LINDEMAN ISLAND ENVIRONMENTAL IMPACT STATEMENT

EXECUTIVE SUMMARY AND INFORMATION PACKAGE

Proposal to develop and operate
the *Lindeman Great Barrier Reef Resort*

All comments and submissions to:

Office of the Coordinator-General
c/- EIS project manager
Lindeman Great Barrier Reef Resort Project
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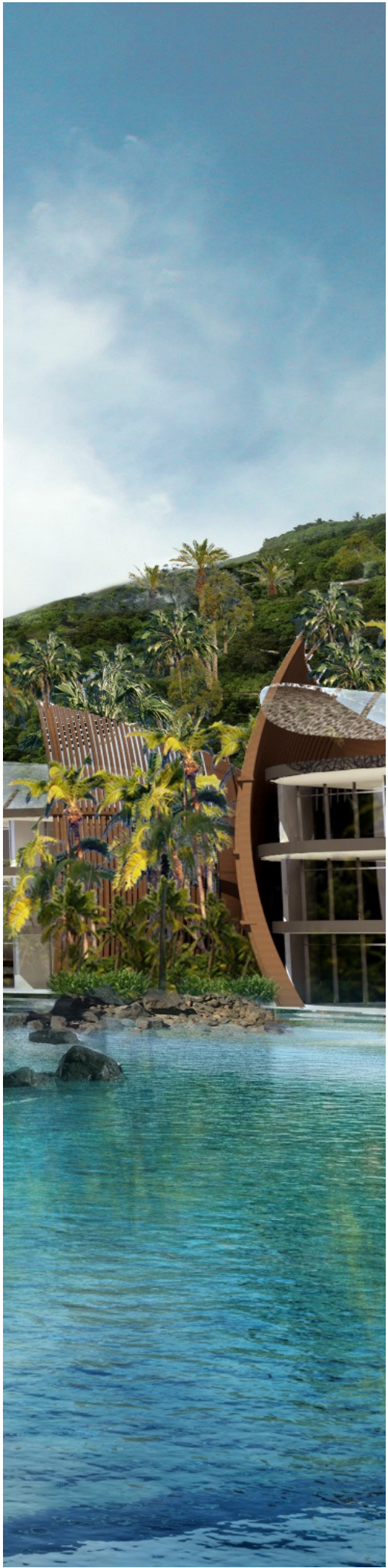
City East QLD 4002
Email: lindeman@coordinatorgeneral.qld.gov.au

We now seek any public comment under the State Development and Public Works Organisation Act 1971, Environment Protection and Biodiversity Conservation Act 1999, regulation 88D of the Great Barrier Reef Marine Parks Regulations 1983 (C'th) and s15 of the Marine Parks Regulations 2006 (QLD). Public submissions will be considered by the Great Barrier Reef Marine Park Authority (GBRMPA), Office of the Coordinator-General and Department of the Environment and Energy in making a decision on this Environmental Impact Statement (EIS).



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With specialist input from:

- Northern Resource Consultants - www.northres.com.au
- Converge Heritage and Community - www.convergehc.com.au
- Aviation Projects Pty Ltd - www.aviationprojects.com.au
- Air Noise Environment - https://www.ane.com.au
- Norling Consulting Pty Ltd - www.norling.com.au
- Marine and Environmental Planning Consultants (now Wild Environmental) - www.wildenvironmental.com

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1. INTRODUCTION

Lindeman Island was one of the first islands in the Whitsunday Island Group to be used as a tourist resort with activities commencing at Home Beach in 1928. Since this time an airstrip, accommodation buildings, jetty, golf course and resort infrastructure have been constructed. The Club Med resort closed in in 2012 and was subsequently purchased by White Horse Australia Lindeman Pty Ltd. This information package has been prepared for White Horse Australia Lindeman Pty Ltd to provide a summary of the proposed redevelopment of the Lindeman Great Barrier Reef Resort. An overview of the project, the applicant, and the potential opportunities and impacts of the project is outlined in this document.

"The vision for the project is to redevelop the existing resort into three world class resorts that showcase the Great Barrier Reef and set new standards in environmental sustainability and resort design."

The current proposal prepared by DBI Design Pty Ltd has evolved through consultation with the project partners, 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 incorporates best practice in sustainable design and construction (refer to **Figure 1. Masterplan Concept**). Key aspects of the proposed project:

- 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 are proposed 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 - a new precinct with services including 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, capable of landing light aircraft and helicopters;
- Marine access – approval is sought for upgrades to the existing jetty and additional moorings;
- 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 being investigated 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.

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.*

Note: A safe harbour is no longer proposed.

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

KEY PLAN

0 50 150 250 400
25 100 200 300 500

FIGURE 1. INITIAL CONCEPT MASTERPLAN

2. ASSESSMENT PROCESS AND MAKING A SUBMISSION

THE PROCESS

The Lindeman Great Barrier Reef Resort project has been declared a coordinated project for which an EIS is required by the Coordinator-General of Queensland under the *State Development and Public Works Organisation Act 1971*. The Commonwealth Minister for the Environment has also determined the Lindeman Island Great Barrier Reef Resort project a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999*.

The EIS process is being led by the State Government pursuant to the bilateral agreement between the State and Commonwealth Governments. The Commonwealth Minister for the Environment will rely on the outcomes of the Queensland Coordinator-General's impact assessment process, including any public submissions, in making a decision.

A component of the project involves an activity requiring a permission under the *Great Barrier Reef Marine Park Act 1975 (GBRMP Act)* and *Great Barrier Reef Marine Park Regulations 1983* (Commonwealth, GBRMP Regulations). As such the referral under the EPBC Act is taken to be an application under the GBRMP Regulations. If the Commonwealth Minister makes a decision to approve the action in the referral under the EPBC Act, the Great Barrier Reef Marine Park Authority will make a decision in relation to the deemed application.

PUBLIC CONSULTATION

The draft EIS is on public display for 30 Business Days. During this time two community meetings will be held – one in Airlie Beach and one in Mackay. Throughout the public notification period of this EIS, anyone may make a submission to GBRMPA and the Coordinator-General about the EIS. GBRMPA and the Coordinator-General are required to accept all properly made submissions. A properly made submission means a submission that:

- is made in writing; and
- is received on or before the last day of the submission period; and
- is signed by each person who made the submission; and
- states the name and address of each person who made the submission; and
- states the grounds of the submission and the facts and circumstances relied on to support those grounds.

Properly made submissions should be submitted by mail, addressed to:

Coordinator-General
c/- EIS project manager
Lindeman Great Barrier Reef Resort Project
PO Box 15517
City East QLD 4002
Email: lindeman@coordinatorgeneral.qld.gov.au

3. COMPANY PROFILE

WHITE HORSE AUSTRALIA

The project is proposed to be undertaken by White Horse Australia Lindeman Pty Ltd ("White Horse Australia"). White Horse Australia is a company jointly owned by Mr William Han of White Horse Group China and Mr Jianfeng Mao of Orion Group Hong Kong. The company acquired the Lindeman Island asset in 2012. The Director of White Horse Australia Lindeman Pty Ltd is Mr Paul Nyholt.

Following its purchase of the resort leases in 2012, White Horse Australia Lindeman Pty Ltd has undertaken consultation with a wide range of tourism industry experts and hotel operators to investigate a wide range of potential development scenarios for the island. 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.

The proponent's objective is to re-establish Lindeman Island as a premier domestic and international tourist destination, whilst protecting the Outstanding Universal Values associated with the Great Barrier Reef World Heritage Area. The over-arching philosophy of White Horse Australia Lindeman Pty Ltd is to promote the ecologically sustainable development of Lindeman Island during construction and operation of the resort.

Whitehorse Australia appointed an EIS Study Team to prepare all aspects of the EIS. The EIS Project Team has worked with the proponent to identify the constraints and opportunities for the project and has modified the project to reflect the environmental features of the site.

4. PROJECT LOCATION AND SITE DESCRIPTION

LOCATION

Lindeman Island is located within the island group referred to as the Whitsundays, a world renowned tourist attraction located approximately 35 kilometres south-east of Shute Harbour and 13 kilometres south of Hamilton Island. The island is located within the Great Barrier Reef World Heritage Area and has a total area of approximately 637 hectares with the existing resort located on perpetual and term leases, covering approximately 138.17 hectares. The balance of the island is National Park.

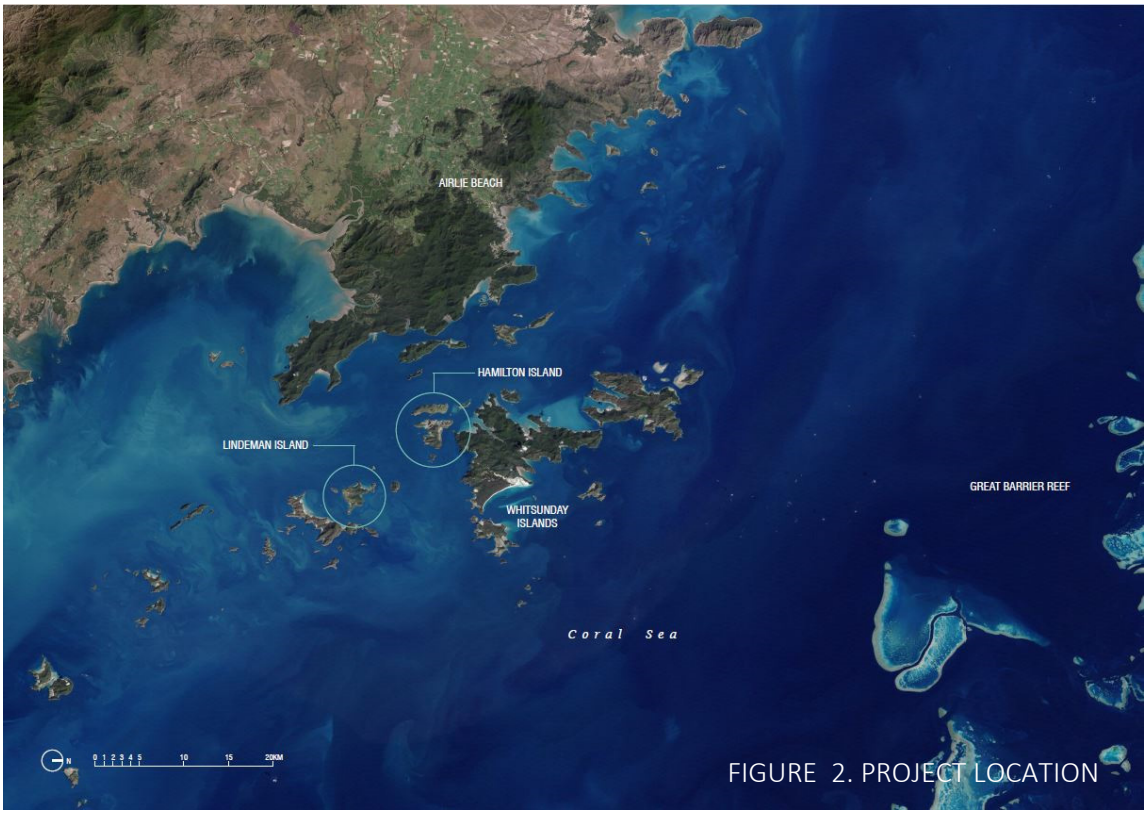

FIGURE 2. PROJECT LOCATION

The existing resort buildings are concentrated on the south-western portion of the island adjacent to Home Beach. The accommodation is housed in 14 wings with a large central facilities building that housed the main restaurant, bars and entertainment facilities. The reception is further up the hill with Nicholson's Restaurant, conference rooms and staff accommodation on the plateau above the resort. All the services areas including power generation plant, sewage treatment works, water filtration and general maintenance, fuel stores and back of house facilities are also on the plateau. A grassed private airstrip approximately 800 metres long is also situated on the plateau used by charter aircraft from the mainland and Hamilton Island.

The resort closed in 2012 with key reasons attributed to damage caused by cyclones, access difficulties, downturn in the global tourism industry and a failure to attract new and emerging tourism markets.

DESCRIPTION

The project has been designed to protect the Outstanding Universal Values (OUV) associated with the Great Barrier Reef World Heritage Area (GBRWHA) through site responsive design, and set new standards in sustainable tourism. Proposed environmental improvements include renewable energy production (solar/diesel hybrid), rehabilitation of disturbed habitats, incorporation of water conservation devices, improvements to stormwater management and a wastewater treatment plant with water treated to Class A+ standard. A National Park and Great Barrier Reef Education Centre is also proposed.

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.

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.

The project is expected to contribute $480 million to the Mackay Region's Gross Regional Product and $620 million to the State's Gross Product. During construction around 300 construction related jobs will be created on the island and approximately the same number of full time equivalent jobs will be created once operational. Operationally the resort is expected to contribute $140 million to the Mackay Region's Gross Regional Product and $195 million to Queensland's Gross Product. On average over 858 visitors and staff will be on the island each day, totalling around 313,170 person days per year.

PROPOSED TIMING

The construction period would involve a period of approximately three years commencing mid-2018. 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:

- 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 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 upgrades 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.

