will be revegetated using local native species. The “butterfly” villas, with their organic roof forms, will be positioned to optimise their integration with the setting with the final location taking into account site attributes such as views, slope, geomorphological features and significant trees. Similarly, the 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 and snorkelling on the reef. The Eco Resort will also provide a servicing function for the glamping facilities described in **section 4.4.10**.

Figure 4-9. Existing aerial photograph of Eco Resort locality.



Figure 4-10. Proposed Masterplan - Eco Resort Precinct.



4.4.4 Tourist Villa Precincts

Two precincts accommodating 89 tourist villas are proposed to the north-east and north-west of the existing resort (refer to **Figure 4-11** and **Figure 4-12**). The north-eastern precinct is located on a gently sloping plateau with the villas designed such that the southern group are aligned to capture sea views whilst the northern group have views towards Mount Oldfield. The Project also proposes the creation of small wetlands in a naturally occurring low-spot within this precinct.

The north-western precinct is embedded amongst the existing golf fairways and follows the western boundary of the current leasehold land. These villas will have filtered views through the woodlands to the sea beyond. All villas will have their own pool and access will be provided by narrow electric buggy tracks generally following the natural contours to minimise environmental impact.

The littoral rainforest and coastal vine thicket vegetation adjacent to these precincts is located outside the disturbance footprint and will be protected through management measures and buffers.

Figure 4-11. Existing aerial photograph of Tourist Villa Precincts.



Figure 4-12. Proposed Masterplan - Tourist Villa Precincts. (Blue line – precinct A and Orange line – precinct B).



4.4.5 Village

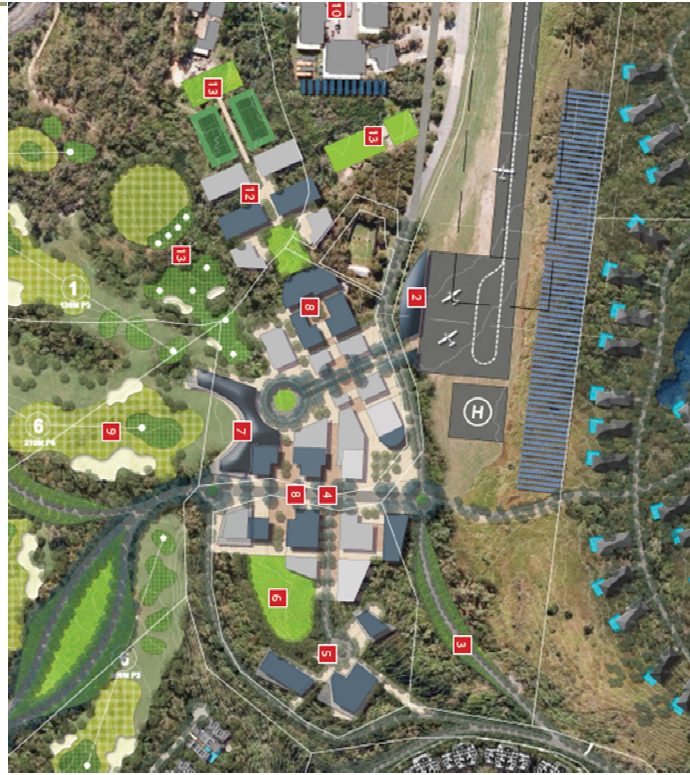
A central village precinct comprising restaurants, bar, night club, conference facility buildings, arrival centre, shops, sport and recreation centre and a staff village is proposed to be developed on the site of the current pool, tennis courts and restaurant (refer to **Figure 4-13** and **Appendix C**). The new village will accommodate a variety of uses and aim to have a constant role of activation and be an entertainment and meeting place for all island guests and staff. 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 (refer to **Figure 4-14**).

The village main street (promenade) will be activated with pedestrians, golf buggies, 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, barbecue pavilions, amenities and a pool recreation zone. Around 300 staff will live on the island at any time, and it is proposed to integrate staff accommodation within the village to create a lively and active precinct.

Figure 4-13. Existing aerial photograph of Village Precinct.



Figure 4-14. Proposed Masterplan - Village Precinct.



4.4.6 Services Infrastructure Precinct

A new precinct with services including power generation, water treatment and sewage treatment, is proposed in the same location as the current service infrastructure precinct (refer to **Figure 4-15**, **Figure 4-16** and **Appendix C**). The project seeks to reduce greenhouse gas emissions through a solar-diesel hybrid system and ensuring that all fittings and devices are energy efficient (e.g. use of LED lighting).

The proposed water treatment plant will consist of membrane microfiltration modules to treat water from the dam in accordance with the Australian Drinking Water Guidelines (refer to **section 4.5.2**).

The existing wastewater treatment plant will be replaced with a membrane bioreactor treatment process with disinfection to produce Class A+ recycled water with very low nitrogen and phosphorus levels (refer to **section 4.5.3**).

Figure 4-15. Existing aerial photograph of Service Infrastructure Precinct.



Figure 4-16. Proposed Service Infrastructure Precinct.



4.4.7 Air Strip and Facilities

The existing airstrip is proposed to be upgraded to provide for near all-weather status, capable of landing light aircraft and helicopters. The existing grass airstrip consists of two runways, the main runway is aligned 18/36 with a nominal length of 1,097 metres (refer to **Figure 4-17**), while the secondary runway is aligned 13/31 with a nominal length of 680 metres. Although well maintained, during wet weather, the lowest part of the main runway in the vicinity of the cross-runway intersection can be flooded which limits aircraft operations at those times to helicopter only. The proponent proposes to upgrade the existing runway to provide for Code 1B non-instrument, day only flights (CASA's Manual of Standards Part 139—Aerodromes). Code 1B aircraft, such as Beechcraft 200 King Air, DHC-6 Twin Otter and Dornier 228-200, are the maximum size of aircraft potentially capable of using the aerodrome (maximum 19 seater) if it is constructed to comply with Code 1B standards. The use by such aircraft is subject to runway length, obstacles, runway slope and various other take-off performance planning considerations. The eventual runway length will be influenced by a range of factors including the cost of construction, the cost of achieving compliance with the applicable regulatory requirements including geometric design and airspace protection, and the extent of the site available for development and the cost of environmental impacts. The maximum runway length that can be achieved (nominally 966 m for take-off in the northerly direction or possibly up to 1042 m subject to operational procedures acceptable to CASA) may still not enable the nominated aircraft to operate to their full payload/range capabilities (refer to **Figure 4-18**). 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 to the west will be used for aircraft parking and aircraft hangars.

In keeping with the positioning of Lindeman Island as a premier tourist destination a custom designed arrivals and departure lounge will be constructed on the edge of the airstrip. 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.

Figure 4-17. Existing aerial photograph of airstrip. **Figure 4-18. Proposed Masterplan – Airstrip.**



4.4.8 Marine Access

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

The proponent originally proposed a safe harbour to provide reliable access for the transfer of guests via ferries, luxury vessels and private charters offering greater protection from the prevailing wind direction than currently available. Following a comprehensive site and ecological assessment, a number of alternative layouts were identified (refer to **Chapter 5**) with the proponent’s preferred location being in the area surrounding the existing jetty and deepwater access channel (refer to **Figure 4-21**). The proposed breakwaters, harbour works and channel batters were to be contained within an area of approximately 5.2 hectares.

As a result of the commencement of the Great Barrier Reef Marine Park Authority’s (GBRMPA) Dredging Coral Reef Habitat Policy (2016), further impacts on Great Barrier Reef coral reef habitats from yet more bleaching, and the recent impacts from Tropical Cyclone Debbie, the proponent has been made aware that the prospects of gaining approval for the proposed safe harbour are remote. Therefore, the proponent no longer seeks to obtain approval to construct a safe harbour at Lindeman Island.

The proponent no longer seeks to obtain approval to construct a safe harbour at Lindeman Island. Instead the proponent seeks approval for upgrades to the existing jetty and additional moorings in sheltered locations around the island to enable the resort’s marine craft to obtain safe shelter under a range of wind and wave conditions.

The existing jetty, moorings and barge landing facilities are located within the State and Commonwealth Marine Park in locations that minimise impacts on coral communities. Key aspects of the proposed design includes:

- The existing turning basin and access channel will be used for boat manoeuvring so that no disturbance of the fringing coral reef will be required;
- Vessels will not be permitted to empty bilges or waste water while using the jetty, barge or mooring facilities at the Lindeman Island resort to protect the marine environment. There is no intention to provide fuel or maintenance facilities;
- The jetty will be the key form of marine access for tourists and staff to/from the island;
- The jetty and barge landing point will be used to move supplies to the central receiving facility within the staff and maintenance precinct. The same operations will efficiently remove refuse from the island;
- Use of seven approved mooring facilities in accordance with GBRMP Permit G13/35494.2;

- In the event of a cyclone boats would need to leave Lindeman Island and would be directed to the mainland harbours where they would require anchorage until the cyclone passes. As part of the resort's Cyclone Management Plan a Warning System is proposed to be developed which will identify the need to monitor Bureau of Meteorology warnings and seek advice as to when evacuation of boats from the island would be required; and
- Adjacent to the jetty, an arrivals lounge and cafe for guests arriving from vessels at the jetty or moorings, it is noted that the proposed arrivals lounge may require permits from the State/GBRMPA.

The following provides further information on the proposed marine access to the island with respect to a safe harbour no longer being proposed.

4.4.8.1 Jetty Upgrades

To improve the functionality of the existing jetty it is proposed to demolish approximately 45 metres of the existing timber and concrete jetty and replace it with a 30 metre x 6 metre floating ferry pontoon as shown in **Figure 4-19**. The pontoon will be connected to the remaining timber jetty by a 15 metre gangway, 2.4 metres wide to provide safe all tide access to the vessels. The structural integrity of the remaining jetty can be reviewed and upgraded as required to support the additional load from the gangway. The proposed pontoon will also provide short-term public access (e.g. set-down and pick-ups) to the island and National Park.

