Aquis Resort at the Great Barrier Reef

Coordinator-General's evaluation report on the environmental impact statement

December 2014

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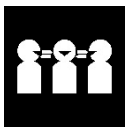

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Synopsis

This report evaluates the potential environmental impacts of the Aquis Resort at the Great Barrier Reef project (the project) and has been prepared under section 35 of *the State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

Aquis Resort at the Great Barrier Reef Pty Ltd (the proponent) proposes to redevelop 343 hectares (ha) of rural land across 11 freehold titles into a large-scale integrated tourism resort. The project would be located south of Yorkeys Knob, approximately 13 kilometres (km) north of the Cairns central business district and 6km north of the Cairns International Airport. The project comprises three distinct precincts:

- a resort complex including a 40ha island surrounded by a 33ha artificial lake to support the resort infrastructure, accommodation for up to 12,000, a convention and exhibition centre, entertainment facilities including gaming and theatres, swimming lagoons, aquarium and a rainforest
- a sport and recreation precinct including an 18-hole golf course and sporting centre
- an environmental management and conservation precinct, including the retention of 52.7ha of native vegetation and restoration of a further 53.2ha.

The project is estimated to require A$8.15 billion capital investment and is expected to create a peak of 3,750 full-time equivalent (FTE) direct construction jobs during stage 1 and a peak of 3,500 FTE direct construction jobs during stage 2.

During operations, the project predicts that during stage 1 it will generate 11,000 operational jobs and in stage 2 a further 9,000 operational jobs.

In undertaking my evaluation, I considered the EIS documentation, issues raised in public submissions, and information and advice received from state government agencies and the Commonwealth Department of the Environment (DE). The following provides an overview of the main issues arising from my evaluation.

Regional growth

The EIS describes significant economic opportunities for Cairns, the Far North Queensland region and Queensland, including:

- an increase of up to $988 million in Gross Regional Product (GRP) during the construction of stage 1 and up to $10,283 million at full operation
- an increase of up to $1,425 million (approximately 0.3 per cent) in Gross State Product (GSP) during the construction of stage 1 and up to $11,769 million (approximately 2.4 per cent) at full operation
- generating up to $3,363 million in state gaming revenue by the year 2030
- an increase of up to 958,000 visitors from interstate and overseas generating up to 3,832,500 additional guest nights with significant flow-on benefits for Cairns Airport, retail services and tourism and transport operators.

Land use

The Cairns Regional Council Planning Scheme (Cairns Plan 2009) recognises the importance of the tourism industry as a driver of economic growth in the region, while seeking to minimise conflict between new development, local communities and other land uses. The EIS identified that the proposed site is the only viable location for a large-scale tourism development, and justifies the proposed location outside of the FNQ2031 Regional Plan urban footprint.

The EIS included a draft Aquis Local Plan (ALP) comprising a master plan and precinct structure plan that regulates the form of the development. The draft ALP and development code provides the basis for material change of use approvals for the proposed development. I am satisfied that the ALP meets the requirements of the *Sustainable Planning Act 2009* to vary the effect of the Cairns Regional Council (CRC) planning scheme.

Social and economic impacts

The project is predicted to significantly increase employment, training and business opportunities for local and regional communities.

The project's significant workforce requirement offers a significant opportunity to increase local and regional employment rates, and through the strategies in the Workforce Development and Management Plan I expect the proponent to:

- maximise local employment opportunities over the life of the project, including opportunities for local Indigenous people and other disadvantaged groups
- work closely with Department of Education, Training and Employment (DETE), the Department of Aboriginal and Torres Strait Islander and Multicultural Affairs (DATSIMA) and other training and employment stakeholders where appropriate, to provide training and skills development opportunities for local people
- ensure that the project minimises the constraints on the supply of labour for other employers in the hospitality, tourism, retail and construction sectors.

The proponent has developed a Housing and Accommodation Plan to address the potential adverse impacts on housing affordability and the cost of living identified in the EIS.

To maximise the direct and indirect economic benefits for Cairns and Far North Queensland, the proponent should provide local and regional businesses with full, fair and reasonable opportunity to tender for project-related supply and service contracts for the life of the project. I note the proponent's commitment to establish a local procurement target, and develop the capacity of local and regional businesses to participate in procurement processes. I expect these commitments to be included in the Local Content Plan.

I require the proponent to implement, monitor and report on the effectiveness of the action plans throughout the life of project to ensure the opportunities created by the project are maximised.

I note the proponent's commitment to work collaboratively with CRC, relevant state agencies, the local community and other stakeholders to refine, implement and monitor

the management plans aimed at mitigating and managing any potential social and economic impacts. These plans will remain the responsibility of the proponent for the life of the project.

Transport and infrastructure

Upgrades to existing roads, transport networks, reticulated water supply, sewerage and waste water disposal, electricity and telecommunications will be required to support the project.

The proposed upgrades to Yorkeys Knob Road and Dunne Road will address the project's potential impacts on local roads. The proponent has proposed to upgrade Yorkeys Knob Road to four lanes and improve its flood immunity and its performance as an evacuation route consistent with the Cairns Western Arterial Road, which is approximately 30 per cent AEP. The proponent has committed to manage traffic during peak periods on state and local roads. I require the proponent to undertake more detailed analysis of the potential impacts for each stage of the project.

The proponent has committed to reduce the project's demand for potable water by capturing and reticulating roof and run-off water, and using recycled water from the Marlin Coast Waste Water Treatment Plant. A more detailed analysis of the project's potable, recycled and waste water needs will be required to ensure the appropriate connection to the water and wastewater infrastructure networks is established.

The proponent is required to complete the necessary analysis of transport and other infrastructure upgrades during the detailed design phase in consultation with CRC and the Department of Transport and Main Roads (DTMR). I have conditioned the proponent to mitigate identified impacts in accordance with applicable standards.

Storm-tide inundation

The project site is potentially affected by storm-tides via overtopping of local creeks and inundation of the frontal dunes. The proposed floor level of the resort complex would be at 7.5m Australian Height Datum (AHD)—well above predicted future storm tide levels. The development would be located, designed and constructed to ensure exposed structures can sustain hydraulic and wind loading from an extreme tropical cyclone event. The project would also be located landward of the dunes, which would also provide some buffering against wave action on the proposed development.

The proposed development is not expected to worsen storm-tide inundation impacts on the existing communities at Yorkeys Knob and Holloways Beach.

Flooding

The project site is located within the Barron River floodplain between Richters and Yorkeys creeks, approximately 6km north of the entrance to the Barron River.

The largest recorded flood in the Barron River occurred in 1977, which was estimated to be a 2 per cent AEP event. It resulted in flood depths of 1–2m across the site and Yorkeys Knob Road was cut off from the Captain Cook Highway.

The flood assessment indicated that the proposed development would generally reduce flood levels across the floodplain upstream of the site, and not cause significant adverse flooding impacts (i.e. no worsening of flood heights or velocities) on existing surrounding urban areas. A key component is the lake, which is designed to improve flood conveyance to compensate for the restriction to flood flow created by the resort complex. The reduction in flooding heights is not expected to affect upstream ecology. There would be no change to the existing creeks that distribute the floodwaters as a result of the project.

The ALP and development code sets flood standards for the proposal. These standards are also included in stated conditions that would apply to all development on the site, including construction activities. The proposed finished podium level of the resort complex precinct (7.5 m AHD) is above the Barron River Probable Maximum Flood (PMF) level of 6.5 m AHD.

Proposed land uses surrounding the resort complex and lake, including a golf course and conservation areas, would be designed to accept more frequent inundation.

Yorkeys Knob Road currently has less than 20 per cent AEP flood immunity and is flooded during such events. The proponent has proposed to upgrade Yorkeys Knob Road to four lanes and improve its flood immunity and its performance as an evacuation route consistent with the Cairns Western Arterial Road, which is approximately 30 per cent AEP. The road and its connections to the Captain Cook Highway/Cairns Western Arterial Road would also be upgraded.

I expect the proponent to ensure the location and design of the development minimises the risk to the safety and health of the community as a result of flooding. I have conditioned the proponent to ensure that that development does not cause adverse flow impacts to properties adjacent to the site up to and including the 1 per cent AEP flood events.

I have also conditioned the proponent to ensure that proposed road upgrades are adequately designed to ensure no adverse effects on existing overland flow paths in upstream and downstream areas.

Lake construction

Construction activities are proposed in two stages over a four-year period. Construction of the lake would require excavation of 2.8 million m^3 of material. A significant volume of excavated material is likely to be coarse sand suitable for re-use in the production of concrete.

Acid sulfate soils

A significant proportion of excavated material is likely to contain acid sulfate soils (ASS). Excavated material would be treated on site in a bunded treatment facility. Treated materials would be used on site or transported off site for beneficial re-use.

The proponent will be required to undertake detailed ASS investigations for all areas of the site where soil disturbance is proposed and these investigations would be undertaken in accordance with the *Queensland Acid Sulfate Soils Laboratory Methods Guidelines* and *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils.*

I have conditioned the proponent to implement best practice ASS management practices to protect the water quality of the underlying groundwater aquifers and receiving waterways.

Groundwater

Water extracted during dewatering activities would be treated to manage contaminants associated with ASS (acidic water, aluminium, iron). The treated water would be used beneficially, subject to appropriate water quality, and any wastewater discharges would need to comply with discharge performance criteria before being released from the site.

I have conditioned the proponent to undertake a groundwater monitoring program during construction. Requirements of a permit under the *Water Act 2000* would ensure that any identified groundwater resource impacts are adequately managed. I have also conditioned the proponent to ensure that groundwater-dependent ecosystems are not adversely impacted by the development.

Stormwater

It is proposed that stormwater run-off from areas disturbed or exposed during construction activities would be designed to drain into the lake, which would act as a detention basin.

I have conditioned the proponent to ensure that sediment and erosion control measures comply with best practice requirements. I have also conditioned the release of any water from the site to achieve the design objectives contained in the State Planning Policy 2014 and the *Queensland Water Quality Guidelines 2009.*

Inlet and outlet pipelines

The proposed artificial lake in the resort complex precinct would be permanently connected to marine waters by a pipeline and pumping system. The inlet pipeline would extend 2.2km offshore through the estuary and shallow bar of Richters Creek. The offshore outlet pipeline would extend 1.4km in the same trench. Construction of the inlet and outlet pipelines would be expected to generate approximately 70,000m^3 of excess sediment, requiring beneficial use or disposal on land.

More detailed sediment sampling will be required prior to construction to determine the quality of sediment that would be disturbed and determine the most appropriate management strategies.

I have conditioned the proponent to ensure that pipeline construction activities do not adversely impact on the water quality of the receiving marine environment and that any disposal of material is undertaken on land. The proponent is conditioned to provide further information to support an application for a development permit to construct the pipeline and for a dredging environmental authority.

Lake operation

The lake water quality would be maintained by the regular pumping of seawater into the lake and discharging through the outlet 1.4km offshore. The EIS indicates that the proposed system would turn over the lake volume within 14 days during normal

operations. If necessary, additional actions to manage the lake water quality may include increased mixing and aeration, lake de-silting, and water treatment via the resort lagoon filtration system.

I have conditioned the proponent to ensure that the operation and maintenance of the lake is consistent with the relevant water quality objectives for the Barron River Basin.

The lake would be designed to be immune from flood events up to 50 per cent AEP. During flood events greater than 50 per cent AEP, the lake would mix with floodwaters and drain to the Coral Sea via the local creeks. After any flood, measures would be undertaken to restore water quality in the lake to normal operating conditions. The EIS indicated that the normal operating regime would be reached within 10–14 days after a flood. At that stage, the water quality in the lake would be likely to exceed that of the surrounding creeks and near-shore waters.

The proponent has considered a number of options to prevent lake water interacting with groundwater. Methods include a cut-off wall around the perimeter of the lake (which extends vertically into the stiff clay layer between the shallow and deeper aquifer systems) or lining the base and sides of the lake.

The use of a cut-off wall down to the stiff clay layer would minimise the exchange water and salinity horizontally into the shallow unconfined aquifer; however, if the stiff clay layer has higher permeability than expected or is discontinuous, the proponent would need to consider using a liner solution. The permeability of the stiff clay layer would be confirmed during the detailed design stage.

To protect groundwater users and environmental receptors (e.g. groundwater-dependent ecosystems), I have stated a condition requiring the proponent to prevent interaction between the lake and adjoining groundwater.

I have conditioned the proponent to prepare a groundwater monitoring and management plan, which would define the measures to be undertaken to address changes to groundwater quality and levels, and aquifer connectivity during construction and operations.

The proponent has committed to enter into a written agreement with owners of registered bores to protect their interest in the event that the registered bores become saline as a consequence of the proposed development.

I have also conditioned the proponent to ensure that the lake does not affect groundwater quality or flow in a way that adversely impacts native flora or fauna.

Marine ecosystems

The project site adjoins several tidal waterways including Thomatis/Richters Creek, Yorkeys and Half Moon Creeks. Much of the catchment, including the project site, has been extensively developed for agriculture, which has contributed to significant sediment and nutrient loads entering the waters of Trinity Inlet.

The Great Barrier Reef Coast Marine Park (GBRCMP) and two fish habitat areas (FHAs)—Yorkeys Creek (FHA-034) and Half Moon Creek (FHA-033)—border the project site. The project inlet/outlet pipeline would be constructed within the Estuarine Conservation Zone of the GBRCMP and Yorkeys Creek FHA. The receiving

environment has been identified as high ecological value (HEV) waters under the Environmental Protection (Water) Policy 2009, which requires the environmental values to be maintained.

The construction and operation of the project inlet/outlet pipeline is expected to have only minor impacts on the marine environment within Richters Creek. The entrance to the inflow pipe will be appropriately screened to minimise entrapment of aquatic fauna in the pipeline and reduce the number of potential pest fish entering the lake.

The EIS indicates that the discharge would not noticeably change the water quality of the receiving environment. I require the proponent to undertake water quality monitoring for the life of the project to demonstrate the maintenance of the environmental values of the receiving environment.

Matters of national environmental significance (MNES)

The northern and eastern boundary of the project site abuts the Great Barrier Reef World Heritage Area (GBRWHA) waters and the inlet pipeline and outlet pipeline extend 2.3km and 1.4km into the GBRWHA.

The Wet Tropics World Heritage Area (WTWHA) is situated approximately 2.5km west of the western boundary of the project site, and 8.5km away from the site via the Barron River, Thomatis Creek, Richters Creek and other watercourses.

Sugarcane production currently uses 211ha (62 per cent) of the site and will cease. Compared to the existing agricultural scenario, the proposed development would result in a significant reduction in pollutant load of at least 76 per cent for total suspended solids, 61 per cent for total phosphorus and 46 per cent for total nitrogen.

The project may require clearing of 0.1ha of woodland and 0.2ha of Melaleuca wetland habitats. The proponent has committed to minimise clearing of this vegetation and utilise existing cleared areas wherever practicable. The proponent has committed to retaining 52.7ha of existing vegetation and restoring 53.2ha of degraded and cleared vegetation as part of the environmental management and conservation precinct.

Clearing of 0.4ha of mangroves would occur for the purposes of establishing services and road infrastructure near Dunne Road. The proponent has committed to restoring 27.3ha of degraded mangrove communities across which forms part of the 53.2ha of restoration across the site.

Threatened flora and fauna and listed migratory species

The proponent has identified the potential project impacts on threatened flora and fauna. The project largely avoids suitable habitat for flying fox, northern quoll, bare-rumped sheathtail bat and the red goshawk, and should result in only minor impacts to these species. The project would result in the clearing of approximately 18 ant plants (*Myrmecodia beccarii*) for service and road infrastructure. The project impacts on aquatic fauna are limited to temporary construction activities and ongoing management of lake water quality. Migratory species habitat is limited to the artificial wetlands on site which will be retained by the proponent, however temporary and minor construction impacts would occur.

To manage impacts on flora, fauna and migratory species I have set conditions to:

- limit the development footprint to avoid disturbance to habitat and restore additional habitat on site including roosting habitat
- implement lighting methods during construction and operation of the project in accordance with the Australian Standards for lighting
- manage water impacts during construction of the inlet/outlet pipeline
- implement noise mitigation measures for marine mammals
- avoid pipeline construction activities during turtle nesting periods
- implement measures to manage cane toads on site.

Great Barrier Reef World Heritage Area

The project site is not located within the GBRWHA although the inlet and outlet pipelines extend 2.3 and 1.4km into the Coral Sea. The project's potential impacts relevant to the GBRWHA relate primarily to visual amenity and water quality.

The proposed development would result in a limited change to the view from the GBRWHA and minimal light spill, consistent with the existing developed coastline. The ALP and development code would limit the height and scale of the development and therefore control the impacts on the visual amenity of the area.

Water quality modelling indicated that water discharged from the artificial lake will be comparable to the receiving water quality and would not contain any contaminants of concern. This will ensure that flora and fauna dependent on good quality water are not affected. Treatment of stormwater would significantly reduce sediment and nutrient loads entering the receiving environment, compared with the current land use.

Additional visitation to the Great Barrier Reef (GBR) and additional urban development has the potential to affect the GBR. Additional visitation is expected to occur through existing and expanded tourism operators. Additional urban development resulting from population increase could place additional stress on the GBR inshore water quality from additional sediment and nutrient loads from treated sewage wastewater and general runoff from urban development. Effective regulatory frameworks are currently in place to manage both any increase in visitors to the GBR and the discharge of wastewater to marine waters. Therefore, the potential consequential impacts of the project would be manageable.

The reduction in gross pollutants and improvement in connectivity to ecosystems adjacent to the GBRWHA would improve the integrity of the GBRWHA.

Consequently, I have not identified any unacceptable impacts on the GBRWHA.

Wet Tropics of Queensland World Heritage Area

The WTWHA is situated approximately 2.5km to the west of the project site. The project site has very limited connectivity to the WTWHA due to existing urban development. A range of existing urban and industrial developments of varying heights are located along the coastline to the north and south of the development. As a result, the project is unlikely to significantly affect the quality of existing views.

The project has the potential to affect the visual connectivity between the GBRWHA and the WTWHA as the site is situated within the view of the two WHAs. This impact is limited to the view of the WTWHA from the near inshore waters.

I have accepted the ALP and development code which provides the broad planning framework for the site and limits the development in height, scale and breadth. The ALP and development code also provide performance standards for lighting and glare.

As a result, I have not identified any unacceptable impacts on the WTWHA.

Great Barrier Reef Marine Park

The project site is located approximately 3.5km south-east of the Great Barrier Reef Marine Park, with the offshore inlet/outlet pipeline being 1.9km from the GBRMP boundary. Due to the distance from the GBRMP and the low risk of impacts on marine water quality, no potential impacts have been identified.

Conditions and proponent commitments

I consider that the environmental impact assessment requirements of the SDPWO Act for the Aquis Resort at the Great Barrier Reef project have been met and that sufficient information has been provided to enable a thorough evaluation of the potential environmental effects of the project.

There are significant local, regional and state benefits to be derived from the project. Any adverse environmental impacts can be acceptably managed through the measures outlined in the EIS and the conditions I have specified in this report.

Accordingly, I recommend the project proceed subject to the conditions and recommendations in this report. Further, I endorse the draft ALP and development code as the basis for material change of use approvals for the proposed development. I am satisfied that the ALP and development code meets the necessary requirements of the *Sustainable Planning Act 2009* to vary the effect of the CRC planning scheme.

In addition, I require the proponent's commitments to be fully implemented.

My report will be provided to the Commonwealth Minister for the Environment pursuant to section 36(2) of the SDPWO Regulation. My report will inform the assessment and decision by the Minister on the controlled action for the project pursuant to section 133 of the EPBC Act.

A copy of my report will also be provided to the proponent, CRC and relevant state government agencies, and will be made publicly available at **www.dsdip.qld.gov.au**

Barry Broe

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Barry Broe
Coordinator-General

17 December 2014

1. Introduction

This report has been prepared pursuant to section 35 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act) and provides an evaluation of the environmental impact statement (EIS) for the Aquis Resort at the Great Barrier Reef (the project).

It is not intended to record all the matters that were identified and subsequently settled. Rather, it concentrates on the substantive issues identified during the EIS process. The report:

- summarises the key issues associated with the potential impacts of the project on the physical, social and economic environments at the local, and state levels
- presents an evaluation of the project, based on information contained in the EIS, additional information on the EIS (AEIS), submissions made on the EIS and information and advice from advisory agencies and other parties
- states conditions under which the project may proceed.

Additional information and investigations will be provided during the project's design phase and further assessments undertaken as part of subsequent approval processes.

This report represents the conclusion of the Coordinator-General's evaluation of the project under the SDPWO Act and the assessment process under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act).

2. About the project

2.1 The proponent

The proponent for the project is Aquis Resort at the Great Barrier Reef Pty Ltd (Aquis). Mr Tony Fung, the Chairman and sole shareholder of the company, is a Hong Kong resident and private investment banker, financier and investor.

Mr Fung has held significant investments in Australia for more than 15 years.

2.2 Project description

2.2.1 Location

The project is proposed to be developed 13 kilometres (km) north of the Cairns Central Business District (CBD), south of the Yorkeys Knob township (refer to Figure 2.1). The project is to be established on 343 hectares (ha) across 11 parcels of land, which are currently freehold and used for sugar cane farming.

Although the site is largely cleared, it is fringed by areas of remnant coastal vegetation and marine areas, most of which are sensitive environmental areas.

The project site is situated in the Barron River delta, within the sub-catchments of Richters Creek/Thomatis Creek, Yorkeys Creek and the Half Moon Creek.