5. PROJECT ALTERNATIVES

RESORT ALTERNATIVES

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

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

The preferred option is the redevelopment of the existing resort to create a variety of accommodation options and a wide range of supporting amenities within the resort. This strategy is fundamental to establishing Lindeman Island's international profile and its competitiveness as a world-class destination resort.

AIRSTRIP ALTERNATIVES

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

SAFE HARBOUR ALTERNATIVES

Marine access to Lindeman Island is currently available via a south-east facing jetty, which is currently exposed to prevailing south-easterly winds, based on recorded data for Hamilton Island Airport. Wave conditions for vessels at the existing jetty mean that it would not be safe for people to embark or disembark boats a large number of days per year. Due to these wave and wind conditions a safe harbour was initially investigated as a means to provide greater reliable access for the transfer of guests, staff, and supplies.

Five alternative locations for a safe harbour were investigated across the Island by BMT WBM (2013), with the mapping of the Home Beach location further refined following ecological and planning assessments undertaken by Cardno (2015 and 2016). The alternative sites located at Gap Beach, Boat Port and Billy Goat Point were not considered feasible as they were remote from existing resort infrastructure, relied on a new access road being created through the National Park, had extreme costs associated with dredging/breakwater construction and were not consistent with the Whitsundays Plan of Management – Setting 1 designation. The remaining Home Beach West option, while consistent with the Whitsundays Plan of Management - Setting 1 designation, was not considered to be desirable due to an aggregate area of coral affected being 0.6 hectares, while the Home Beach East location affected a smaller aggregate area of coral of 0.23 hectares (plus an additional 0.02ha disturbed by sedimentation). Based on the assessment of the alternative locations, Home Beach East, was identified as the preferred location for a safe harbour.

The assessment of the safe harbour also involved the identification of various designs at Home Beach to seek to limit disturbance to the existing coral communities, resulting in an overall reduction of the aggregate area of coral habitat to be disturbed from 1.8 hectares in the initial design proposed in the EPBC Act referral documents to 0.23 hectares (plus an additional 0.02ha disturbed by sedimentation) for the preferred Safe Harbour Option 4. Safe Harbour Option 4 was preferred over all designs as it limited the aggregate impact on coral directly affected to 0.23 hectares, with all other options affecting a greater aggregate area of coral. It also proposed one of the smallest development footprints at 4.46 hectares and re-used the existing channel and turning basin area.

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

6. TENURE

The proponent seeks to revise existing site tenure and boundary arrangements to reflect current development and infrastructure within National Park. The overall area of National Park land is proposed to decrease by 31.632 hectares (which is achieved by dedicating 5.299 hectares to National Park from existing perpetual lease and revoking 36.931 hectares), with these areas historically used or managed as part of the previous resort's operations and is largely confined to previously disturbed land. The proposed boundary changes will result in a more regularised boundary between the resort and the National Park and will remove inconsistent uses off the protected area estate.

The site includes an area of 9.473 hectares on the western coastline which is proposed for a commercial camping facility or "glamping" structures following comprehensive site suitability assessments. The proposed glamping facility will be subject to an authority under section 35 of the *Nature Conservation Act 1992* and would seek to increase the range of experiences at the resort and provide new and innovative experiences in accordance with the *Queensland Ecotourism Plan 2016 - 2020*.

Key aspects of the proposed tenure arrangements (subject to negotiations with State agencies) include:

(a) 29.406 hectares of National Park currently subject to a term lease will be relinquished to the State for National Park;

(b) 5.299 hectares of existing perpetual lease will be dedicated as National Park;

(c) 9.473 hectares will remain as National Park but be subject to a specific authority under section 35 of the *Nature Conservation Act* for a glamping facility;

(d) 36.931 hectares is proposed to be revoked from National Park and added to the Perpetual Lease, with 5.919 hectares of this total to be subject to a Nature Refuge Agreement; and

(e) A cash payment, or works, or a combination, will be offered for the balance of any required compensation.

7. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The Lindeman Great Barrier Reef Resort Project is a "controlled action" under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) and requires approval from the Commonwealth Minister under Part 9 of the EPBC Act before it can proceed. The proposed jetty upgrades and marine environment surrounding the project are located within the Great Barrier Reef World Heritage Area (GBRWHA), Marine Park (GBRMP) and National Heritage Area (GBRNHA). The GBRWHA extends from the low water mark on the Queensland coast to the edge of the continental shelf, and from the tip of Cape York Peninsula to just north of Fraser Island, an area of approximately 348,000km2. The GBRWHA, like other Australian World Heritage Properties, is protected as a MNES under sections 12 to 15A of the EPBC Act. The Great Barrier Reef is also listed as a Natural Heritage Place (NHP), which is listed as a MNES under sections 15B and 15C of the EPBC Act while the Great Barrier Reef Marine Park (GBRMP) is protected under sections 24B and 24C of the EPBC Act. Listed threatened species, communities and migratory species also occur in or in the vicinity of the site and are listed as a MNES under sections 18, 18A, 20 and 20A of the EPBC Act.

The controlling provisions for the project under the EPBC Act include the following MNESs:

1. World Heritage properties (sections 12 and 15A of the EPBC Act);
2. National Heritage places (sections 15B and 15C of the EPBC Act);
3. Great Barrier Reef Marine Park (sections 24B and 24C of the EPBC Act);
4. Listed threatened species and communities (sections 18 and 18A of the EPBC Act); and
5. Listed migratory species (sections 20 and 20A of the EPBC Act).

Matters of National Environmental Significance have been addressed by detailed investigation of the terrestrial and marine environments of the island, by a constraints-based approach to project planning, risk assessments and mitigation measures to avoid or reduce potential impacts.

CONTROLLING PROVISION 1: WORLD HERITAGE PROPERTIES

Lindeman Island is a 637 hectare continental island within the Great Barrier Reef World Heritage Area (GBRWHA), and many of the matters of national environmental significance are associated with its World Heritage status. The National Park encompasses most of the island and the southwest corner has a history of grazing use and contains a former node of tourist resort development. The World Heritage Values include the scenery of the island and surrounding waters, fringing coral reefs and associated reef-building processes, habitat for migratory species (birds and marine fauna), and flora and fauna typical of continental islands which add to the biodiversity of the GBRWHA. Most of these features are outside the Project area, or associated with the waters and land-water interface.

The GBRWHA was cited for all four natural criteria set out in Article 2 of the World Heritage Convention under the 'Operational Guidelines for the Implementation of the World Heritage Convention':

- *Criterion vii: Contains superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance (aesthetics);*

  As seen from external viewpoints, almost all the elements and features which contribute to significant aesthetic values will remain unaffected by development i.e. those which make up the diversity of landscapes and seascapes, the view from Kennedy Sound and the perceived naturalness of the island. The main exceptions will be the associated buildings at Home Beach although these will occupy only approximately 563 linear metres (3.35%) of the island coastline, will be visible only from the limited number of boats within Kennedy Sound and are within the existing resort and jetty area. When viewed from Kennedy Sound, the proposed redevelopment of the resort at Home Beach will also represent a significant improvement in comparison to the visually-intrusive hillside apartments of the existing resort. The earthworks for the extended airstrip which will involve some re-shaping of landform will also be visible, although this will be mostly concealed from external viewpoints and will be revegetated to integrate with the natural landscape. As a result of the constraints-based approach to planning and a range of design and mitigation measures for integrating the separate precincts into their landscape settings, the effects of the proposed development are considered minor and acceptable based on the findings of the viewshed analysis and the proposed mitigation measures, as well as the design initiatives adopted. The proposed development, will cause visible changes to only a minor proportion of the island and it will not detract overall from its natural scenic amenity.

- *Criterion viii: Outstanding examples representing the major stages of Earth's history or significant geomorphic or physiographic features*

  The main impacts of the proposed development on the island's geomorphology will arise from construction of the upgraded airstrip and to a lesser extent the land clearing and earthworks required for the development precincts. Minor reshaping works will be required as part of the revised golf course layout and extension to the dam. However, these activities will not result in impacts on significant geomorphic or physiographic features that contribute to GBRWHA values. With respect to the proposed airstrip, the alignment and slope of the airstrip have been designed to minimise cut and fill. The associated clearing and earthworks actions are not considered to be significant impacts on World Heritage values in relation to geomorphic processes.

- *Criterion ix: Outstanding examples of on-going evolution; and Criterion x: Contains important and significant habitats for in-situ conservation of biodiversity, including threatened species.*

  Habitats in the marine survey area include fringing coral reef, encrusting algae reef, sandy beach, soft bottom substratum, sparse seagrass and macroalgae, with intertidal rocky shores and open waters for fish, crustaceans and marine mammals. A shallow rock platform habitat extends 100-350 m offshore through which a boating channel and swing basin that was excavated circa 1965. The habitat types potentially affected by the project are widely represented within the broader regional area and it is considered unlikely that any particular marine, aquatic or intertidal habitat or individual species is restricted to areas that will be directly modified by the project. Construction of a safe harbour is no longer proposed and as such impacts on coral habitats will be avoided.

No Commonwealth-listed species of threatened or near-threatened flora or fauna were recorded on Lindeman Island, and only four migratory birds. In this respect, the terrestrial biodiversity of Lindeman Island is typical of the Whitsunday Islands. There are two Commonwealth listed Threatened Ecological Communities (TECs) present:

- Littoral rainforest/ vine thicket, a Critically Endangered community under the EPBC Act, which is found in multiple locations in the west and south of the study area but mainly close to the shoreline and in protected gullies; and which corresponds to RE 8.12.11a ('Of Least Concern' under the VMA); and

- Broad leaf tea-tree (Melaleuca viridiflora) woodland community in high rainfall coastal north Queensland, which in this region corresponds generally to Regional Ecosystem (RE) 8.3.2, classed as 'Endangered' under Queensland's Vegetation Management Act (VMA).

Of the two TECs on the island, the project impacts will be limited to the Broad Leaf Tea Tree (*Melaleuca viridiflora*) Woodland where an area of 1.5 hectares will be disturbed as part of the clearing and trimming required to meet aviation obstruction limitation surface requirements associated with the runway. The clearing of the Broad Leaf Tea Tree (*Melaleuca viridiflora*) Woodland will be offset by delivering a direct, on-the-ground, conservation outcome that improves or maintains the viability of this community. The most suitable mechanism for delivering an appropriate conservation outcome is the restoration of degraded areas of this community, such as the section that is to be retained on the western side of the runway. Under the current design concept (November 2016), there are at least 3.66 hectares of degraded Broad leaf tea-tree woodland to be retained that could be restored to an ecological condition consistent with the listed community. The net outcome of restoring this area would be an increase of more than 40% to the current extent of the listed community on Lindeman Island.

FIGURE 3. MELALEUCA VIRIDIFLORA COMMUNITY

CONTROLLING PROVISION 2: NATIONAL HERITAGE PROPERTIES

The Great Barrier Reef World Heritage Area is one of nearly one hundred properties included as a national heritage place on the National Heritage List. The place has the same boundary as the World Heritage Area. While there are specific criteria that apply to the listing of national heritage places, the national heritage listing of the world heritage properties was done on the basis of those values identified by the World Heritage Committee. Therefore, for the purposes of this assessment, the values of the Great Barrier Reef national heritage place are taken to correspond to the world heritage criteria.

CONTROLLING PROVISION 3: GREAT BARRIER REEF MARINE PARK (SECTIONS 24B AND 24C OF THE EPBC ACT)

The Great Barrier Reef Marine Park is an MNES and proposals potentially affecting the Park are to be assessed using the MNES Significant Impact Guidelines (DoE 2013). Approximately 98% of the Great Barrier Reef World Heritage Area is within the Great Barrier Reef Marine Park (GBRMP), the remainder being Queensland waters and islands. The GBRMP was declared in 1975 with the purpose of preserving the area's outstanding biodiversity whilst providing for reasonable use. Under the zoning plan the site is included This is facilitated by a spectrum of management zones ranging from General Use Zones to Preservation Zones, generally allowing ecologically sustainable activities. The site is located within the Conservation Park Zone and the Setting 1 area of the Whitsundays Plan of Management.

The Whitsundays Plan of Management includes strategies to manage the impact of activities on the area. 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.

The Great Barrier Reef Region Strategic Assessment Report acknowledges the importance of tourism to the region with the following statement included "*Importantly, the tourism industry makes much of the vast area of the Great Barrier Reef accessible to visitors; without it, many visitors simply would not be able to enjoy or experience the Region's values. The industry, therefore, plays a key role in fulfilling Australia's world heritage obligation to 'present' the Great Barrier Reef World Heritage Area. Most tourism programs involve education and interpretation activities, aimed at increasing appreciation and understanding of the natural environment and sustainable practices that support the Reef*" (p5-29).

CONTROLLING PROVISION 4: LISTED THREATENED SPECIES AND COMMUNITIES (SECTIONS 18 AND 18A OF THE EPBC ACT)

Two Threatened Ecological Communities were identified in the Protected Matters Report as potentially occurring within the study area or within a 50 kilometre radius being the Littoral Rainforest and Coastal Vine Thickets of Eastern Australia and the Broad leaf tea-tree (*Melaleuca viridiflora*) woodlands.