Refer to **section 4.12.9** for information regarding the construction of the jetty upgrade.

Figure 4-19. Current and proposed jetty layout.



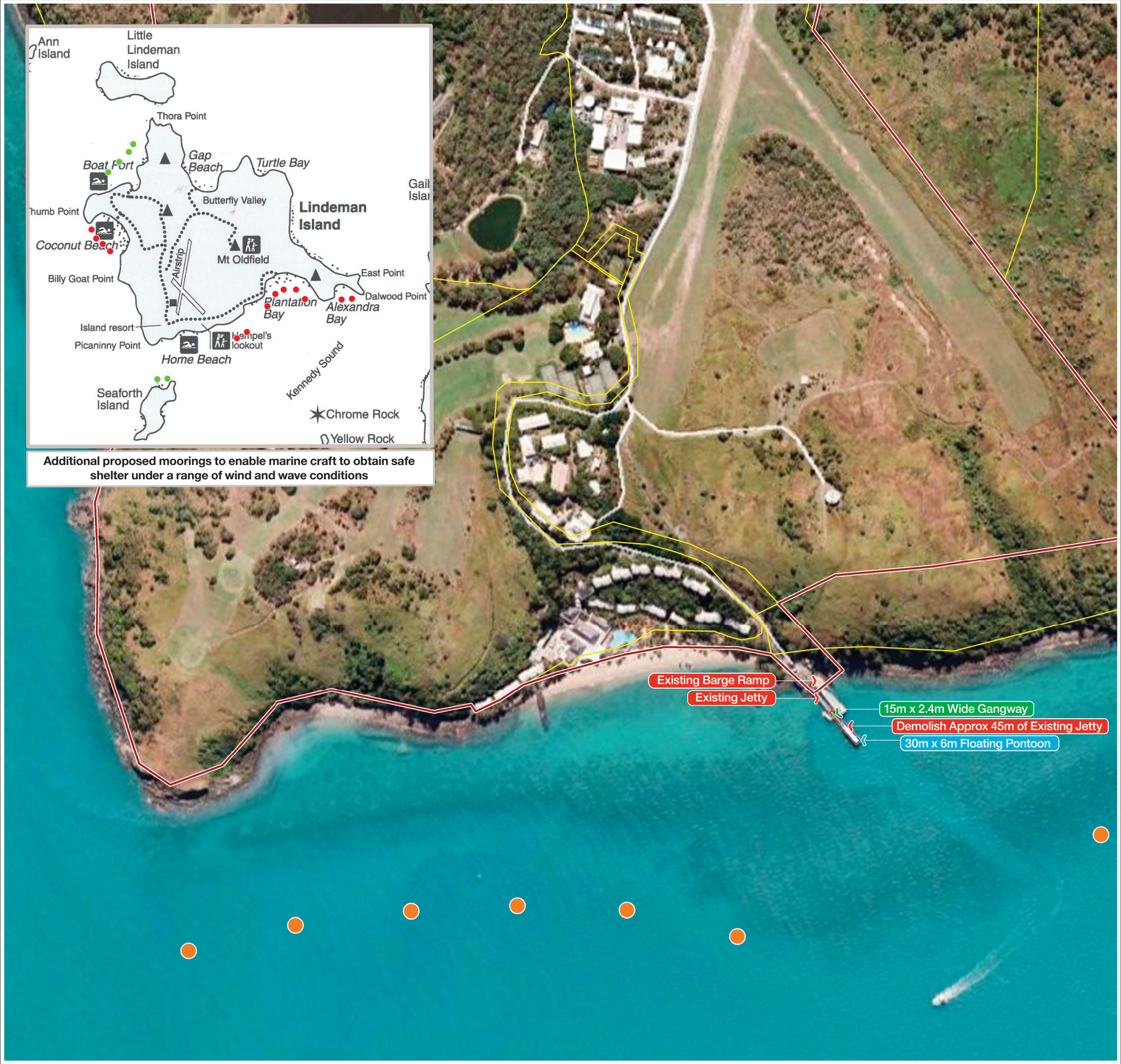
4.4.8.2 Moorings

The proponent has a current GBRMPA permit (G13/35494.2) for seven moorings at Lindeman Island being GM0227, GM0228, GM0229, GM0230, GM0231, GM0232 and GM0233. As a safe harbour is no longer proposed the proponent seeks approval for additional moorings in sheltered locations around the island to enable the resort's marine craft to obtain safe shelter under a range of wind and wave conditions (refer to **Map 4-1**).

The proposal includes new moorings at Lindeman Island. Privately owned moorings may not be installed without a permit from the Great Barrier Reef Marine Park Authority (GBRMPA) and Queensland Parks and Wildlife Service. The installation of any mooring, pontoon or tourist facility is subject to the application, assessment and decision-making processes under the Regulations for a relevant permission to install a mooring, pontoon or tourist facility or operate a tourist program. The processes under the Regulations include an assessment of the suitability of the proposed installation site for a mooring, pontoon or tourist facility. In addition, according to the Whitsunday Plan of Management, the Authority will only grant new permissions for moorings that will be installed within the setting 1 area of 'Lindeman Island Resort' (i.e. the designated area in front of the existing resort at Home Beach to the coastal 500 m line).

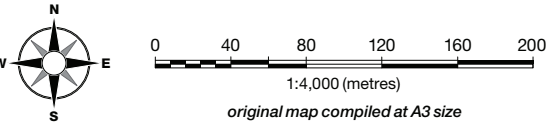
The proposed moorings would be located on soft sediment and at a sufficient distance beyond the reef edge to avoid potential harm to coral from the mooring structure and attachments and vessels. Mooring would be appropriately designed to accommodate the maximum load requirements (vessel sizes) and for minimising the risk of environmental damage, and design drawings would be approved or certified by a Registered Professional Engineer of Queensland. The precise mooring locations and designs within the setting 1 area would be take into account 'best-practice' guidelines as given in GBRMPA's 'Policy on Moorings in the Great Barrier Reef' and the 'Supporting information to the Policy on moorings in the Great Barrier Reef'.

An application to GBRMPA for moorings would be submitted on approval of the EIS along with appropriate supporting documentation.



LEGEND

-  Proposed Site Boundary
-  Cadastral Boundary
-  Approximate Location of Mooring Based on (GBRMPA Permit No. G13/35494.2)
-  Additional Safe Weather Proposed Moorings (subject to GBRMPA Permit)
-  Additional Proposed Moorings (subject to GBRMPA Permit)



DRAWING TITLE	Proposed Jetty and Approved Moorings
DRAWING DATE	12 June 2017
DRAWING VERSION	2.0
COORDINATE SYSTEM	GDA 94; MGA Zone 55
MAP PRODUCED BY	Cardno QLD Pty Ltd
JOB NUMBER	HRP15078

DATA SOURCE
Google Earth: Date of Photography 07/03/2008.
Cadastral data: State of Queensland (Department of Natural Resources and Mines) 2015; Property Boundaries Queensland; Publication date: 02/04/2015.

Lindeman Great Barrier Reef Resort & Spa
ENVIRONMENTAL IMPACT STATEMENT

Proposed Jetty and Moorings

4.4.8.3 Barge Access

There is an existing all tide access barge landing ramp on Lindeman Island that was used by the former resort to move materials and equipment. It is proposed that this landing point also be used during the construction and operational phase of the upgraded resort. No further infrastructure or disturbance of the fringing reef is required.

Figure 4-20. Existing aerial photograph of the jetty/barge landing location.

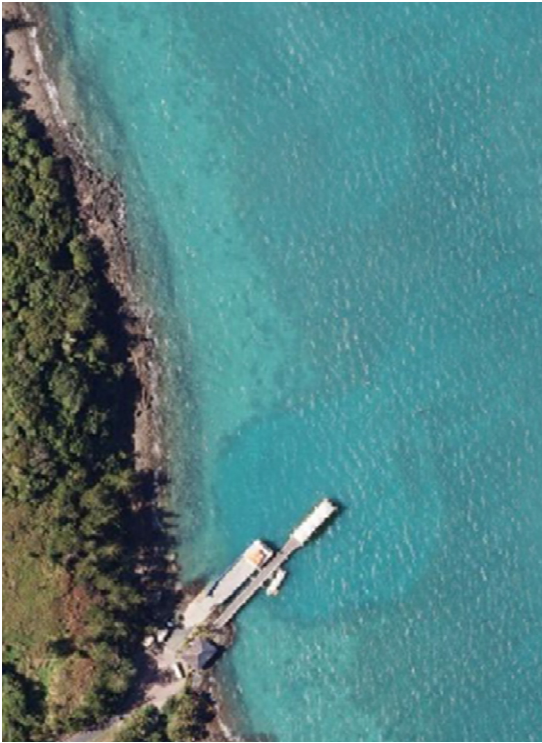
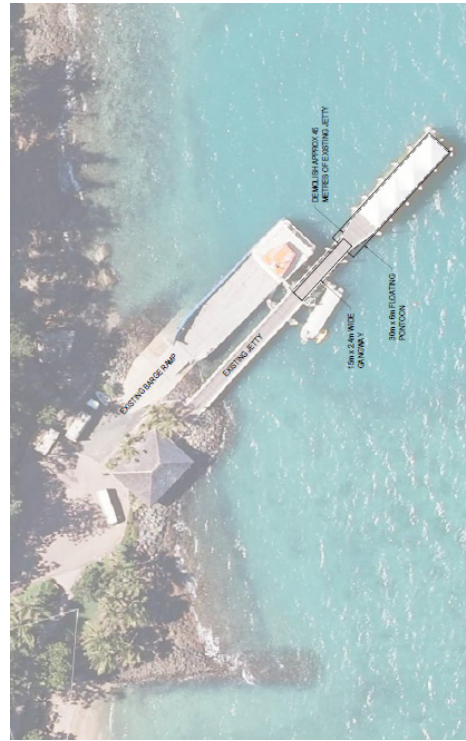


Figure 4-21. Proposed Marine Access.