The site is adjacent to the Great Barrier Reef World Heritage Area, which is closest to the site at the low water mark. The Wet Tropics World Heritage Area is located 2.5 km from the site. The Great Barrier Reef and Wet Tropics World Heritage Areas are also listed as National Heritage Places.

The Great Barrier Reef Marine Park (Commonwealth) lies offshore approximately 3.5 km from the site.

The Great Barrier Reef Coast Marine Park (State) is adjacent to the site and extends into Richters Creek bordering the eastern to southern areas of the site, and Yorkeys Creek, which enters the site from the north and extends through the site. The state marine park includes an estuarine conservation zone for these creeks. In addition, Richters Creek and Half Moon Creek include declared fish habitat areas.

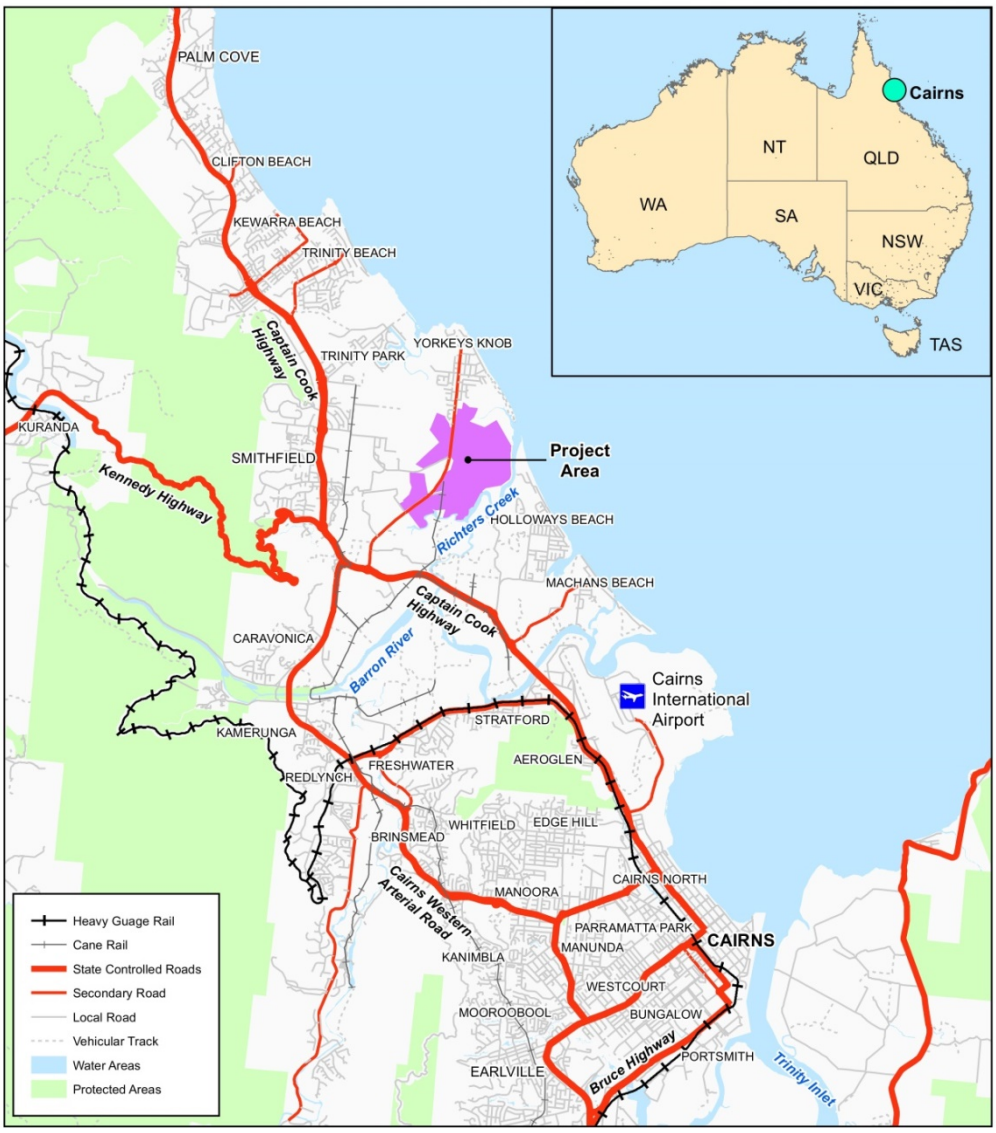


Figure 2.1 Project location

2.2.2 Project components

The objective of the project is to establish an integrated tourism resort consisting of three precincts, the resort complex precinct, sports and recreation precinct and the environment management and conservation precinct. An overview of these precincts is provided below.

Resort complex precinct

This precinct is proposed to be 73ha in size, consisting of a 40ha island surrounded by a 33ha artificial lake. The island is to contain up to eight towers accommodating 12,000 guests in 7,500 hotel rooms and suites at peak occupancy. This precinct would also include:

- gaming facilities (40,000m^2)
- convention and exhibition spaces covering 25,000m^2
- two 600-seat theatres with a total gross floor area (GFA) of 5,000m^2
- 10,000m^2 of retail, restaurants, bars and food and beverage outlets
- an architectural aquarium with a total GFA of 2,250 m^2 and a rainforest with a total GFA of 2,500m^2
- a 12.4ha reef lagoon as a central feature
- a cultural heritage centre
- shared space, back-of-house and services, with a total GFA of 350,000m^2
- guest and staff parking for 1,400 vehicles, with a total GFA of 80,000m^2
- landscaping, lagoons, pools and entry water features with a total GFA of 110,000m^2.

As the project site is situated in a flood-prone area, the ground floor of this precinct would be constructed on a podium level set at 7.5m Australian Height Datum (AHD). This level is above maximum predicted storm tide, tsunami level and the Probable Maximum Flood (PMF) level for the Barron River.

Sports and recreation precinct

A 155ha indoor–outdoor sports and recreation precinct would surround the resort complex precinct, including an 18-hole golf course (including driving range and clubhouse), a tennis centre, equestrian facilities and other outdoor sports and recreation activities. The precinct would also include a community sports and recreation facility on land north of Dunne Road and west of Yorkeys Knob Road. Landscaping and vegetated buffers are to be provided to screen development in the precinct from Yorkeys Knob Road and to reduce impacts on, or from, adjacent agricultural land and other uses.

The precinct would also include 3,000 staff car parks.

Environment management and conservation precinct

A 105.9ha environment management and conservation precinct is proposed to protect and preserve existing native vegetation—including 52.7ha within the project site. It would also restore a further 53.2ha of vegetation within the project site. The restoration

works would enhance biodiversity values by maintaining natural vegetation, restoring buffers to existing natural vegetation and removing waterway barriers to improve connectivity of Yorkeys Creek through to the Cattana Wetlands. The remainder of this precinct would preserve the biological and cultural heritage values of the site by providing walkways, viewing platforms and interpretative displays.

2.2.3 Infrastructure requirements

The proposed resort requires the following infrastructure to enable its development: roads, water, power, and lake management infrastructure.

Road networks

The proposal includes upgrades to Yorkeys Knob Road and Dunne Road.

The state-controlled Captain Cook Highway between Yorkeys Knob Road and Cairns city, and the Cairns Western Arterial Road and associated arterial roads would be used during the construction and operational stages of the project.

Wastewater

The proposal includes the provision of a dedicated rising main from the site to the Marlin Coast wastewater treatment plant (WWTP) prior to Stage 1 of Aquis Resort commencing operation.

Water

The proposal requires connection to the existing water supply network at the Captain Cook Highway and via Dunne Road to University Reservoir through the provision of dedicated service connections.

Power

The proposal would require upgrade to the Smithfield substation to supply energy to and within the site. The proponent is working with Ergon Energy to discuss the power needs of the development.

Lake infrastructure

To maintain water quality within the lake, the proponent proposes to establish a tidal exchange system that includes a 1.8m diameter inlet and outlet pipeline extending into the Coral Sea from the lake. The inlet pipeline would extend 2.2 km through the estuary and shallow bar of Richters Creek to an offshore point in the Coral Sea. The offshore outlet pipeline would extend 1.4 km and would follow the same alignment as the inlet pipeline.

2.2.4 Development stages

Construction phase

The development of the project is proposed to occur in two stages, with Stage 1 scheduled from 2015–18 and Stage 2 from 2020–24.

The construction phase of the project would involve upgrading the existing service infrastructure such as water supply, sewerage treatment plant and access roads required for undertaking the main construction works. It would also involve shaping the site, including land excavation of 2.8 million m^3 of material to establish the artificial lake. These works would be undertaken on cleared land, which is currently farm land. Existing infrastructure such as cane rail and plant sheds would be demolished and removed from the site.

Some of the excavated material would be re-used on site for establishment of the island and concrete production. Any remaining material may be used offsite for beneficial re-use, subject to the necessary approvals. Potential beneficial re-use options include beach replenishment, backfilling sand pits within the Barron River delta, engineering fill on a residential subdivision or as a surcharge road and fill for major earthworks projects in the Cairns area.

The main building works would be undertaken during this stage.

Construction of the inlet and outlet pipelines

Onshore construction of the pipeline infrastructure for the lake would be undertaken using an open trench through a cleared area adjacent to the western bank of Richters Creek.

Works in the transitional zone between onshore and offshore works are likely to be undertaken under 'dry' conditions, and are likely to involve using sheet piling and coffer dams. Following dewatering, the trench would be excavated to the necessary levels.

The offshore section of the inlet and outlet pipelines would be installed using a long-reach excavator mounted on a spud barge. A second barge would be used to make the pipe joints and to progressively lower the pipe into the trench. The trench would then be backfilled using a third barge. Any excess material would be transported back to the project site for beneficial reuse.

Operations phase

The project would operate 24 hours a day, seven days a week and is anticipated to attract up to 1.5 million guests annually, 1 million from the accommodation facilities and additional 500,000 visitors directly to the entertainment facilities.

A key component of the operations phase is the operation of the artificial lake. During normal operations, the water quality of the lake would be maintained by continuously pumping seawater into the lake from the proposed inlet pipeline 2.2km offshore and discharging through the offshore outlet pipeline 1.4km pipeline offshore. The water exchange would occur every 14 days under normal operation and the water levels in the lake are expected to vary by about 0.075m due to the pumping cycle.

During large flood events, the lake would become inundated and would join floodwater across the adjacent part of the Barron River delta.

2.2.5 Dependencies and relationships with other projects

The EIS reported that the project has no relationship to other projects within the overall region. Other projects such as the Satori Resorts – Ella Bay and Sheraton Mirage refurbishment at Port Douglas would not be in direct competition with this proposal.

Three resource-related projects within the region: South of the Embley (bauxite mine), Cape Alumina bauxite mine and port facilities near Weipa and the Wongai Project north-west of Cooktown may compete for labour and materials during the construction phase of the project; however the timing of these projects is uncertain.

3. Environmental impact statement assessment process

In undertaking this evaluation, I have considered the following:

- the initial advice statement (IAS)
- the EIS and technical reports
- comments and submissions on the EIS from non-government organisations and members of the public
- additional information to the EIS from the proponent
- advice received from state and local government agencies.

The steps taken in the project's EIS process are documented on the project's webpage at **www.dsdip.qld.gov.au/aquis**

3.1 Coordinated project declaration

On 1 August 2013, I declared this project to be a 'coordinated project' under section 26(1)(a) of the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act). This declaration initiated the statutory environmental impact evaluation process of Part 4 of the Act, which required the proponent to prepare an EIS for the project.

3.2 Commonwealth assessment

On 5 May 2014, the Commonwealth Minister for the Environment determined that the project is a 'controlled action' under the EPBC Act requiring assessment via an accredited assessment under the SDPWO Act. The controlling provisions are:

- sections 12 and 15A, world heritage properties
- sections 15B and 15C, national heritage places
- sections 18 and 18A, listed threatened species and communities
- sections 20 and 20A, listed migratory species
- sections 24B and 24C, Great Barrier Reef Marine Park.

For further detail on MNES, refer to section 6 of this report.

3.3 Terms of reference

The draft terms of reference (TOR) for the EIS for the project were released for public and advisory agency comment from 12 August 2013 to 9 September 2013. Fifty-six submissions were received, comprising 19 from advisory agencies, 10 from non-government organisations and 27 from public submitters.

The final TOR was prepared, having regard to comments received, and was issued to the proponent on 2 October 2013.

As the TOR was finalised before the project was referred to the Commonwealth Department of the Environment (DE), on 22 May 2014 I approved amendments to the final TOR to reflect the decision by the Commonwealth Minister for the Environment that the project is a controlled action under the EPBC Act.

3.4 Review of the EIS

The EIS prepared by the proponent was released for public and agency comment from 23 June 2014 to 5 August 2014. 254 submissions were received, copies of which were forwarded to the proponent and DE. The main issues raised in public submissions were:

- changes to land use planning, traffic and the potential increase in service and labour costs for some local businesses
- the size and location of the proposed development within the coastal zone and the Barron River floodplain
- water quality issues during construction and management of the artificial lake.

3.5 Additional information to the EIS

On 16 September 2014, I requested that the proponent submit additional information to the EIS to address the issues raised in the submissions.

On 7 October, the proponent lodged the AEIS. The AEIS was reviewed by relevant agencies and key stakeholders. Comments were provided to further inform my evaluation. I have considered submissions on the EIS and advice on the AEIS in my evaluation of the project.

4. Project approvals

4.1 Statutory approvals

Following the release of this evaluation report, the project will require approvals from Australian, state and local government agencies before it can lawfully proceed. These are listed in Table 4.1.

Table 4.1 Approvals and permits likely to be required for the project

Item	Relevant approval	Legislation	Authority
Controlled action	EPBC Approval	*Environment Protection and Biodiversity Conservation Act 1999*	DE (Commonwealth)
Vary the effect of a local planning instrument (Aquis Local Plan and development code)	Preliminary approval for material change of use (MCU)	*Sustainable Planning Act 2009* (SPA)	CRC
MCU, operational works, building works and plumbing and drainage works	Development permit	SPA CRC Planning Scheme	CRC State Assessment and Referral Agency (SARA)
Development impacting on state transport infrastructure	Development permit	*Transport Infrastructure Act 1994* (TI Act)	DTMR
Taking of a protected plant	Clearing permit	Nature Conservation (Protected Plants) Conservation Plan 2000	DEHP
Possible damage to protected wildlife habitat and/or interfering with breeding places	Species Management Plan/Threatened Species Management Plan or damage mitigation permit	Nature Conservation (Wildlife Management) Regulation 2006	DEHP
Environmentally Relevant Activities (ERAs) for chemical storage, extraction and screening activities	Environmental Authority (EA)	*Environmental Protection Act 1994* (EP Act)	DEHP
Operational works (tidal works or prescribed tidal works)	Development permit	SPA *Coastal Protection and Management Act 2004*	CRC SARA
Operational work (Clearing of native vegetation)	Operational works permit	SPA *Vegetation Management Act 1999*	CRC SARA
Operational work (waterway barrier works)	Development permit	SPA *Fisheries Act 1994*	CRC SARA
Operational work (taking or interfering with water	Development permit	SPA	SARA
Design, construction and operation of inlet/outlet pipelines and overflow structures	Marine Parks permit	*Marine Parks Act 2004*	DNPSR

Item	Relevant approval	Legislation	Authority
Taking water for the dewatering of the lake	Water permit	*Water Act 2000*	DNRM

4.2 Local government approvals

The proponent intends to apply for a preliminary approval for a material change of use (MCU) under Section 242 of SPA to include the draft ALP and development code in the CRC planning scheme. More detail is provided in section 5.1.2 of this report.

Under Section 37 of the SDPWO Act, the information and referral stage and notification stage prescribed by SPA will not apply to the assessment of the preliminary approval. If approved, the ALP and code will provide the basis for CRC to assess subsequent development applications.

4.3 State government approvals

The project will require development approvals that are likely to be initiated under SPA and lodged through the State Assessment and Referral Agency. Applications for these approvals would follow the IDAS process and would require an information and referral stage. These approvals could relate to MCU, operational works, building works and plumbing and drainage works. Under Section 39 of the SDPWO Act I have stated conditions in Appendix 2, Schedule 2 of this report for MCU and operational works applications.

A development application for an MCU under SPA represents an application for an EA to undertake a prescribed ERA under the EP Act. I have stated conditions in Appendix 2, Schedule 3 of this report for the EA. In accordance with Section 47C of the SDPWO Act, the stated conditions must be included in the EA, and additional conditions developed by DEHP for inclusion in the final EA must be consistent with my stated conditions.

Under Section 39 of the SDPWO Act I have stated conditions in Appendix 2, Schedule 1 of this report for the preliminary approval. Additional conditions developed by CRC must be consistent with these conditions.

Under Division 8 of Part 4 of the SDPWO Act, the Coordinator-General has the power to impose conditions for some matters where no other relevant regulatory regime exists. Imposed conditions have been applied to this project for social impact assessment reporting requirements and environmental offsets (refer Appendix 1).

4.4 Australian Government approvals

A decision on the controlled action will be made by the Commonwealth Minister for the Environment under section 133 of the EPBC Act. The minister will use the information in this report to determine whether or not to approve the controlled action under the EPBC Act and, if so, apply conditions to the approval necessary to limit the impact on MNES.

4.5 Environmental management plans

The proponent has committed to developing environmental management plans (EMPs) for the planning, construction and operational phases of the project. The EMPs will convert the undertakings and recommendations of the EIS into actions. The EMPs and associated sub-plans are to be refined and expanded during the detailed design phase of the project. This will need to be undertaken in consultation with the relevant advisory agencies, incorporating additional project information to ensure environmental impacts are managed appropriately. The finalised EMPs will include site-specific management strategies, monitoring requirements and corrective actions.

Effective implementation of the EMPs will satisfy the commitments made by the proponent in the EIS. Proponent commitments are listed in Appendix 4 of this report.

5. Evaluation of environmental impacts

This section outlines the major environmental effects identified in the EIS, additional project information, submissions on the EIS and comments from advisory agencies and other stakeholders. I have commented on the effects and, where necessary, included conditions or recommendations to mitigate adverse impacts.

5.1 Regional growth, planning and infrastructure

5.1.1 Local and regional growth

Predicted population growth is an indicator of the community's future needs for services and facilities, and is an important factor in planning for upgrades to local and regional networks and infrastructure. In submissions on the EIS, several agencies and the CRC noted that a significant increase in population could impact on the cost and timing of service delivery and infrastructure provision.

Cairns is the largest population centre in Far North Queensland and plays a vital role in servicing the needs of the broader community throughout the region. The CBD is the focal point for employment in the government, administrative, retail, commercial and specialised services sectors, and is supported by key regional infrastructure including the Cairns Airport, the Port of Cairns and a medical precinct containing the major hospitals.

Beyond the CBD, the suburbs of the Cairns urban area extend to Palm Cove in the north and Gordonvale in the south, in a highly linear form constrained by physical features and agricultural land uses. In the wider Cairns Regional Council (CRC) area there is approximately 2,405 hectares of land suitable for residential development, that could yield up to 25,300 dwellings and accommodate 68,400 persons. This represents approximately 15 years of supply, based on current population projections and expected dwelling yields.

Current population projections without the Aquis project predict the resident population of Cairns will be 244,083 persons by 2036—an increase of approximately 93,000

persons from the 2011 census. Queensland Treasury and Trade (QTT) update the population projections on a regular basis.

The Far North Queensland Regional Plan (FNQ 2031) notes that an increasing proportion of dwellings will need to be supplied by infill and redevelopment within the existing urban footprint area. CRC has established major activity centres at Smithfield in the north, Earlville in the west and Edmonton in the south to encourage higher residential densities, support public transport initiatives and provide local employment opportunities. The southern growth corridor including the Mount Peter greenfield development area is expected to cater for most of the city's residential growth over the life of the regional plan.

Impacts

The EIS stated that the project presents significant economic and employment opportunities for Cairns, the Far North Queensland region and Queensland including:

- an increase of up to $988 million (approximately 9 per cent) in Gross Regional Product (GRP) during the construction of Stage 1 and up to $10,283 million (approximately 74 per cent) at full operation
- an increase of up to $1,425 million (approximately 0.3 per cent) in Gross State Product (GSP) during the construction of Stage 1 and up to $11,769 million (approximately 2.4 per cent) at full operation
- generating up to $3,363 million in state gaming revenue by 2030
- an increase of up to 958,000 visitors from interstate and overseas generating up to 3,832,500 additional guest nights with significant flow-on benefits for Cairns Airport, retail services and tourism and transport operators
- creating up to 3750 (stage 1) and 3500 (stage 2) full-time equivalent (FTE) direct construction jobs and 20,000 FTE direct operational jobs.

The EIS included a range of scenarios indicating how the project could precipitate higher than anticipated rates of population growth, based on different assumptions about the composition of the workforce and the number of indirect jobs that the project could support in other sectors of the economy.

Population growth modelling, undertaken by the proponent, indicated the project would increase Cairns' population to approximately 310,000 persons by 2036, an increase of 66,000 persons on QTT's estimate. The proponent's estimate was based on the following assumptions:

- half of the construction jobs and 80 per cent of the operational jobs (both direct and indirect jobs for all stages) would require external workers
- indirect to direct job multiplier rates of 0.75 for construction jobs and 1.75 for operational jobs
- there would be 1.5 dependents for each external worker.

Both QTT and the proponent's estimates assume increases in economic growth and demand for labour. The EIS identified potential labour shortfalls in the construction,

trade and hospitality sectors during peak construction and operational stages of the project.