The critically endangered Littoral Rainforest and Coastal Vine Thickets of Eastern Australia is found in small pockets on the southwest coastline and is not disturbed as part of the project.

An area adjacent to the existing runway strip (shown on the RE mapping as RE 8.3.2) contains a Melaleuca community consistent with the Broad Leaf Tea-tree (Melaleuca viridiflora) Woodlands in High Rainfall Coastal North Queensland TEC. The majority of the Broad-leaf tea tree woodland on the eastern side of the runway strip is consistent with the community listed under the EPBC Act, and is therefore a MNES. Despite these impact avoidance and minimisation approaches, there is a significant residual impact to this community in the form of a 1.5 hectare reduction in extent resulting from vegetation clearing and trimming requirements from the runway upgrade. This significant residual impact triggers the requirement for the provision of an environmental offset under the EPBC Act. The most suitable mechanism for delivering an appropriate conservation outcome is the restoration of degraded areas of this community, such as the section that is to be retained on the western side of the runway. Under the current design concept (November 2016), there are at least 3.66 hectares of degraded Broad leaf tea-tree woodland to be retained that could be restored to an ecological condition consistent with the listed community. The net outcome of restoring this area would be an increase of more than 40% to the current extent of the listed community on Lindeman Island.

Threatened Flora Species

No threatened or near threatened flora species were detected within the study area, despite extensive flora surveys over three different survey periods and a variety of seasonal conditions. A total of seven flora species listed under the EPBC Act with potential relevance to the study area were identified in the desktop analyses, based on a 50km buffer for the search area. The likelihood of occurrence within the study area for each of these species was assessed during desktop analyses using key criteria such as presence of local records, and habitat suitability/quality. From this assessment, none of the EPBC Act listed species were considered to have a moderate or high likelihood of occurrence.

Threatened Fauna Species

No threatened fauna species were observed within the study area during any of the surveys conducted to date. The potential for impacts to conservation significant species determined to have a moderate or high likelihood of occurrence during the desktop assessment are discussed below. Conservation significant species with a low likelihood of occurrence are not included in the following impact assessment.

Marine species and communities

All of the threatened marine species that could potentially utilise the marine habitats in the project marine area were considered temporary visitors and none were considered to reside permanently or breed in marine habitats on the foreshore or in waters in close proximity to Lindeman Island. As such, they do not rely implicitly on the marine habitats in the project area, which account for only a very small proportion of the regional habitat potentially used by threatened species in the region.

Some marine turtles, cetaceans and the dugong would occur in the project marine area. All of these species could potentially utilise the marine habitats in the project marine area but were considered temporary visitors, and none were considered to reside permanently or breed in marine habitats on the foreshore or in waters in close proximity to Lindeman Island. The greatest risk to these species would be vessel strike to mammals and marine turtles given there would be increased vessel activity associated with ongoing operations of the project. Approach distances and interaction with marine mammals is regulated under State and Commonwealth regulations and the risks would be reduced through a management plan proposed as part of the Resort Environmental Management Plan which would seek to educate skippers on behaviours when in the vicinity of marine mammals and turtles and keeping appropriate vigilance. These arrangements would make the risk of vessel strike acceptably low.

CONTROLLING PROVISION 5: LISTED MIGRATORY SPECIES (SECTIONS 20 AND 20A OF THE EPBC ACT)

A number of migratory and listed marine species have been recorded or are likely to use the island and surrounding waters, but there are no 'important habitats' for migratory birds (as defined by DEWHA 2009) nor is the island a significant turtle rookery. The proposed development, with a small development footprint predominantly limited to areas of lower environmental significance and higher tolerance of disturbance, and with mitigation measures as proposed, has an overall a low risk of causing detrimental impacts on listed species, communities, geomorphological processes or ecology of the island.

Terrestrial Migratory Species

No nesting sites for any listed migratory bird species were observed during the surveys. The habitat within the study area may provide foraging opportunities for migratory species, particularly intertidal zones and sandy shorelines. Disturbance from increased visitation on shoreline areas may restrict the suitability of these habitats for foraging by bird species. However, the shoreline habitat relevant to the proposed action is not an important area of habitat for shorebirds or other migratory species. There are substantial areas of similar or better quality habitat for shorebirds at the locality and the broader region. Therefore, the proposed action will not cause a significant decline in the availability and quality of the habitat for these species. The proposed action is unlikely to impact the lifecycle of an ecologically significant proportion of any terrestrial migratory species with potential to occur in the area.

Marine Migratory Species

All of the listed migratory species that could potentially utilise the marine habitats in the project marine area were considered temporary visitors and none were considered to reside permanently or breed in marine habitats on the foreshore or in waters in close proximity to Lindeman Island. As such, they do not rely implicitly on the marine habitats in the project marine area, which account for only a very small proportion of the regional habitat potentially used by migratory species. Hence, the potential impacts to migratory species would be limited to those associated with disturbance or injury to individuals visiting the island. It is considered that most marine migratory species visiting the foreshore or the waters in close proximity to Lindeman Island and that would be disturbed (during foraging, resting or while in transit between areas) by increased activity associated with project construction or ongoing operations on the south-western corner on the island, would be able to move to other (undisturbed) parts of the island or to similar habitats within the region. This may be inconvenient to individuals but not harmful and would not be a significant impact to migratory species. In addition, given marine operations would be best practice and include a comprehensive environmental management plan (as part of the Resort Environmental Management Plan), the risks of water pollution and degradation of water quality and transmission of water borne diseases would be acceptably low as would the potential for the key threatening process to occur 'Injury and fatality caused by ingestion of, or entanglement in harmful marine debris'.

SUMMARY

Matters of national environmental significance have been addressed by detailed investigation of the terrestrial and marine environments of the island, by a constraints-based approach to project planning, risk assessments and mitigation measures to avoid or reduce potential impacts. Lindeman Island is a 637 hectare continental island within the Great Barrier Reef World Heritage Area (GBRWHA), and many of the MNES are associated with its World Heritage status. Most of the island's terrestrial area is protected as National Park, with tourist leases in the southwest corner and contains an existing node of intensive tourist resort development (formerly Club Med). Consistent with the Mackay Regional Council's Draft Planning Scheme, *Queensland Ecotourism Plan 2016 - 2020* and the Whitsundays Plan of Management, White Horse Australia Lindeman Pty Ltd, plans to redevelop the existing tourism node into a world-class complex of three inter-related and jointly managed resorts with current best practice design, construction and operation of tourism facilities.

In terms of the five controlling provisions applicable to Lindeman Island under the EPBC Act, there will be significant residual impacts on the Broad Leaf Tea-tree (*Melaleuca viridiflora*) woodland, but no significant impacts on listed marine or migratory species, or any endangered or vulnerable species. Impacts on the Broad Leaf Tea-tree community are capable of being offset.

The project would also play a key role in fulfilling Australia's world heritage obligation to 'present' the Great Barrier Reef World Heritage Area by providing a tourism program that involves education and interpretation activities aimed at increasing appreciation and understanding of the reef.

8. LAND USE

The proposed Lindeman Great Barrier Reef Resort Project is consistent with key provisions included in the *State Planning Policy, Mackay, Isaac and Whitsunday Regional Plan* and the *State's Ecotourism Plan 2016 – 2020,* which supports tourism development opportunities that showcase the world renowned Great Barrier Reef and address issues with the existing unoccupied island resorts. It also facilitates the achievement of key directions included in the Strategic Framework of the Draft Mackay Region Planning Scheme which encourages on Lindeman Island "*tourism development that maintains sensitive environmental and landscape character values*". An assessment of the proposal against the relevant codes included in both the current and Draft Mackay Region Planning Scheme has identified that proposed development complies with the acceptable or performance based outcomes of the relevant codes by ensuring that:

- The proposed resort is adequately serviced by the full range of appropriate on-site systems;
- The proposed buildings integrate with the established visual amenity of the surrounding landscapes;
- The proposed resort provides high quality design outcomes reinforcing the sense of identity of the local area and region;
- The proposed resort maintains and enhances the ecological integrity of environmentally significant features within and adjoining the site, adjoining coastal areas and National Parks and the Great Barrier Reef;
- The proposed resort responds to the physical attributes and constraints of the land;
- The proposed resort has been designed to incorporate sustainable land management practices such as retention and enhancement of native vegetation and water sensitive urban design; and
- The proposed resort does not adversely affect the amenity of adjacent areas and uses, particularly residential uses and other sensitive land uses.

FIGURE 4. LINDEMAN ISLAND CLUB MED RESORT WHEN OPERATIONAL, SOURCE: TOURISM AND EVENTS QUEENSLAND

9. COASTAL

Wave conditions at the site are affected by occasional tropical cyclones and south-easterly trade winds. Despite the limited fetch from Shaw Island, wave conditions at the current resort jetty are sometimes unsuitable for berthed vessels and passenger safety. Wind data is available from nearby Hamilton Island airport and historical cyclone track data from the Bureau of Meteorology. The present beach is generally only usable at high tide and is often affected by strong south-easterly winds. Hence White Horse Australia Lindeman Pt Ltd propose that the redeveloped resort will have a pool and beach area on the leeward side of the existing natural beach. The present beach area at the resort is held between two low crested rock groynes that are submerged at high tide.

A range of data collection tasks (e.g. current data) and numerical modelling was undertaken for the EIS in order to develop the data necessary to assist in the design of shoreline facilities. These investigations have been undertaken being cognisant of projected climate change parameters, mainly in terms of sea level rise and intensification of cyclones, and has been used to optimise the project design so that potential deleterious effects were ameliorated early in the design process.

The layout has been designed to provide for safe operations for a 100-year planning period including Sea Level Rise of 0.8m.

FIGURE 5. LINDEMAN ISLAND SITE INSPECTION 10/3/15

10. MARINE ECOLOGY

The project's marine area includes sandy beaches, rocky shores, fringing coral reef, soft bottom areas, sparse seagrass and macroalgae. These marine habitats are important to mobile fauna including fish, shark, rays, sea snakes, macrocrustaceans, marine turtles, marine mammals and marine birds. Some of which are listed threatened or migratory species. A safe harbour is no longer proposed and as such the proponent seeks approval to upgrade the existing jetty and provide additional moorings around the island to provide safe shelter during a range of wind and wave conditions. Marine access to the resort will also be provided via the existing barge landing point located next to the jetty.

Key impacts associated with the development include are limited to:

- Acid sulphate soils;
- Degradation or contamination of water quality from hydrocarbons, nutrients and waste;
- Introduction of marine pests or diseases; and
- Increased reef visitation impacts.

An assessment of the above impacts has indicated that they can be appropriately managed, with coral colonies amenable to transplanting being relocated and artificial habitat created. The key mitigation strategy for reducing potential for impacts will be the Environmental Management Plan (EMP) for the project. The EMP states the commitments and objectives that are relevant to the controlling risk. The EMP contains specific, measurable targets to achieve the objectives. In turn those targets necessitate the application of certain management actions.

CORAL

A comparison of the coral cover and communities on the reef in the vicinity of the resort with coral habitat on other Whitsunday islands indicated it was not unique, but rather it shows characteristics typical of fringing reefs in the region.

FIGURE 6. SITE OF PROPOSED JETTY UPGRADES.

SEAGRASS AND MACROALGAE

The marine area adjacent to the existing resort provides seagrass and macroalgae habitat. During a recent survey, seagrass meadows were generally sparse (mostly between 1% and 5% cover and one patch south of the existing jetty with cover > 10%), with a low above-ground biomass, with some soft and hard corals occurring in the same area (BMT WBM 2013). Some *Halophila spinulosa* was found in the dredged channel at the jetty site. A comparison of the distribution of the latest available survey (BMT WBM 2013) with the survey undertook by Hyland et al. (1988) indicates that seagrass distribution did not change substantially over time. The low cover in the small area of seagrass within the footprint suggests it would not be an important habitat for any species, including its potential for being an important food source to marine turtles or dugongs. Indirect impacts to seagrass from ongoing operations of the resort are considered negligible or not sufficient to affect seagrass and macroalgae assemblages.

FISH, SHARKS AND RAYS, SEA SNAKES AND MACROCRUSTACEANS

The subtidal rock and reef habitat at Lindeman Island is used by a range of adult and juvenile fish species including cod, butterflyfish, damselfish, wrasses and parrotfish. Over 48 taxa of fish were recorded from depths ranging from 2 to 4 m water depths in the vicinity of the proposed resort. Fish assemblages of Lindeman Island are typical of inshore waters of the Great Barrier Reef and major reef fin-fish families are likely to be generally similar to those found on reefs located a comparable distance from the mainland. Generally, inshore reefs of the central Great Barrier Reef tend to host fewer fin-fish species compared to mid-shelf or outer-shelf reefs. The dominant fish species of inshore reefs are Pomacentrids, Lutjanids and Chaetodontids, Labrids, while Acanthurids and Scarids are generally found in lower numbers on inshore reefs compared to mid or outer-shelf reefs (Williams 1982, Williams and Hatcher 1983). The risk to fish, sharks and rays, sea snakes and macrocrustaceans from the jetty upgrades and ongoing operations would generally be low given only a negligible amount of their habitat would be affected (relative to the extent in entire region).