4.4.9 Golf Course Upgrade

The existing nine hole golf course is proposed to be upgraded and repositioned to provide seven holes (refer to **Figure 4-22**). The golf course is to be located outside the catchment of the water supply dams and integrated with the existing native vegetation (refer to **Figure 4-23**). Grass species selected for the golf course will feature drought tolerance and low-fertilizer characteristics. The existing smaller dam is proposed to be filled in and used for a driving range as it will no longer be required for the disposal of treated effluent. The upgrades to the existing golf course will enable it to continue to operate as an essential component of the resorts infrastructure and total water cycle management regime.

Figure 4-22. Existing aerial photograph of golf course.



Figure 4-23. Proposed Masterplan – Golf Course Upgrades.



4.4.10 Ecotourism facilities - Glamping

As part of the current project a small scale ecotourism facility providing approximately thirty “glamping” structures is proposed to the north-west of the existing resort in accordance with the *Draft Queensland Ecotourism Plan 2015 – 2020* and the *Nature Conservation Act 1992* (refer to **Figure 4-24** and **Figure 4-25**). The proposed site is located within the current National Park lot (Lot 429 NPW622) with a total site area of approximately 990m². An associated central facilities building with an area of 136m² is also proposed. All structures would be designed to be temporary/light weight with water, sewage treatment and power to be provided from the existing resort. Day to day servicing and administration would be undertaken from the eco-resort. The *Nature Conservation Act 1992* (NC Act) applies to the State’s National Parks, Conservation Parks, Nature Refuges and Coordinated Conservation Areas. The NC Act provides opportunities for ecotourism facilities that are consistent with the area’s natural and cultural resources and values.

The operation of an ecotourism facility on a National Park will usually involve activities in the park conducted outside the facility such as interpretive walks. These activities will require a separate commercial activity permit or agreement to be granted. Under the provisions of the NC Act, before an approved ecotourism facility can be authorised through the granting of a lease or other authority, the use must be prescribed by regulation as a permitted use for the land.

Further information on the proposed glamping facilities is included in **Chapter 6 – Tenure**.

Figure 4-24. Existing aerial photograph of glamping facility.

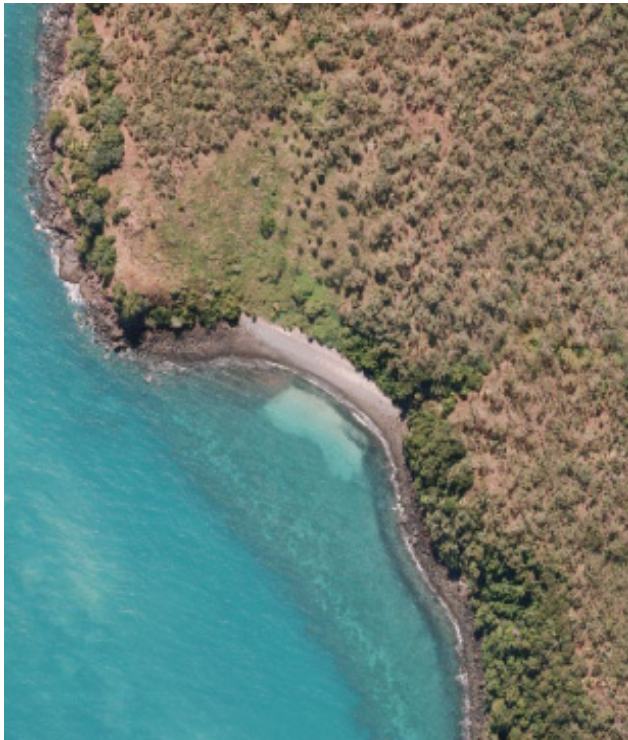
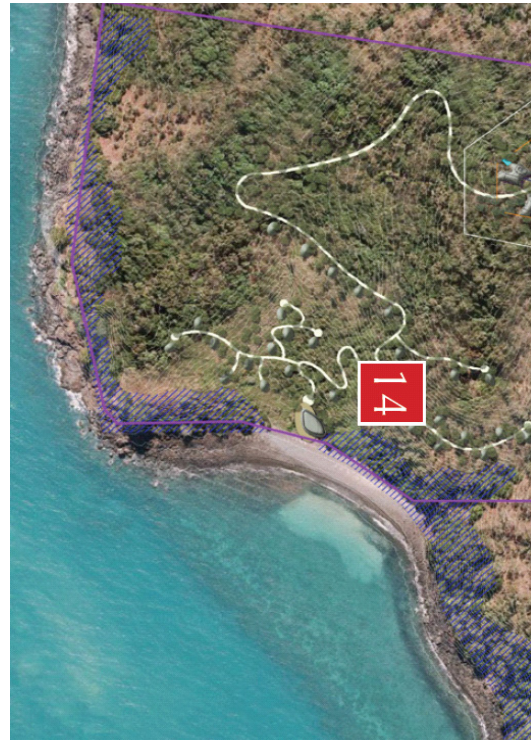


Figure 4-25. Proposed Masterplan – Glamping Facilities.



4.4.11 National Park and Great Barrier Reef Education Centre

A National Park and Great Barrier Reef Education Centre is proposed to be located next to the existing jetty buildings. The centre would include informative displays about the Great Barrier Reef, dive and snorkel sites around the island and the marine ecology and National Park features guests may experience. It would also include opportunities for the guests to be involved in a range of conservation programs and activities on the island, such as shoreline clean-ups.

4.4.12 Lagoon

A new lagoon pool is proposed next to the foreshore of Home Beach edged by a private internal facing beach, protected from the prevailing winds. The lagoon is proposed as a primarily salt water swimming facility that offers an all-year round, safe swimming without stingers. No artificial reefs within this lagoon are proposed.

The lagoon would be primarily a salt water, wet edge, free form, cement rendered swimming pool that has an artificial beach which extends into the water by about 2 - 3 meters. Part of the lagoon will be designed as a separate fresh water pool. The lagoon would have an approximate area of 3,000m² and an average depth of 900mm, as such its volume will be around 2.7 Megalitres (ML). Water would be pumped from the ocean in accordance with any required permits and transferred into an on-site filtration system. When in operation, water would be diverted through the sand filters, undergoing a natural chlorination process and chemical sanitation prior to filling the lagoon. To limit ongoing maintenance all fixtures and fittings will be an appropriate grade of stainless steel or aluminium.

An intake pipe from the ocean is proposed (subject to GBRMPA permit) to fill and top up the lagoon levels. Any water to be discharged from the lagoon as part of the cleaning and maintenance process would be pumped to a small desalination plant to be installed near the lagoon to remove the salt concentration of the water (refer to **Map 4-2**). This water would then be treated in the waste water plant prior to discharge on the site (refer to **Chapter 24 – Infrastructure**). The salty brine residue from the desalination plant will be removed from the island by barge. No outfall pipes to the ocean from the lagoon are proposed.



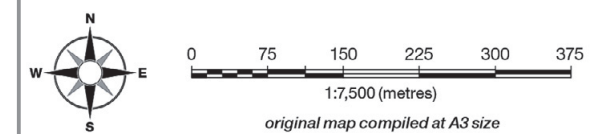
LEGEND

Lagoon Water Supply and Treatment

- Proposed Desalination Plant
- Proposed Sewage Treatment
- Proposed Intake Point for Lagoon Water
- Proposed Pipeline of Water from Lagoon

Other

- Proposed Site Boundary
- Proposed Sea Bed Lease Boundary



DRAWING TITLE Map 4-1: Lagoon Water Supply and Treatment

DRAWING DATE 20 December 2016

DRAWING VERSION 2.0

COORDINATE SYSTEM GDA 94; MGA Zone 55

MAP PRODUCED BY Cardno QLD Pty Ltd

JOB NUMBER HRP15078

DATA SOURCE

Basemap: DBI Masterplan; Date: 04/05/2016.

Lindeman Great Barrier Reef Resort & Spa
ENVIRONMENTAL IMPACT STATEMENT

Conceptual Diagram of Lagoon Water Supply and Treatment

MAP **4-2**

4.5 Infrastructure Requirements

4.5.1 Stormwater Management

It is proposed to incorporate appropriate water sensitive urban design techniques within the development to minimise the impact of stormwater runoff on the receiving waters, in accordance with best management practices. Grassed swales, vegetated buffer strips, bioretention basins and gross pollutant traps may therefore be adopted at various locations within the development. Regular monitoring and maintenance of the stormwater quality treatment devices will ensure that they operate at a high level of efficiency in treating the stormwater runoff from the development. Refer to **Chapter 17 – Water Quality** for further information.

4.5.2 Water Supply

The raw water supply source for the island is Gap Creek Dam located to the north of the existing development. A new water treatment plant will be constructed to produce potable water in accordance with the Australian Drinking Water Guidelines (NHMRC & NRMCC, 2004) suitable for use within the development. The treatment plant would be located north of the existing plant and will be upgraded to consist of modular treatment units consisting of membrane microfiltration. These units are preferred as they are fully automated, require minimal operation and do not require any polymer or coagulant, reducing the possibility of spills and associated environmental impacts. If required, further disinfection will be provided by ultra violet irradiation and chlorination. Recycled water produced at the new wastewater treatment plant would be used for a range of non-potable uses within the development, including toilet flushing, wash-down and irrigation of the island's golf course and landscaped areas. Separated reticulation networks consisting of pipelines, pump stations and storage tanks will be constructed to deliver potable and recycled water to the required areas within the resort.