The EIS workforce projections indicate the project would require more operational labour for gaming, retail, clerical and managerial roles than would be available in Cairns. Many of these roles have low entry qualifications. The EIS asserts the shortfalls in labour, during construction and operation phase, could be met by external workers moving to Cairns.

The requirement to use external workers, however, could be reduced with implementation of the proponent's Workforce Development and Management Plan. The proponent has committed to maximising local employment opportunities and identifying opportunities to support employees and their families relocating to Cairns.

If, as stated in the EIS, the project reduces unemployment, the EIS's estimate of population growth may be overstated. Dependency ratios quoted in the EIS are higher than would be expected in a regional location – particularly if unemployment is low. In addition a low skill workforce may take short term employment at the resort complex and not live permanently in Cairns, and is less likely to have dependents, (e.g. tourist on working visas and backpackers).

The draft planning scheme retains opportunities for future residential growth and expansion in the Cairns southern growth corridor. CRC notes there may be some capacity close to the project to accommodate higher residential densities, particularly in the Smithfield area. Housing for the project's additional population would need to be met by increased residential densities in Smithfield as well as other areas within Cairns.

The project would impact on other construction developments and service industries in Cairns during the project's construction phase. Demand for materials and construction services will increase. A proportion of growth in demand for materials could be met from suppliers within Cairns (as indicated by the proponent in their commitment to purchase goods and services locally) and from suppliers outside the Cairns region. However the scale of the construction would require the proponent to engage large construction firms that have capacity to complete multi-billion dollar developments.

Coordinator-General's conclusions

The project presents significant economic and employment opportunities for Cairns, the Far North Queensland region and Queensland.

I note the current emphasis of the Cairns planning scheme on accommodating growth in city's southern growth corridor, but expect that infill and redevelopment opportunities will account for an increasing proportion of new residential development in accordance with FNQ2031.

I accept that there will be population growth as a direct result of the project. Taking into account the proponent's commitments to maximise local employment outcomes and the factors discussed above, I consider the project's impacts on population growth are likely to be less than projected in the EIS.

I expect the proponent to fulfil their commitments in relation to workforce management, local purchasing and monitoring and reporting on housing impacts of the project. The latter of these is discussed in the Social and Economic section of this report. These commitments will assist the CRC, local business and the Cairns community to adjust to changes that arise directly from the project's construction and operation and assist in managing regional growth.

5.1.2 Land-use planning

Overview

The proponent intends to divide the project site into three distinct precincts connected by a network of internal roads, and cycle and pedestrian pathways. The project site comprises 340.6ha of land and watercourse areas covering a total of 340.6ha across 11 freehold titles. The proponent has an option to purchase the following lots:

- Lot 100 on NR3818
- Lot 4 on RP713690
- Lot 1 on RP724792
- Lot 2 on RP745120
- Lots 2 - 4 on RP746114
- Lot 4 on RP749342
- Lots 1 and 2 on RP800898
- Lot 60 on RP835486.

All lots are directly accessed by either Yorkeys Knob Road or Dunne Road. Sugarcane production covers 211ha (62 per cent) of the site, and the remaining areas include farm infrastructure, residences, roads, tracks, a section of cane tramway, natural areas, cleared unfarmed areas and abandoned aquaculture ponds. Several road reserves, road allowances and easements—owned by either CRC or the State—exist over the land identified within the site boundary, and are used for drainage, esplanade reserves or allocated for future roads.

The proponent proposes to enter into an Indigenous Land Use Agreement (ILUA) pursuant to the *Native Title Act 1993* with all persons who hold or may hold native title in the project site. At the time of writing, the site includes areas that are subject to a registered native title determination including unallocated state land, parts of Richters Creek and offshore areas.

Relevant state and local government planning

The Far North Queensland Regional Plan

The Far North Queensland Regional Plan (FNQRP) is a statutory planning framework introduced in 2009 to guide growth and development in the region until 2031. The FNQRP takes precedence over all other planning instruments and provides context for local planning and development assessment.

The FNQRP sets out the preferred settlement pattern to accommodate growth, and includes a set of desired environmental outcomes (DEOs) to guide the region's development and land use outcomes. Local government planning schemes and subordinate policies must align with the intent of the DEOs and their supporting principles and policies. The repeal on 26 October 2012 of the State Planning Regulatory Provisions that accompanied the FNQRP provides further decision-making autonomy to local government to determine if a development proposal represents an appropriate outcome for their area.

The proponent's assessment of the project against all aspects of the FNQRP identified inconsistencies relating to the change of land use, loss of good quality agricultural land and development outside the existing urban footprint.

State planning policies

On 2 December 2013 the Queensland Government released a new State Planning Policy (SPP) that replaces 14 previous SPPs with a single SPP. The new SPP sets out policies about matters of state interest in the planning and development assessment system and forms part of the government's broader commitment to planning reform.

The State Development Assessment Provisions (SDAP) set out the matters of interest to the state for development assessment, where development applications are assessed by or referred to the state. The proponent's assessment revealed that the loss of strategic cropping land associated with the project would be inconsistent with the relevant SDAP model. DNRM has advised that this aspect of the project will not trigger assessment of strategic cropping land under the *Regional Planning Interest Act 2014*.

Cairns Regional Council Planning Scheme

The CRC planning scheme (Cairns Plan) commenced on 1 March 2009. At the strategic level, the Cairns Plan recognises the importance of the tourism industry as a driver of economic growth, while seeking to minimise conflict between new development, local communities and other land uses. The proponent's assessment of the project against all aspects of Cairns Plan identified inconsistencies relating to the loss of good quality agricultural land, the location of development outside of the nominated urban footprint and the change of land use.

Public consultation for the new draft CRC planning scheme concluded on 10 December 2014. The project site is included in the rural land use category in the draft scheme, and remains outside of the urban footprint.

Aquis Local Plan and development code

A draft Aquis Local Plan (ALP) and development code was included in the EIS. The ALP is intended to function as part of a preliminary approval under section 242 of the SPA to vary the effect of the Cairns Plan by specifying:

- a framework of development precincts and precinct intents that support the development code objectives

- the type of development that is envisaged within the preliminary approval area and the corresponding levels of assessment
- performance outcomes and acceptable outcomes.

A preliminary approval by CRC would, through the proposed ALP and development code, establish specific assessment provisions that will apply in assessing any subsequent development applications within the project site. All development will be assessed by CRC against the development code, or against the Cairns Plan in the case of impact assessable development. The draft ALP and development code are included in Appendix 9.

Alternative project locations

The EIS assessed the suitability of the following locations in Cairns for the proposed project as alternatives to Yorkeys Knob:

- Edmonton/Gordonvale
- Cairns CBD
- Cairns northern beaches
- Atherton Tableland
- Barron River delta.

Locating the proposed project in the Edmonton/Gordonvale area was rejected due to the potential loss of cane land close to the Mulgrave Mill, or the loss of land at Mt Peter currently designated for future urban development. The Cairns CBD and northern beaches options were rejected due to the unavailability of suitable development sites capable of accommodating a 'destination integrated resort'. The Atherton Tableland was rejected due to the distance from the Cairns airport and lack of highway access.

Three potential sites were identified in the Barron River delta – Freshwater; Caravonica; and the proposed Yorkeys Knob site. All three sites were identified as strategic cropping land with flooding impacts. The proposed Yorkeys Knob site was selected due to the ability to contain flooding impacts onsite, separation from residential areas and the most direct access to the airport and CBD.

The proponent has stated that the proposed scale is critical to the success of the project. While the proposed land use change is inconsistent with elements of FNQ2031 and Cairns Plan, the proposed site is located between two established urban areas and close to transport networks, particularly the airport.

Landscape and visual amenity

There are no regionally or locally significant landscape features on the project site. The project will be visible from a number of locations including the GBRWHA and WTWHA, and would impact on the existing landscape and visual amenity due to scale, height of the built form, the introduction of artificial lighting and construction activities.

The EIS stated that the project site's proximity to other urban development, including Cairns International Airport, will assist the project to integrate with the surrounding environment, when viewed from beyond the site. The proponent has committed to establishing a 105.9ha environmental management and conservation precinct around

the project site, including the restoration of a 60m wide strip of degraded vegetation to further reduce the visual impact of the built form. The top levels of the hotel towers would remain visible.

The restoration area will also reduce the exposure of surrounding areas to artificial light spill and glare. The proponent has committed to complying with the applicable standards for lighting design—including the use of downward facing, shielded and low intensity methods, mounting external lights below tree canopy heights, and installing screens and window tinting to further reduce the project's lighting impact.

Stockpiles, equipment storage and maintenance areas would be visible during the construction phase of the project. The proponent has committed to restore degraded vegetation prior to construction of the project to reduce the visible impact of construction activity.

Coordinator-General's conclusions

For the purposes of a preliminary approval under SPA, the EIS adequately describes the proposed land use characteristics of the project. The draft ALP and development code provides sufficient detail to inform the detailed design stage of the project, and for the assessment of development.

I am satisfied that the EIS provides sufficient justification for the proposed location outside the designated urban footprint.

The ALP includes a master plan and precinct structure plan that demonstrate the likely form of the development, consistent with the proposed development code. Key features include:

- the proposed vehicle access points
- the location of the resort precinct podium
- the establishment of vegetation screening and buffers
- setbacks from existing roads and adjacent land uses
- performance standards for lighting, glare and colour schemes.

While the built form and relationships between the different land uses will be refined by the proponent during detailed design, any development must be consistent with the ALP and development code. I have stated a number of conditions relating to the preliminary approval and subsequent operational works and material change of use approvals.

I have also stated conditions to ensure the proponent applies lighting design in accordance with Australian Standard *AS4282-1997 – Control of the obtrusive effects of outdoor lighting* and *AS1158 – Lighting for Roads and Public Spaces to the development.*

5.1.3 Transport and infrastructure

Overview

Major infrastructure will be required to support the project during the construction and operation stages. Key issues include upgrades to existing roads, transport networks, reticulated water supply, sewerage and wastewater disposal, electricity and telecommunications.

The proponent will control and maintain internal site infrastructure. It will also provide service connections for external infrastructure and transfer ownership of onsite infrastructure to the service provider/network owner where appropriate.

Existing infrastructure and services

Transport networks

The project site is accessed by Yorkeys Knob Road, which connects the township of Yorkeys Knob to the Captain Cook Highway. Dunne Road provides an alternative route between Yorkeys Knob and Smithfield, and intersects Yorkeys Knob Road at the proposed entry point to the site. Both roads are relatively low-volume, two-lane local roads with limited flood immunity.

State-controlled roads identified in the EIS that would be affected include the Bruce Highway, Mulgrave Road, Cairns Western Arterial Road, Captain Cook Highway, Sheridan Street and the Kennedy Highway. Due to the narrow linear development footprint of Cairns, the network conveys most of the commuter and freight movements with limited opportunities for alternative routes.

Public transport in the vicinity of the site is limited to a local bus service that operates between Smithfield, Yorkeys Knob and the CBD. DTMR has released a final concept design report for the Cairns Transit Network project that includes a preferred alignment for a busway corridor adjacent to the Captain Cook Highway and Yorkeys Knob Road intersection. Dunne Road and Yorkeys Knob Road are designated as district pedestrian and cycle routes in the CRC Cairns Beaches District Plan, and the Captain Cook Highway and Cairns Western Arterial Road function as trunk cycle routes.

Water and sewerage

The project site has no water supply or dedicated sewerage infrastructure. Cairns Regional Council Water and Waste (CRCWW) is responsible for water supply and waste treatment in the Cairns urban area.

The site is within the catchment supplied by CRCWW's University Reservoir, and this reservoir is fully committed to existing demand. The township of Yorkeys Knob is serviced by a water main located within the Yorkeys Knob Road reserve.

The Marlin Coast Wastewater Treatment Plant is located on Dunne Road and services the sewerage catchment area that includes the project site. The plant was recently upgraded to improve the quality of wastewater discharged into the environment. The EIS states that the plant is currently running at approximately 75 per cent capacity. A

rising main receives the combined flows from all of the Yorkeys Knob pump stations and conveys the wastewater to the plant via Yorkeys Knob and Dunne Road.

The plant produces Class A and Class C treated water for supply to commercial businesses and recreational facilities in the area. There is currently a significant oversupply of recycled water from the plant. There is no trunk recycled water main in service.

Energy and telecommunications

Ergon Energy is responsible for the reticulation of electricity to the project site. Yorkeys Knob is currently serviced by a single 22kV feeder which has limited spare capacity.

Telstra provides communication services including fixed line, broadband and mobile coverage to Yorkeys Knob via an optic fibre cable along Yorkeys Knob Road, and antennas in Yorkeys Knob. Existing conduit and cable reticulation towards the site is insufficient for construction work communications.

Proposed infrastructure and potential impacts

Transport networks

Transporting materials, including excavated material, from the site will generate a number of vehicle movements during both construction stages. Heavy vehicle trips are expected to reach 242,143 during stage 1 and 68,438 during stage 2 at a daily peak of 585 trips and 132 trips respectively. Daily construction staff vehicle movements are expected to peak at 5,250 (stage 1) and 4,900 (stage 2).

Once the resort is fully operational, up to 11,250 guests will require transport to and from the airport and other locations, and up to 20,000 staff would commute in staggered shifts. The project is also expected to attract day visitors from the region and back-of-house deliveries.

Two access points to the site from Yorkeys Knob Road are proposed. The first is aligned with an existing unconstructed road corridor, to provide access from the south while also serving as the junction for a proposed new road between Dunne Road and Yorkeys Knob Road. The second access will be located at the intersection of Yorkeys Knob and Dunne Roads, based on a reconfiguration of the existing intersection.

Local roads

The project is likely to have a significant impact on the volume of traffic on Yorkeys Knob Road, particularly during the AM (8am to 9am) and PM (5pm to 6pm) peak periods. The EIS states that these impacts will be in excess of the 5 per cent background traffic increase threshold, and the proponent has committed to upgrade Yorkeys Knob Road from two to four lanes with improved flood immunity to maintain an appropriate level of service during all stages of the project.

Potential impacts from the project on Dunne Road are predicted to be less significant, with additional traffic expected to move in the opposite direction to existing peak period flows. The proponent has committed to upgrade Dunne Road to a two-lane divided

standard to improve the current geometry, and to enhance connectivity with the inter-suburban road network that services the northern beaches area.

State-controlled roads

The EIS assessed the potential impacts on the level of service of the state-controlled road network. Significant impacts above DTMR's 5 per cent background traffic increase threshold were identified at two points on the Captain Cook Highway—the Yorkeys Knob Road intersection and the Caravonica roundabout—while less significant impacts were identified on the link between Barron River and the Caravonica roundabout. Significant impacts were also identified on the Cairns Western Arterial Road between the Freshwater Creek Bridge and the Caravonica roundabout. Assessment against the Cairns Strategic Transport Model (CSTM) confirmed that the project is likely to impact on both state controlled and local roads.

DTMR noted that the project could significantly increase heavy vehicle movements between the site and the Cairns Port, the Portsmith rail freight handling facility and commercial and industrial areas in southern Cairns. The EIS states that equivalent standard axle (ESA) movements could exceed 5 per cent above base levels for sections of the Captain Cook Highway and Cairns Western Arterial Road.

Construction and operational traffic could also impact on a number of other sections and intersections of the network not given detailed consideration in the EIS. Other factors including the pavement impacts of additional traffic movements, road safety strategies and the adequacy of network drainage structures will be determined prior to construction.

Public and active transport

Trip generation modelling in the EIS assumed that guests would use coaches, mini buses, limousines or taxis. The majority of visitor and worker movements (70 per cent and 90 per cent respectively) are attributed to private vehicles with no allowance for public transport usage. The balance of worker movements is attributed to active transport modes including pedestrian and cycling trips. The site will be configured to provide adequate car parking facilities for all stages of construction and operations.

Water and sewerage

Potable water

The project will generate a significant demand for potable water. During construction, an estimated 3.88ML/day (stage 1) and 0.84ML/day (stage 2) will be required for concrete production, earthworks placement, dust control and workforce demand. At full operation and in the seasonal peak period, an average of 4.45ML/day of potable water will be required.

The existing trunk main connection on Yorkeys Knob Road is unable to meet the demands of the project. A dedicated main connecting the site to the bulk water main in the Captain Cook Highway corridor is proposed, along with a secondary supply main

from the site to existing trunk infrastructure in MacGregor Road. The main will be required before construction commences.

While the proponent has committed to initiatives to reduce potable water demand during operation, the EIS states that the existing University reservoir will require augmentation or new storage to meet the project's bulk water needs.

Recycled water

Treated recycled water practices and rainwater harvesting are expected to provide approximately 60 per cent of the project's total water needs at full operation. The EIS indicates peak period demand for re-use water during construction is expected to be 4ML/day, increasing to 4.2ML/day at full operation which includes up to 3.88ML/day for dry season irrigation and the balance for toilet flushing.

A dedicated recycled water trunk main is proposed to connect the site to the Marlin Coast Wastewater Treatment Plan via the Dunne Road corridor. The project's re-use water requirements will exceed the plant's current surplus capacity.

Wastewater

A temporary wastewater pump station will be established during the Stage 1 construction phase to connect to the existing Yorkeys Knob rising main. Before operations commence, the proponent will construct a trunk pump station adjacent to the site, and dedicate the land and ownership of the pump to CRC. A dedicated rising main will connect the pump to the Marlin Coast Wastewater Treatment Plan via the Dunne Road corridor. The project's operational wastewater requirements exceed the plant's existing capacity. Section 5.4 of this report provides additional detail about the project's potential impacts on water quality.

Energy and telecommunications

The project will require 29MW from the electricity network, and the proponent proposes that this additional capacity would be delivered via two 132KV feeders along the Cairns Western Arterial Road corridor to an on-site energy and communications hub. Ergon Energy has confirmed that this load will not be available without network augmentation that is not currently planned, and DTMR has noted that there is insufficient width in the proposed corridor to accommodate additional feeders.

The project will require augmentation of the existing fixed line, broadband and mobile networks. The proponent proposes to install new fibre optic cables between the site and the Freshwater exchange along the existing alignment, on-site mobile network infrastructure, and integrate the infrastructure with the National Broadband Network upon commencement in the Yorkeys Knob area.

Coordinator-General's conclusions

For the purposes of a preliminary approval, the EIS adequately describes the infrastructure requirements of the project during all stages of construction and operation. At full operation the project will impose demands on a number of critical infrastructure networks that exceed their existing and planned capacity.

The proposed upgrades to Yorkeys Knob Road and Dunne Road will address the project's potential impacts on local roads in proximity to the site. A more detailed analysis of the potential impacts of each stage of the project on all relevant sections and intersections of the state-controlled road network will be required for any subsequent development applications including:

- the location of key supply points for construction materials and associated heavy vehicle movements
- consideration of planned network upgrades including the Smithfield Bypass and projects identified in the Captain Cook Highway Link Plan
- agreed vehicle capacity, traffic volume and level of service assumptions
- pavement, road safety and network drainage impacts.

The proponent should complete this analysis during the detailed design phase in consultation with CRC and DTMR, and I have conditioned the proponent to manage the project's transport network impacts by ensuring that the necessary infrastructure is provided in accordance with the applicable standards (Appendix 2).

I note the proponent's commitment to reduce traffic during peak periods by:

- establishing a dedicated fleet of high occupancy vehicles for guest transfers and staff transport, and operating these services in a manner that complements existing public transport services
- staggering shift arrangements for construction and operational staff
- providing end-of-trip facilities including secure storage and change rooms and showers to encourage active transport modes
- implementing incentive schemes to encourage workers to carpool and use public transport.

While existing services to the site are limited, I expect the proponent to maximise opportunities for staff to use public transport, and note the location close to the site of the preferred alignment for a future busway corridor.

The proponent has committed to providing adequate on-site car parking facilities to meet the requirements of construction and operational workers. I also expect these facilities to provide adequate car parking for visitors accessing the proposed community facilities in the sport and recreation precinct, so that the amenity of surrounding residential areas and the efficiency of the local road network is not compromised.

I note the proponent's commitment to develop a Total Water Management Plan with strategies to reduce potable water demand including the capture and reticulation of roof and runoff water, and the use of treated water from the Marlin Coast Wastewater Treatment Plant. A more detailed analysis of the project's potable, re-use and wastewater needs will be required for any subsequent development applications where connection to the water and wastewater infrastructure networks is proposed.

The proponent should complete this analysis during the detailed design phase in consultation with CRC, and I have conditioned the proponent to manage the project's

water impacts by ensuring that the necessary infrastructure is provided in accordance with the applicable standards (Appendix 2). Bulk water supply and wastewater treatment is via a commercial arrangement with Council. The EIS identified that the project will trigger upgrades to both water supply and wastewater treatment. The Council and the proponent will need to negotiate costs associated with bringing forward this infrastructure.

The proponent has committed to achieve the highest possible energy efficiency standards and overall sustainability and is targeting a six-star rating for all buildings. While the provision of energy and communications services to the site will be a matter for negotiation with commercial providers, the proponent needs to provide these services in accordance with applicable standards to ensure the health and safety of guests, visitors and staff.

The proponent must fund and provide the infrastructure required to support the margin of additional demand generated by the development.

5.2 Social and economic impacts

The EIS included a Social Impact Assessment in accordance with the government's *Social impact assessment guideline*. The components of the SIA included:

- community and stakeholder engagement
- workforce management
- housing and accommodation
- local business and industry content
- health and community wellbeing.

The SIA included all components and phases of the project. Whilst the casino licence is being assessed separately from the EIS process, there are potential impacts and proposed management strategies emerging from the SIA that relate to establishing a large-scale gaming facility.