MARINE TURTLES, MARINE MAMMALS AND MARINE BIRDS

All of the marine turtles, marine mammals and marine birds that could potentially utilise the marine habitats in the project marine area were considered temporary visitors and none were considered to reside permanently or breed in marine habitats on the foreshore or in waters in close proximity to Lindeman Island. As such, they do not rely implicitly on the marine habitats in the Project area, which account for only a very small proportion of the regional habitat potentially used by these species. As part of the Resort Environmental Management Plan, the risks of degradation of water quality and transmission of water borne diseases would be acceptably low as would the potential for the key threatening process to occur 'Injury and fatality caused by ingestion of, or entanglement in harmful marine debris'. The greatest risk to marine turtles, marine mammals and marine birds would be vessel strike to marine mammals, marine turtles and possibly the Whale Shark given there would be increased vessel activity associated with ongoing operations of the project. Approach distances and interaction with marine mammals is regulated under State and Commonwealth regulations and the risks would be further reduced given marine operations would be best practice and based on a management plan (as part of the Resort Environmental Management Plan). These arrangements would make the risk of vessel strike acceptably low.

BEACHES AND INTERTIDAL ROCKY SHORES

The present resort beach is held between headlands and groynes and as such loss by longshore transport may be negligible. From time-to-time sand may be lost by transport seaward beyond the reef edge, but that loss is not quantifiable. Some wind-blown sand loss may occur and resort management procedures will likely return any windblown sand to the beach.

FIGURE 7. LINDEMAN ISLAND SITE INSPECTION 10/3/15.

11. FLORA

The study area contains a variety of remnant, mature regrowth (non-remnant) and disturbed habitats. Remnant vegetation within the study area mainly consists of mixed eucalypt woodland with a grassy understorey, with some rocky slopes along the coastline containing coastal vine thicket. The east and west margins of the runway strip contain Broad-leaved Tea Tree woodland and the existing resort, golf course, and runway strip areas contain non-remnant vegetation. The Northern Resource Consultant (NRC) survey identified two conservation significant vegetation communities in the study area. The Broad-leaved tea-tree (*Melaleuca viridiflora*) woodland community is listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* and the *Vegetation Management Act 1999 Act* and the Littoral Rainforest and Coastal Vine Thicket community is listed as critically endangered under the EPBC Act. The endangered tea-tree woodland occurs on the eastern and western margins of the runway strip. Coastal vine thicket communities were ground-truthed and mapped in small sections along the southern extent of the island as well as one large section along the western coastline.

At a State level the native grassland community, RE 8.12.13a, occurs within the study area and has an 'of concern' status under the *Vegetation Management Act 1999 Act.*

No flora species listed as threatened under the EPBC Act or the *Nature Conservation Act 1992* were detected during the surveys, despite targeted survey effort in potentially suitable habitat areas.

FIGURE 8. LINDEMAN ISLAND SITE INSPECTION 10/11/15

COASTAL VINE THICKET

The *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia* Threatened Ecological Community is scattered throughout the rocky slopes of the shorelines within the study area. While this community is classed as a 'least concern' Regional Ecosystem under the Queensland vegetation management framework, the full extent of this community equates to the critically endangered community listed under the EPBC Act. This community is therefore a matter of national environmental significance. The current design concept (November 2016) includes resort infrastructure areas that occur in close proximity to this community. It is recommended a buffer zone of at least five metres should be applied to all areas of this community. While small patches of this community can be resilient, invasion by exotic plant species represents a significant threat to this community. A pest plant management plan and the implementation of a five metre buffer zone will support the maintenance of biodiversity values for this community.

BROAD LEAF TEA-TREE (MELALEUCA VIRIDIFLORA) WOODLANDS

Vegetation consistent with the *Broad Leaf Tea-tree (Melaleuca viridiflora) Woodlands in High Rainfall Coastal North Queensland* Threated Ecological Community is present within the current lease areas of the resort and is protected under both Commonwealth and State legislation, although the definitions of this community are different under these statutes.

EPBC Act

A number of approaches have been adopted through the design phase to avoid and minimise impacts to this community. Despite these impact avoidance and minimisation approaches, there is a significant residual impact to this community in the form of a 1.5 hectare reduction in the extent resulting from vegetation clearing and trimming requirements from the airstrip runway upgrade. This significant residual impact will be offset through the delivery of a site-based restoration program to maintain or increase the extent of this community.

Vegetation Management Act

The full extent of the Broad-leaf tea tee woodland on Lindeman Island equates to endangered RE 8.3.2. This is because the definitions for remnant vegetation under the VM Act are based on canopy attributes and to not take ground-cover attributes and condition into consideration. The community on both sides of the runway strip therefore equates to a matter of state environmental significance. The disturbance footprint has been aligned to minimise disturbance as much as possible, and therefore, where possible, the disturbance has been located in the degraded habitat on the western side of the runway strip. The total disturbance footprint for RE 8.3.2, including areas to be cleared or trimmed, is 5.14 hectares. The *Queensland Environmental Offsets Policy – Significant Residual Impacts Guideline i*dentifies the relevant impact area threshold for 'significant' impacts as 2 hectares (for communities with a sparse structural category). The 5.14 hectare disturbance footprint will be offset through a combined delivery mechanism incorporating a land-based offset and a financial compensation payment. The total environmental offset liability for significant residual impacts to RE 8.3.2 will be determined through field-based habitat assessments of the proposed impact areas.

NATIVE GRASSLAND

Multiple areas of the native grassland community, RE 8.12.13a, occur within the study area. RE 8.12.13 has an 'of concern' status under the VM Act and is therefore a matter of state environmental significance, but is not listed as threatened under the EPBC Act. This community occurs on slopes and headlands surrounding various sections of the existing resort infrastructure. It also occurs on the western headland in the area nominated for the proposed 'glamping facility'. Disturbance to this community has been avoided by design where possible by locating infrastructure in areas of existing disturbance. The proposed glamping facility has been designed to avoid disturbance to the grassland community in this area, with the disturbance footprint focussed on degraded (non-remnant) areas of existing disturbance. Similarly, some of the habitat supporting relatively intact grassland on the slopes of the southern headland are to be retained as part of the development design. The total disturbance footprint within RE 8.12.3 is 4.19 hectares. The extent of degraded grassland areas outside the development disturbance footprint will be utilised for land-based environmental offset delivery. However, any significant residual impacts beyond those that can be offset through a land-based approach could be offset through a combined approach that includes a financial compensation payment.

PEST PLANT SPECIES

Pest plant species were common throughout the study area, particularly in the non-remnant vegetation communities. Pest species commonly occurring in a variety of habitats within the study area include Guinea grass, Lantana, Sensitive weed, Bidens, Chinese burr (*Triumfetta rhomboidea*), Balloon cotton bush (*Gomphocarpus physocarpus*), Common centro (*Centrosema molle*), and Snake weed (*Stachytarpheta cayennensis*). *Leucaena* is present in eucalypt woodland and native grassland areas along the margins of existing disturbance areas. A control program for this species has recently taken place (early 2015) and has significantly reduced the cover of this species in the resort area. However, some large patches still remain (e.g. at the western end of the cross-strip runway) and regeneration where control has taken place was evident during the December 2015 surveys. Grader grass (*Themeda quadrivalvis*) is known to occur in disturbed areas on Lindeman Island, and the field surveys confirmed its presence within the study area. The largest area of Grader grass occurs at the eastern end of the cross-strip runway, surrounding a drainage area on the southern side.

Three restricted species were observed during the field surveys: Giant rat's tail grass (*Sporobolus sp.*), Singapore daisy (*Sphagneticola trilobata*) and Lantana. Giant rat's tail grass was not recorded anywhere within the lease areas, but was observed at a few locations along the National Park track to 'Boat Port' and has likely been introduced by visitors using the track. Giant rat's tail grass is a restricted invasive plant under the *Biosecurity Act 2014*. Lantana is a restricted invasive plant under the *Biosecurity Act 2014* that occurs in all communities surveyed within the study area. Singapore daisy is also a restricted invasive plant that was observed in resort garden areas and adjacent coastal vine thicket vegetation near existing resort infrastructure on the southern coastline. Implications and recommendations regarding the presence of pest species are discussed in the following sections of this report.

NON-REMNANT VEGETATION

Most non-remnant vegetation is located throughout the existing disturbed areas of the resort, runway strip, and golf course. Vegetation associated with resort gardens, maintained lawns, the golf course, and the runway strip has been excluded from the remnant vegetation mapping due to an absence, or very low cover, of native species. Exotic grasses, particularly Guinea grass, dominated these areas with scattered native and exotic shrubs and trees. Other common exotic species in disturbed areas include Bidens, Lantana, Sensitive weed, Streaked rattlepod and Leucaena (*Leucaena leucocephala*).

FIGURE 9. LEUCAENA LEUCOCEPHALA.

12. FAUNA

The study area consists of remnant and non-remnant vegetation, providing habitat features for fauna species in the form of tree hollows, loose bark, coarse woody debris, boulders, crevices and rock piles. The presence of highly mobile fauna species (such as birds and bats) is likely to be influenced by seasonal characteristics such as rainfall, with these species foraging when suitable trees are flowering or fruiting.

A total of 76 fauna species from 42 families was identified within the study area using a variety of different observation and trapping techniques. This included 47 species of birds, 14 reptile species, two amphibian species, and 13 mammal species (including 12 bat species). Most of the native fauna recorded are common in coastal habitats throughout much of Queensland.

No threatened or near threatened fauna species were observed during the fauna survey period. However, some of the bat echolocation call data obtained is potentially from the Coastal Sheathtail Bat, and it is likely this species forages over the study area from time to time. The study area does not support any unique terrestrial habitat values for this species, and similar habitat is available in the surrounding National Park areas. The steep rocky slopes along some of the shorelines within the study area represent potential roosting habitat for this species. It is recommended disturbance to these areas is minimised. In general, potential roosting habitat correlates strongly with the presence of the coastal vine thicket Threatened Ecological Community and therefore avoidance of this community will also result in avoidance of potential Coastal Sheathtail Bat roosting habitat.

FIGURE 10. BROWN BOOBY (SOURCE: NICK ATHANAS)

WATERCOURSE AND WETLAND HABITAT

No Ramsar wetlands are located within the study area or within the broader region. Shoalwater and Corio Bays are the nearest Ramsar Wetlands and these are located over 200 km south of the study area. No referrable wetland areas as shown on the Queensland referrable wetland mapping are located within the study area. However, the Queensland referrable wetland mapping identifies some general ecologically significant wetlands along some of the shoreline of Lindeman Island. These areas of shoreline potentially provide habitat and foraging areas for shorebirds.

There is one large permanent water body created by the construction of Gap Creek Dam near the centre of the study area, which contains some aquatic vegetation and wetland habitat values. This water body and associated aquatic vegetation provides habitat for a variety of wetland bird species. There are no watercourses as shown on the vegetation management watercourse map within the study area, but one feature identified as Gap Creek is mapped on other State mapping layers. There are some ephemeral drainage features located within the study area in remnant and non-remnant areas. These features are located in steep and often rocky terrain with a very small catchment, and consequently they would likely only flow for very short periods of time immediately after rainfall events. These features do not sustain any significant aquatic habitat and there is no distinct riparian vegetation or additional biodiversity associated with them. The vegetation communities surrounding these

EXISTING DISTURBANCE AND HABITAT CONDITION

The main disturbance to remnant vegetation in the study area is the existing resort, runway strip, and golf course. These areas comprise maintained lawns and ornamental flora species, with some native vegetation retained or regenerated throughout. As discussed previously, the existing infrastructure has resulted in the removal and fragmentation of some native vegetation, but the overall viability and connectivity of the native vegetation communities present is generally intact. Lindeman Island has a history of multiple land uses, including grazing activities and different resort developments. The grassland around the existing resort has been modified and exotic species dominate much of this area. Native grasslands occur naturally on island headlands in the region, particularly on slopes with a south and southeast aspect. Many of the sloped grassland sites within the study area, particularly those with a southern aspect, remain relatively intact, with minimal exotic species invasion. However, the majority of flat grassland areas are comprised of exotic species, particularly Guinea grass. Disturbance in these areas is likely due to historical grazing activities, and the extent of this disturbance has resulted in the fragmentation of native grassland habitat. While the native grassland contains a low diversity of flora species and low fauna habitat value, invasion by exotic grasses represents a significant threat to the biodiversity values of this community. Exotic species invasion has also significantly impacted the biodiversity values of the Broad leaf tea-tree community. All other communities within the study area are generally intact, with exotic species invasion generally restricted to the margins of previously cleared areas.

PEST ANIMAL SPECIES

Evidence or direct observation of three pest species was detected during the fauna surveys, all of which commonly occur in disturbed habitats throughout Queensland. The following species were observed within the study area: Cane toad (*Rhinella marina*), Black rat (*Rattus rattus*) and Asian house gecko (*Hemidactylus frenata*).

13. SCENIC VALUES

FIGURE 11. LINDEMAN ISLAND SITE INSPECTION 28/04/15

Lindeman Island's key aesthetic values include its diversity of scenic landform, shoreline and seascape features. Part of the existing character of Lindeman Island is the perception that it is largely natural, low-key and relatively undeveloped, although the existing Home Beach node of development includes a golf course, dam, airstrip and the Club Med Resort (currently closed), and parts of the island which were formerly grazed.