Refer to **Chapter 18 – Water Resources** for further information.

4.5.3 Wastewater Treatment

A new wastewater treatment plant is proposed to be constructed to produce recycled water suitable for use within the resort. The wastewater treatment plant will consist of a membrane bioreactor treatment process with disinfection to produce Class A+ recycled water with very low nitrogen and phosphorus levels. The treatment plant will consist of screening, activated sludge reactor with compartments for treatment in the presence and absence of oxygen, microfiltration and ultra/nanofiltration membranes, ultra violet disinfection and chlorination. The biosolids will be dewatered on site and transported to the mainland for disposal at a registered facility. The treatment plant will be constructed in a single stage of a daily treatment capacity of 1ML. This capacity provides treatment for three times the average dry weather flow based on 100% occupancy at an equivalent population of 1,478 Equivalent Persons (EP). A wastewater generation rate of 230 L/EP/day has been used to size the treatment plant and is greater than the average dry weather flow used for calculating peak design capacity for ERA 63 – Sewage treatment under Schedule 2, part 13, item 63 of the EP Regulation, which is 200 L/EP/day. This ensures a conservative estimate of infrastructure requirements.

Additional storage will be constructed offline to provide four hours storage of three times the average dry weather flow (estimated at 170 kilolitres, based on 100% occupancy). This provides contingency storage in the event of excess flows which may occur during extreme wet weather conditions. Flows diverted to this storage will be fed back through the plant for treatment following return to normal conditions. Due to the negligible increase in flows expected to intercept the new sewerage system through inflow and infiltration, the diversion pond is provided as a contingency only and is considered to be required in only rare extreme weather events.

Refer to **Chapter 22 – Waste Management** for further information.

4.5.4 Energy Supply

All power to the existing resort was historically supplied entirely by diesel generators located at the service industry precinct based on a historical peak load demand of between 1.0 to 1.2 Mega Watts (MW). The estimated total load demand for the new development is 4.1MW, which is about 4 times the load demand of the former resort. In line with White Horse Australia's vision to develop a truly sustainable and world-class eco-resort, the option to install a solar-diesel hybrid system to provide energy for the proposed resort was investigated. The system comprises a "mini-grid" system of solar generation (roof and ground mounted), large scale battery storage and diesel backup to provide an environmentally friendly, reliable and cost effective energy supply to the island. A number of suitable areas have been identified for the mounting of solar panels across various roof-tops, with the target buildings being the Village Precinct, Staff Accommodation, Service Infrastructure Precinct and the Aircraft Hangers. The overall preference is for a bulk and centralised installation of roof-mounted solar panels on large and predominantly flat (or slightly angled) and contiguous roof-surfaces aligned with the ideal NW-N-NE facing orientation.

In addition to the centralised roof-mounted solar panels, the concept design requires the installation of ground-mounted solar panels to provide the necessary and additional solar generation capacity to displace the amount of diesel usage. The recommended land areas for the installation of ground mounted solar arrays is well hidden from the general view of the guest living and accommodation areas and are reasonably flat and includes the areas at the end of the runway strip (northern section) and around the service industry precinct. With careful planning during the detailed design stages, it is possible to maximise the solar generation from the limited land areas surrounding the airport run-way, through compact array designs and low profile layouts which comply with the Civil Aviation requirements as well as manage any glare-risks from the solar panels. The existing service industry precinct is ideally suited to house the central energy storage system, power management and "mini-grid" control systems.

Refer to **Appendix M – Solar Diesel Hybrid Feasibility Study** for further information.

4.5.5 Internal Transportation Network

It is anticipated that the majority of deliveries, visitor and staff movements will originate on the mainland with connection to the island gained via barge or ferry from Shute Harbour. Transportation between the resort facilities will be undertaken on foot, by golf buggies and service vehicles. The pathways are designed for service vehicles and electric golf buggies 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 buggies to be transported directly to their rooms.

Each of the main central facility buildings include buggy parking and recharge areas. Refer to **Chapter 25 – Transport** for further information.

4.5.6 Telecommunications

Telstra has an existing telecommunication tower number 4741009 located on Lot 2 HR1351 which provides 3G services (850MHz). Optus is also investigating options to establish a mobile phone tower on the island in a location where visual impacts can be appropriately mitigated. These towers will provide the telecommunication facilities necessary to support the operation of the resort.

Figure 4-26. Location of existing telecommunication tower.



Source: OzTowers, 2017 (<https://oztowers.com.au/Home/FullSiteInfo?siteId=13576>).

4.6 Design Concept

The main design objectives of the project 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, lake or island views (refer to **Appendix C – Masterplan Concept (DBI Design Pty Ltd)**).

4.6.1 Site Responsive Design

The terrestrial component of the proposed development has also been planned and designed in response to biophysical conditions (slope, stormwater run-off, rocky outcrops and significant vegetation), as well as existing areas of disturbance and visibility from the GBRWHA. Detailed site investigations/ground truthing was also undertaken to ensure the appropriate siting of each building and structure on the island. Project planning and design were also influenced by the island's isolation with respect to electricity generation, water supply and other infrastructure servicing.

Habitat, visual sensitivity and other natural values have constrained the location and extent of the proposed development footprint and its low-rise built form. This constraints-based approach to project planning has reduced potential visual and other environmental impacts, and a risk management approach has also been adopted. The latter has identified environmental management measures, which together with initiatives in sustainable design and operation, are appropriate for the World Heritage values of the island and surrounding waters.

The layout and design of the jetty has been based on surveys of the marine habitats in a study area off the south-western part of Lindeman Island, including the excavated navigation channel. Several options for orientation, size and layout were modelled and tested against the constraints of environmental impacts, and discussed with relevant agencies, before selecting the design now proposed.

4.6.2 Building Heights

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 complement, integrate and appear part of the natural topography. The main objective of the DBI masterplan is to ensure that building and landscape design protect areas of conservation significance and complement the 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 locations. Existing resort building footings, roads and infrastructure will be re-developed and incorporated to the maximum extent possible, consistent with these objectives.

The masterplan 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. The proposed building heights are summarised in **Table 4-2**.

Table 4-2. Proposed Building Heights.

Precinct	Type	Proposed number of storeys
Jetty/Marine Access	Retail/Beach Club	1
	National Park and Great Barrier Reef Education Centre	1
5 Star Beach Resort	Pool Bar	1
	Central Facilities	3
	Hilltop Suites	3
	Pool Suites	3
Village + Maintenance	Airport Lounge	1
	Conference Centre	2
	Retail	1
	Sport Centre	1
	Staff Accommodation	3
	Maintenance	1
Future Tourist Villas	Villas - West Precinct	2
	Villas - East Precinct	2
Spa Resort	Central Facilities	2
	Type 'A' Courtyard/Villa	1
	Type 'B' Hilltop Villa	1
	Type 'C' Cliffside Villa	1
	Type 'C2' Cliffside Villa	2
	Type 'D' Exclusive Villa	1
5 Star Eco Resort	Eco Butterfly Villa	1
	Eco Butterfly Villa	2
	Eco Treetop Villa	2
	Central Facilities	1.5
	Glamping Facilities	1
	Glamping Tent	1
Airport	Hangars	1
Lakeside Restaurant		1
Day Spa	Reception & Amenities	1
	Treatment Rooms (x14)	1
	Chapel	1
	Rock Bar - 6 Star	1

4.6.3 Landscaping and Site Rehabilitation Works

Degraded areas surrounding the existing resort facilities will be rehabilitated to provide suitable landscape outcomes that promote the key ecological and visual qualities of the island. Landscaping to the resort precinct provides an opportunity to rehabilitate the existing cleared areas with native trees and grasslands and provide positive environmental and visual outcomes (refer to **Chapter 10 – Flora and Fauna**). 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 connected to provide a more resilient natural system with substantial environmental benefits.

White Horse Australia 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 Whitsundays 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 envisaged that the proposed built forms will be sensitively integrated.

DBI has 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.

Refer to **Appendix C – Masterplan Concept (DBI Design Pty Ltd)**.

4.7 Masterplan Refinement

The proponent has refined the initial Masterplan designs as presented in the Initial Advice Statement and EPBC Act Referral Form on the basis of the biodiversity (terrestrial and marine), hazard (bushfire and coastal processes), energy (solar panels) and stormwater investigations undertaken as part of the EIS. The design refinement process has been driven by an objective to avoid or minimise potential impacts where possible through the location or design of project elements. The following **Table 4-3** summarises the key differences between the initial masterplan included in the Initial Advice Statement and the current masterplan for which approval is now being sought.

Table 4-3. Key masterplan changes since Initial Advice Statement.