The SIA assessed the potential impacts at different geographical scales including:

- the suburb of Yorkeys Knob, directly adjacent to the project site
- the northern suburbs of Cairns, commonly referred to as the 'Cairns beaches' area including Machans Beach, Holloways Beach, Yorkeys Knob, Brinsmead, Freshwater, Redlynch, Caravonica, Smithfield, Trinity Park, Trinity Beach, Kewarra, Clifton Beach and Palm Cove
- the Cairns urban area including the northern suburbs, CBD and southern suburbs to Gordonvale
- the Cairns region including the Cairns urban area, Port Douglas and Mossman to the north, Tablelands to the south-west, and south to Innisfail.
- the broader Cairns service area including the Cairns, Cape York and Gulf of Carpentaria regions.

Impacts

The EIS identified the following positive impacts:

- direct employment opportunities during the construction and operational phases
- construction and operational supply chain opportunities for existing and emerging businesses seeking to service the project
- additional options for retaining 18–24 year olds in the region due to enhanced training and employment opportunities
- better community access to sport and recreation facilities.

The EIS identified the following potential negative impacts:

- rising living costs throughout the Cairns urban area arising from increases in house prices and rents as construction and operation staff seek to reside in the local community
- increased demand on human service and community safety agencies
- labour market drain from other sectors of the economy to the project
- reduced amenity and lifestyle changes for residents in Yorkeys Knob and the Cairns beaches area
- cultural change associated with a significant increase in tourist visitation
- an increase in the incidence of problem gambling, social dislocation and the resulting demand for support services.

The proponent has committed to develop management plans to address these and other project impacts. These plans are outlined in Appendix 5 of this report and are reflected in the proponent's Commitment Register at Appendix 4.

Further engagement with stakeholders is required to finalise the baseline data, targets and indicators needed to ensure that the management plans are developed and implemented prior to the commencement of construction. The following sections consider the extent to which the proposed plans and proponent commitments address the impacts of the project.

Community and stakeholder engagement

Engagement between the proponent and project stakeholders included the formation of a community reference group and sector specific focus groups, one-on-one meetings with local and regional organisations likely to be impacted including resident associations, and a range of feedback and engagement mechanisms. Almost 2000 community feedback forms were received, with almost one-third from residents of the Cairns northern beaches area and a significant number from Yorkeys Knob residents. Respondents from all parts of Cairns largely supported the project, with the level of support increasing with distance from the project site.

The proponent has committed to finalising a Community Engagement Plan prior to commencing the project. The engagement plan would include strategies for engaging with affected communities and other stakeholders, and monitoring and reporting arrangements to ensure the effectiveness of these strategies over time. The proponent

has also committed to work with these stakeholders to develop a Construction Management Plan to minimise disruptions during the construction phases. Details on both plans are provided in Appendix 5.

Workforce management

Construction is expected to occur during two four-year stages. The construction workforce will peak in the third year of each stage at approximately 3,750 workers in stage 1, and 3,500 workers in stage 2, and the project is expected to create a significant demand for skilled labour during construction.

The EIS noted that the Far North Queensland region has fewer highly skilled workers in comparison with larger regional and metropolitan areas in Australia, with a higher unemployment rate and lower participation rate. While a component of the construction workforce may need to be sourced from outside the region, capacity in the labour market and the relatively long lead times between construction peaks present an opportunity to train and employ local residents. There is also an opportunity to attract local residents with commensurate skills who are currently working remotely in the manufacturing and resource sectors.

Once fully operational the project is expected to require up to 20,000 workers in a range of gaming, retail, clerical and managerial roles. Stage 1 has a larger operational workforce requirement (11,000 workers) than stage 2 (9000 workers), but both stages represent a significant opportunity for a region where employment growth during the most recent inter-census period (2006–11) was limited to approximately 7,300 FTE jobs.

The EIS stated that the low entry qualifications required for many of the operational roles presents an opportunity to train and employ local residents. Queensland Treasury and Trade (QTT) and the Department of Aboriginal and Torres Strait Islander and Multicultural Affairs (DATSIMA) have suggested the proponent consider drawing on the regional pool of unemployed and under-employed residents, including Indigenous residents, to maximise employment outcomes for a diverse cross-section of the community.

CRC noted the potential for a project of this size to impact on the ability of other employers to attract and retain staff. The regional economy is dominated by the tourism and hospitality, retail, human service and construction sectors, and is subject to seasonal peaks and periods of lower economic activity. Labour supply constraints could increase costs for local businesses that are passed on to the community, and could ultimately reduce the availability of essential services and facilities.

The proponent has committed to develop a Workforce Development and Management Plan aimed at maximising local employment opportunities for the life of the project. The plan would identify potential labour constraints for other employers and opportunities to support employees and their families relocating to Cairns. Further detail on the plan is provided in Appendix 5.

Housing and accommodation

Aquis has the potential to increase demand for housing in Cairns where supply is limited.

Residential building approvals in Cairns have remained at low levels since 2009. Notably there were no approvals for multi-unit dwellings during 2013/14. In the absence of a supply of new dwellings, the EIS noted that greater demand for existing dwellings from construction and operational workers could lead to rent and purchase price increases, particularly in suburbs adjacent to the project site.

These impacts could occur when the project commences, or may begin earlier because of speculative investment in local housing markets.

CRC and the Department of Housing and Public Works noted that significant or rapid housing cost increases can displace low-income households, limit the ability of local businesses to attract and retain staff, and impose additional costs on the community as residents are forced to commute longer distances. Section 5.1.1 of this report considers the consequential population growth that may accompany the project and the potential land-use and built-form impacts.

Before commencing construction the proponent has committed to finalise a Housing and Accommodation Plan that will assess the impacts on housing sub-markets in the region, include strategies for mitigating and managing those impacts, and establish a regular monitoring and reporting framework to ensure the plan's effectiveness over the life of the project. Detail on the plan is provided in Appendix 5.

Local business and industry content

The local economic benefits are higher when the inputs for a project can be sourced locally. The EIS noted Far North Queensland and Cairns tourism operators, accommodation and hospitality, and retail sectors provide a base for the project to draw on and the project would provide economic benefits for the region.

However, large projects have the potential to 'crowd out' other development by limiting the supply of goods and services, or affecting demand in other sectors of local and regional economies. The Department of Tourism, Major Events, Small Business and the Commonwealth Games suggested that mitigation measures may be required to ensure that the timing of the project's hotel facilities does not adversely affect other short-term accommodation providers, particularly in the Cairns CBD.

The proponent has committed to develop a Local Content Plan, including a local procurement policy and targets, to provide opportunities for local and regional businesses to benefit from the project. The plan will apply during construction and operational phases for the life of the project, and will include a monitoring and reporting framework to ensure the plan's effectiveness over the life of the project. Further detail on the plan is provided in Appendix 5.

Local sugar industry

The EIS assessed the potential impact on the local sugar industry because the project site will occupy land used for cane farming. The site accounts for less than 1 per cent

of cane harvested for the Mulgrave and South Johnstone mills, and is unlikely to have a significant impact on the viability of these mills. Similarly the proposal would not impact on the retention of the narrow gauge haulage railway line running south to the Mulgrave Mill at Gordonvale.

Health and community wellbeing

Tourism activities in Cairns and Far North Queensland contribute to economic growth and the wellbeing of individuals and communities. Consultation for the project revealed that new development should maintain and enhance the region's liveability as the basis for future growth and prosperity.

The potential public health impacts associated with a project of this size include an increased risk of infectious and communicable disease from overseas visitors and workers from outside the region. The EIS stated that appropriate medical facilities will be provided on-site for workers and guests during construction and operation, and Queensland Health noted that these facilities will be critical in reducing the project's impacts on local health services.

Although there are no direct impacts from the project on the day to day operation of existing schools and educational facilities, the EIS identifies a potential increase in the local student population if workers and their dependents move into the region. The Department of Education, Training and Employment (DETE) noted ongoing monitoring would determine whether any population increase associated with the project contributes to enrolment pressure across the local network of schools.

The proponent has committed to develop the following plans to mitigate and manage potential impacts on the health and wellbeing of local and regional communities:

- Responsible Gambling Plan
- Community Health and Wellbeing Plan
- Cultural Development Plan
- Community Services and Facilities Plan.

Coordinator-General's conclusions

Determining the potential impacts of a large project with staged construction and operational periods extending over many years requires the proponent to adopt an adaptive management approach based on rigorous monitoring and reporting to ensure that mitigation and management strategies respond to any additional or changing impacts as they emerge.

I note the proponent's commitment to work collaboratively with CRC, relevant state agencies, the local community and other stakeholders to refine, implement and monitor the management plans aimed at mitigating and managing the potential impacts. These plans will remain the responsibility of the proponent for the life of the project.

I require the proponent to continue to engage openly and transparently with all stakeholders, particularly the communities in Yorkeys Knob and adjacent suburbs, to

ensure they are informed about the project's impacts and their concerns are considered in reaching decisions about mitigation measures.

The proponent has proposed a Community Engagement Plan that includes ongoing engagement with impacted communities during the project planning, construction and operational stages. The plan needs to complement the issue-specific management plans that are aimed at engaging with particular stakeholders.

The project has the potential to significantly impact local and regional housing markets, both prior to commencement and during peak construction and operational workforce periods.

The proponent has developed a detailed outline of the proposed Housing and Accommodation Plan in response to the potential impacts on housing affordability and the cost of living identified in the EIS. I require the proponent to avoid, manage or mitigate project-related impacts on housing supply and affordability during all stages of the project, by establishing pre-project housing market benchmarks as a basis for monitoring change over time.

The proponent will complete and implement the Community Engagement Plan and Housing and Accommodation Plan prior to commencing construction. Both plans will be made available to the public, and the proponent will monitor and report on their effectiveness in accordance with Appendix 1, Schedule 1, Condition 1.

The project's significant workforce requirement is an opportunity to increase local and regional employment rates. Through the strategies in the Workforce Development and Management Plan I expect the proponent to:

- maximise local employment opportunities over the life of the project, including opportunities for local Indigenous people and other disadvantaged groups
- work closely with DETE, DATSIMA and other training and employment stakeholders where appropriate, to provide training and skills development opportunities for local people
- ensure that the project does not constrain the supply of labour for other employers in the hospitality, tourism, retail and construction sectors.

To maximise the direct and indirect economic benefits for Cairns and Far North Queensland, I require the proponent to provide local and regional businesses with full, fair and reasonable opportunity to tender for project-related supply and service contracts for the life of the project. I note the proponent's commitment to establishing a local procurement target, and developing the capacity of local and regional businesses to participate in procurement processes, and expect these commitments to be reflected in the Local Content Plan.

I consider the proponent's commitments to maximise opportunities for local employment and local businesses to be a key outcome of the project. Implementing these strategies would provide lasting benefits to the Cairns region and the State.

The project will be located close to existing residential areas, and will rely on local and regional transport networks to transport materials, guests and workers. I expect the proponent to minimise the impact on emergency services in the region during the life of

the project and ensure the safety of guests and workers, and note the proponent's commitment to working closely with community safety agencies (including QPS, QAS and QFES) to achieve these outcomes through a Community Health and Wellbeing Plan.

I require the proponent to avoid, manage or mitigate project-related impacts on local community services, social infrastructure and community health and safety, and note the proponent's commitment to working closely with CRC, human service agencies (including Queensland Health, DETE, Department of Communities, Child Safety and Disability Services (DCCSDS) and DATSIMA) and community stakeholders to develop and implement a Community Services and Facilities Plan.

The project will reach a critical milestone when the proponent applies for a development permit to begin construction of Stage 1. At that point, I expect the proponent to have prepared a detailed draft of each of the remaining management plans following engagement with all relevant stakeholders, along with clear timeframes for finalising each plan before commencing construction.

This information will be made publicly available when the first material change of use application is lodged for stage 1 of the project. All management plans (relevant to addressing social impacts) will be made publicly available upon project completion and the proponent will monitor and report on their effectiveness in accordance with Appendix 1, Schedule 1, Condition 1.

5.3 Natural hazards

5.3.1 Coastal processes

The project site is located approximately 600m from the shoreline and is influenced by a range of coastal processes.

The coastline near the site forms part of the area known as the Cairns Northern Beaches. The frontal beach ridge along the coastline is a wave-constructed formation and the crest level of this ridge corresponds with the upper limit of wave run-up under high water conditions. The topography of the frontal beach ridge is relatively consistent along the entire beach frontage.

The Northern Beaches area has a history of erosion problems and rock revetment works have been constructed in some places to prevent horizontal recession of the shoreline. CRC has also undertaken beach nourishment works along sections of the coast to address beach erosion.

Storm-tide inundation

A storm-tide is the combined effect of a storm surge generated by strong onshore winds (typically associated with a tropical cyclone) and the normal astronomical tide.

The project site is potentially inundated during extreme weather events via extreme water levels in the adjoining creeks and overtopping of the frontal dunes by storm-tides.

The presence of the frontal dunes, which have an elevation of 3–3.5m AHD, provides some protection against 'wave effects' during storms. The height of the dunes would be generally above a 1 per cent annual exceedance probability (AEP) storm-tide event (inclusive of wave set-up and run-up), which is predicted to be up to 3.11m AHD.

The EIS also included an assessment of the effects of future sea level rise of 0.8m. Given that the finished floor level of the main development area would be at 7.5m AHD, these areas would be well above extreme storm-tide level, including potential sea level rise. Surrounding parts of the site, including the sports and recreation precinct would be affected by 1 per cent AEP events and lower for future sea level rise scenarios.

The EIS indicates that the proposed development is not expected to exacerbate storm-tide inundation impacts on the existing communities at Yorkeys Knob and Holloways Beach as they would be impacted regardless of whether the development proceeds.

Shoreline erosion and sea level rise

The project would also be located well beyond the dunes, which would also provide some buffering against wave attack on the development. However, the proponent has considered that rock protection may be provided on the inner edge of the artificial lake to mitigate any impacts associated with wave attack during such events. This determination would be further investigated during the detailed design stage of the project.

The predicted maximum limit of the shoreline erosion in the project area is 400m from the shoreline. As the proposed development would be 600m landward of the shoreline, it would be generally located outside of the predicted maximum shoreline erosion-prone area. Only a small portion of the eastern boundary of the development is included in this area; however, no structures would be built that could be at risk of shoreline erosion.

The EIS indicates that the highest astronomical tide for the year 2100 would affect areas up to 3.5–4km inland as a result of sea level rise including the project site. Any threat of tidal inundation on the project site could need to be addressed in conjunction with existing residential communities between Holloways Beach and Yorkeys Knob .

5.3.2 River migration

The Barron River drains into Trinity Bay via three tidally connected outlets, including its main channel Thomatis/Richters Creek and Redden Creek. Redden Creek is only a minor distributary and its mouth is closed for most of the year due to the presence of the Barron River bar.

Thomatis/Richters Creek is a major distributary and provides a more hydraulically efficient pathway than the main channel due to the shorter distance to the sea. As a result, approximately 30 per cent of the annual net seaward flow from the Barron River is diverted down Thomatis/Richters Creek. The point at which the main channel of the Barron River splits into the Thomatis/Richters Creek distributary (referred to as the 'Thomatis Creek bifurcation') is located 2.2km upstream from the project site.

During the 1970s there was concern over increasing flows in Thomatis/Richters Creek and the stability of the bifurcation. A range of erosion mitigation works have since been implemented to minimise this risk.

Investigations undertaken by the proponent indicate that the area has stabilised over time, which is evident from the increase of sediment build-up and vegetation growth that has occurred around the bifurcation and the banks further downstream. While there is some evidence that the bifurcation has stabilised, there is a possibility that channel widening in Thomatis Creek could occur as a result of future flood events.

Widening the channel could have an adverse impact on the project and the communities of Yorkeys Knob, Holloways and Machans beaches. This widening may result in Thomatis/Richters Creek becoming the main channel of the Barron River and ultimately increase net seaward flow in the Thomatis/Richters Creek. The channel switch would subsequently reduce the long-term supply of sediment to Machans and Holloway beaches. This could lead to major shoreline erosion in these areas and other erosion impacts in the vicinity of the project area. This channel switch could also be expected to exacerbate flooding impacts on these communities and the project site.

The proponent has acknowledged this risk, however they expect such processes to happen more gradually and that stabilisation works could be implemented to mitigate such impacts. The proponent has committed to provide a financial contribution to fund additional armour works to stabilise the bifurcation, should it be required (Commitment 21).

Erosion—Richters Creek

The proposed location of the onshore pumping assets (e.g. station/inlet sump and valve room) is located in the area of historical creek-mouth movement which has occurred as a result of channel migration and spit growth. Historical aerial photographs indicate that the mouth of Richters Creek periodically moves and becomes quite restricted at times. These processes pose medium to long-term risks of erosion to pumping and discharge assets. The proponent must mitigate any risk to bank protection works in this area to protect the integrity of these structures.

Based on a recommendation by DEHP the proposed location of the inlet sump and the pump station/valve room on the western bank of Richters Creek would be relocated further inland to prevent this infrastructure from being impacted by any migration of Richters Creek mouth.

EIS investigations indicated that Thomatis/Richters Creek appears to be stable with the exception of the bend adjacent to Lot 2 RP8000848 on the southern boundary of the site. This section of the creek has no riparian vegetation and there is evidence of bank erosion. The proponent has indicated that rock protection works are also likely to be implemented in this area to improve bank stability. Such works would be integrated with the erosion protection works required for the construction of the lake overflow at this location. The rock protection works would need to be adequately designed to ensure no significant changes in sediment transport as the stability of Yorkeys Knob Beach depends on a sufficient supply of sediment from Richters Creek.

The EIS investigated the option for two lake overflow channels to supplement lake discharges following heavy rainfall or floods. The proposed options included one overflow discharging to Richters Creek from the south-west corner of the lake and another discharging from the north-west corner of the lake to Yorkeys Creek.

Modelling indicated that it would be possible for all floodwater to be released from the Richters Creek overflow and that the Yorkeys Creek overflow would not be necessary. Large-volume discharges to Yorkeys Creek from the proposed overflow could affect stream morphology and vegetation due to it being a small creek system. While it is likely that only the Richters Creek overflow will be adopted, the proponent would further investigate the need for two overflow channels during detailed design.

The proponent would also be required to ensure that overflow discharges during the operation of the lake have no adverse impact on stream morphology (i.e. stream bed and bank impacts) or vegetation up and downstream from the overflow channel.

Coordinator-General's conclusions

I note that the project's habitable floor levels would be built well above the predicted storm-tide inundation levels and that the development would be located, designed and constructed to ensure exposed structures can sustain flooding from a storm-tide event with no estimated impact .

I acknowledge the proponent's commitment to provide a financial contribution to fund additional works at the Thomatis Creek bifurcation (if required) and to locate sump and pump station/value infrastructure further inland from the western bank of Richters Creek.

Flooding

The project site is located within the Barron River floodplain between Richters and Yorkeys creeks, approximately 6km north of the entrance to the Barron River.

The catchment experiences high seasonal rainfall with the coastal part of the catchment receiving an average annual rainfall in excess of 2,000mm. Intense periods of heavy rainfall and cyclones in the region have resulted in significant flooding events within the flat and low-lying coastal areas.

Floods occur typically between January and March. The largest recorded flood occurred in 1977, which is estimated to be a 2 per cent AEP event. It resulted in flood depths of 1–2m across the site and Yorkeys Knob Road was cut off from the Captain Cook Highway.

The existing project site is generally flat (levels across the site range from 1m AHD to 5m AHD, but generally between 1m and 3m) and is prone to flooding. Flood modelling for the existing site indicates average flood levels during a 1 per cent AEP flood events is between 1m and 3.5m across the site. Peak probable maximum flood (PMF) levels range between 3m and 5.5m.

Yorkeys Knob Road currently has less than 20 per cent AEP flood immunity.

The proposed finished floor level of the resort complex precinct (7.5m AHD) is well above the Barron River PMF level of 6.5m AHD.

Flood-tolerant land uses surrounding the resort complex and lake, including the golf course and conservation areas, would also be designed to accept more frequent inundation. These uses do not require a high level of earthworks and would not result in flooding impacts on off-site areas. The golf course and car park would be designed to have a flood immunity of 20 per cent AEP.

The development has been designed to minimise off-site flooding impacts. A key component is the lake which would improve flood conveyance and compensate for the restriction to flow provided by the resort complex.

Flood modelling indicated that after the development is constructed, flood levels would generally be reduced across the floodplain upstream of the site, and no significant adverse flooding impacts would occur on existing urban areas. Modelling also indicated that there will be a reduction in water levels during a 1 per cent AEP flood event as a result of the project along the western side of the lake and an increase in water levels on the northern and eastern side of the lake.

Council has advised that modelling presented in the EIS indicates that an afflux (a rise in water level upstream of an obstruction) greater than 20mm could occur to east of the development. However, it is expected that the project would be refined during detailed design to ensure that afflux above 20mm would not extend beyond the boundary of the site. The development will be designed to ensure no unacceptable afflux or velocity effects (higher velocities or adverse flow paths) occur outside of the property boundaries.

The proponent has proposed to upgrade Yorkeys Knob Road to improve its flood immunity and its performance as an evacuation route. The road and its connections to the Captain Cook Highway/Cairns Western Arterial Road would be upgraded to be trafficable in a 2 per cent AEP flood event. This would involve raising the road by increasing its vertical alignment by 1–1.5m with the use of additional culverts and widening it to four lanes. All ancillary infrastructure including pump stations, electrical equipment and connections to Marlin Coast WWTP would also be designed with sufficient flood immunity.