The proposed Lindeman Great Barrier Reef Resort Project (including a longer airstrip and a golf course) has been planned and designed around the constraints and opportunities identified through site investigations, including scenic values and visual sensitivity. These have been analysed by the mapping of view sheds and visibility, which indicated that a high proportion of Lindeman Island showed no visible built form as seen from offshore, contributing to its character and perceived naturalness, with the exception of the existing resort visible within Kennedy Sound. The plateau area in the southern view shed (with the existing airstrip and staff quarters) has limited visibility. The intention to create an island resort environment which is integrated within its natural setting has also dictated the proposed built form, which will be mainly 2-storey villas plus 3.5-storey apartments demonstrating a highly sympathetic and organic architectural style. Apart from the 3.5 storey apartments and 4 storey hotel building, all built form is potentially capable of being screened or visually 'softened' between trees with only parts of the upper levels and roof forms visible. The 3 storey high Central Facilities building in the Spa Resort Precinct will be visibly prominent on the headland at Picaninny Point but will form an attractive iconic landmark through its organic architectural shape and materials.

As seen from external viewpoints, almost all the elements and features which contribute to significant aesthetic values will remain unaffected by development i.e. those which make up the diversity of landscapes and seascapes, the view from Kennedy Sound and the perceived naturalness of the island. The main exceptions will be the buildings at Home Beach although these will occupy only approximately 563 linear metres (3.35%) of the island coastline, will be visible only from the limited number of boats within Kennedy Sound and are within the existing resort and jetty area. When viewed from Kennedy Sound, the proposed redevelopment of the resort at Home Beach will also represent a significant improvement in comparison to the visually-intrusive hillside apartments of the existing resort. The earthworks for the extended airstrip which will involve some re-shaping of landform will also be visible, although this will be mostly concealed from external viewpoints and will be revegetated to integrate with the natural landscape. As a result of the constraints-based approach to planning and a range of design and mitigation measures for integrating the separate precincts into their landscape settings, the effects of the proposed development are considered minor and acceptable based on the findings of the view shed analysis and the proposed mitigation measures, as well as the design initiatives adopted. The proposed development, will cause visible changes to only a minor proportion of the island and it will not detract overall from its natural scenic amenity.

FIGURE 12. LINDEMAN ISLAND SITE INSPECTION 10/3/15

14. CULTURAL HERTAIGE

INDIGENOUS CULTURAL HERITAGE

The Whitsunday Islands and other central coastal Queensland Islands were originally occupied by the Ngaro people around 9,000 years ago with settlements concentrated at Nara Inlet on Hook Island (Barker, 2004). Following sea level stabilisation during the late Holocene around 3,000 years BP (Before Present) there was an increase in the use of sites in the Whitsunday Islands with many Islands settled by the Wiri, Yuibera and Yuwibara People. Sites on the islands reflect a pattern of maritime specialisation including exploitation of fish, shellfish and Green Turtle. Associated with this marine focus was a specialised technology consisting of bone points, fish hooks and detachable harpoons. Matthew Flinders observed campfires on Whitsunday Island, while Captain Phillip King, while sailing through the Whitsunday Passage in 1819 and 1820, noted the presence of Aboriginal fires on a number of islands (Rowland 1986:74). Commander Bingham in 1868 stated that Lindeman Island "*was the only island among those in the same area where natives were seen"* although traces of them were found on other islands (Blackwood, 1997: 127). Blackwood (1997: 127) suggested that "*Lindeman Island was the site of an Aboriginal Camp from time to time because of the reliable water supply in the stream at the southwest corner of the island*."

One (1) Aboriginal cultural heritage site is recorded on the DATSIP database on Lindeman Island, but outside the site and two (2) other recorded sites are on nearby islands. Based on the desk top review the objects/sites potentially present within the site are likely to include stone artefacts as isolated finds or within scatters and shell Middens - featuring surface and/or subsurface deposits of marine shell and often including other material such as the remains of fish, crustaceans and marine mammals and stone artefacts. Lindeman Island has been identified as part of the Ngaro People's traditional country (Barker, 2004, p. 29) and has been part of areas claimed by a number of native title groups, most recently the Yuibera People. There is currently no native title determination application over the island. Preparation of a Cultural Heritage Management Plan in accordance with the requirements of Part 7 of the *Aboriginal Cultural Heritage Act 2003* commenced in June 2016. The Cultural Heritage Management Plan will address the Indigenous heritage values listed in the *Great Barrier Reef Region Strategic Assessment 2014*.

NON-INDIGENOUS CULTURAL HERITAGE

The island has a long tradition of tourism development with the Nicholson's hosting the first of the Embury expeditions in Christmas 1928 where over 100 people camped along Home Beach in tents. Since the initial construction of the homestead and associated structures at Home Beach the site has been subjected to at least 11 phases of demolition and construction. These have ranged from relatively minor renovations to extensive reconstructions that included the addition of new accommodation buildings, entertainment areas and swimming pools. The Non-Indigenous Cultural Heritage assessment identified three Non-Indigenous Cultural Heritage sites within the project area, however only Site 1 - Airstrip was found to have cultural heritage value. The cultural heritage assessment concluded that the nature and level of impact on NICH by the project is manageable and that heritage recording compliant with the Draft EPA Guidelines for Archival Recording should be undertaken for Site 1 - Airstrips, prior to being developed. No historic sites listed in the Great Barrier Reef Strategic Assessment Report are located in the project area.

15. AIR QUALITY

The EIS provides an assessment of the air quality impacts associated with the construction and operation of the Lindeman Great Barrier Reef Resort. The key potential air quality impacts associated with the proposed development include particulate emissions during construction, odour emissions from waste storage and sewage treatment, and combustion emissions from diesel power generation. The sensitive receptors considered in the assessment include the receptors associated with the proposed resorts, sensitive ecological environments and the marine environment.

Predictions of pollutant concentrations were completed using the computational model CALPUFF for the activities associated with the operation of the redevelopment and Ausplume for the construction phase. Predictions were compared against the adopted air quality criteria from the Environmental Protection (Air) Policy 2008 (EPP Air).and other relevant guidelines. The results of the modelling for the construction phase indicate that the potential for nuisance dust, total suspended particulate, PM10 and PM2.5 impacts on resort areas are minimal provided that appropriate dust management measures are adopted. Exceedances of the deposited dust nuisance criteria are predicted for the protected vegetation located along the western shoreline and an area extending out 200 m from the shoreline to the south west of the six star resort. Given the conservatism incorporated into the modelling and the lack of evidence of adverse impacts on vegetation and marine park environments at these concentrations, the risk associated with the proposed development is considered to be low. Despite this, it is recommended that best practice dust management measures are adopted during construction of the resort areas on the island including:

- Regular use of water sprays on exposed areas of ground including any internal roadways to ensure soil moisture remains sufficient to suppress visible dust production;
- Minimising dust generating activities such as site clearing, levelling and preparation during dry and windy conditions; and
- Limit vehicle speeds on site and/or use of gravel on heavily trafficked haul routes.

Air quality impacts associated with the operation of the redevelopment and potential for cumulative impacts are predicted to be minimal. Predicted emissions for power generation are shown to comply with the relevant criteria for all modelled pollutants. Furthermore, predictions of odour emissions from waste storage and sewage treatment were shown to have minimal impact on the amenity of the proposed sensitive receptors (resort and staff accommodation). Given this, where all plant and equipment (including power generation and waste handling equipment) is adequately maintained in accordance with environmental best practice to ensure emissions are minimised as far as practicable.

16. SOCIAL

A Social Impact Assessment has been prepared for the project in accordance with the Coordinator-General's *Social Impact Assessment Guideline* (2013). The primary project area, Lindeman Island itself, has no permanent residents, and so the majority of impacts will be experienced in the key areas of employment, transport, and supplier activity around the two access points of Airlie Beach and Mackay. The redevelopment of Lindeman Island would operationally have a negligible impact on the mainland base from where people will depart for the Island, Airlie Beach. Unlike greenfield developments where a community would be facing a large change to its social fabric through the development of a resort of this scale, the Whitsundays, and their mainland base Airlie Beach, have long been involved in the tourism and associated industries. The area is well equipped and adapted to deal with community members moving in and out, for people moving through the area for their visits to the islands and workers going on and off shift, and therefore will have little difficulty in adapting to having an additional resort among the Whitsunday Islands (noting that there was already a resort on Lindeman Island until 2012).

Since project commencement consultation has been undertaken with key stakeholders (including Government agencies, peak industry groups, community organisations and business groups) to inform the Social Impact Assessment and the EIS. In March 2016 a Newsletter was issued to 144 stakeholders seeking views and comments on the proposed project. The proponent also commissioned and released a project website to provide information and the opportunity to provide comments on the project (http://lindeman.net.au). The proponent has also met with State and Local Members of Parliament, State/Commonwealth Government agencies and presented the project to Local Marine Advisory Committee in Airlie Beach and Mackay. The proponent is seeking wider community feedback during the EIS public notification phase to gather additional input on the social impact assessment of this project.

The Social Impact Analysis has found that there will be little community disruption associated with this project with employees largely being locals, with a minor proportion of FIFO staff (predominantly for specialists or unique skill sets). All staff, both locals and FIFO, during all construction and operation phases, will reside on-site on the island for the length of their shifts. Due to the proposed use of charter bus services and parking options, there will be very little, if any, transient population influx or non-resident people staying in the larger project area when they are not working. Due to the intention to hire 70% existing local workers during construction (and close to 100% during operations), there is no evidence to suggest that the project will have any impact on living costs nor affect demand on housing or other resources.

Strategically, the redevelopment brings investment and revitalisation of an existing asset on the Whitsundays, with a large part of the works being undertaken on already developed lands, with only a minor proportion of works occurring in greenfield sites. Capitalising on the current economic climate to provide visitors a greater choice in accommodation and experiences in the Whitsundays is a positive direction for the region, which is experiencing an economic adjustment period since the nearby mining boom has subsided. Socially the proposed development has negligible and minor negative impacts due to its location on a primarily uninhabited island, however there are a range of impacts to the greater region that should be addressed as outlined in the Environmental Management Plan. Overall, the assessment has identified that the overall social benefits of this project outweigh any risks and negative impacts.

17. ECONOMIC

The economic assessment undertaken as part of the project seeks to quantify the direct and indirect economic impacts on local, regional and State economies arising from the restoration of a key tourism asset to operational status. The assessment has found that overall the construction and operation of the proposed resort will have significant impact on Regional GDP with a final development cost of approximately $583 million generating total employment during construction of 1,750 person years (FTE) in the Mackay Region. Potential benefits and costs along with any relevant positive or negative externalities have been valued, where reasonable, and results of the assessment are presented as the net present value of the project. The economic assessment also provides an analysis of the region economy, population, likely labour demand, transport infrastructure networks, housing market costs and local business and supply chain associated with the proposed project.

The proposed redevelopment and expansion of the Lindeman Island Resort is expected to provide large positive community benefits. In summary, the key economic benefits of the project include:

- Restoring a key tourism accommodation facility to operational status;
- Assisting the Region to attain its goal of almost doubling visitor expenditure (as included in the State's DestinationQ Blueprint) through the reopening and expansion of a key tourism facility;
- Adding $480m during construction to the Mackay Region's Gross Regional Product over a three and a half year period;
- Generating total employment during construction of 1,750 person years (FTE) in the Mackay Region. Due to the expected three and a half year construction period, this translates to an average of 490 persons (FTE) over this period;
- Adding $140m (gross) or $100m (net) during operations to the Mackay Region's annual Gross Regional Product, where "gross" assumes that all visitors would not have otherwise stayed elsewhere in the Region and "net" assumes that 30% of visitors would have stayed elsewhere in the Region;
- Generating total employment during operations of 800 (gross) and 560 (net) (FTE) persons in the Mackay Region, where "gross" assumes that all visitors would not have otherwise stayed elsewhere in the Region and "net" assumes that 30% of visitors would have stayed elsewhere in the Region;
- Generating a Net Present Value to the community of between $83m and $357m, indicating that the project should proceed;
- Generating a positive impact upon the local marine transport operators through the need for a significant increase in visitors being transported between Lindeman Island and the mainland; and
- Generating a positive lift in backpacker visitors to the Region, as an increase in operational staff stimulates this market, which is an important source of operational labour.

The high quality of the proposed resort facilities and expected growth of the tourism market will also ensure that it will mostly target a new market for the Whitsundays, thus limiting the extent to which the proposed resort facility would simply take trade from existing Whitsunday tourism operations.

18. NOISE AND VIBRATION

The Lindeman Great Barrier Reef Resort has been planned and designed and will be constructed and operated to protect the environmental values of the acoustic environment. The Noise and Vibration chapter of the EIS provides an assessment of the current and proposed airborne noise and vibration impacts associated with the construction and operation of the development against the current relevant statutory criteria, in particular the *Environmental Protection Act 1994, Queensland Environmental Protection (Noise) Policy 2008* and Department of Transport and Main Road's Construction Noise Guideline. As the resort is currently not operational, noise from the existing noise sources was referenced but not separately assessed as a part of this assessment, as noise sources on site will be subject to change once the construction and operation of the development commences.