Precinct	Initial Masterplan included in Initial Advice Statement (May 2015)	Masterplan (May 2017)	Reason for change
Jetty	Area: 7.57 hectares Location: long axis aligned to north –south	Area: 4.67 hectares and a further 0.407 hectares for land based infrastructure. Location: long axis aligned to east-west parallel to foreshore. The safe harbour is no longer proposed. Accordingly, remaining references to, and images of, a safe harbour on various figures and maps in the EIS are no longer current	As a result of the commencement of the Great Barrier Reef Marine Park Authority's (GBRMPA) Dredging Coral Reef Habitat Policy (2016), further impacts on Great Barrier Reef coral reef habitats from bleaching, and the recent impacts from Tropical Cyclone Debbie, the proponent has been made aware that the prospects of gaining approval for the proposed safe harbour are remote. Therefore, the proponent no longer seeks to obtain approval to construct a safe harbour at Lindeman Island. Instead the proponent seeks approval for upgrades to the existing jetty and additional moorings in sheltered locations around the island to enable the resort's marine craft to obtain safe shelter under a range of wind and wave conditions. Accordingly, remaining references to, and images of, a safe harbour on various figures and maps in the EIS are no longer current.
5 Star Beach Resort	Signature Building designed to have a rectangular shape.	Reduction in bulk of Signature Building with more articulated building form.	Reduce visual impact of building when viewed from the foreshore.
	Pool pavilion building	Pool pavilion building removed from southern part of lagoon foreshore.	Pavilion integrated with central facility building and to mitigate visual impact from foreshore.
Maintenance	Black water treatment dam	Replacement of black water treatment dam with golf course driving range.	The black water treatment dam is no longer required due to the sewage treatment plant water quality standard.
	No solar panels indicated on Masterplan layout.	Solar panels indicated in service industry precinct and at northern end of runway.	Electrical engineering report proposes a 75% solar to 25% diesel split as being the most efficient way to provide power to the resort.

Precinct	Initial Masterplan included in Initial Advice Statement (May 2015)	Masterplan (May 2017)	Reason for change
	Location of water and sewage treatment plant.	Increase in area provided for water and sewage treatment plant.	Information provided on the detailed design of the water and sewage treatment plant.
Tourist Villa Precinct	Villa numbers: 95 Some villas in western precinct located included on land within existing National Park proposed to be revoked.	Villa numbers: 89 All villas located outside of existing National Park Boundary.	The villa location and number were refined following detailed ground-truthing, assessment of site constraints and discussions with State Government.
Spa Resort	Villa numbers: 55 Location of Day Spa and Villas potentially impacting on Coastal Littoral Rainforest Community.	Villa numbers: 59 Location of Day Spa and Villas outside of Coastal Littoral Rainforest Community.	The Day Spa and some villas were relocated following ground-truthing to avoid impact on the Coastal Littoral Vine Thicket Community and steep topography. The change to the configuration also enabled an increase in the number of villas.
Eco Resort	Villa numbers: 49 Some villas located included on land within existing National Park proposed to be revoked.	Villa numbers: 41 All villas located outside of existing National Park Boundary.	The villa location and number were refined following detailed ground-truthing, assessment of site constraints and discussions with State Government.
Glamping facility	Glamping facility not included in initial masterplan.	Inclusion of 30 glamping facilities on National Park land and a central facility building located outside of State grassland community.	Alignment with the State's Ecotourism Plan.
Airstrip	A 1,200 metre long runway was proposed.	A 966 metre long runway is now proposed, with a taxiway and helipad near main arrival building.	Runway is now designed for Code 1B aircraft and reorientated to west to minimise impact on listed Broad Leaf Tea Tree Community.
	Hangars located to north of the existing cross-runway.	No hangars proposed to north of the existing-cross runway.	Hangars removed to avoid impact on listed vegetation community and need to revoke land from National Park.
Golf Course	A four hole golf course was proposed.	An expanded golf course is proposed with seven holes, including a new area for the driving range and changes to the previous alignment.	Black Water Dam no longer required due to design of sewage treatment plant and a driving range is now proposed on that location. Redesign of Eco Resort and Western Tourist Villas has resulted in a re-alignment of the golf course.
Dam	Dam located within current location.	Increase to shape and configuration of existing dam to increase inflows from adjacent catchment area.	Water supply analysis indicated that without additional inflows that the dam could potentially run dry.

4.8 Expected capital expenditure

The construction and operation of the proposed resort will have significant impact on Regional GDP with a final development cost of approximately \$583 million and the creation of approximately 300 full time jobs during construction and a similar number once operational. Refer to **Chapter 15 – Economic** for further information.

4.9 Regional and local context of the project's footprint and impact area

Located centrally within Queensland, the Mackay Region's economy is primarily based upon coal, tourism and agriculture, with sugar cane being the main agricultural product of the region. Coal is Queensland's largest export and the western part of the region contains the northern part of the Bowen Basin, Australia's largest coal resource (and comprising a high proportion of the higher priced coking or metallurgical coal). The Bowen Basin recorded a boom in activity during the 2008 to 2012 period, followed by three years of contraction, in line with falling coal prices. This contraction has led to the closure of some mines, the scaling back of operations at other mines and delays to the commencement of new mines that were ready to proceed in the post-2012 period. In turn, this has led to lower population growth, higher unemployment rates and excess housing capacity in the region.

Overall, the coal industry has undergone several rapid expansion and contractions over the past few decades in response to global demand levels and prices. Ultimately, the future of the coal mining industry will guide the pace of growth in the region. In the short to medium term, the state of the coal industry will most likely be subject to further volatility. Due to climate change, in the long term, the future of the coal industry will be dependent upon the ability of the industry to develop carbon capture and storage techniques to sequester the carbon released from the burning of coal into the ground. Tourism is an especially important economic sector for the Whitsunday area, which boasts a number of popular island resorts and associated infrastructure at Airlie Beach and Shute Harbour. The tourism product elsewhere in the region is more focused upon business travellers and the self-drive tourist market. This sector has suffered from the adverse impacts of the GFC, the high Australian dollar and impacts from floods and cyclones.

The region has traditionally been a strong sugar producer and exporter, generating 30% of Australia's sugar production. With falling world sugar prices, rationalisation within the industry and increased competition from other crops, the local sugar industry has experienced difficult trading conditions over the past 15 years. Over this period, its economic strength to the Region has declined in proportion to the contributions from coal and tourism. It should be noted that the Australian dollar has depreciated significantly in the past year or so and is expected to depreciate further. This is good news for the prospects of these three main export-oriented industries of the Region.

The Mackay Region accommodated almost 4% (182,000 persons) of the state's population as at June 2014. It achieved a higher growth rate than the state in the 2001 to 2014 period (2.3% per annum compared with 2.0%). However, the effect of the current poor state of the coal sector in the Region is illustrated by a much more subdued population growth in the Region of only 1.1% from 2013 to 2014. Refer to **Chapter 15 – Economic** for further information.

4.10 Relationship to other major projects and/or developments

There are no other proposed major projects within the region of a size or nature comparable with that proposed on Lindeman Island. The following provides an overview of the relationship to other significant island tourism developments in the region:

- Hamilton Island is the largest inhabited island of the Whitsunday Islands and the only island in the Great Barrier Reef with its own commercial airport. Commercial airlines Qantas, Virgin and Jetstar all operate flights to/from Hamilton Island Airport. While the island offers six different types of accommodation, qualia targets the luxury end of the market. Situated on the secluded northern-most tip of the island, qualia offers 60 private one-bedroom 'pavilions' and a beach house, each with ocean views; and
- Hayman Island is the most northerly of the Whitsunday Islands, part of the Cumberland Island Group. Perhaps one of the most internationally renowned luxury island resort destinations in Australia, Hayman Island's Resort has received several renovations since its initial opening in 1950. Extensive renovations were made in 2011 during which the island's vegetation was also restored following the significant impact of Tropical Cyclones Anthony and Yasi. This included the development of a new botanical garden. One&Only took over management of the resort in 2013 and relaunched the resort as 'One&Only Hayman Island' in July 2014. The One&Only resort is much more family friendly than the other identified luxury destinations, offering a kids club and babysitting service. Transfers are available from Hamilton Island Airport or Whitsunday Coast Airport by launch or by helicopter or seaplane.

Refer to **Chapter 14 - Social** and **Chapter 15 – Economic** for further information regarding other major projects.

4.11 Workforce and Employment

4.11.1 Construction

During the three year construction period, employment on the island is expected to average 300 full time equivalent (FTE) persons. The construction stage is expected to generate total employment of 1,750 (FTE) person years in the Mackay Region (averaging 490 FTE jobs over the three and a half year construction period). In Queensland, total employment generated is expected to total 2,660 FTE person years (averaging 740 FTE jobs over the three and a half year construction period). Employment numbers have been expressed in FTE terms which is a widely-used comparative measure of employment where an FTE of 1.0 is equivalent to a full-time worker. It allows comparison across different industry sectors, where differing proportions of full-time, part-time and casual workers may exist.

The expected annual employment generation represents 0.4% of the projected 2018 labour market for the Mackay Region and 5.1% of the current number of unemployed persons in these areas. Accordingly, unlike the situation experienced during the recent mining boom, the proposed construction project is not likely to place an undue strain on the Mackay Region's labour market. No significant impact upon wage levels in the Mackay Region is expected to result due to the significant spare capacity that exists within the region's labour market.

The proposed construction project is not expected to have an adverse impact upon the local or regional housing market. With all of the temporary construction workers proposed to be housed on the island, demand for mainland accommodation is expected to be derived from a small proportion of workers likely to relocate their families to the region and from indirect employment resulting from the project. The local and regional housing markets are in a weakened state and have sufficient capacity to absorb any resulting demand for housing in the local area.

4.11.2 Operation

During operations, employment on the island is expected to average 300 FTE persons. The operational stage is expected to generate total employment of 800 (FTE) persons in the Mackay Region in gross terms and 560 FTE persons in net terms. In Queensland, total employment generated is expected to total 1,050 FTE persons in gross terms and 680 FTE persons in net terms.

The expected operational employment generation represents 0.5% of the projected 2023 labour market for the Mackay Region in gross terms and 0.4% in net terms. It also represents 8.3% of the current number of unemployed persons in these areas in gross terms and 5.8% in net terms. Accordingly, unlike the situation experienced during the recent mining boom, operation of the proposed resort is not likely to place an undue strain on the Mackay Region's labour market and no significant impact upon wage levels in the Mackay Region is expected due to the significant spare capacity in the region's labour market. Traditionally, the Whitsundays tourist facilities have been largely staffed by the itinerant backpacker market that visits the state's tourism hotspots during peak tourist periods. During the recent GFC-induced downturn in tourism, lower levels of backpackers have been attracted to the Whitsundays (and other tourist destinations) due to the lower levels of work opportunities. Accordingly, the proposed Resort is likely to stimulate this backpacker segment of the tourism market.