The project is not expected to significantly alter flood velocities across the site. Modelling indicated that flood velocities would be generally less than 1m/s at the peak of a 1 per cent AEP event. These velocities are not expected to result in scouring of grassed areas or be hazardous to people.

Coordinator-General's conclusions

The resort precinct will be constructed on a podium level set at 7.5m AHD, which would be well above the PMF level for the Barron River flooding events. I require that the artificial lake surrounding the island be adequately designed to convey floodwaters through the site to compensate for the raised resort complex.

I expect the proponent to ensure the location and design of the development minimises the risk to the safety and health of the community as a result of flooding.

I have conditioned the proponent to ensure that that development does not cause adverse flow impacts or actionable nuisance upstream and downstream of the site up to and including the 1 per cent AEP flood events.

I have also conditioned the proponent to ensure that road upgrades are adequately designed to ensure no adverse effects on existing overland flow paths in the upstream and downstream areas along the full length of the roads.

5.3.3 Hazards and emergency response

Hazards

In addition to storm-tide inundation and floods, the project site is susceptible to tropical cyclones (affecting Cairns on average once every two years).

High-risk periods for cyclones are during the wet season months. During this time, the resort occupancy would be expected be significantly lower. These occupancy levels would be expected to further reduce following warnings of extreme weather events and the closure of day guest facilities.

The project site is also susceptible to events such as earthquakes and tsunamis. Earthquakes with strong magnitude (5 to 6 on the Richter scale) are rare (0.1 per cent AEP); however, they can have catastrophic effects given that the typical soft sediments of deltas and coastal plains can amplify earthquake shaking and can become unstable. This would be addressed by ensuring that all buildings are designed to meet the Australian earthquake loading code.

Tsunamis are also considered rare (0.1 per cent AEP); however, resort structures have been designed to withstand calculated loads for tsunami events. The proposed height of habitable structures and safe refuge facilities in the main resort complex would be 7.5m AHD and therefore above the CRC tsunami evacuation level of 6m AHD.

‘Shelter in place’ facility

The proponent has proposed a ‘shelter in place’ facility to provide safe refuge for guests and staff during major cyclone and other significant hazardous events (e.g. tsunamis). A shelter-in-place approach is considered to be acceptable for this size of development, as it would be logistically difficult to evacuate the magnitude of guests and staff during extreme events. Evacuation would be prioritised for special needs people, and this evacuation would be early, or for medical emergencies. A helipad would also be provided for emergency medical evacuations.

Habitable floor levels and safe refuge facilities are proposed above 7.5m AHD and would therefore be located above extreme flood levels, extreme cyclonic storm-tide and wave level and severe tsunami level.

The size of the refuge would be defined during the detailed design stage of the project. However would be designed to accommodate the full occupancy of guests and staff and meet minimum space requirements.

The proponent would ensure that emergency supplies, emergency generators and onsite medical facilities are also located at this level to provide adequate immunity. Emergency supplies including food, water, fuel, bedding, etc. would need to be stockpiled so that the resort can independently cater for all visitors for a period of at least three days. This facility would also be designed to maintain radio communications with emergency service providers

The facility may also be used to provide additional safe refuge for residents in the surrounding Yorkeys Knob area. The proponent has committed to examine opportunities to provide shelter facilities for Yorkeys Knob residents.

The potential function of the resort as a shelter for the community would need to be considered and decided in consultation with the local disaster management group as it would have implications for the management of emergencies in the wider community and would require specific safety measures.

Coordinator-General's conclusions

I expect the proponent to ensure that the development provides immunity to and safe refuge from extreme natural hazard events and risk.

I note that the proponent would need to determine emergency management response policies, procedures and guidelines during detailed design and in advance of the relevant applications for further approvals.

I also note that the proponent has committed to prepare and implement an Integrated Emergency Management Plan, specific to the project and tailored to the cultural background and demographic of the visitors. This plan would include measures that address hazards during the construction and operation of the project such as cyclones, flooding, storm tide and tsunami. The Integrated Emergency Management Plan would be developed in consultation with the local disaster management group, Queensland Ambulance Service and Queensland Fire and Rescue Service.

5.4 Water Quality

The project site falls within a low lying coastal area in the Barron River floodplain between several creeks including Thomatis/Richters Creek, Yorkeys and Half Moon Creeks. The Barron River catchment has a total area of 217,500ha. Much of the catchment, including the project site, has been extensively developed for agriculture, which has contributed to significant sediment and nutrient loads entering the waters of the catchment.

5.4.1 Existing environment

Waterways and freshwater habitat

Richters Creek runs along the southern and eastern boundaries of the project site and discharges into Trinity Bay 5.6km north of the mouth of the Barron River. Richters Creek is connected to the Barron River via Thomatis Creek 2.5km upstream from the project site. Water quality is largely influenced by inflows from the Barron River and

runoff from the catchment and is also likely to be influenced by discharges from the prawn farm upstream from the project site.

The project site contains a number of freshwater features including natural melaleuca wetlands, which are predominantly sustained by groundwater. Five disused aquaculture ponds are also located on the southern boundary of the site adjacent to Richters Creek. These water features were observed to provide habitat for a high diversity of bird species. No water is currently extracted from the natural ponds within the melaleuca wetland area or aquaculture ponds. There are also several small farm dams, which are used for a range of activities in the local catchment.

Marine habitats

Waterways surrounding the project site support a range of important habitat values. Richters and Yorkeys Creeks include sections mapped as Great Barrier Reef (GBR) Coast Marine Park 'estuarine conservation' zone and the waters offshore from the site are mapped as GBR Coast Marine Park 'general use zone'. The site adjoins Half Moon Creek Fish Habitat Area (FHA) along its western and northern boundary and Yorkeys Creek FHA along its southern, eastern, and northern boundaries.

The surrounding creeks and immediate offshore area have not been observed to support seagrass or reef habitats. The closest seagrass beds are 8km south-west of the site in Trinity Inlet. The closest mapped coral reefs include a small reef at Taylor Point 7km north-west of the project site, the coastal fringing reef of Double and Haycock Island 10km north of Richters Creek mouth and the mid-shelf fringing reef at Green Island 25km east of Richters Creek mouth.

Hydrogeology

Soils across the site are moderately to highly permeable. The surface layer of soils is typically firm to stiff clay to a depth of 2m below ground level and is underlain by looser sands and gravels at a depths between 7 to 10m. Soils at greater depths vary with soft clays located along the eastern and southern margins near Richters Creek and sandy material in the central development area.

Groundwater investigations indicated that the site is underlain by two types of aquifers including a shallow unconfined (water table) aquifer and a deeper semi-confined aquifer. The shallow unconfined aquifer is separated from one or more, deeper underlying semi-confined/confined aquifers by a confining clay layer (aquitard).

Groundwater monitoring indicates that groundwater elevations in the unconfined aquifer fluctuate between 0.5 and 3.5m and are influenced by rainfall and tidal conditions in Richters/Thomatis Creek and to a lesser degree Yorkeys Creek. Long-term seasonal variability in groundwater levels is approximately 2–3m within the unconfined aquifer.

Groundwater elevations within the semi-confined aquifers are generally consistent with the unconfined aquifer, which suggests there is likely to be connectivity between the aquifers, although these results could be attributed to the construction of groundwater bores.

There are a number of groundwater users within 500m of the western boundary of the site. Groundwater has been used for agriculture in the past; however is not currently used due to high operational costs. Groundwater has also been used for garden watering at adjacent residential properties.

Contaminated land

The proposed development site has been used for agriculture, which has the potential to contribute to land contamination. Sources of potential contamination include farm chemicals (i.e. herbicide and pesticides) hydrocarbons, oil and lubricants. Areas of concern include in and around farm buildings where fuel/chemical storage and mixing have occurred.

None of the parcels of land within the project site are listed on the Queensland Government contaminated land register.

The parcel of land on Lot 2 on RP8000898 is listed on the Environmental Management Register for the prescribed activity 'petroleum product or oil storage'.

More detailed investigations would be required prior to excavation to determine soil contamination throughout the site.

Sediments

Richters Creek

Bed sediments in Thomatis/Richters Creek are predominantly silt/clay with some traces of sand and gravel. Samples from Thomatis/Richters Creek indicated that sediment quality is good with contaminant levels (e.g. herbicides, pesticides, insecticides, BTEX (volatile organic compound founds found in petrol) and TPH (total petroleum hydrocarbons found in oils) all below the limit of reporting (LOR).

Metals and metalloid concentrations were below Australian and New Zealand Environment Conservation Council (ANZECC) interim sediment quality guidelines (ISQG) low trigger values for all sampled sites. The exception was antimony, chromium and nickel. Nickel concentrations were above ISQG-high trigger value at the site sampled adjacent to Lot 2 RP800898. Aluminium and iron concentrations were also high for all sampled sites. These concentrations are likely to be associated with the presence of acid sulfate soils (ASS) in the project area.

Nitrogen concentrations were below the LOR for all sites. Phosphorus concentrations were high for all sites, which is likely to be from agricultural runoff.

Offshore

The concentration of nutrients in marine sediment samples were below LOR at all sites. The concentration of metals and metalloids were below ISQG-low trigger values for all samples.

Acid sulfate soils

Field investigations undertaken for the EIS indicate that the top 1 to 2m of the soil profile is not likely to contain actual ASS or potential ASS (PASS) material. However PASS material is expected to underlie the entire site below this layer.

Surface water quality

Creeks

Yorkeys Creek bisects the central and northern portions of the site and discharges into Trinity Bay adjacent to the mouth of Richters Creek. Water quality in Yorkeys Creek is considered poor as it is influenced by agricultural and urban runoff. Tidal gates installed approximately 300m upstream of the Yorkeys Creek mouth have affected upstream water quality due to reduced tidal flushing. Restricted tidal influence in addition to road construction works have also contributed to ASS contamination in Yorkeys Creek near the corner of Dunne and Yorkeys Knob Road.

Half Moon Creek runs along the north-western to northern boundary of the site and discharges to the Coral Sea north of the site, approximately 300m north-west of the Yorkeys Knob Marina. Water quality in Half Moon Creek has been impacted by runoff from agricultural and urban development and discharge from the Marlin Coast wastewater treatment plant (WWTP) located 500m upstream from the project site. Water quality has also been impacted by the presence of tidal flaps that impede tidal influence above Dunne Road.

High nutrient levels were observed in all creek systems. Metal and metalloid concentrations were generally below ANZECC trigger levels, with the exception of boron, manganese (observed consistently above the limits), zinc and copper (observed occasionally above the limits) which exceeded trigger values in Richters Creek. All other parameters including hydrocarbons, pesticides and herbicide concentrations were below the limit of reporting for all creeks.

Overall Thomatis/Richters Creek was observed to have better water quality than Yorkeys and Half Moon Creeks due to it being a larger and a better flushed system and the absence of tide restricting infrastructure.

Near-shore

Water quality monitoring indicates that nutrient concentrations at the near shore monitoring sites are generally consistent with Queensland Water Quality Guidelines (QWQG). However some samples indicated higher levels of nutrients as a result of inflows from the Barron River.

Groundwater quality

Unconfined aquifer

Groundwater monitoring indicates that the salinity within the unconfined aquifer varies from potentially potable to saline. This variability is considered to be typical of a hydrogeological environment that comprises variable sediment types (from highly

permeable sands and gravels to low permeability silty clays) and connectivity to tidal creeks.

Higher salinities were observed in the sections of the aquifer closest to Richters and Yorkeys Creeks and salinity concentrations became lower with increasing distance from the creeks. Salinity variation within the shallow unconfined aquifer is also influenced by seasonal conditions with lower salinities observed during the wet season.

Groundwater samples indicate high levels of nutrients, with nitrogen and ammonium levels exceeding the water quality objectives for most sections of the unconfined aquifer. This is likely to be attributed to fertiliser use within the agricultural areas and water quality of adjacent waterways. Groundwater samples also indicate that groundwater is acidic to mildly acidic (pH ranging from 4.85 to 6.47). These conditions are likely to be associated with the presence of acid sulfate soils.

Semi-confined aquifer

Groundwater data from the semi-confined aquifer is limited, however the data shows that water in this aquifer ranges from fresh to brackish/saline. Past monitoring of the deeper semi-confined aquifer indicates that the upper sections are relatively saline and there is a reduction in salinity with depth, with freshwater conditions at depths of 70m to 100m.

5.4.2 Project impacts and mitigation measures

Lake construction

Construction activities are proposed in two stages over a four-year period. Construction of the lake would require excavation of 2.8 million m^3 of material. A significant volume of excavated material is likely to be coarse sand suitable for re-use in the production of concrete.

The proponent has considered a number of off-site beneficial re-use options for excess material, which would be further investigated during detailed design. Based on the proponent's preliminary investigations, all material can be beneficially used off site, subject to further approvals.

Acid sulfate soils

A significant proportion of excavated material is also likely to contain PASS/ASS material. Excavated material would be treated on site for ASS and treated materials would be either used on site or transported off site for beneficial re-use.

The proponent would implement an ASS management plan (ASSMP) to manage impacts associated with the disturbance of acid sulfate soils during construction. ASS/PASS material would be treated on site in a bunded treatment facility. Treatment would either be undertaken using a batching process in dedicated treatment cells or a continuous mixing process. Approximately 105,000 tonnes of lime (about 25 000 tonnes/year over the full construction period) would be required to treat ASS/PASS material. Tailwater collected from treatment and storage areas would be treated prior to being pumped to the lake excavation area.

Water quality impacts would be managed during the construction of the lake by restricting earthworks and ASS treatment/stockpiling activities to the dry season to reduce the likelihood of working areas being exposed to floodwaters and surface water runoff. Storage hoppers and/or storage sheds would be provided on site to enable safe and dry storage of treated material.

Coordinator-General's conclusions

I have conditioned the proponent to implement best practice ASS management practices to protect the water quality of the underlying groundwater aquifers and receiving waterways.

The proponent would be required to undertake detailed ASS investigations for all areas of the site where soil disturbance is proposed, in accordance with the *Queensland Acid Sulfate Soils Laboratory Methods Guidelines* and *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils*.

With these measures in place, ASS would be adequately managed during construction.

Groundwater

Groundwater losses of 900ML from the unconfined aquifer, is anticipated as a consequence of dewatering activities during lake construction. The proponent would require a permit under the *Water Act 2000* to remove this groundwater resource. No other groundwater extraction from the unconfined and semi-confined aquifer is proposed for use during construction.

The volume and rate of groundwater extraction from within the lake footprint would need to be managed to ensure the existing freshwater/saline water interface is maintained outside of the lake boundaries.

Groundwater barrier works (i.e. cut-off barrier or liner) would be undertaken before excavating the lake below groundwater level. The barrier would prevent in-situ dewatering of ASS surrounding the lake and the potential export of acidic waters to the excavation area. Infiltration trenches may also be used to maintain groundwater levels outside the containment area.

The proponent has committed to developing a groundwater monitoring program before commencing site works. Monitoring would be undertaken at regular intervals during construction to monitor impacts on groundwater levels and quality, and to allow corrective actions.

The water extracted during dewatering activities would be treated to manage contaminants associated with ASS (acidic water, aluminium, iron) and any discharges would need to comply with discharge performance criteria before being pumped to the lake. The treated water extracted from the lake should be used beneficially, subject to appropriate water quality.

Coordinator-General's conclusions

I have conditioned the proponent to undertake a groundwater monitoring program during construction to adequately manage any identified groundwater impacts. I have

also conditioned the proponent to ensure that groundwater-dependent ecosystems are not adversely impacted by the development.

Stormwater

Stormwater runoff from areas disturbed or exposed during construction would be designed to drain into the lake, which would act as a detention basin.

All stormwater control measures would be designed in accordance with the *Best Practice Erosion and Sediment Control for Building and Construction Sites* (International Erosion Control Association [IECA] Australasia 2008) and the Far North Queensland Regional Organisation of Councils (FNQROC) *Regional Development Manual* and would ensure stormwater management releases meet the construction phase design objectives specified in the State Planning Policy 2014 (Appendix 3, Table A) and the QWQG.

Coordinator-General's conclusions

I have stated conditions requiring any release of water from the site to achieve the design objectives contained in the State Planning Policy 2014 and the QWQG, and the proponent has committed to using best practice environmental management measures that support the achievement of these objectives.

I have conditioned the proponent to ensure that sediment and erosion control measures comply with requirements of the IECA's *Best Practice Erosion and Sediment Control* and the FNQROC *Regional Development Manual*.

Pipeline construction

Outlet pipeline options

The EIS investigated two locations for the lake discharge outlet: the mouth of Richters Creek and an offshore location.

The proposed outlet in the mouth of Richters Creek would involve works within the State Great Barrier Reef Coastal Marine Park 'estuarine conservation zone' and the Yorkeys Creek declared FHA. As the management objective of these areas is to protect the natural integrity of the habitats by minimising habitat disturbance, the preferred location of the discharge pipeline is offshore rather than in the mouth of Richters Creek.

Placement of an outlet offshore would also reduce the risk of the outlet being damaged by debris, scouring, burial or clogging during floods and prevent ongoing maintenance excavation to keep the outlet clear. Other operational benefits of the offshore location would be the ability to maintain continual discharge rather than limiting discharge to ebb-tide conditions.

Inlet and outlet pipeline construction

The inlet pipeline would extend 2.2km offshore through the estuary and shallow bar of Richters Creek. The offshore outlet pipeline would extend 1.4km and would follow the same alignment as the inlet pipeline and be installed in the same trench. Construction

of the inlet and outlet pipelines would be expected to generate approximately 70,000m^3 of excess sediment, requiring beneficial use or disposal at the site.

Onshore construction would be undertaken using an open trench through a cleared area adjacent to the western bank of Richters Creek. Water quality impacts would be mitigated by undertaking excavation works during the dry season and using appropriate sediment and erosion control measures to minimise the opportunity for runoff from the disturbed areas entering Richters Creek.

Works in the transitional zone between onshore and offshore works are likely to be undertaken under 'dry' conditions, which is likely to involve the use of a coffer dam to hold back tidal water and dewatering. Following dewatering, the trench would be excavated to necessary levels. Excavated materials would be stockpiled in the contained area and neutralised with lime if required.

Offshore trenching works are likely to be undertaken using a long-reach excavator on a four-pole-spud barge. The trench would be excavated to a depth of 3m, a maximum top width of 16m and a bottom width of 4m (4m for double pipe and 2m for single pipe). Sections of the pipeline located in the mouth of Richters Creek would be buried to a depth of RL –9.6m AHD, to ensure the pipeline remains buried particularly during major flood events. The proposed depth is 5.4m below scoured bed depth that occurred during the 1977 floods.

The pipeline trench would be covered and backfilled using suitable material such as sand and fine gravel. Any excess material would be moved on site for treatment (if required) and used or disposed of on site.

Sediment plumes generated during the construction of the pipeline are not expected to impact any sensitive habitats (e.g. coral and seagrass), as the closest sensitive areas are well outside the immediate impact area. Silt curtains may be installed around work areas to reduce the dispersion of sediments.

Overflow construction

An overflow channel would be provided to allow water to discharge from the lake to Richters Creek when the lake level is above its design level of 1.5m AHD (e.g. following heavy rainfall or floods). The overflow is likely to be an open channel approximately 20m wide. The proposed overflow channel would be constructed on the bank adjacent to the site on Lot 2 RP8000898 in an area that is devoid of riparian vegetation. As this area is already affected by erosion, the proponent would be required to adequately manage runoff to ensure erosion is not exacerbated in this area. Adequately managing runoff and erosion would reduce the potential for sedimentation and increased turbidity in Richters Creek.

Coordinator-General's conclusions

The construction of the pipeline and overflow channel would create temporary and localised impacts on water quality. I am satisfied that the proposed mitigation measures would adequately manage potential impacts. I have conditioned the proponent to

ensure that pipeline construction activities do not adversely impact on the water quality of the receiving marine environment.

The proponent must provide further information to support an application for a development permit for operational works (tidal works or prescribed tidal works other than dredging). This would include details on construction methodology and materials used during construction and the final design of the works (e.g. layout and cross sectional drawings of infrastructure).

More detailed sediment sampling will be required before construction to determine the quality of sediment that would be disturbed during construction of the pipelines. This would ensure that the correct management strategies are implemented based on the quality of sediment.

I have conditioned the proponent to undertake appropriate sediment and erosion control measures during construction to manage any adverse impacts on the physical integrity and water quality of Richters Creek.

Operation

Surface water resources

The project would not involve any impoundment, extraction, discharge, injection or loss of surface water. The project would involve use of surface water only during large Barron River flooding events (i.e. events with a frequency of less than 50 per cent AEP).

Diversion of overland flow during such events would need to occur as part of the flood management measures; however, this would not involve any diversion or interception of surface water.

Modelling for a 1 per cent AEP flood indicates that flood waters would pass through the site and diversion would only occur around the resort complex itself. Any surface water captured by the lake would be discharged as quickly as practicable. The project would therefore not require any approvals for the use and control of surface water managed under the Water Act.

Most of the artificial water bodies (i.e. farm dams) located within the site are likely to be drained and filled in during construction. The removal of these water bodies is not expected to significantly affect surface water resources. All of the natural existing water bodies within the melaleuca wetland and the aquaculture ponds are intended to be retained on the site.

Stormwater

Stormwater runoff from the resort complex would be designed to pass through stormwater treatment devices, which would treat stormwater before collection for re-use on site or discharge to the lake.

The proponent is required to ensure the development incorporates appropriate stormwater controls and design elements which meet the post construction phase

stormwater management design objectives of the State Planning Policy 2014 (Appendix 3 Table B (Wet Tropics climatic region)).