The noise and vibration assessment has identified that construction of the project will result in predicted exceedances of the *Department of Transport and Main Roads Transport Noise Management Code of Practice - Construction noise criteria* for a number of the proposed construction scenarios. General noise mitigation measures to minimise construction noise impacts as far as possible have been identified. Any predicted exceedances are generally a result of very quiet ambient noise levels, and therefore stringent criteria, combined with large numbers of plant that have been adopted for each modelled scenario. This modelling has been carried out to provide a worst case scenario and it may be possible to reduce the number of plant on site and still provide the same level of operations by making processes more efficient. Ground vibration levels at 75 metres from driven piling, and general construction activities are expected to range between approximately 0.01 and 1.2 mm/second at the nearest receiver. Based on this, the estimated vibration level at all sensitive receivers near to the proposed Zone 3 site is likely to comply with both the human comfort and building damage criteria adopted for this project.

Operationally, predicted aircraft noise levels from the proposed airstrip upgrade are likely to impact the proposed development and as such indicative building construction requirements based on Queensland Development Code MP4.4 have been identified in this report. Predicted noise levels from truck movements are expected with thein daytime and evening noise limits. Operational truck movement operations should be limited to 3 trucks per day and should operate during daytime only. Based on the worst case scenario of 4 diesel generators running simultaneously, the predicted noise levels from the proposed energy plant is expected to exceed both daytime and night-time EPA noise limits. Therefore, an enclosure or noise barriers located around the diesel generators has been recommended. Predicted noise levels from the proposed water treatment pump and from a medium boat docking is expected to comply with the adopted assessment noise limits. Exceedances are predicted for docking boats with a maximum sound power level of 100 dB(A) or a sound pressure level of 78 dB(A) @ 5 metres. Boat docking activities are recommended to be limited to the daytime (7am to 6pm) and evening (6pm to 10pm) period only.

The closest habitable island from the development is Hamilton Island and is located approximately 13 kilometres away from the proposed development. Based on the distance of Hamilton Island from the proposed development, assessments have identified that there should be no short or long term adverse noise impacts from the proposed development on the nearest receivers.

19. WATER QUALITY

Water quality is naturally variable, and is dependent on numerous factors such as land use, catchment management practices, antecedent conditions, soil types, climatic and seasonal factors and in-stream processes. The water quality objectives for the assessment were sourced from the *Environmental Protection (Water) Policy 2009 - Proserpine River, Whitsunday Island and O'Connell River Basins Environmental Values and Water Quality Objectives*, and associated plans. The *Water Quality Guidelines for the Great Barrier Reef Marine Park 2010* were also referenced. The majority of Lindeman Island is classified as Whitsunday Island freshwater with High Ecological Value (HEV) for Aquatic Ecosystems, however the existing and proposed developed area of Lindeman Island (with the exception of glamping area on the western coast) is not included in this area and is therefore classified as Moderately Disturbed Freshwater.

As the freshwater streams on Lindeman Island are ephemeral limited opportunity exists to undertake baseflow monitoring, however despite this two rounds of event based water quality testing were able to be conducted at the site within the waterways. The water quality testing identified that that current water quality meets the specified objectives. In June, at site LIND06 there was an elevated level of Total Suspended Solids (TSS). In accordance with the Geotechnical Assessment undertaken for the project it is unlikely there are substantial groundwater resources on the island and as such this resource is not relied upon for any water supply and was not further assessed.

The stormwater and water management strategy for the Lindeman Great Barrier Resort Project aims to reduce the pollutant load being discharged to streams that drain to the Great Barrier Reef Marine Park with measure to be adopted that:

- Re-uses rainwater, reducing potable water demand and stormwater pollutant loads;
- Treats and re-uses wastewater for non-potable uses on site;
- Minimises the potential sources of stormwater pollutants;
- Treats stormwater runoff to remove sediment and nutrient load;
- Replicates existing flow patterns;
- Reduces potential for scour and erosion;
- Integrates open space with stormwater drainage corridors and treatment areas to maximise public access and recreation and preserve waterway habitats and wildlife corridors.

MUSIC modelling undertaken as part of the EIS has identified that stormwater quality across all measures (Total Suspended Solids, Phosphorus, Nitrogen and Gross Pollutants) are predicted to improve as a consequence of the proposed development due to increased treatment (buffer strips, bio-retention basins, constructed wetlands and gross pollutant traps), stormwater re-use and proposed revegetation around the site. Appropriate measures to control erosion and sediment will be implemented during the construction phase. Further additional water quality testing is proposed at the terrestrial and marine sites prior to the commencement of construction.

20. WATER RESOURCES

The resort's current and proposed water supply source is Gap Creek Dam located to the north of the existing resort development. No extraction of groundwater resources is proposed due to the limited nature of this resource. Recycled water produced at the new wastewater treatment plant is proposed to be used for a range of non-potable uses within the development, including toilet flushing, washdown 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.

A water balance model was set up in GoldSim to determine the water demand for the site and likely reliability of supply, noting that in accordance with the Geotechnical Assessment, it is unlikely there are substantial groundwater resources and as such no extraction or use of this resource is proposed. The GoldSim model was set up based on 50 years of climate data from 1950 to 1999 for Lindeman Island, sourced from Queensland Government Department of Science, Information Technology and Innovation (DSITI) SILO program. The GoldSim model was able to model the complex interactions between different water demands and flows. It was also able to model the potential impact that reduced rainfall could have on the reliability of supply.

The water balance modelling in GoldSim for the proposed development identified that additional sources of water were required for a reliable source of water. The proposed water strategy for the site includes:

- Diversion of an additional 27 hectares towards the dam;
- Water efficient fittings and appliances will be used;
- Water saving showers to be installed in preference to baths and spas;
- Awareness programs for guests and employees will be run to encourage efficient use of water;
- A minimum 10kL rainwater tank will be installed at each villa which will be connected to a minimum roof area of 100m2. The rainwater tank will be used for pool top up and toilet flushing;
- A 500kL rainwater tank (total combined size) for resort pool top up will be connected to 3500m2 of roof area;
- A 350kL rainwater tank will be connected to a minimum of 6300m2 roof area surrounding the WTP. This will be used as a first preference for water for the WTP;
- Recycled water will be used for toilet flushing (communal areas and resort units), laundry, irrigation and washdown; and
- Backflow recycling tanks will be used for all pools.

The resultant total water demand for the site was 160.1 ML/year including irrigation and pool top up. This would be supplied on average by 75.0 ML/year from the dam; 21.2 ML/year from rainwater tanks; 18.3 ML/year from recycled water for non-potable internal demands; and 45.6 ML/year from recycled water for irrigation. This is equivalent to a total water demand (including pool top up) of 325 L/EP/day. With the proposed water recycling, improved water efficiency and rainwater harvesting the demand from the dam compared to the existing resort development has reduced from 103.0 to 75.0 ML/year.

The proposed water supply for the resort (dam and rainwater tanks) will only capture a small component of the total water that flows over the site and will have a minimal impact on the flow regimes and volume of water discharged to reef waters during a rainfall event.

In accordance with the *Water Supply Safety and Reliability Act 2008* a Drinking Water Quality Management Plan will be prepared and submitted to the regulator for approval. The Plan will include contingencies for provision of water supply requirements in the event of a failure of the main supply. The levels within Gap Creek Dam will be closely monitored. A Water Contingency Action Plan will be developed in consultation with the regulator and implemented in the event of an unexpected failure of the main water supply to the resort or low dam levels.

FIGURE 13. GAP CREEK DAM (28/04/15)

21. FLOODING

A hydrologic analysis for Lindeman Island was carried out using Watershed Bounded Network Model (WBNM). The catchments contributing to flow into the dam and Lindeman Island resort extend over the south-western part of Lindeman Island. The runoff from the eastern part of the study area generally flows in a southerly or westerly direction to the existing airplane runway and staff accommodation areas. The waterway then has its confluence with the outflow from Gap Creek Dam, near the golf course. The combined flow then discharges to the western coast of the island. Small catchment areas discharge runoff to the southern coastline of the island. Temporal patterns and rainfall intensities for Lindeman Island were determined in accordance with Australian Rainfall and Runoff (AR&R). A rainfall on grid TUFLOW model was initially developed for the study area to determine the key flow paths on the island, especially in the flatter areas in the tableland at the top of the island. The rainfall on grid model was also used to confirm catchment boundaries and inflow points. The total size of the catchment in the study area is approximately 189 hectares. The percentage impervious for each sub-catchment was determined based on aerial photography and site inspection and totals approximately 4.93%. The 1% AEP event was analysed for a range of storm durations to determine the range of critical durations throughout the catchment.

Detailed hydrologic and hydraulic modelling shows that for the proposed development the 1% AEP flood event in the Gap Creek catchment there is flooding in the vicinity of some of the proposed buildings including the aircraft hangers, and a small part of the tourist villa district located east of the runway. These issues will need to be addressed during the detailed design of the site.

The proposed extension to Gap Creek Dam will increase the catchment area contributing to the dam but not all inflows will be diverted into the dam due to environmental restrictions on works in this area. During small rainfall events, a new waterway will direct flow contained in the main channel of the creek to the extension of the dam. During medium to large rainfall events, some of the runoff from the additional catchment will be directed to the dam, but the remainder will continue in a southerly direction along the existing floodplain.

The flood assessment also included a dam break analysis. In a dam-break scenario the sudden release of a large volume of water from the dam has the potential to overtop the existing ridge near the golf course, allowing flow to discharge towards the resort area. A dam crest failure has the potential to increase the population at risk, therefore it is recommended that the elevation of the existing earth bund be raised through earthworks by 500 mm and that no buildings be sited in the area that would be inundated during a dam failure event.

Average annual rainfall is not likely to change as a consequence of climate change, however there is likely to be an increase in rainfall intensity during the wet season and likely reductions in rainfall intensity in dry seasons. The flood assessment included an analysis of the Probable Maximum Flood Event, which is not affected by climate change.

22. BIOSECURITY

Flora studies undertaken by Northern Resource Consultants (2016) identified a total of 30 existing exotic species across the Lindeman Island resort. The area for this survey covered the resort perpetual and term lease areas of Lindeman Island. A number of these species are present throughout the existing resort grounds and gardens, with others persisting in native regrowth and non-native grassland areas. While a total of 30 exotic species have been recorded, not all represent a significant environmental threat. The proposed development of the resort has the potential to introduce exotic plant species not previously recorded on Lindeman Island through the construction and operational phases of development. Furthermore, there is the potential for native species from outside of the region to be introduced that could become pests (e.g. *Corymbia torelliana*). These species have the potential to pose serious local environmental impacts if they are permitted to invade. Exotic species of particular note include *Pennisetum polystachion* Mission grass*; Cryptostegia grandiflora* Rubbervine and *Opuntia spp. Opuntia* cactus. A Pest Management Plan is proposed which documents management strategies to mitigate this risk.

The Northern Resource Consultants 2016 study recorded the cane toad (*Rhinella marina*), black rat (*Rattus rattus*) and Asian house gecko (*Hemidactylus frenata*). Under Schedule 2 of the *Public Health Act 2005*, rats are prescribed as designated pests. Provisions of the *Public Health Regulation 2005* provide local governments with guidance on the requirements of proofing from rat entry and ensuring rats do not live or breed on land around a dwelling. The cane toad is considered a significant pest in Queensland (Department of Employment, Economic Development and Innovation, 2010) but is not scheduled under the LP Act. The Asian house gecko is considered a significant threat to the abundance of native gecko species across its naturalised range (Department of Employment, Economic Development and Innovation, 2009). The species is common throughout many parts of Queensland in domestic environments.

The proposed development of the resort has the potential to introduce exotic animal species not recorded on Lindeman Island previously through the construction and operational phases of development (e.g. tramp ants, cats and feral pigs). These species may have the potential to pose serious local environmental impacts if they are permitted to invade. A Pest Management Plan is proposed which documents management strategies to mitigate this risk.

Marine pests have the potential to pose serious economic, environmental, and social impacts if they are permitted to invade. In this regard it is proposed to educate harbour visitors about the voluntary national biofouling management guidelines under the National System for the Prevention and Management of Marine Pest Incursions and ensure rigorous inspection and cleaning of niche areas of commercial vessels using the jetty, barge landing point and also moorings.

23. BUSHFIRE ASSESSMENT

The proposed development is located adjacent to areas of bushland and grassland habitats that are bushfire prone and within which fires periodically occur either due to natural causes or as part of the active a management for hazard reduction and nature conservation purposes. The presence of bushfire prone areas on Lindeman Island will expose human health and property to a risk of harm and as such bushfire hazard and risk management measures need to be implemented as part of the design and ongoing operation of the proposed development. This requirement is accentuated by the fact that the proposed resort is located on an island and cannot be readily serviced by Queensland Fire and Emergency Services (QFES) firefighting resources that are based on the mainland.