Operation of the proposed resort is not expected to have an adverse impact upon the local or regional housing market. With all of the operational staff planned to be housed on the island, demand for mainland accommodation is expected to be derived from a small proportion of workers who may relocate their families to the Region and from indirect employment resulting from the project. As explained above, the local and regional housing markets are in a weakened state and have sufficient capacity to absorb any resulting demand for housing in the local area.

4.11.3 Workforce Accommodation and Transport

The on-site construction workforce is expected to be accommodated on the island in the Staff Accommodation Buildings proposed to be constructed in the Village Precinct. The workforce will be managed by using the local and regional workforce, with a proportion to be FIFO. The local construction workforce is proposed to be transported to and from the island between work period breaks by ferry from Shute Harbour and are expected to be drawn from Airlie Beach, Jubilee Pocket, Cannonvale and Proserpine. Local workers would commute from their hometown to Shute Harbour for fast ferry across to the island. The locals would have a shortened time on the island, being 5 days on and 2 days off (weekends). Regional workers or Fly-in Fly out (FIFO) workers would fly into Proserpine or Hamilton Island airport from a range of centres. It is anticipated some companies may elect to arrange their own chartered flights, or come to a commercial agreement. From Proserpine airport there would be buses to Shute Harbour, where they would then fast ferry across to the island. The percentage of these workers would likely be 30% of total workers. A FIFO roster system similar to the resource sector would work best for these types of workers (3 weeks on, 1 week off) ensuring that the changeover occur so that work is continuous. It is envisaged that a management system is utilised to manage the FIFO rosters, such as SKILLED.

It would be anticipated that local companies may charter a bus depending on the number of workers, to help avoid parking problems at Shute Harbour. Locals that reside closer to Shute Harbour (Cannonvale, Proserpine, Airlie, Jubilee Pocket) may either drive themselves or be dropped off at Shute Harbour, with this estimated to be 70% of total workers.

4.12 Project Construction Stage

4.12.1 Proposed construction staging and schedule of works

The construction period would involve a period of approximately three years commencing mid-2018. The Beach Resort is due for completion mid-2020, Spa Resort early 2021, Eco Resort in mid-2021, and the remaining facilities progressively completed through 2021. The resorts will be opened at the same time in mid to late 2021. Due to the size and magnitude of the overall project, the proponent's construction work strategy is to break the project into five stages (refer to **Table 4.4** and **Map 4-3**):

- Stage 1 – Civil Works, Construction Camp, Demolition and Infrastructure;
- Stage 2 – Jetty upgrades, Beach Resort, Beach Resort Central Facilities, Arrival and Departure Facilities, Airstrip Runway and Facilities, Village, Sports Centre, Education Centre and Facilities, Staff Accommodation, Golf Course and Fixtures, Fittings and Equipment
- Stage 3 – Spa Resort and facilities including Rock Bar and Day Spa, Facilities and Fixtures, Fittings and Equipment;
- Stage 4 – Eco Resort and Facilities including Restaurant, Boat House and Health and Recreation Centre; and
- Stage 5 – Villa Construction and Ecotourism Facilities.

The following schedule is proposed:

- The “finishes crew” would work on Stage 1 while the “structure crew” works on Stage 2. Once the finishes are completed in Stage 1 this crew would move onto Stage 2 to complete these works;
- Separate crews would work on the jetty and 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 Beach 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; and
- The resorts would open at same time in mid to late 2021.



LEGEND
 Proposed Site Boundary

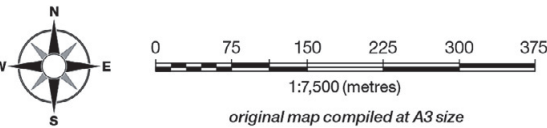
Construction Staging

- Stage 1**
Construction Camp
Civil Works
Demolition
- Stage 2**
Safe Harbour
Arrival and Departure Lounge -
Airstrip and Facilities
Island Village
Sports Centre and Facilities
Staff Accommodation
Golf Course
Five Star Beach Resort
Central Facilities Five Star Beach Resort
Fixtures, Fittings and Equipment

- Stage 3**
Six Star Spa Resort
Facilities including Rock Bar and Day Spa
Fixtures, Fittings and Equipment

- Stage 4**
Eco Resort
Facilities including Restaurant, Boat House and Health/Rec Centre
Fixtures, Fittings and Equipment

- Stage 5**
Villa Construction
Ecotourism Facilities (Glamping)
Fixtures, Fittings and Equipment



DRAWING TITLE	Map 4-2: Construction Staging and Quarry Location
DRAWING DATE	20 December 2016
DRAWING VERSION	2.0
COORDINATE SYSTEM	Unprojected Geographics
MAP PRODUCED BY	Cardno QLD Pty Ltd
JOB NUMBER	HRP15078
DATA SOURCE	Basemap: DBI Masterplan; Date: 04/05/2016.

Lindeman Great Barrier Reef Resort & Spa
ENVIRONMENTAL IMPACT STATEMENT

Construction Staging and Quarry Location

4.12.2 Pre-construction activities

Following approvals being obtained, detailed civil drawings will be completed for bulk earthworks, demolition and pathways. At this time the water treatment plant and wastewater treatment will be ordered and shipped to the island in modules with the intent to have this infrastructure in place prior to the bulk of the building works commencing, which is when site construction workforce will peak. Prior to any work commencing on the island the Principal Contractor will brief all employees on the requirements of the Construction and Environmental Management Plan. Initial site works will include:

- Implement recommendations associated with the installation of erosion and sediment control measures (e.g. sediment basins, silt traps, sediment fences and other measures to minimise erosion and sediment run-off);
- Identification and screening of protected vegetation;
- Construction of a secured set down area near the existing jetty to allow the Contractor to unload the barge in the shortest possible timeframes;
- Electricity supply by standby diesel generators will be organised and investigate initial solar power options;
- The establishment of construction facilities compound near the location of the proposed Village Precinct, construction offices, staff accommodation, concrete batching plant and material stock piles etc.;
- Construct waste water treatment plant and water treatment plant, before these plants come on-line bottled water will be shipped to the island and temporary toilets will be provided on-site;
- Demolition of the existing Beach Resort and associated central facilities building; and
- Testing quarry reserves to determine resource capability.

4.12.3 Proposed demolition and construction methods

Demolition will occur to the existing resort hotel, villas and units to make room for the proposed development. During the demolition stage, the Contractor will salvage and reuse building materials such as crushing concrete, bricks and pavers, for reuse as road base, drainage and scour protection; and salvaging suitable timber and steel for building framework. In summary, estimates of key waste streams generated by proposed demolition works within the resort area are:

- Concrete, bricks, tile and rubble – 2,580m³;
- Timber – 40m³;
- Plasterboard – 200m³;
- Glass – 37m³; and
- Scrap metal - 30m³.

The method of construction of the proposed resort 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 also be explored to speed up the construction process. The extent of excavation on the proposed upgraded airstrip and proposed enlargement to the existing dam, will mean that some rock may be encountered. Where hard rock eventuates, this will be assessed by a qualified geotechnical consultant and Contractor. Appropriate measures, including

blasting, will be considered. If blasting is proposed, it will be subject to appropriate controls as required by relevant authorities and conducted in accordance with relevant Australian Standards.

4.12.4 Concept Designs - Water, Telecommunications, Power and Transmission Infrastructure

The location, concept designs and capacity of infrastructure are described in the following sections of the EIS:

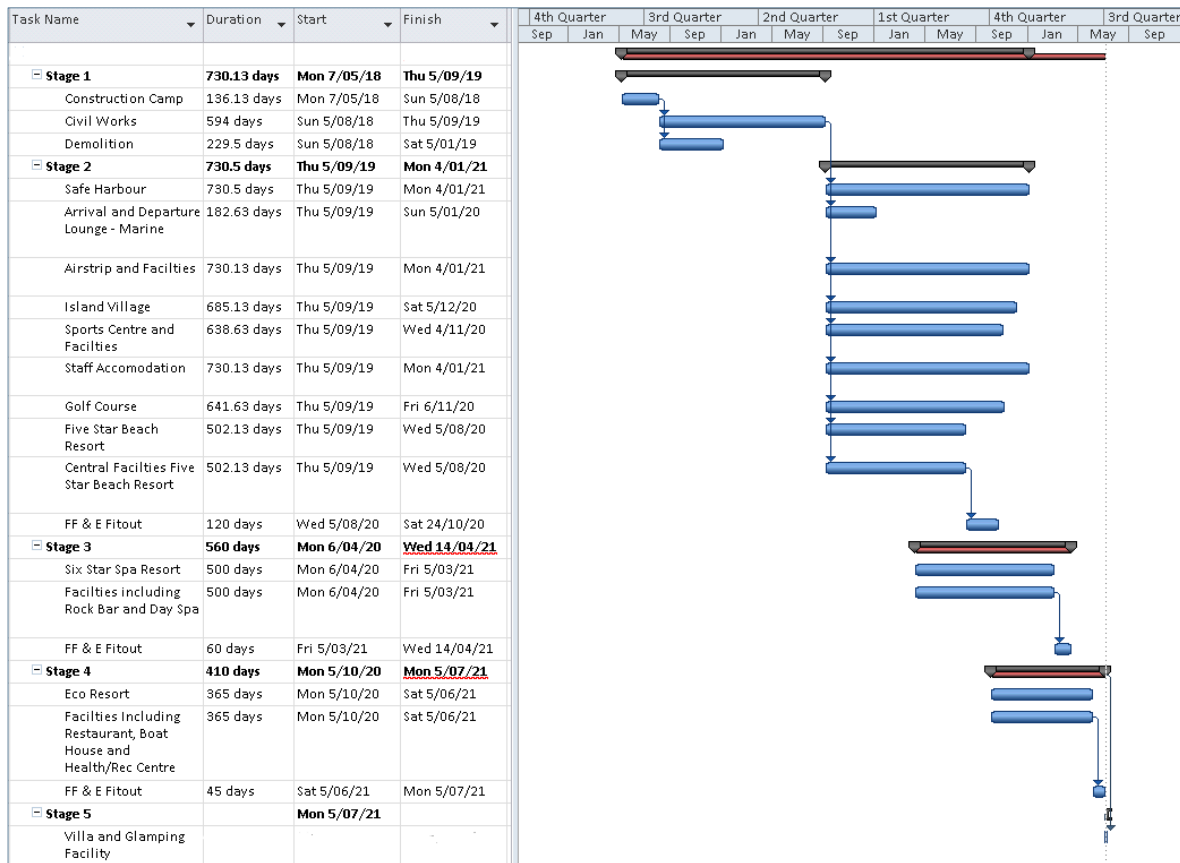
- Water supply - refer to **Chapter 18**;
- Power generation and transmission infrastructure – no connections to the mainland are proposed - refer to **section 4.5.4**; and
- Telecommunications - it is proposed that the existing telecommunication tower which is situated on the site be used for mobile phones and internet access.