Treated stormwater would be used to supplement irrigation requirements and non-potable uses, which would further reduce the pollutant load entering the receiving environment by reducing the volume of stormwater water runoff.

Stormwater runoff from the sport and recreation precinct in the western development areas would drain principally to Half Moon Creek and runoff from the eastern development area would drain to either Yorkeys or Richters Creek.

Stormwater management devices would be integrated into the design of these areas to ensure that stormwater is adequately treated before being discharged to the receiving waterways. Sediment and nutrient loads from the golf course and recreation areas would be reduced through the use of stormwater treatment devices, optimising fertiliser use and incorporating measures to prevent overwatering. Stormwater management measures would be further investigated during the detailed design.

The proponent proposes to use recycled class A water from the Marlin Coast WWTP for irrigation of the golf course and other landscaped areas. Wastewater from the development is proposed to be exported to Marlin Coast WWTP for treatment. A large proportion of the treated effluent would be used to substitute part of the development's water demand, including irrigation. This proposed water recycling strategy would reduce the project's reliance on potable water and the volume of treated water to be discharged from the Marlin Coast WWTP.

The Marlin Coast WWTP currently achieves a tertiary wastewater treatment and has capacity to produce 6.2 ML/day of class A re-use water. The WWTP would need to be upgraded to adequately service the needs of the development—increasing its capacity from 8.3 ML/day to 17 ML/day and upgrading treatment processes to achieve class A+ effluent. Class A+ would be required for water being used for toilet flushing. The proponent has committed to fund these upgrades. Any recycled water used and/or stored on site must comply with the Public Health Regulations 2005.

The change in land use from cane farming to the project with best practice stormwater treatment design measures is expected to result in a significant reduction in total suspended solids (TSS), total nitrogen (TN) and total phosphorous (TP) loads entering the receiving environment. Modelling undertaken for the EIS indicates that, compared with the existing agricultural scenario, the proposed development would result in a pollutant reduction load of at least 76 per cent for TSS, 61 per cent for TP and 46 per cent for TN. This would meet the State Planning Policy 2014 post-construction stormwater management design objectives for TP (60 per cent) and TN (40 per cent) and almost meet the objective for TSS (80 per cent).

Coordinator-General's conclusions

I note that the proponent has committed to ensure that the proposed development is suitably designed to accommodate stormwater flows to avoid local flooding or adverse impacts on the water quality of the receiving environment. I state conditions to ensure this outcome in Appendix 2.

I am confident that the proponent would implement best practice environmental management measures that support the achievement of the stormwater management design objectives contained in the State Planning Policy 2014.

Lake operation

The proponent has committed to manage the lake to protect the water quality of the receiving environment. The EPP (Water) identifies the receiving environment as 'high ecological value' (HEV) waters, which requires that environmental values be maintained. The lake operating regime would be further refined during detailed design for the lake

The performance of the lake was evaluated using a numerical model called TUFLOW FV. The model was used to simulate a range of relevant biophysical processes and effects in the lake, such as lake stratification and lake flushing time and predict distributions of the relevant water quality parameters (e.g. dissolved oxygen, nutrients, and chlorophyll-a).The TUFLOW FV model was configured with Barron River flow and meteorological data to simulate a recent 12-month period (August 2012 to July 2013). The modelling period encompassed 'dry' and 'wet' periods as follows:

- dry: October to December 2012
- wet: January to March 2013
- flood: (Australia Day 2013): 20 January 2013 to 14 February. The peak flood flow for this event was between a 50 per cent AEP and a 20 per cent AEP flood event.

Normal operation (dry and wet conditions)

During normal operations, the water quality of the lake would primarily be maintained by continuously pumping seawater into the lake and discharging through the offshore outlet.

A bund would be constructed around the lake at a level of 2m AHD to prevent the lake from receiving local runoff from surrounding areas and being inundated by minor flood flows from the Barron River (up to 50 per cent AEP event). The bunds would also provide additional temporary storage capacity (13 per cent or 0.17GL) for rainwater, floods and in situations where water cannot be discharged. Water-sensitive urban design features within the resort complex precinct, would reduce sediment and nutrients loads by capturing and treating surface water runoff prior to being released into the lake.

Modelling of the performance of the proposed lake management and discharge during dry and wet (non-flood conditions) over a 12-month period indicates no overall notable change in the water quality of the receiving environment. The modelling results are considered to be conservative and have not included the effects of mixing devices and aerators. Submerged mixing devices and aerators within the lake would further assist in maintaining water quality by reducing surface temperatures, increasing dissolved oxygen levels and preventing thermal and salinity stratification within the lake. The precise location and operational regimes of these devices will be determined at subsequent modelling and/or design phases.

The EIS indicates that with the proposed mixing devices the whole lake could be fully flushed within 14 days during normal operations (i.e. wet and dry periods).

Water from the lake would be pumped via the 1.4km pipeline to the proposed offshore release point, which is located within an area mapped as HEV waters. As the management intent for such HEV waters under the EPP (Water) is to maintain the indicators for all environmental values, the proponent must ensure that any releases from this point do not change any of the system's existing natural attributes (e.g. physico-chemical, biological and habitat). This would be achieved by ensuring that non-flood discharges meet the relevant water quality objectives for the Barron River Basin.

Water quality would be monitored consistently for the life of the project at the intake and the outlet location and within body of the lake. Data collected from the monitoring points would be used to demonstrate that water quality targets are met and to detect any adverse water quality conditions.

Should monitoring detect adverse water quality conditions, the proponent would either suspend the intake or discharge of lake water. Direct management actions to resolve adverse water quality for the lake would include:

- increasing flushing
- increasing mixing via mechanical means (i.e. de-stratification)
- aquatic plant harvesting
- lake de-silting
- containment and treat in place using the filtration system of the saltwater lagoon within the resort complex precinct.

The EIS indicated there is low risk of adverse impacts on the receiving environment, provided that the water quality of the lake is maintained and lake releases are managed appropriately.

The proponent would need to continue collecting baseline water quality data for the offshore outlet pipeline location to determine operational water quality discharge targets. The proponent has committed to undertake monthly monitoring until February 2015 or later if warranted.

I have conditioned the proponent to ensure that operation and management of the lake achieves the relevant water quality objectives for the Barron River Basin. This would ensure that all waters being released from the lake do not change any of the existing natural attributes of the receiving environment, therefore meeting the management intent for HEV waters.

I am confident that the use of mixing devices and aerators within the lake would further assist in maintaining water quality and subsequently reduce the potential for excessive algal growth in the lake

Post-flood operation

The lake would be designed to be isolated from flood events up to 50 per cent AEP. During higher flood events, the lake would mix with floodwaters and drain to Richters Creek. The EIS indicated that during higher flood events floodwater from Richters

Creek would be expected to displace approximately 90 per cent of lake's water (i.e. 90 per cent floodwater and 10 per cent lake water) which would result in saline lake waters becoming fresh and high nutrient and suspended sediment loads. At this stage the lake would be expected to have a similar water quality to Richters Creek.

The EIS indicates during such an event, normal intake and discharge operations would be temporarily suspended and floodwaters would be discharged to Richters Creek via the proposed lake overflow channel. Once the flood level drops below 2m AHD, seawater intake would be resumed and run continuously to restore operational water quality levels with discharge to Richters Creek via the overflow channel. The location of the lake intake pipe is largely unaffected by a Barron River flood, and would allow the lake to be immediately flushed with relatively clean marine water.

The normal intake and discharge operating regime would recommence once the water quality of the lake system has returned to an acceptable quality. The proponent estimates that the normal operating regime could re-commence within 10–14 days after a flood (i.e. once lake water quality returns to pre-flood conditions). Modelling indicates that at this time, the water quality of the lake is likely to be better than the surrounding creeks and near-shore waters.

Coordinator-General's conclusions

I note that the final lake operating regime (i.e. normal and post-flood) would be further refined during detailed design for the lake. I have conditioned the proponent to ensure that lake releases from the offshore outlet comply with the relevant water quality objectives for the Barron River Basin and I am confident that this can be achieved. I have conditioned the proponent to ensure that no other contaminants are directly or indirectly released to the receiving environment.

I require the proponent to monitor water quality for the life of the project to manage discharge and to evaluate the success of the discharge limits in maintaining environmental values of the receiving environment.

I have also conditioned the proponent to ensure that the lake is designed to exclude overland flow up to a 50 per cent AEP flood event.

Groundwater quality

The proponent proposes to install groundwater cut-off structures to limit interaction between the lake and groundwater. Preliminary modelling indicates that reducing the permeability (hydraulic conductivity) of the side and base of the lake to below 0.001 m/d (~1 × 10-8 m/sec) would effectively isolate and contain saline water within the lake. The proponent has considered a number of options including an impermeable cut-off wall around the perimeter of the lake which extends vertically into the stiff clay layer between the shallow and deeper aquifer systems. Lining the base and sides of the lake or another method to reduce the permeability of the lake bed.

The use of a cut-off wall down to the stiff clay layer would minimise the exchange water and salinity horizontally into the shallow unconfined aquifer, however if the stiff clay layer has a higher permeability than expected or is discontinuous there would be a risk

of salinity migrating vertically downward from the lake into the deeper semi-confined aquifer. The proponent would need to consider using a combination of cut-off wall and lining solution if there is a risk of vertical salinity migration. The permeability of the stiff clay layer would be confirmed during the detailed design stage.

Lining options may include an impermeable barrier of clay or another impermeable material. The proponent would need to ensure that any materials used as liners would have appropriate durability to avoid saltwater ingress into the freshwater aquifers. Such liners would also need to be adequately maintained for the life of the lake. A decision on which of these to adopt would be made during detailed design.

The lake barrier works would affect the local groundwater flows in the shallow unconfined aquifer, recharge to the shallow aquifer, and flow paths between the shallow and deeper aquifer systems. The proponent has committed to monitor groundwater monthly until February 2015 or longer if warranted, for both shallow and deeper groundwater aquifer systems, to obtain sufficient baseline data.

Monitoring would inform the preparation of a detailed groundwater monitoring and management plan, which should detail how groundwater impacts will be monitored and managed on site, including parameters (e.g. levels, salinity, pH) to be tested from monitoring bores, action thresholds and remedial actions to be undertaken. The proponent would be responsible for taking any remedial action.

Coordinator-General's conclusions

To protect groundwater users and environmental receptors (e.g. groundwater-dependent ecosystems), I state a condition requiring the proponent to prevent interaction between the lake and adjoining groundwater.

I have conditioned the proponent to prepare a groundwater monitoring and management plan that defines what measures would be undertaken to address changes to groundwater quality and levels, and aquifer connectivity during construction and operation.

The proponent is required to enter into a written agreement with owners of registered bores to protect their interests in the event that the registered bores become saline as a consequence of the proposed development.

I have conditioned the proponent to ensure that the lake does not affect groundwater quality or flow in a way that adversely impacts native flora or fauna.

5.5 Construction impacts

5.5.1 Air quality

Sensitive receptors located near the project area include the urban areas of Yorkeys Knob and Holloways Beach (across Richters Creek) and rural receptors located to the south and west of the project area. Other potential receptors include aircraft and vehicles using Yorkeys Knob Road, which may have reduced visibility due to dust.

Local air quality is influenced by motor vehicle emissions, agricultural activities such as sugar cane firing, occasional bushfires and control burns. The EIS stated that existing traffic volumes in the project area are considered low compared with Cairns City and there are no large industrial facilities in the region. The existing air quality meets health and amenity criteria except for particulate concentrations associated with controlled burns and cane firing.

Issues and mitigation

Construction

Air quality impacts during construction could include dust from earthworks activities, uncovered ground, and concrete batching. The proponent has committed to manage dust impacts on sensitive receptors by using buffering, water sprays, wind breaks, and revegetation works. Buffers would be provided particularly in areas where there are no existing natural buffers. These mitigation measures would ensure that dust emissions do not extend beyond the boundary of the site.

Earthworks involving ASS can be a source of odour. The proponent has committed to locate the ASS treatment facilities an adequate distance away from residences and Yorkeys Knob Road. Due to the large area of the site, the proponent would have capacity to provide appropriate buffering between working areas and existing residences.

All construction activities are required to meet the air quality standards under the EP Act and air quality objectives of the Environmental Protection (Air) Policy 2008 (EPP (Air)).

The proponent has committed to prepare and implement an air quality monitoring program (including dust deposition monitoring) during construction. The proponent has also committed to consult with Queensland Health when preparing the construction and operational environmental management plan to reduce the risk of adverse human health within the local community—e.g. dust mitigation during construction and operational phases.

Operation

The EIS considered air emissions associated with the additional traffic and flights that would increase as a result of the development. All airport operations (including aircraft emissions) would be under the control of North Queensland Airports.

Operational sources of air emissions include motor vehicle and aircraft traffic and various greenhouse gas emissions; however, the additional emissions are not expected to exceed health and amenity criteria.

All operational activities are required to meet the air quality standards under the EP Act and the air quality objectives of the EPP (Air).

The proponent has incorporated appropriate performance measures into the local area plan to ensure that air quality impacts are managed adequately throughout construction and operation.

Coordinator-General's conclusions

I am satisfied that air quality impacts generated by the project would be unlikely to exceed the parameters set by the EPP (Air). I have conditioned the proponent to ensure that air pollutants, dust and sediment particles from filling and excavation are adequately managed to ensure no environmental nuisance impact on sensitive receptors. My conditions are set out in Appendix 2.

I have conditioned the proponent to ensure that construction and operational activities do not cause environmental nuisance at a sensitive place other than where an alternative arrangement is in place.

Further approvals would be required for ERAs under the EP Act and development approvals under the SP Act. Additional construction air quality management plans would need to be submitted to EHP and council for approval, and as part of applications for development approval, the proponent would be required to demonstrate that the air quality objectives would be met.

Based on the temporary nature of the project's impacts on air quality, the mitigation measures and the subsequent approvals required for project activities, I am satisfied that air quality impacts would be minimal and appropriately managed.

5.5.2 Noise and vibration

Dominant sources of noise in the project area include traffic on Yorkeys Knob Road and aircraft overhead. Sensitive receptors include the urban areas of Yorkeys Knob and Holloways Beach (across Richters Creek) and rural receptors located to the south and west of the project area.

Issues and mitigation

Construction

Potential sources of noise and vibration include earthworks, pile-driving and vehicle movements. Other sources of construction noise include concrete batching processes. Noise and vibration impacts during construction would be managed through the provision of appropriate buffer distances between working areas and sensitive receptors and restricting the hours of work.

The proponent has committed to prepare a noise and vibration management plan as part of the construction EMP, when detailed information is available on the construction process, activities, and equipment. The management plan would be prepared in accordance with Australian Standard AS2436-2010 – *Guide to noise and vibration control on construction, demolition and maintenance sites*.

All construction activities are required to meet the noise standards and acoustic objectives under the EPP (Noise).

Operation

Potential sources of operational noise include entertainment and retail buildings (air conditioning, amplified music, outside dining etc.), golf course maintenance operations,

and helipad operations. Noise impacts during operations would be managed by providing adequate buffering between these areas and the sensitive receptors, incorporating design elements that help reduce noise, and ensuring operational activities meet the required noise standards and acoustic objectives. Further mitigation measures would be investigated during detailed design.

Operational activities would be required to meet the noise standards and acoustic objectives of the EPP (Noise).

The project could generate a 22 per cent increase in flights arriving and departing from Cairns International Airport. The additional flights that would not add to the level of noise associated with the operation of airport, however could increase the frequency of noise episodes. All airport operations (including noise emissions) would be under the control of North Queensland Airports.

The project would also result increased in noise emissions in the project area associated with increased traffic flow on Yorkeys Knob Road and proposed new project roads. The proponent must assess road traffic noise on Yorkeys Knob Road associated with the increased volume of traffic that would be associated with the project.

Noise impacts associated with increased traffic on Yorkeys Knob Road would be assessed using the TMR Road Traffic Noise Management: Code of Practice. The EIS indicated that noise mitigation measures would need to be considered for two 2-storey residences at the intersection of Yorkeys Knob Road and Robinson Road.

Coordinator-General's conclusions

I consider that noise and vibration associated with the operation of the development can be maintained at a level that complies with the standards under the *Environmental Protection Act 1994*.

I have conditioned the proponent to ensure that construction and operational activities do not cause environmental nuisance at a sensitive place other than where an alternative arrangement is in place.

As part of applications for development approval, the proponent would be required to demonstrate that noise attenuation and control measures would be effective in achieving acoustic quality objectives stated within EPP (Noise).

A detailed assessment of noise levels would be undertaken once contractors have been commissioned as part of the subsequent ERA application process. Where ERAs are proposed, a detailed noise impact assessment is required. I require the proponent to comply with the noise conditions for the EA.

5.6 State biodiversity values

5.6.1 Regulated vegetation

Five regional ecosystems (REs) are present on site, with three listed as 'of concern' and two listed as 'least concern' under the *Vegetation Management Act 1999* (VM Act).

A small area of endangered RE 7.3.12b (Floodplain [other than floodplain wetlands] woodlands) is located on the outside of the northern boundary of the project site.

The following of-concern REs are present inside the northern and eastern perimeter of the project site:

- RE 7.3.2b woodland and open forest
- RE 7.2.4b floodplain woodland and open forest
- RE 7.3.25a riverine wetland or fringing riverine wetland.

The areas of least-concern REs are located on the inside of the northern and eastern parameter of the project site. This RE consists of mangroves (RE 7.1.1) and melaleuca wetland (RE 7.3.25a). Mangroves are the most extensive RE on the site and are also a marine plant under the *Fisheries Act 1994*. Small areas of mangrove habitat located near aquaculture ponds are mapped as reef regrowth watercourse vegetation under the VM Act. Sections of this mangrove habitat are mapped as areas of general ecological significance under the Environmental Protection Regulation 2008.

A small area of samphire-dominated salt pan is located on site, west of Yorkeys Knob Road. For descriptions of REs on site, refer to Chapter 7 of the EIS.

Impacts and mitigation measures

The project may require clearing of 0.1ha of woodland and 0.2ha of melaleuca wetland habitats. The proponent has committed to avoiding clearing this vegetation and using existing cleared areas wherever practicable. The proponent has committed to retaining 52.7ha of existing vegetation and restoring 53.2ha of degraded vegetation as part of the environmental management and conservation precinct on the site. Therefore, the project would have a net beneficial impact on this habitat.

Groundwater disturbance associated with earthworks and the artificial lake may affect adjacent Melaleuca woodlands. These impacts would be reduced through appropriate groundwater management during the construction and operation of the lake. The proponent would be required to implement a groundwater-dependent ecosystem management plan (GDEMP), requiring all impacts on groundwater and associated vegetation to be identified and managed. Groundwater is further discussed in section 5.4 of this report.

A total of 0.4ha of mangroves would be cleared to establish service and road infrastructure near Dunne Road. Given that 27.3ha of mangrove communities will be restored across the site, the project would have a net beneficial impact on this habitat.

5.6.2 Threatened plants

The ant plant (*Myrmecodia beccarii*) is the only listed flora species recorded on site. This species is listed as vulnerable under the *Nature Conservation Act 1992* (NC Act) and under the EPBC Act. As discussed in Section 8.2.1 of this report, I conclude that the project would result in a loss of 18 ant plants. Accordingly, a clearing permit under NC Act would be required.

The dark-stemmed antler orchid or mangrove orchid (*Dendrobium mirbelianum*) is the only listed flora species considered likely to occur on site. It is listed as endangered under the NC Act and under the EPBC Act. The project would not have direct or indirect impacts on this species because no clearing of this plant would occur (refer to section 6.3.1).

5.6.3 Threatened terrestrial fauna

Five terrestrial animals listed under the Nature Conservation (Wildlife) Regulation 2006 (NCWR) have been found on site and two are likely to occur (refer to Table 7-7, Chapter 7 of the EIS). The species found on site include the Australian swiftlet, Macleay's fig parrot, black-necked stork, beach stone curlew and the radjah shelduck. The blue-faced parrot-finch and the Apollo jewel butterfly are likely to occur on site due to the presence of foraging habitat.

Seven terrestrial fauna species have been listed under both the NC Act and the EPBC Act. These species include the estuarine crocodile, northern quoll, red goshawk, eastern curlew, spectacled flying-fox, bare-rumped sheathtail bat and the little tern. Section 8 of my report includes the evaluation on the impacts on these species and I conclude that the project would have no residual impacts on these species.

Impacts and mitigation measures

The project has the potential to affect threatened fauna species through clearing of foraging habitat. As discussed in section 5.6.1 (Regulated vegetation), clearing of 0.7ha of woodland, melaleuca wetland and mangrove habitats may occur as a result of the project. The proponent has committed to retain 52.7ha of these habitats and the aquaculture ponds. A total of 53.2ha of degraded vegetation would be restored as part of the environmental management and conservation precinct. These works would result in a net beneficial impact on the species by providing additional foraging habitat.

The construction of the inlet/outlet pipeline at the mouth of Richters Creek would have a direct impact on un-vegetated soft sediments and the associated benthic macroinvertebrate communities. It also has the potential to disturb the surrounding mangrove communities. These impacts could reduce the amount and quality of foraging and breeding habitat for threatened terrestrial species, including the beach stone curlew. The proponent has committed to limit the disturbance footprint within this area and construct the pipeline within an already cleared area. Furthermore, the EIS reports that the loss of un-vegetated soft sediments and associated benthic macroinvertberate communities is likely to cause a minor ecological impact.