The Bushfire Hazard and Risk Assessment (BHRA) provides an assessment of the post-development bushfire hazard levels to identify bushfire hazard and risk mitigation recommendations that are designed to ensure that human health and property is not exposed to an "unacceptable" risk in the event of a bushfire. Provided that appropriate consideration is given to the implementation and maintenance of bushfire hazard and risk mitigation measures, including necessary resourcing and training of resort staff, the resort's infrastructure.

24. WASTE MANAGEMENT

A range of environmental controls and mitigation measures have been recommended to minimise potential risks to the environment associated with waste management practises for the Lindeman Great Barrier Reef Resort. These measures will include regular monitoring and inspections, tracking of wastes, and regular audits of waste streams to identify opportunities for increased reuse and recycling, and improved waste management practices. Engineering and procedural controls, such as construction of bunded containment areas, covering bins and stockpiles likely to generate odour or litter, and aeration of composting materials, have also been recommended to minimise the potential environmental impacts of waste management. Based on the implementation of the above proposed mitigation measures, potential impacts to the environment from unmanaged waste are considered unlikely during and following the proposed redevelopment works.

The waste management strategy focuses on avoiding waste generation during construction and operation wherever possible, through implementation of procurement policies, planning and scheduling, training and awareness, and specific work practices.

25. SITE CONTAMINATION

Land contamination could potentially result from the spillage or on-site disposal of hazardous materials or wastes generated by the demolition of the existing resort and construction and/or operation of the resort. This potential for impact includes the potential for impact and disposal of dredging materials and sediments on land (if required). Project materials and wastes will be managed in a manner that will prevent such contamination. It is the specific intention of the proponent that project construction and operation activities will not cause contamination that will result in the land requiring listing on the Environmental Management Register or Contaminated Land Register. Procedures for the proper storage and management of hazardous materials are detailed in the Environmental Management Plan, the Hazard and Risk chapter of the EIS and the Emergency Management Plan.

Chemicals, fuels, oils and any other substances such as liquid wastes that, if spilled would cause pollution or contamination of the land or water, will be stored appropriately to minimise the risk of environmental impact. Chemical storage will comply with Australian Standards and Safety Data Sheets (SDS) requirements. SDS for products kept on site will be readily available to employees and contractors. Smaller quantities of chemicals, fuels

and oils will be stored in self bunded pallets, within a bunded area in the workshop, or in a bunded container on the site. Diesel will be kept in bulk quantities (up to 130,000 L) in double skinned tanks (self-bunding). Waste products, (e.g oil/water separator waste, sludges and residues), will be contained within weatherproofed, sealed and bunded areas to ensure stability of the waste containment receptacles and prevent any leakages or spills causing environmental harm to soils, surface water or groundwater. Regular inspections will be carried out of the tanks, bunds and storage areas to ensure integrity. If additional baseline contamination sampling is required additional to the intrusive investigations is required to manage construction risk, this will be carried out immediately prior to commencement of demolition and construction.

Whilst every care will be taken to avoid contamination of soils, if soil contamination does occur, this will be disposed to landfill or a constructed containment cell on the island with the relevant approvals if required.

26. ACID SULFATE SOILS

Acid Sulfate Soils (ASS) are the common name given to naturally occurring sediments and soils containing iron sulphides. The Queensland Acid Sulfate Soil Technical Manual (2014) stipulates that ASS is associated with low lying areas below 5m Australian Height Datum (AHD) include sediments of recent geological age (Holocene) within marine or estuarine sediments and tidal lakes. ASS can be found or can form in any anoxic, aqueous environment where sulfate-reducing bacteria are provided with organic matter (their energy source) and available sulfate ions. Examples include bottom sediments in drains, dams, constructed and natural waterways, swamps and billabongs, periodically stagnant creeks and places with perched watertables. These environments are not restricted to coastal areas.

The Cretaceous age of the volcanic geology of Lindeman Island is not typical of geologies which contain ASS. Consequently no previous ASS surveys have been carried out by QASSIT on Lindeman Island. An ASS Natural Hazards Overlay Map provided within the 2009 Whitsunday Shire Planning Scheme identified no areas underlain by ASS are shown for Lindeman Island. Additionally, a visual inspection of the sides and bottom of existing turning basin and navigation channel (carried out by Cardno Marine Ecologists on 19-21 January 2016) noted the absence of lenses of sediments and soils below the coral and coral derived surface material.

Given the above lines of evidence and based on an overall understanding of the likelihood of distribution of ASS in similar geologies across Australia, additional intrusive investigations to confirm the absence of ASS is not considered warranted on Lindeman Island. Management measures to manage any residual risk from naturally occurring soil acidity would include soil baseline sampling and pH testing during construction to ensure acidic soils disturbed are suitable for landscaping and do not generate an inappropriate level of risk to waterways.

27. INFRASTRUCTURE

ENERGY SUPPLY

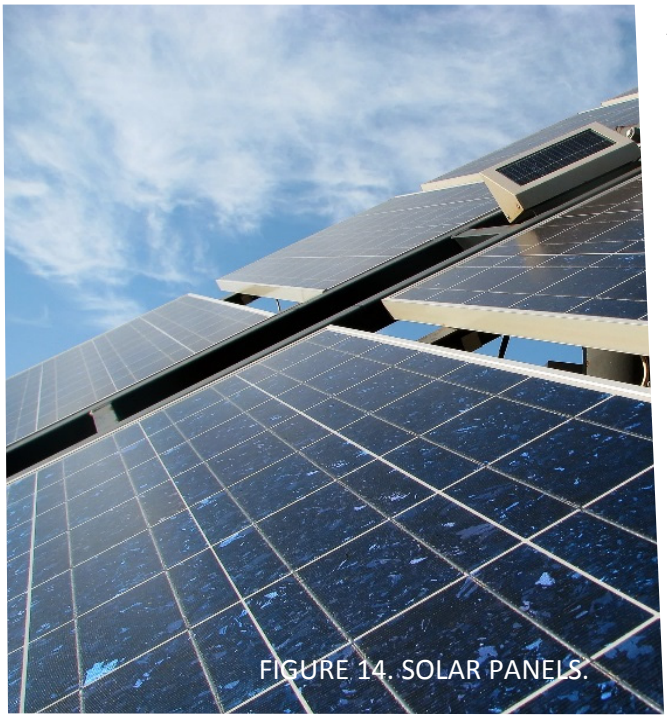

FIGURE 14. SOLAR PANELS.

A solar-diesel system is proposed to provide for the resort's energy requirements. Due to the limited available land area for ground-mounted solar arrays, the level of solar energy that is likely to be achieved is 35% to 44% of the total energy consumption (based on masterplan dated November 2016). The estimated capital investment for this level of renewables is between $15M to $25M, with an estimated payback period between 3 to 8 years, depending on the timing of investment and load demand/energy consumption. The exact level of renewable energy investment will largely depend on capital costs, return on investment, sustainable operating costs as well as land area which is available for the installation of ground mounted solar arrays.

The target buildings for the installation of roof-mounted solar panels are located around the central village, retail precinct, staff accommodation and the aircraft hangars. In addition to the centralised roof-mounted solar panels, the concept design proposes the installation of ground-mounted solar panels to provide the necessary solar generation capacity to displace the amount of diesel usage. The recommended land areas for the installation of ground mounted solar arrays are well hidden from the general view of the guest living and accommodation areas, and do not detract from the vision of having minimal impact both visually and environmentally. These land areas are also reasonably flat, and largely devoid of natural vegetation and/or are outside of the protected vegetation areas, as shown on the master plan. The existing powerhouse area (which is between the Retail Precinct / Commercial Centre and the Aircraft Hangers, shown circled below) is ideally suited to house the central energy storage system, power management and "mini-grid" control systems. This location was previously used for the diesel generators to power the island from its central location and has been preserved for the same intention in the latest masterplan.

WASTE WATER INFRASTRUCTURE

A new wastewater treatment plant will be constructed to produce recycled water suitable for use within the development for the proposed uses. 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 one megalitre. This capacity provides treatment for three times the average dry weather flow based on 100 percent occupancy at an equivalent population of 1,478 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 – Sewerage treatment works under Schedule 2, part 13, item 63 of the Environmental Protection Regulation 2008, which is 200 L/EP/day. 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 percent 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. If discharge is required from the recycled water storage tank, flows will be discharged via Gap Creek downstream of the dam. All discharges of recycled water from the Lindeman Great Barrier Reef Resort development will meet the requirements of the Great Barrier Reef Marine Park Regulations 1983 and the Great Barrier Reef Marine Park Authority Wastewater Discharge Policy 2005 for Wastewater Discharges from Marine Outfalls to the Great Barrier Reef Marine Park. With regard to E.coli levels, the adopted treatment standard is more stringent than required by the regulations.

Recycled water will be discharged to land via irrigation of the golf course and landscaped areas across the development. The estimated total annual volume for discharge via irrigation is approximately 67 ML. This is based on the results of Modelling of Effluent Disposal via Land Irrigation (MEDLI) modelling. MEDLI identified that based on a 50 year modelling period, and adopting a range of conservative assumptions relating to per person water use and resort occupancy rates, no recycled water is required to be discharged to the ocean via Gap Creek downstream of the dam wall, except during extreme wet weather events when irrigation is unable to occur and storages are at capacity. Based on the above, it is considered a storage of 12 ML will provide sufficient storage of all recycled water. The modelling is based on the previous 50 years of climate data. Changes in weather patterns resulting in prolonged or extreme wet weather events may result in discharges of recycled water.

Management strategies will be developed and implemented to monitor the performance of the wastewater collection, treatment and reuse infrastructure. Prior to operation, a monitoring program of the receiving environment will be implemented to establish background data. Regular sampling and monitoring of the receiving environment will be carried out during the operation of the collection, treatment and reuse scheme and compared to the initial background data to monitor environmental impacts. In the event a negative impact is observed, actions will be taken to minimise the impact and avoid further impacts. Actions may include ceasing of irrigation within a nominated area, or increasing storage capacities within the collection system, or at the treatment plant.

FIGURE 15. PROPOSED WASTEWATER INFRASTRUCTURE

WATER TREATMENT PLANT

A new water treatment plant will be constructed to produce potable water in accordance with the Australian Drinking Water Guidelines (NHMRC & NRMMC, 2004) suitable for use within the development. The treatment plant will 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 plant 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. The detailed specification of the treatment system will be confirmed during the final design phase.

The water treatment plant will be sized to meet the demands of the development based on the conservative design assumptions of 100 percent occupancy and the water treatment plant providing all water demands (that is, assuming no use of recycled water). Based on an equivalent population of 1,478 EP, the plant will have the capacity to produce a daily flow of potable water of 0.44 ML. Potable water will be stored in a 3 ML potable water storage tank located at the water treatment plant. This includes an allowance of 0.14 ML for firefighting purposes, and an emergency storage of seven days average day demand or 3.5 days peak day demand.

Recycled water produced at the new wastewater treatment plant will be used for a range of non-potable uses within the development, including toilet flushing, washdown and irrigation of the island's golf course and landscaped areas. The volume of recycled water available will vary with occupancy. Desalination of seawater is not proposed for the provision of drinking water supply requirements of the Lindeman Great Barrier Reef Resort Project but is proposed to treat the water from the lagoon prior to pumping to the . Gap Creek Dam has a 10 to 15 metre wide spillway channel located at the western end of the main wall. The spillway is approximately 1.7 m lower than the crest of the wall. A new transfer main will be constructed to transfer raw water from the spillway to the new water treatment plant.

The existing water treatment plant consists of coagulation, settling, media filtration and UV disinfection with an estimated maximum treatment capacity of 600 kL/day. Treated water is stored in two 600 kL storage tanks adjacent to the plant. The treated water is pumped to a Clearwater Storage tank located on a high point to the southeast of the airstrip. Treated water is then distributed throughout the network under pressure. The water treatment plant is providing water for domestic purposes on the island. Bottled water is used for drinking and cooking. This approach will be maintained during the construction phase until such time as the Clearwater reservoir is decommissioned or works impact on the existing distribution network. At this time, the new water treatment plant and distribution network will be constructed to provide both potable and non-potable water demands during the remainder of the construction phase. Sampling and monitoring of the water supply from the existing water treatment plant will include weekly testing for process monitoring and to ensure the water is safe for the intended uses (i.e. non potable). As bottled water is to be used for potable uses, quality monitoring is not required.

Following commissioning of the new water treatment plant, a sampling and monitoring program will be developed in accordance with the regulator's Planning Guidelines for Water and Sewerage which requires where there is a reticulated drinking water supply, water of drinking water quality should be used for human consumption, food preparation, utensil washing, oral hygiene and bathing (AS/NZS 3500, AS/NZS 4020, WSAA, 2002, Water Supply Code of Australia). All potable water supplies to the Lindeman Island development will be required to comply with the Australian Drinking Water Guidelines (NHMRC & NRMMC, 2004).

DESALINATION PLANT

The proposed lagoon at the Beach Resort will be filled with seawater pumped from the ocean in accordance with required permits. Water to be discharged from the lagoon as part of the cleaning and maintenance program would be pumped to a small desalination plant to be installed near the lagoon to remove the salt concentration of the water. This water would then be pumped to the sewage treatment plant for treatment prior to discharge on the site. 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.