4.12.5 Construction – Hours of Operation

Staggered rosters are proposed to ensure construction occurs on the island 7 days a week. The standard arrangement is for workers to be in teams and a supervisor leading hand for that sub-contract to be on cross over roster to do a handover to ensure there is no down time on the works. It is assumed that construction works for the resorts, airstrip and jetty will occur between 6.30am and 6.30pm, seven days per week as the resort will not be operational at this time, and the villa construction will occur during standard (daytime) hours. The delivery of construction materials will be limited to daytime hours.

4.12.6 Sequencing and staging of activities

Due to the size and magnitude of the overall project, the proponent's strategy is to undertake construction work in five stages (refer **Table 4-4**). Eastview Australia Pty Ltd will undertake the Project Manager role to ensure the successful delivery of the project.

Table 4-4. Proposed Schedule (noting a safe harbour is no longer proposed).

4.12.7 Capacity of high-impact plant and equipment

High impact plant and equipment will be managed to ensure that it does not cause environmental nuisance. Hazardous materials will be limited as much as possible. All necessary product information and data would be stored on site for easy reference. It will be the responsibility of the design team and Contractors to ensure alternative, low hazard materials are used wherever possible. All potentially hazardous wastes (e.g. waste oils, batteries, fuels and chemical etc.) will be stored in separate containers located within a bunded and roofed hardstand area in accordance with AS 1940-2004 *The storage and handling of flammable and combustible liquids*. Appropriate spill response procedures will be established and implemented, and appropriate clean up equipment/ materials will be provided where any waste storage activities are undertaken to prevent the contamination of stormwater and the environment. For instance, any spillage/ leaks of chemicals or fuels to be contained within bunded areas and stored in sealed containers for disposal at licensed facilities on the mainland. Waste oil and the like will be transported for recycling on the mainland.

Regular inspections will be undertaken for stormwater drainage systems in areas used for the storage or handling of wastes and other hazardous materials to ensure all drains are free of litter and operating at optimum efficiency. The exact type and numbers of equipment to be brought to the island cannot be confirmed until a contractor is appointed by the proponent, however, it is anticipated that the following construction equipment will be required to be barged from Shute Harbour to the island:

- Concrete trucks, prime mover, loaders, tip trucks, rollers, bulldozers, graders, compactors, excavators, backhoes, bob cats;

- Equipment associated with the jetty upgrade;
- Bitumen spraying and laying equipment;
- Mobile cranes; and
- Concrete batching plant.

High impact plant and equipment will be managed to ensure that it does not cause environmental nuisance or harm with respect to noise, air and vibration.

4.12.8 Site Works

4.12.8.1 Civil Engineering

The proposal to redevelop the existing resort at Lindeman Island into a world class integrated resort will require civil works to form the site and necessitate the construction of infrastructure to provide services for the development. The site will ultimately comprise the following key components of infrastructure: water and sewerage treatment plants and associated mains, stormwater drainage and treatment areas, flood storage ponds, airport, jetty upgrade, roads and bridges, electrical and power supply and distribution network. All civil works will be designed and constructed using environmental sustainable principles, materials and processes to minimise the impact on the sensitive surrounding environment.

4.12.8.2 Earthworks

An Initial Geotechnical Investigation has been completed and is included in **Appendix F – Geotechnical Assessment**. The key findings of the investigation were:

- The slopes on the island in the areas of proposed new and redevelopment appears to be suitable for the proposed structures and infrastructure;
- Development on the slopes greater than 15 degrees will need to be done in a manner of best practice;
- The soils are generally thin and less than 1.0m deep before strong volcanic rock is encountered; and
- The natural soils, from the laboratory testing and inspection; have not proved to be particularly dispersive.

4.12.8.3 Vegetation clearing footprint

The vegetation clearing footprint for the development would be limited to the smallest size with existing building foundations reused where possible. The site cover of the proposed development is 76,257m². All work will be undertaken in accordance with the Construction Environmental Management Plan which will seek to minimise impacts on the existing vegetation and ensure the rehabilitation of the site on completion of the works.

4.12.8.4 Concept Design

An initial concept engineering design for the proposed development has been completed in accordance with relevant engineering standards and guidelines (refer to **Figure 4-27**). Further refinement of the design will occur as the development process continues. In regard to earthworks, there are significant parts of the proposed development area where slopes are less than 15 degrees in gradient and minimal level change is

required. The steeper areas are mostly confined to the slopes around the coastlines and the more elevated areas, any access roads in these areas will be design and constructed along the existing contours to minimise earthworks. Retaining walls will be needed on the project at specific locations where the gradient of cuts and fills are excessive. The design intent is to utilise retaining systems that minimise visual impacts and integrate well with the existing environment such as gabion structures which can utilise existing rock excavated from the site. The concept design completed for the proposed roads, drainage and services has confirmed that suitable infrastructure can be provided for the development.

4.12.8.5 Clearing

In areas that require cut and fill in order to shape the final landform, clearing of existing vegetation will be required. The intent is to minimise the areas requiring clearing through a design approach that focusses on minimising land disturbance and working with existing site levels as much as possible.

4.12.8.6 Excavations including Dredging

The concept design has identified the following key excavation or borrow areas that will be required to complete the necessary earthworks on the site as indicated on **Map 4-2** (noting that the safe harbour is no longer proposed) being:

- Expansion of the Storage Dam – In order to increase the reliability of water supply it is proposed that an area of approximately 37,860m³ be excavated to extend the dam and include a new drainage channel that will enable an additional 27 hectares to be diverted towards the dam. The dam diversion channel will also change the stage-storage relationship, increasing the volume of the dam from 199.6 to 207.3 M;
- Other Borrow Areas - Two potential borrow areas are the existing quarry area which will be a source of pavement materials and a new cut area proposed in the airstrip which will provide a source of fill material. The borrow areas will be managed during construction with suitable erosion control devices in place. After construction is completed the borrow areas will be rehabilitated and revegetated.

A sales permit under the *Forestry Act 1959* will be required to remove State-owned quarry material.

4.12.8.7 Fill Areas

Preliminary findings from the earthworks analysis and modelling suggest:

- There may not be a need to import fill to form the development; and
- Fill areas will be distributed throughout the proposed development area, with relatively shallow depths of fill.

[illegible]

4.12.8.8 Quality Control

Standard earthmoving equipment is proposed to complete the required earthworks. Material will be excavated and hauled from borrow areas and placed into the fill areas. All earthworks operations will be completed by competent civil contractors under the supervision of the certifying engineers and in accordance with AS3798 – *Guidelines on Earthworks for Commercial and Residential Developments*. This includes testing regimes to confirm the suitability of the materials and the placement techniques.

4.12.8.9 Bridges and Culverts

Given the soil types and site gradients, the existing site drains well and there are no major drainage problems. There are however some drainage paths that will be crossed by road infrastructure and accordingly bridge and culvert structures will be required. From the concept design it is anticipated that two (2) bridges are required with a number of minor culvert crossings also required. The drainage structures will be designed and constructed in accordance with relevant engineering standards and guidelines. Further refinement of the design will occur as the development process continues. Particular attention will be paid to details around each structure to minimise the impact of concentrated discharge of stormwater into the existing environment.

4.12.9 **Jetty Upgrade and Additional Mooring Construction**

4.12.9.1 Jetty Upgrade

The upgrade to the existing jetty will be undertaken within the same footprint as the existing structure with additional piling required for the floating pontoon component as shown in the following **Figure 4-29**. Approximately 45 metres of the existing jetty will be demolished and transported to the mainland for disposal at an approved disposal facility. The piling for the floating pontoon will be installed by driving the piles from a floating barge and the pontoon will be towed from the mainland and connected to the insitu piles. The access gangway will have a hinge connection to the existing jetty and a sliding connection at the pontoon end to accommodate any tidal movement. All necessary services e.g. water, power, lighting and fire services will be installed on the pontoon. The pile driving process will be subject to a Construction Environmental Management Plan to ensure no adverse impact on the marine environment. The demolition and construction process is estimated to take approximately four weeks. Time on site will be kept to a minimum as the construction of the pontoon will be done offsite in a factory.