The construction and operation of the project would introduce artificial light and noise to the project site, which could impact on the foraging habitat for threatened fauna. To reduce light-associated impacts, lighting design consistent with relevant standards will be implemented. Restoring vegetation within the environmental management and conservation precinct would reduce noise and light impacts on species. These works would commence before construction of built form to allow vegetation buffers to establish and provide noise and light buffering for the species.

5.6.4 Protected marine fauna

Five aquatic animals listed as vulnerable under the NCWR have been identified within a 5km radius of the project site. These include the humpback whale, green turtle, hawksbill turtle, flatback turtle and the saltwater crocodile. Three aquatic species are also listed as endangered under the NCWR including the loggerhead turtle, leatherback turtle and the olive ridley sea turtle. These species are protected under the EPBC Act and are discussed in section 8.2.1 of my report. My evaluation did not identify any residual impacts on these species.

5.6.5 High conservation value wetlands

The project site includes areas that are mapped as 'general ecological significance'. These areas are associated with the five natural ponds located within the southern portion of the site and the Yorkeys Creek, Richters Creek and Half Moon Creek. The abandoned aquaculture ponds are mapped as a lacustrine water body on the site and support a range of aquatic flora and fauna.

These ponds will be retained as part of the project and no impacts are anticipated to occur during construction or operation. As a result, the project would have no residual impact on the wetlands.

5.6.6 State marine park

The Great Barrier Reef Coast Marine Park (GBR Coast MP) is the Queensland State marine park located adjacent to the Commonwealth Great Barrier Reef Marine Park (GBRMP). The GBR Coast MP has been established under the *Marine Parks Act 2004* and is managed through the provisions of the Marine Park (Great Barrier Reef Coast) Zoning Plan 2004.

The eastern, northern and western boundaries of the project site abut the Estuarine Conservation zone. Seaward of high water lies the General Use Zone with management arrangements extending seaward into the GBRMP. Aquatic connectivity to the site exists via Yorkeys Creek, which bisects the central and northern portions of the project site. The project inlet/outlet pipelines would be situated within both of these zones.

A development permit would be required from the Department of National Parks, Recreation, Sport and Racing (NPRSR) for the following project activities:

- sampling and surveys to support pipeline design and engineering
- construction of the pipelines and any overflow structures in the Richters Creek
- operation of the inlet/outlet pipelines.

5.6.7 Fish habitat areas

Two fish habitat areas (FHAs)—Yorkeys Creek (FHA-034) and Half Moon Creek (FHA-033)—border the project site. Yorkeys Creek FHA covers an area of 117ha and is located along the eastern and southern perimeter of the project site. The Yorkeys Creek FHA includes both the Yorkeys and Thomatis/Richters Creeks. The Half Moon

Creek FHA covers an area of 216ha and is located on the northern perimeter of the project site.

The EIS finds that Yorkeys Creek and Half Moon Creek are not in pristine condition due to agricultural and urban runoff and are characterised by low habitat diversity. Five tidal gates and flaps are located across both FHAs, which restrict passage of fish and other aquatic fauna. The creeks support a range of mangrove associations, which provide shelter, foraging and nursery habitat for fish and invertebrates. The FHAs support barramundi, mangrove jack, whiting, blue salmon and bream. A range of commercially important crustacean species are also present including swimmer crabs, mud crabs, banana prawns and tiger prawns.

Yorkeys Creek FHA is identified as a Management B area, which has been declared for the purposes of conserving core fish habitat, maintaining the natural condition of fish habitats and natural processes in the area.

Impacts and mitigation measures

The project has the potential to impact on the Yorkeys Creek FHA during construction and operation. During construction of the inlet/outlet pipeline at the mouth of Richters Creek, impacts on water quality, aquatic habitats and fish habitat could occur.

Construction

Water quality impacts would be mitigated by undertaking excavation works during the dry season and using appropriate sediment and erosion control measures to minimise the opportunity for runoff from the disturbed areas entering Richters Creek. For further detail on water quality refer to section 5.4 of my report.

The works may have a temporary and localised impact on the mangrove habitat around the mouth of Richters Creek. In addition, the works would have a direct loss of un-vegetated soft sediments and the associated benthic macroinvertebrate communities. To manage these impacts, construction of the pipeline will be undertaken within an already cleared area, thereby reducing the impact on surrounding mangrove communities. The EIS reported that the loss of un-vegetated soft sediments and associated benthic macroinvertberate communities is likely to result in a minor ecological impact.

The proponent has committed to removing the tidal gates within the Yorkeys Creek FHA. This would improve natural water flows and fish passage. Additionally, it would increase the fisheries values by improving the habitat for nursery grounds.

Operation

The inlet screen would be designed to physically prevent fauna impingement and entrainment, and keep them at a distance where velocities are such that they can avoid entrainment. The screen would also prevent pest fish entering the lake. Based on the evaluation of this assessment and proposed mitigation measures, the potential impacts on Yorkeys Creek FHA are anticipated to be minor. Further investigation would occur following detailed design to identify any significant residual impacts.

Marine fauna

Marine fauna listed under the NCWR are discussed in section 8 of my report. The assessment concluded that the project would have no residual impacts on these species.

5.6.8 Animals pests and weeds

Under section 77 of the *Land Protection (Pests and Stock Route Management) Act 2002*, landowners are required to ensure that land is kept free of Class 1 and 2 animal pests and weeds. Landowners do not need to control Class 3 animal pests and weeds unless the land is in, or adjacent to, an environmentally significant area. The project site is located adjacent to the Great Barrier Reef World Heritage Area and habitat that could support the critically endangered bare-rumped sheathtail bat. These areas are considered to be environmentally significant areas under section 79 of the Land Protection (Pests and Stock Route Management) Act.

Class 2 animal pests found on site include the feral dog and pig. Class 2 weeds found on site include the sickled pod, two species of rat's tail grass and Class 3 weeds found include lantana, prickly pear and Singapore daisy. The proponent would manage these weeds and pest animals to maintain the integrity of the site. The proponent has committed to keep the site free of invasive weeds and pest animals in accordance with a weed and pest management strategy.

A declared pest fish, tilapia, has been observed within Richters Creek. This fish is declared under the Fisheries Regulation 2008. A tilapia management plan would be implemented to control colonisation of the artificial lake by tilapia.

Coordinator-General's conclusions

The proponent has adequately assessed the impacts of the project on matters of state environmental significance. I have stated conditions to limit clearing of woodlands, melaleuca wetlands and mangrove habitats, undertake maintenance and restore degraded vegetation on site prior to commencement of construction. To avoid impacts on threatened fauna I have stated conditions to implement lighting methods consistent with relevant Australian Standards.

The proponent has committed to implement a lake management strategy to manage impacts on fisheries values associated with water quality. The proponent is also required to implement a pest and weed strategy and a tilapia management plan to control pests and weeds on site.

I have stated conditions that the proponent must undertake a groundwater monitoring program during construction to ensure that any identified groundwater impacts on melaleuca wetlands habitats are adequately managed.

Environmental offsets are unlikely to be required for the project. However, during the detailed design stage, the proponent will confirm any significant residual impacts on the Yorkeys Creek FHA. If significant residual impacts are identified, the proponent will be required to provide an offset in accordance with my conditions.

6. Matters of national environmental significance

6.1 Introduction

This chapter presents the findings of the Coordinator-General's assessment on matters of national environmental significance (MNES) for the Aquis Resort at the Great Barrier Reef project (the project).

On 2 April 2013, the proponent referred the project to the Commonwealth Minister for the Environment (EPBC 2014/7169) for a determination as to whether or not the project would constitute a controlled action under section 75 of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). On 5 May 2014, the Commonwealth Minister determined the project to be a controlled action. The following controlling provisions are relevant to the project:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- listed threatened species and communities (sections 18 and 18A)
- listed migratory species (sections 20 and 20A)
- Great Barrier Reef Marine Park (sections 24B and 24C).

The Commonwealth Minister determined the assessment method to be the EIS process under Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act), which is accredited under the EPBC Act.

6.2 Project description

The Aquis Resort project is proposed to be developed 13km north of the Cairns Central Business District (CBD), south of the Yorkeys Knob Township. The project is to be established on a 343ha parcel of land, which is predominantly used for sugar cane production.

The proposed project is an integrated tourism resort consisting of three precincts: a resort complex precinct, a sports and recreation precinct and an environmental management and conservation precinct. A key project element is a new artificial lake and island within the central portion of the project site. The artificial lake surrounding the island would convey floodwaters through the site. A range of other infrastructure is required to support the construction and operation of the project.

The project site is situated in the Barron River floodplain, within the sub-catchments of Richters Creek, Yorkeys Creek and the Half Moon Creek. The project site is not located within the GBRWHA; however, the northern and eastern boundary of the project site abuts the GBRWHA waters and the proposed inlet pipeline and outlet pipeline extend 2.3km and 1.4km respectively into the Coral Sea.

Out of 343ha of the project site, 282ha consists of cane fields and other cleared areas. Within the remaining areas, mangrove-dominated vegetation and Melaleuca wetlands

are predominant habitat types. Artificial aquaculture ponds are located on the southern boundary of the site which support a range of wetland birds, mammals and amphibian species.

Adjacent areas protected under state legislation include the Great Barrier Reef Coast Marine Park and two Fish Habitat Areas (FHA) located within the Yorkeys Creek and Half Moon Creek. No seagrass or coral reefs are located near the project site.

6.3 Listed threatened species and threatened communities

This section assesses the project against the objectives and priority actions of conservation advices, recovery plans and threat abatement plans. Adequacy of the surveys undertaken for each species was also checked against relevant survey guidelines. The residual impacts of project on threatened flora, threatened ecological communities (TEC) and threatened fauna are also assessed in this section.

An EPBC protected matters search report (PMR) was generated on 26 May 2014, which considered a five-kilometre radius around the proposed development site.

6.3.1 Habitat within the project site

A total of 53.4ha of natural vegetation has been identified on the project site. The EIS categorises this vegetation into five broad habitat types which are spatially independent and capture the full range of ecological attributes and values across the project site. These habitat types are described below and depicted in figures 6.1 and 6.2.

Mangroves/fringing mangroves comprise the dominant native vegetation on site and occur on the margins of Richters Creek and Yorkeys Creek. This habitat type is intact and of high ecological integrity. Some areas of the project site which have been previously cleared are currently regenerating.

Woodland/riparian area occurs primarily in the north-eastern portion of the project site, with regrowth assemblages appearing further inland on the site on raised beach dunes.

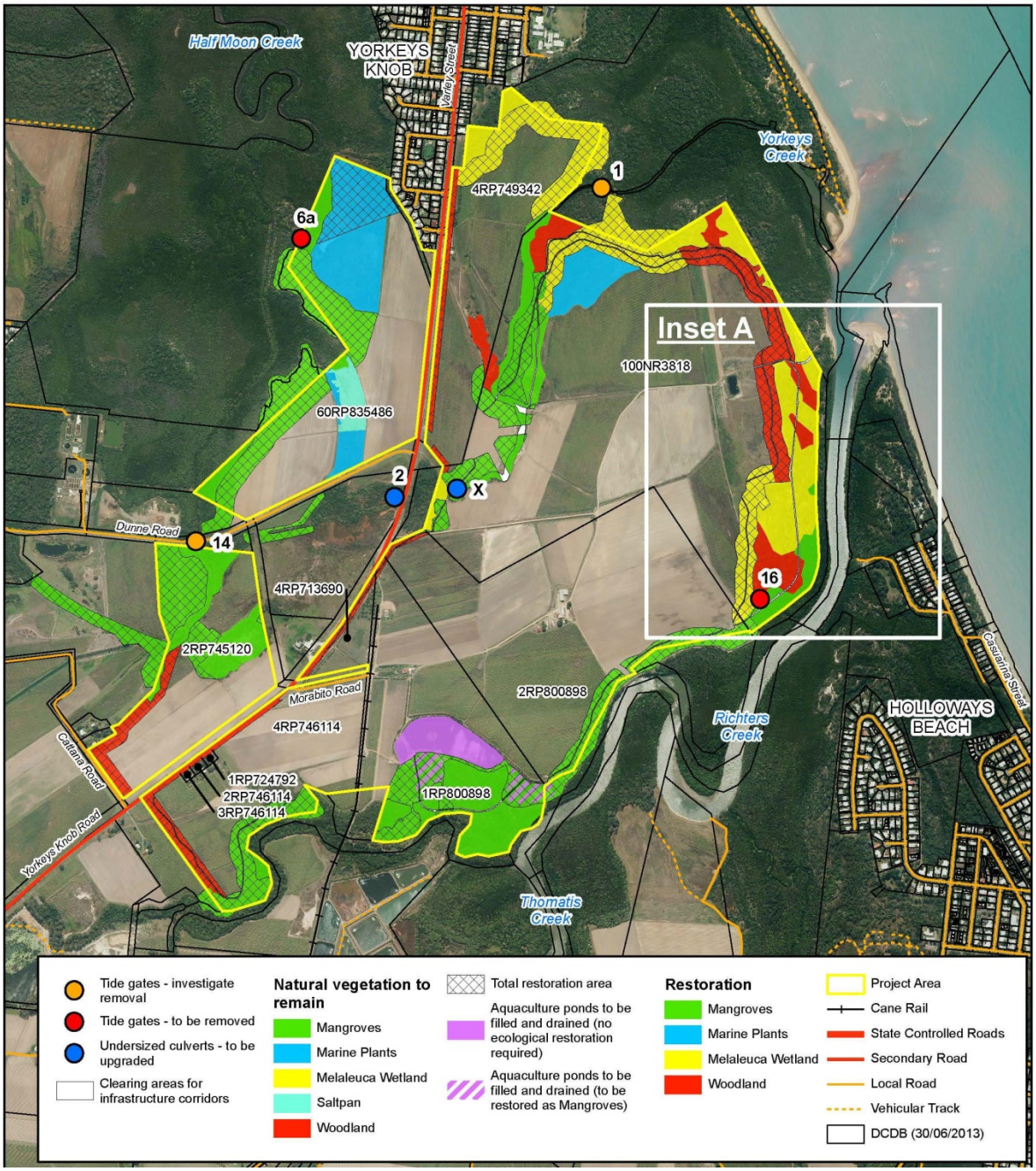


Figure 6.1 Broad habitat types and proposed clearing

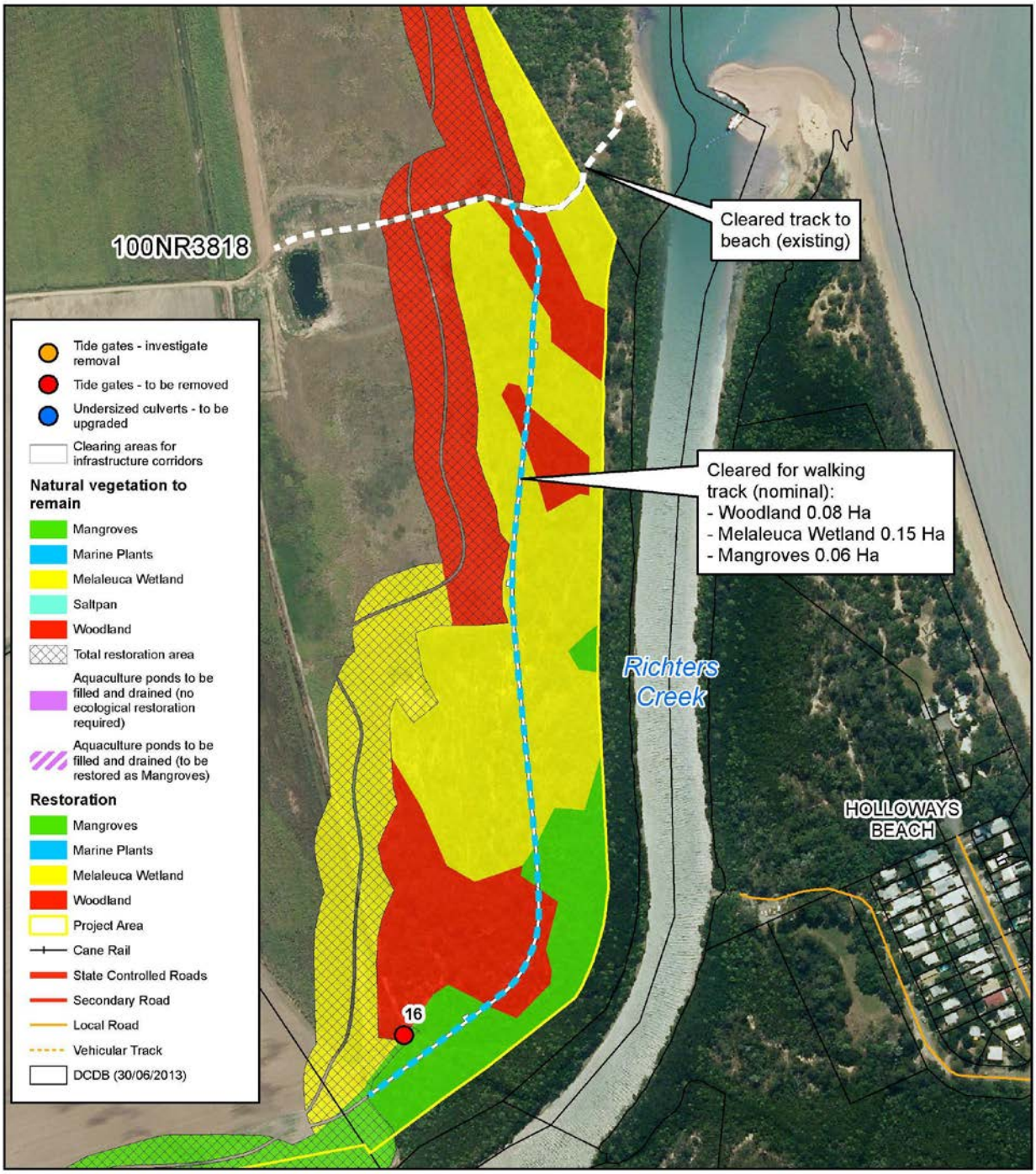


Figure 6.2 Broad habitat types (inset 1)

The extent of each habitat type, area of proposed clearing and restoration works is detailed in Table 6.1.

Table 6.1 Habitat types, proposed clearing and restoration

Broad habitat type	Area		
	Existing vegetation (ha)	Proposed clearing (ha)	Proposed restoration (ha)
Mangroves/fringing mangroves	22.1	0.4	27.3
Melaleuca wetland	12.4	0.2	12.2
Woodland	6.7	0.1	13.7
Marine plants (other than mangroves)	10.4	Nil	Nil
Salt/clay pan	1.9	Nil	Nil
TOTAL	**53.4**	**0.7**	**53.2**
Non-native	35.81	Nil	Nil
Artificial waterbodies	5.6	All ponds to remain	33.0 (not included in total above)

Source: Flanagan Consulting 2014

Threatened flora

The PMR identifies 16 threatened flora species within 5km of the project area (refer to Section 22, Table 22-29 of the EIS). Fourteen species identified in the PMR have not been found on the site as no suitable habitat is available for these species.

Field surveys

The proponent has undertaken a terrestrial vegetation survey of the project site during the dry (August to October) and wet season (December to May). Five 30m by 30m permanent study plots were identified which were representative of the broad habitat types present on the site. In addition, flora was also surveyed in five transects placed within the same regional ecosystem and adjacent to the five permanent study plots.

Out of the 16 listed flora species, survey guidelines are only available for the threatened orchids. The Survey Guidelines for Australia's Threatened Orchids recommend undertaking surveys for orchids during the peak flowering period. The terrestrial survey undertaken as part of the EIS was undertaken during the recommended survey period. Accordingly, the survey is consistent with the relevant survey guidelines.

Ant plant

The ant plant (*Myrmecodia beccarii)* is listed as vulnerable under the EPBC Act. This species is known to occur in open woodland dominated by *Melaleuca viridiflora* or mangroves. It has been recorded north of Trinity Park, north-east of Cairns and south of the Cairns CBD (Atlas of Living Australia, 2014). The species has been identified

within the mangrove and Melaeluca-dominated broad habitat type on the project site. This habitat is located along the inside of the northern and western perimeters of the project site (refer to Figure 6.1). The EIS estimated that a density of 30 plants per hectare is likely to be present.

The proponent proposes to clear 0.4ha of mangroves across three corridors to establish service and road crossings to the south of Yorkeys Knob Road. Mangroves are one of the preferred habitats for the threatened ant plant. The project has potential to impact upon the ant plant species through clearing of preferred habitat.

During detailed design, the proponent will seek to avoid clearing mangrove forest that contains the ant plant by relocating the corridor to another suitable location. Where this is not possible the clearing would affect approximately 18 plants. This clearing may result in minimal fragmentation of the existing population as these corridors will need to remain cleared to allow for maintenance of the infrastructure.

Clearance of ant plants and the resulting population fragmentation are not considered a significant impact on this species as it is unlikely to lead to a long-term reduction in the population.

The proponent has committed to restoring 27.3ha of mangroves on site and 13.7ha of woodland on the project site. These restoration works would provide an adequate mitigation measure for these impacts. These works would provide additional preferred habitat for the species which would support the survival of existing ant plants and encourage growth of new plants.

The approved conservation advice for the ant plant identifies the main threat for the species as clearing of lowland paperbark woodlands, localised settlement pressures and direct removal or destruction of plants by collectors. None of these threats are anticipated to occur as a result of the project.