The desalination plant is to be located at the eastern end of the lagoon pool. An intake system will convey seawater from the ocean to the lagoon pool via an intake pipeline located in the marine water to the south of the lagoon pool. Seawater will enter the pipeline through an intake head with screening designed to minimise the ingress of marine fauna. The design, construction and operation of the intake system will be in accordance with regulatory requirements and standards to consider:

- Location and alignment of intake structure to minimise entrainment or entrapment of marine organisms or sediment taking into account distance from seabed and mean sea levels,;
- Low seawater intake velocities to minimise disruption to marine life;
- Screening of seawater to restrict ingress of marine fauna;
- Prevention of erosion of seabed around the intake structure; and
- The requirements for dosing of anti-fouling chemicals into the intake pipeline. Any chemicals used in the intake system will be prevented from release into seawater through incorporation of control interlocks and appropriate flushing to prevent chemical residuals remaining in the intake pipeline.

A monitoring program will be developed to monitor entrainment of marine biota.

TELECOMMUNICATION

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.

28. TRANSPORT

The region generally is highly accessible, with airports in Mackay, Proserpine and Hamilton Island and supporting infrastructure already well developed in order to support the established tourism industry in the region. The majority of deliveries, staff and resort guests will arrive by barge or ferry from Shute Harbour.

MARINE

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 (Tp) greater than 2s (Hs ≥0.3m) 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 (Hs ≥0.3m). However, larger vessels (>20m), such as a barge, are able to tolerate slightly higher waves and hence be affected by wave conditions less frequently. The smaller ferries that operate in this region are 25m long and the bigger catamaran is 35m long. For these vessels one can adopt Hs ≥0.4m as the limiting safe operation wave height. These conditions are equalled or exceeded for 18% of the time, about 66 equivalent days per year, on average.

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 include:

- 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 Great Barrier Reef Marine Park 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.

Proposed 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.

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 GMO233. 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.

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.

AERONAUTICAL

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, 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. 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.

RESORT ACCESS

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

MAINLAND ROAD TRAFFIC

A scoping assessment for the state controlled road network has determined that the project will have significant construction traffic impacts on the state controlled road network and further assessment will be required. It is noted that the operations deliveries have not been estimated due to a lack of information with regards to the anticipated operations. With respect to workforce trips, a significant impact will be generated for the section between Flametree and Shute Harbour. In terms of delivery trips, relating to heavy vehicles, the entire length of Proserpine-Shute Harbour Road will need to be assessed, as all sections exceed the 5% threshold. Until such time that assumptions regarding vehicle movements can be defined with more certainty, a pavement impact assessment should be delayed due to the potential variability of the outputs. It is recommended that the Coordinator General should condition that a scoping assessment and potentially a pavement impact assessment be undertaken once these items have more certainty.

29. RISK AND HAZARD

The risk assessment identifies key risks to the environment, health and safety arising from the construction and operation of the project. The EIS assesses the potential impacts associated with these risks and details the measures which are proposed to mitigate the identified impacts. The construction and operation of the site will be undertaken in accordance with a series of management plans which include these management measures and provide relevant performance criteria, monitoring and recording commitments, and corrective actions in the event of failure to achieve the performance criteria. Consultation has been undertaken with Local Disaster Management Groups as part of the preparation of the EIS through seeking a response to the Stakeholder Newsletter issued in March 2016 and discussions with the Department of National Parks, Sport and Recreation associated with bushfire management.

The following key measures are proposed:

- An overarching Environmental Management Plan (EMP) has been developed to guide the management of the project and incorporate key commitments of the EIS. The EMP provides performance criteria to minimise the impacts of the Project on the surrounding physical and social environment during the construction and operational phases, provides mechanisms whereby the environmental performance of the works can be measured, and specifies corrective actions in the event of non-compliance with the stated criteria.

- An Evacuation and Emergency Response Plan (EERP) will be prepared for the resort construction and operation and will include specific provisions relating to training, criteria for declaring an emergency, emergency contact details, onsite plans to handle emergencies, a description of the mechanisms to alert people to an emergency, emergency procedures and evacuation routes and procedures (e.g. bushfires; flooding; disease outbreak). The plan will be developed in consultation with the Local Disaster Management Group, Queensland Health, Emergency Services, and other stakeholders to determine most efficient and practical management and transport procedures (e.g. transport to Proserpine or Mackay).

- All Project staff will undergo a mandatory induction process which will include first aid training, evacuation and emergency response training and basic fire training. All Project staff shall receive training for general environmental responsibilities, site-specific values such as ecological values and features to be preserved (onsite and offsite), environmental management controls, particularly in relation to water quality;

- A Natural Disaster Strategy will be developed in consultation with key local and State agencies to respond to all possible natural disasters that may occur. The strategy shall reference the *Whitsunday Disaster Management Plan 2014* in the nomination of mitigation measures to protect the community and community assets from identified natural disasters which may impact all or part of the Whitsunday Region.

30. MANAGING ENVIRONMENTAL IMPACTS

An Environmental Management Plan (EMP) has been prepared on behalf of White Horse Australia Lindeman Pty Ltd to protect the environmental, social and cultural heritage values of the island and surrounds which could potentially be affected by the project, during both the construction and operation phases. The EMP would apply to land and marine based construction and operational activities required to achieve the protection of environmental values and compliance with legislative standards. It establishes the framework, including environmental protection objectives, standards, measurable indicators and management strategies to ensure that environmental values are protected during each stage of the project. This is also achieved by specifying monitoring, reporting and auditing requirements, with nominated responsibilities and timing, to ensure that the commitments are met. The EMP also identifies corrective actions if monitoring indicates that the requirements have not been met for the following elements:

(a) Terrestrial Ecology;

(b) Marine Ecology;

(c) Coastal;

(d) Scenic amenity;

(e) Cultural Heritage;

(f) Site Contamination;

(g) Water resources;

(h) Air Quality;

(i) Noise and Vibration;

(j) Social and Economic;

(k) Waste management;

(l) Transport and Traffic; and

(m) Hazard and Risk.

31. CONCLUSION

Tourism investment is of critical importance to the Queensland economy. Tourism creates and sustains jobs, generates export revenue, strengthens and diversifies regional economies and provides opportunities for people to have nature based experiences.

White Horse Australia's proposal to redevelop the existing resort at Lindeman Island has been designed to protect the Outstanding Universal Values of the Great Barrier Reef World Heritage Area and set new standards in sustainable tourism. The proposal by White Horse Australia will create approximately 800 (gross) and 560 (net) (FTE) persons in the Mackay Region and will add $480 million during construction to the Mackay Region's Gross Regional Product over a three year period. It will also generate a Net Present Value to community of between $83 million and $357 million. The project is consistent with key tourism policies in the State Planning Policy, Mackay, Isaac and Whitsunday Regional Plan, Queensland Ecotourism Plan 2016 - 2020 and the Mackay Destination Tourism Plan 2014 - 2020.

The project has been determined to be a "Significant Project" pursuant to Section 26 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act) due to the economic, social and environmental impacts associated with the project. The project has also been declared a "controlled action" under the provisions of the *Environmental Protection and Biodiversity Conservation Act 1999* due to potential impacts on matters of national environmental significance including the Great Barrier Reef World Heritage Area, the Great Barrier Reef Marine Park, Great Barrier Reef National Heritage Place, listed threatened species, threatened ecological communities and migratory species. This EIS has assessed potential impacts on these matters of national environmental significance, as well as the project's other environmental, social, economic and cultural values. It has included an assessment of baseline conditions and potential impacts or risks, including direct, indirect and cumulative impacts. The hierarchy adopted in the EIS for managing likely impacts has been avoidance, minimisation, mitigation and lastly the offset any residual impacts.

The proposed masterplan layout seeks to revitalise an existing tourism asset and represents the redevelopment of an existing tourism node that first commenced operations in 1928. The existing resort is focussed on the south-western corner of Lindeman Island with accommodation housed in 14 wings with a central facilities building adjacent to Home Beach. The existing reception facilities, Nicholson's Restaurant, conference rooms and staff accommodation are located on the plateau above the resort at Home Beach. All service areas including power generation plant, sewage treatment works, water filtration and general maintenance, fuel stores and back of house facilities are located on the plateau. A grassed private airstrip is also situated on the plateau. Sea access is currently gained from a jetty and a concrete boat ramp adjacent to the resort. All services and facilities are in need of an upgrade due to cyclonic damage the obsolete nature of the accommodation and ageing plant and equipment.

The resort layout has been comprehensively ground-truthed and iteratively refined to minimise impacts on matters of national environmental significance with development prioritised in existing disturbed areas. In areas outside the current development disturbance area, the masterplan layout has been informed by detailed site surveys including an analysis of significant vegetation, coral communities, steep or visually prominent areas and areas prone to natural hazards. In some areas the siting of essential infrastructure such as the airstrip will have unavoidable impacts. The creation of an airstrip which meets air safety requirements will necessitate the clearing of 1.5 hectares of Commonwealth listed Broad Leaf Tea Tree (*Melaleuca viridiflora*) threatened ecological community and 5.14 hectares of the equivalent State listed community (RE 8.3.2). The project will also result in disturbance to 4.19 hectares of State listed native grassland (RE 8.12.13). In order to address these residual impacts environmental offsets under Commonwealth and State legislation are proposed.

It is the recommendation of the EIS that the project be approved as:

- The project has been designed to minimise impacts on the outstanding universal values of the Great Barrier Reef World Heritage Area and all other matters of national and state environmental significance;
- The project avoids impacts on the Littoral Rainforest and Coastal Vine Thickets of Eastern Australia threatened ecological community by locating development outside this community and ensuring appropriate buffer distances are maintained;
- The project will not have a significant impact on threatened or near threatened fauna species as none were observed during the fauna survey period;
- Environmental offsets are proposed to address the residual impacts to the native grassland community (State listed: 4.19 hectares) and the Broad Leaf Tea-Tree (*Melaleuca viridiflora*) threatened ecological community (Commonwealth: 1.5 hectares and State listed: 5.14 hectares);
- The project will not result in the removal of coral or seagrass communities with a safe harbour no longer proposed. Instead the proponent seeks approval to upgrade the jetty and obtain additional moorings to enable resort vessels to shelter under a range of wave and wind conditions;
- The project has been designed to limit impacts on aesthetic values of the Great Barrier Reef World Heritage Area by mitigating visual impacts of development through the siting of infrastructure, roads and buildings, use of appropriate building design, colour, texture, natural screening and landscaping;
- Buildings and infrastructure are sited and designed to minimise potential impacts from bushfire, storm tide inundation, erosion, flooding and dam break failure;
- The proposal is consistent with key tourism policies included in the State Planning Policy, Mackay, Isaac and Whitsunday Regional Plan, Queensland Ecotourism Plan 2016 - 2020 and the Mackay Destination Tourism Plan 2014 – 2020;
- The project will provide ecotourism opportunities consistent with the Queensland Ecotourism Plan through the provision of a National Park and Great Barrier Reef Education Centre (for guests and visitors) and glamping facilities within the National Park. It would also provide nature based experiences such as guided scuba diving and coral planting programs;
- The project will result in significant economic and social benefits associated with tourism investment which is of critical importance to the Queensland economy following the downturn in the mining industry. The proposal by White Horse Australia will create approximately 800 (gross) and 560 (net) (FTE) persons in the Mackay Region and will add $480 million during construction to the Mackay Region's Gross Regional Product over a three and a half year period. It will also generate a Net Present Value to the community of between $83 million and $357 million;
- The project will result in improved environmental performance associated with:
  - power generation using solar photovoltaic cells and diesel generation back up;
  - sewage treatment to Class A+ quality standard;
  - improvements to water quality through the installation of stormwater treatment devices;
  - climatically responsive design of buildings;
  - recycling/reuse of water;
  - the revegetation of some previously disturbed areas; and
  - pest species management to limit exotic species invasion and restoration of degraded habitats.
- Approval of the resort and the consequent investment will provide the financial means to ensure improvement and ongoing maintenance of water quality, pest management, bushfire and vegetation rehabilitation on Lindeman Island; and
- An over-arching Environmental Management Plan has been prepared to ensure environmental values protected and enhanced through construction and operation of the resort.

32. NEXT STEPS AFTER PUBLIC CONSULTATION PERIOD CLOSES

At the end of the public notification period, the Office of the Coordinator General, Department of Environment and Energy and GBRMPA will consider all 'properly made' submissions to determine whether the proponent is required to prepare additional information to address issues raised during the notification period.

Public notification of any additional information provided is at the OCG's and GBRMPA's discretion. To the extent that the project involves a material change of use, or requires impact assessment, under the *Sustainable Planning Act 2009* (SP Act), a properly made submission for the purposes of the EIS is taken to be a properly made submission about the application under the Integrated Development Assessment System (IDAS) (SDPWO Act, s37).

33. FURTHER INFORMATION

Information on the project, the EIS and the proponent can be found on the Lindeman Great Barrier Reef Resort Project website at http://lindeman.net.au/ and the Coordinator-General's website at http://www.statedevelopment.qld.gov.au/assessments-and-approvals/lindeman-great-barrier-reef-resort-project.html

LINDEMAN ISLAND EXECUTIVE SUMMARY & INFORMATION PACKAGE