Figure 4-28. Proposed Jetty Upgrades.



4.12.9.2 Moorings

The seven approved moorings will be constructed in accordance with the approved plans or more recent requirements. The proposed moorings would be located on soft sediment and at a sufficient distance beyond the reef edge to avoid potential harm to coral from the mooring structure and attachments and vessels. Mooring would be appropriately designed to accommodate the maximum load requirements (vessel sizes) and for minimising the risk of environmental damage, and design drawings would be approved or certified by a Registered Professional Engineer of Queensland. The precise mooring locations and designs within the setting 1 area would be taken into account 'best-practice' guidelines as given in GBRMPA's 'Policy on Moorings in the Great Barrier Reef' and the 'Supporting information to the Policy on moorings in the Great Barrier Reef'.

An application to GBRMPA for moorings would be submitted on approval of the EIS along with appropriate supporting documentation.

4.12.9.3 Maintenance Dredging

Maintenance dredging is unlikely to be required over the course of the resort's operation with the sediment transport modelling predictions providing only very small rates of sediment transport across the existing channel under ambient conditions. If maintenance dredging is to be undertaken it is only expected to be required very occasionally or following a major cyclone and in such circumstances the dredged material will be barged to the mainland for disposal in a licensed waste management facility.

4.12.10 Prescribed Environmentally Relevant Activities

The project is likely to involve a range of Environmentally Relevant Activities' (ERAs) under the *Environmental Protection Regulation 2008* (EP Reg) for which an environmental authority will be required. Where a particular ERA is identified in the EP Reg as a 'concurrence ERA' the Environmentally Relevant Activity also becomes assessable development under the *Sustainable Planning Regulation 2009* (i.e. also requires a development approval). The following aspects of the project may trigger the need for an environmental authority for:

- ERA 6 - Asphalt manufacturing where there may be a need to produce asphalt on site for construction purposes greater than 1,000t per year;
- ERA 8 - Chemical storage;
- ERA 14 - Electricity Generation;
- ERA 15 - Fuel Burning;
- ERA 16 Extractive and screening materials;
- ERA 33 - Crushing, milling, grinding or screening; where processing of rock and fill is required on site where more than 5,000t of material in a year;
- ERA 41 - Cement manufacturing more than 200t or more of cement in a year;
- ERA 43 - Concreting batching;
- ERA 50 - Bulk Material Handling;
- ERA 53 - Composting and soil conditioner manufacturing (more than 200t a year);
- ERA 56 - Regulated Waste Storage;
- ERA 57 - Regulated Waste Transport;
- ERA 60 - Waste disposal;
- ERA62 - Waste Transfer Station;
- ERA 63 - Sewage treatment; and
- ERA 64 - Water Treatment.

4.12.11 Location of quarry operations

The island has several sites that could be considered for a quarry for construction materials, including gravel supply for concrete, namely the existing valley of the dam, the old quarry area, air strip cut and other new areas. The use and extension of the old quarry is favoured from both a planning and technical/commercial perspective. The area is shown on **Map 4-3**. It appears the quarry has been used a disposal area for green waste for many years which may now need removal prior to quarrying. The rock in the area seems to be of a quality that may produce aggregate for use in concrete and pavement materials subject to petrographic

analysis and durability testing. The quantity of rock and accessibility also seems to be favourable. There is existing aggregate bin and track access into the area. Also this area is secluded by the vegetation and landscape meaning it is not easily visible from surrounding areas. The quarry was previously blasted and no doubt would require blasting to work it in future and to extend the resource.

The airstrip is currently undulating and one aim of future development is to flatten this surface and extend for use by larger (Code 1B type) aircraft complying with current air safety standards.

4.13 Project Operation Stage

4.13.1 Hours of operation

The following hours of operation are proposed once operational:

- The Central Facility Buildings and restaurants will be open from 6:30am for breakfast to 10:00pm (with the exception of the night club and rock bar that will be open until midnight);
- The jetty arrivals/departures will operate from 6:00am to 7:00pm;
- The golf course will operate from 7:00am to 5:00pm;
- The sports centre will be open from 6:00am to 8:00pm;
- The chapel will be open via appointment only;
- All day for pool and recreation facilities; and
- The airstrip will only be available for use during daylight hours.

4.13.2 Proposed Resort Activities

It is proposed that the resort will offer guests a range of leisure and recreational activities, both land and water based. The following activities are proposed:

- Leisure activities – resort dining and entertainment will be concentrated at the Village Precinct and also the central facility buildings at the proposed Beach Resort, Spa Resort and Eco Resort;
- Sport activities – a range of leisure and sporting activities are proposed including swimming at the foreshore lagoon and villa pools, golf, tennis and fitness activities at the proposed sport and recreation centre;
- Guided tours and talks - a number of reef appreciation tours and guided tours are proposed to be offered to resort guests;
- Proposed Activities in the National Park - more than 15 km of bushwalks are available on Lindeman Island both within the site and the adjacent National Park. Some the key walks in the National Park include:
 - i. Mount Oldfield (Grade: moderate) - Distance: 7.2 km return - this walk involves a steady climb and features some of the most diverse vegetation on the island with views on reaching the peak;

- ii. Coconut Beach (Grade: moderate) - Distance: 5.4 km return - This track takes you through eucalypt forest to the resort dam, a great place for bird spotting. It then descends to the sandy beach through fringing scrub, giving the beach a secluded feel.
 - iii. Coconut Beach–Boat Port Circuit - distance: 6.5 km return - this track as a circuit or as separate sections to either Coconut Beach or Boat Port.
 - iv. Boat Port (Grade: moderate) - Distance: 5.4 km return - this walk passes through rainforest, grassland and open forest and offers spectacular views;
 - v. Gap Beach (Grade: moderate) - Distance: 5.4 km return - Winding through eucalypt forest and dry rainforest this track emerges at a pebbly beach; and
 - vi. Plantation Beach (Grade: easy) - Distance: 4.2 km return - Mainly grassland, this track also winds through rainforest, emerging at a rocky foreshore.
- Boating and fishing - water activities will be subject to a permit from the Great Barrier Reef Marine Park Authority but are proposed to include jet skis, sailing, scuba diving, fishing, scenic helicopter and seaplane flights, sea kayaks and windsurfing; and
 - Swimming and snorkelling – swimming and snorkelling over Lindeman Island’s reef flat at high tide within designated areas.

4.13.3 Commissioning process

The commissioning process is the key procedures that need to be checked for the major infrastructure and also site rehabilitation processes as the development nears completion.

Table 4-5. Proposed commissioning process.

Infrastructure	Key Procedures	Responsibility
Sewage treatment plant	- Install and test the wastewater treatment facilities in accordance with the design, specification, checklists provided by the supplier. - Prepare and issue Operation and Maintenance Manuals. - Carry out all performance testing, water quality monitoring and reporting as per the Operation and Maintenance Manuals.	Contractor
Water treatment plant	- Install and test the water treatment facilities in accordance with the design, specification, checklists provided by the supplier. - Prepare and issue Operation and Maintenance Manuals. - Carry out all performance testing, water quality monitoring and reporting as per the Operation and Maintenance Manuals.	Contractor
Solar Panels and Batteries	- Ensure factory acceptance testing has been undertaken for each panel, battery system and associated equipment prior to delivery to site. - Contractor shall ensure compliance with completion of plans and rectify any defects. - Where required the Contractor will provide test certificates of the installation of the panels, batteries and system.	Contractor
Diesel generators	Ensure factory acceptance testing has been undertaken for each generator and associated equipment prior to delivery to site.	Contractor

Infrastructure	Key Procedures	Responsibility
	- The Contractor is to provide necessary fuel, ensure each generator has sufficient load for testing and associated equipment to undertake the tests. - The Contractor is to provide detailed as-constructed drawings of the generators and associated equipment at completion of the works.	
Dam extension and drainage channel works	Undertake dam extension and drainage channel works in accordance with detailed design, specification and construction checklists provided by Engineers.	Consultant Contractor
Desalination plant (for removing salt from lagoon water prior to treatment in sewage treatment plant)	- Install and test the water treatment facilities in accordance with the design, specification, checklists provided by the supplier. - Prepare and issue Operation and Maintenance Manuals. - Carry out all performance testing, water quality monitoring and reporting as per the Operation and Maintenance Manuals.	Contractor
Stormwater drainage system	- Engineers provide design, specification and construction checklists to the Contractor prior to commencement of works. - Contractor will ensure compliance with the plans and rectify any defects. - Weeding and planting in the detention basins and adjoining areas. - Removal of accumulated debris and sediment at three monthly intervals or following large rainfall events. - Inspection and repair of sub-soil drainage system. - Repair of erosion and scouring at the pipe inlet and outlet.	Consultant Contractor Resort maintenance personnel
Site Rehabilitation and Landscaping	- Undertake site landscaping in accordance with approved plans, including the proposed rehabilitation of the grassland community in Area A as shown on the proposed tenure Map 6-3. - Undertake weeding and maintenance of vegetation.	Contractor Resort maintenance personnel

4.13.4 Management structure of final development

The proponent intends that a single international luxury resort operator be appointed to manage the three resorts on the island. No agreement has been reached as yet with an operator, although the operator would potentially include Starwood Hotels (Sheraton, St Regis, W Hotels, Westin and The Luxury Collection), Hilton, Four Seasons, Banyan Tree, Intercontinental and Shangri-La.

4.13.5 Location and scale of parking requirements

The main mode of transportation across the island will be the electric golf buggy with small trucks for the delivery and transfer of goods and materials. The central facility buildings in each resort, village precinct and all villas will have allocations for the storage and charging of the buggies. The impact of workers parking on the mainland is described in **Chapter 25 – Transport**.