The conservation advice recommends several actions for support and recovery of the species, with minimising adverse impacts from land use at known sites being the most relevant to the project. Impacts from land use would be minimised through the restoration of mangrove and melaleuca woodland habitats on site and providing adequate buffering between these areas and resort complex precincts. An environmental management and conservation precinct will be established to manage/maintain these habitats and the establishment of the sport and recreation precinct would provide adequate buffering between the conservation precinct and main development area. Therefore, the project is consistent with the relevant conservation advice.

Based on the consideration of mitigation measures and proposed restoration works, a loss of 18 plants would occur.

Dark-stemmed antler orchid

The dark-stemmed antler orchid or mangrove orchid (*Dendrobium mirbelianum*) is listed as endangered under the EPBC Act. The species typically grows on trees in mangroves and coastal swamps and this broad habitat type is present on the project site. However, the terrestrial survey undertaken as part of the EIS did not identify any

dark-stemmed antler orchids on the project site. Accordingly, the project would not have an impact on this species.

Blue antler orchid

A targeted search was also undertaken for the blue antler orchid (*Durabaculum nindii* syn. *Dendrobium nindii*), which has not been identified in the PMR, but is known to occur within mangroves in near coastal swamps. The species is listed as endangered under the EPBC Act and has not been found on site; therefore the project would not have an impact on this species.

Sedge

The EIS reports that targeted searches were conducted for a sedge (*Eleocharis retroflexa),* which has not been identified in the PMR, but is known to occur within mangroves, coastal swamps and associated habitats. Suitable habitat for this species is available on sections of Yorkeys Creek, some internal cane drains and the aquaculture ponds. The sedge is listed as vulnerable under the EPBC Act. The species has not been found on site. Therefore the project would not have an impact on this species.

Conclusion

I conclude that the project would not result in unacceptable impacts on the ant plant, considering both the potential impacts and proposed mitigation measures. Furthermore, I consider that the project would have a net benefit to the ant plant by restoring 27.3ha of mangroves, which will support survival of existing plants and encourage growth of new plants. I require the proponent to manage impacts through the stated conditions to ensure there are no unacceptable impacts on the ant plant, including:

- limiting the development footprint to avoid disturbance to habitat
- restoring preferred habitat on site as part of the environmental management and conservation precinct.

Threatened ecological communities

An ecological community is a naturally occurring group of plants, animals and other organisms that are interacting in a unique habitat. Its structure, composition and distribution are determined by environmental factors such as soil type, position in the landscape, altitude, climate and water availability. An ecological community becomes threatened when it is at risk of extinction.

The PMR identified two TECs, namely the broad leaf tea tree woodland (*Melaleuca viridiflora*), which is endangered and littoral rainforest and coastal vine thickets community, which is critically endangered.

These communities are not located within the project site and are situated 1.1km to the south-west and 5.8km north-west of the site. Consequently, the project would not have any indirect impact on these communities.

Threatened terrestrial fauna

The PMR identifies 20 listed terrestrial fauna species (excluding migratory species) within 5km of the project area . The spectacled flying fox (*Pteropus conspicillatus*) is the only one found on site. Three other species, the northern quoll (*Dasyurus hallucatus*), red goshawk (*Erythrotriorchis radiates*) and bare-rumped sheathtail bat (*Saccolaimus saccolaimus nudicluniatus*) have the potential to occur but have not been found on the site. The remaining sixteen species have not been found on site, nor does the site contain any suitable habitat for these species.

Field surveys

A desktop review, vegetation surveys and fauna surveys were undertaken to confirm the presence of threatened birds and bats. Surveys were undertaken by qualified ecologists during the dry and wet seasons. A range of techniques was used, including a point count survey technique, nocturnal call playbacks and anabat microbat calls. Surveys were undertaken in accordance with the survey guidelines for Australia's threatened bats and threatened mammals.

Spectacled flying fox

The spectacled flying fox (*Pteropus conspicillatus)* is listed as vulnerable under the EPBC Act. Individuals and small groups of the species were seen and heard during nocturnal surveys undertaken on the project site. No camps of the species have been confirmed on site, however preferred foraging habitat (mangroves and melaleuca woodland) is present along the western side of Richters Creek and within the north and north-western areas of the project site. The surveys did not identify any roosting sites.

The project could affect the behaviour of the spectacled flying fox as a result of clearing of foraging habitat and introduction of artificial light and noise. Approximately 0.7ha of potential foraging habitat is proposed to be cleared for the purposes of establishing minor service and road crossings to the south of Yorkeys Knob Road.

The loss of foraging habitat would be mitigated by restoring 53.2ha of the mangrove, Melaleuca wetland and woodland habitats on the site. This would result in an overall increase in foraging habitat for the spectacled flying fox.

The risk of potential further loss of foraging habitat within the affected project area, associated with groundwater disturbance would be reduced through groundwater management during the construction and operation of the central lake. The proponent would also be required to implement a groundwater-dependent ecosystem management plan (GDEMP), requiring the proponent to identify, monitor and manage any impacts on groundwater and associated vegetation.

During construction, intense noise could impact on the species, and the effects of artificial light could occur during construction and operation of the project. The proponent has committed to implementing a range of measures to mitigate noise and lighting impacts.

Potential light impacts would be managed through restoration of approximately 12.2ha of melaleuca wetland and 13.7ha of woodland habitat along the edge of the foraging

habitat. This buffer has been set at a nominal width of 60m and is expected to reduce light impacts during the operation of the project. In addition, lighting methods consistent with the Australian Standard 4282-1997 *Control of the obtrusive effects of outdoor lighting* would be implemented. These methods include but are not limited to use of lower intensity lamps that are directed downwards, shields, louvres, screens and/or window tinting on east-facing windows and balconies, and those above the fourth storey or the height of nearby tree canopies.

The *National Recovery Plan for the Spectacled Flying Fox* identifies the main threats to the species as loss of foraging habitat, illegal killing, incidental mortality in commercial fruit crops and harassment by humans and natural events such as cyclones. The recovery plan lists identification and protection of critical native foraging habitat for the spectacled flying fox as one of its main objectives. The project is not inconsistent with this objective as restoration of 53.2ha of foraging habitat will be undertaken. Furthermore, implementing a GDEMP would reduce the potential for groundwater impacts on this foraging habitat.

Based on the overall increase in preferred habitat, proposed management measures for groundwater, and implementation of noise and light reduction techniques, the project would not result in any residual impact to the spectacled flying fox.

Northern quoll

The northern quoll is listed as endangered under the EPBC Act. The northern quoll (*Dasyurus hallucatus)* has not been found on the project site. However it is considered to be potentially present. The species occupies a range of habitats, including rocky areas, eucalypt forest and woodlands, sandy lowlands and beaches. Approximately 13ha of suitable habitat, woodland habitat is located to the eastern and northern boundaries of Lot 100 (refer to Figure 6.1). No denning habitat is present on site. Prey including beetles, grasshoppers, spiders, toads and also fruit and nectar are available across the site.

Artificial light, noise and vibration from the project have the potential to affect the northern quoll habitat and could reduce available food for the species. Loss of foraging habitat for this species could occur by potential groundwater disturbance resulting from earthworks and ongoing presence of the artificial lake. Refer to section 6.3 of this report (Spectacled flying fox) for further melaleuca woodland impacts associated with groundwater.

The proponent has committed to implement best-practice lighting methods during construction and operation of the project. These methods will include but not be limited to mounting lights low, shielding lights to stop escaping upwards and outwards, using long wave length lights (500–700 nanometres, orange to red) and reducing the wattage and brightness of lights.

In addition, the proponent will restore approximately 12.2ha of melaleuca wetland and 13.7ha of woodland habitat along the edge of the preferred habitat. The proposed buffer has been set at a nominal width of width of 60m and would form part of the environmental management and conservation precinct. This buffer will reduce light and noise impacts.

The *National Recovery Plan for the Northern Quoll* identifies ingestion of cane toads as the main threat to the northern quoll. It also identifies competition and direct predation by the European red fox (*Vulpes vulpes*), feral cats, inappropriate fire regimes, hunting and population isolation as other threats to the northern quoll.

The recovery plan identifies the following recovery actions, which are of relevance to the project:

- halt northern quoll declines in areas recently colonised by cane toads
- reduce the impact of feral predators on northern quolls.

A threat abatement plan (TAP) for cane toads recommends implementing and monitoring emergency management of cane toad impacts on northern quoll through techniques such as trapping, fencing of small areas and manual removal of the cane toad from designated sites.

An approved conservation advice for the species is not available, however draft conservation advice is available as part of the listing advice. This advice also notes that cane toads are a threat to northern quoll.

Cane toads have been found within the project site and a pest and weed management strategy will be implemented to manage cane toads during construction and operation of the project. The proponent would be required to adhere to strict hygiene protocols to ensure that no additional cane toads are brought to site during transport of construction materials.

Two other threat abatement plans are applicable to the northern quoll, namely the *Threat Abatement Plan for predation by the European red fox* and *Threat Abatement Plan for predation by feral cats.* The objectives and actions identified as part of these plans are not applicable to the project.

As a result of this assessment, the project is not inconsistent with the national recovery plan and threat abatement plans for the northern quoll. Considering the potential impacts and mitigation measures, the project would have no residual impact on the northern quoll.

Bare-rumped sheathtail bat

The bare-rumped sheathtail bat (*Saccolaimus saccolaimus nudicluniatus)* is listed as critically endangered under the EPBC Act. The field surveys (including anabat recordings) confirmed calls from individual and small groups of bats from this genus however the calls could only be identified to genus level. It is unknown if the bare-rumped sheathtail bat is present within the project area. No roosting sites have been found on site however habitat surveys indicated that the project site contains some large trees within the eucalypt/woodland areas which may provide suitable roost hollows. The closest known roost site is at Centenary Lakes in Cairns. The bare-rumped sheathtail bat typically feeds on aerial insects over the woodland/forest canopy.

The project has potential to affect the bare-rumped sheathtail bat by affecting the quality of potential roosting habitat and the behaviour of prey as a result of noise,

vibration and artificial light. The bat could also be affected by loss of potential roosting habitat (melaleuca woodland) clearing and groundwater disturbances during construction and operation of the artificial lake – if not appropriately managed.

To manage these impacts, a range of mitigation measures are proposed to be implemented. Activities that are likely to be noise and vibration intensive will be conducted over a short period of time and will be adequately separated from the melaleuca woodland habitats. Impacts of artificial lighting would be managed through restoration of a 13.7ha vegetation buffer along areas of potential roosting habitat. The proposed buffer has been set at a nominal width of 60m and would form part of the environmental management and conservation precinct. This buffer would be adequate in reducing light impacts. As previously discussed, the proponent has also committed to implementing lighting design in accordance with the *Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting* and *AS1158 – Lighting for Roads and Public Spaces* to further reduce these impacts. Refer to sections above for further detail on lighting techniques.

The project has the potential to have a minor impact on the potential foraging habitat for the red goshawk, as 0.1ha of woodland may be cleared. The proponent has committed to avoiding the clearing of this habitat as far as practicable and utilising already cleared areas. Furthermore, 13.7ha of this habitat will be restored as part of the project which, would increase suitable habitat for the bare-rumped sheathtail bat.

A national recovery plan is available for the bare-rumped sheathail bat. The plan identifies the key threats to the bare-rumped sheathtail bat as habitat clearance, the availability of tree hollows, clearing of vegetation for agriculture and livestock grazing, altered fire regimes, saltwater intrusion and invasion by exotic weed species. Other threats include timber collection and targeted removal of hollow-bearing and dead trees, competition for hollows, disease and climate change. As previously discussed, the proponent would adequately manage the potential impacts on the roosting habitat associated with groundwater disturbance and light, noise and vibration impacts. A pest and weed management plan would be implemented to manage exotic weeds on site.

In summary, the project is not inconsistent with the national recovery plan. The project would have no residual impacts on the bare-rumped sheathtail bat.

Red goshawk

The red goshawk (*Erythrotriorchis radiates*) is listed as vulnerable under the EPBC Act. The species may forage on the site as there is suitable foraging habitat, Eucalypt woodland, although there is no suitable nesting habitat available. Generally, the nesting habitat is typically a subset of foraging habitat, with a tall stand of trees selected as a nest location. It is typically found in forests and woodlands with a range of vegetation types, large prey populations and permanent water. It primarily feeds on small birds, however it occasionally feeds on larger prey such as duck and Australian-brush turkeys.

The project could have a minor impact on the potential foraging habitat for the red goshawk as 0.1ha of woodland may be cleared. The proponent has committed to avoiding the clearing of this habitat as far as practicable and utilising already cleared

areas instead. The project could potentially cause loss of melaleuca woodland habitats due to groundwater disturbance. Potential impacts on this species would be reduced through the restoration of 13.7ha of woodland habitat which would increase foraging habitat for the species. The project would have no impact on the nesting behaviour of the species as there is no suitable nesting habitat on site.

A recovery plan is available for the red goshawk. The main objective of the recovery plan is to maintain populations of red goshawk across their range and implement measures to promote recovery of the species. The primary threat to the red goshawk is clearance of native forests and woodlands for agriculture, while secondary threats are fragmentation and degradation of habitat, direct disturbance and/or loss of nesting sites and changes in prey availability. The recovery plan identifies five objectives, none of which are directly applicable to the project. The project increases habitat, improves connectivity at the local level and may provide additional habitat for the red goshawk prey and is therefore, not inconsistent with the recovery plan.

On the basis of this assessment, the project would not result in a residual impact on the species.

Conclusion

I conclude that the project would not result in unacceptable impacts on the listed threatened fauna and would not be inconsistent with relevant national recovery plans and threat abatement plans. Furthermore, I consider that the project would have a net benefit for the spectacled flying fox through restoration of 53.2ha of foraging habitat, for the northern quoll through restoration of 25.9ha of preferred habitat and for the bare-rumped sheathtail bat and the red goshawk through restoration of 13.7ha of preferred habitat.

I require the proponent to comply with all stated conditions to ensure there are no residual impacts on the spectacled flying fox, northern quoll, red goshawk and the bare-rumped sheathtail bat as follows:

- limiting the development footprint to avoid disturbance to habitat
- implementing lighting methods during construction and operation of the project in accordance with the *Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting* and *AS1158 – Lighting for Roads and Public Spaces*
- restoration of vegetation buffers along areas of potential roosting habitat as part of the environmental management and conservation precinct
- implementing measures to manage cane toads on site.

Threatened aquatic fauna

The PMR identified 13 threatened aquatic species within 5km of the project site, with five having a moderate likelihood and eight having a low likelihood of occurring (refer to Section 22, Table 22-36 of the EIS).

Mammals

The EIS reported that the blue whale has a low likelihood of occurrence within the offshore and estuarine waters adjacent to the project site. The humpback whale has a moderate likelihood of occurring within offshore waters as it has been sighted within 2km of the inlet/outlet pipeline corridor. It has a low likelihood of occurring within the estuarine areas surrounding the project site.

The humpback whale is typically found along parts of the Australian coastline from April to December when it migrates from Antarctica to a warmer winter breeding ground in the GBR. However, there are no preferred habitats that would support important populations of this species near the project site.

The project has the potential to affect the humpback whale during the construction of the 2.3km inlet/outlet pipeline extending into the Coral Sea. These impacts are associated with water quality and underwater noise.

Trenching of the seabed may cause temporary and localised water quality changes due to sediment plumes, turbidity and potential exposure of contaminated sediments.

To manage water quality impacts, the proponent has committed to establishing silt curtains around the work area to contain sediments. The proponent would be required to ensure that silt curtains do not trap any turtles or other marine fauna.

If required, a no-fines gravel backfill will also be utilised. Sediment sampling has indicated that surface sediment within the pipeline footprint is unlikely to be contaminated. Nutrient and metals/metalloid concentrations in sediments samples were low and are therefore not considered likely to present a risk to marine organisms. The proponent would be required to further assess sediment quality within the proposed disturbance area prior to construction and would be required to appropriately manage any identified contaminants.

The project is likely to result in a net beneficial impact on water quality. The EIS demonstrated that changing the land use of the project site from a cane farm to an urban development will reduce export of pollutants by at least 76 per cent for TSS, 61 per cent for TP and 46 per cent for TN. Re-use of treated effluent would further reduce these discharges. Furthermore, quality of discharged water from the artificial lake would be comparable to the received environment, therefore reducing the potential to affect existing water quality. For further detail, refer to section 5.4 of this report (Water Quality).

Underwater noise would increase during this period and could disturb the whales' behaviour, such as ability to communicate, navigate or detect predators and prey. To manage underwater noise, the proponent has committed to implement measures including soft-start piling and consider timing of activities to avoid noise-sensitive periods for whales (migration period, June to November). A mega-fauna spotter would also be employed to monitor a 500m exclusion zone prior to commencing a noise-intensive activity. If whales are observed, the activity would be suspended until 30 minutes of observations have passed since the last sighting.

The national recovery plan for the humpback whale details habitat degradation as one of the key threats for the humpback whale. Activities such as changing water quality and water flow regimes causing extensive sedimentation or erosion can degrade humpback whales habitat. As discussed previously, to manage water quality impacts the proponent has committed to implementing a range of water quality mitigation measures during construction and operation. As a result, the project is not inconsistent with the objective of maintaining the protection of humpback whales from human threats.

As a result of this assessment, I conclude that the project would have no residual impact on humpback whales.

Marine turtles

Six species of marine turtles have been identified in the PMR, with four species having a moderate likelihood of occurrence within the offshore marine waters. These species include the loggerhead turtle, green turtle, flatback turtle and hawksbill turtle. Green turtles can forage in Richters Creek and Yorkeys Creek due to the presence of mangroves.

The EIS did not identify significant habitat or key nesting areas for marine turtles near the project site. However, Yorkeys Knob beach and Holloways beach could support low density of turtles on these beaches. Therefore the proponent has committed to undertake additional turtle nesting surveys in the 2014/2015 nesting season.

The project could affect marine turtles through the introduction of artificial light (if nesting areas are confirmed as present), water quality changes and increased noise levels associated with construction of the inlet/outlet pipeline.

Light shed modelling indicates that lights from higher levels of buildings will be visible from one point at the mouth of Richters Creek and from near-shore and off-shore waters during the night. If nesting areas are present, this could affect the hatchling sea-finding behaviour of marine turtles.

To manage the potential lighting impacts a vegetation buffer will be planted along the eastern boundary of the project site, with vegetation growing up to 20m high. This would shield the potential nesting sites (if any) from artificial light. Furthermore, the proponent has committed to implementing lighting design in accordance with the *Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting* and *AS1158 – Lighting for Roads and Public Spaces* to reduce light spill on these areas. Refer to section 6.3 (Spectacled flying fox) for further details on lighting methods.

Trenching of the seabed may cause temporary and localised water quality changes due to sediment plumes, turbidity and potential exposure of contaminated spoil. Furthermore, the works would result in increased underwater noise.

To manage water quality impacts during trenching of the seabed, the proponent will implement a range of mitigation measures. These measures are detailed in the above section on mammals. Furthermore, during the operations stage, the project is likely to result in a net beneficial impact on water quality. The EIS demonstrates that changing

the land use of the project site from a cane farm to an urban development will reduce discharge of pollutants by at least 76 per cent for TSS, 61 per cent for TP and 46 per cent for TN. Re-using treated effluent would also further reduce these discharges. Discharge of water from the artificial lake would be comparable to water quality of the receiving environment, therefore reducing the potential to affect existing water quality. For further detail, refer to section 5.4 of this report (Water Quality).

To manage noise impacts, the proponent has committed to establishing an exclusion zone prior to commencing a noise-intensive activity and use soft-start piling construction techniques. Refer to section 6.3 (Listed Threatened Species and Threatened Communities) for further details on noise mitigation measures.

The overall objective of the national recovery plan for marine turtles is to reduce detrimental impacts on Australian populations of marine turtles and hence promote their recovery in the wild. The recovery plan lists seven key threats to the integrity of marine turtles, including deteriorating water quality and marine debris. As discussed above, the project would have an overall beneficial impact on water quality. Marine debris would be managed through implementation of the Construction Environmental Management Plan. As a result, the project would not be inconsistent with national recovery plan.

The TAP for predation, habitat degradation, competition and disease transmission by feral pigs is relevant to the loggerhead turtle, hawksbill turtle and the flatback turtle as feral pigs are a known or perceived threat to these species. This plan has five key objectives for managing feral pigs and the project is not inconsistent with any of these objectives. No specific actions in the plan are directly applicable to the project.

The TAP for predation by the European Red Fox is relevant to the loggerhead turtle, green turtle, leatherback turtle and the flatback turtle. The goal of this plan is to minimise the impact of foxes on biodiversity in Australia and its territories by protecting affected native species and ecological communities and by preventing further species and ecological communities from becoming threatened. The plan identifies five main objectives for managing red foxes and the project is not inconsistent with any of these objectives. The most relevant actions are implementing best-practice effective fox control methods within the project site. However, this action would only apply if the turtle nesting surveys identify nesting sites on Yorkeys Knob beach and Holloways beach.

The TAP for impacts of marine debris on vertebrate marine life is relevant to all marine turtles identified in the PMR. The plan identifies four objectives as follows:

(1) contribute to long-term prevention of the incidence of harmful marine debris

(2) remove existing harmful marine debris from the marine environment

(3) mitigate the impacts of harmful marine debris on marine species and ecological communities

(4) monitor the quantities, origins and impacts of marine debris and assess the effectiveness of management arrangements over time for the strategic reduction of debris.

Marine debris includes plastic material, such as bags, bottles, paints and adhesives. The proponent has committed to implement a Construction Environmental Management Plan (CEMP) to manage general waste during the construction of the offshore inlet/outlet pipeline corridor. With these measures in place, the project would have no residual impact on marine turtles.

Overall, considering the potential project impacts and proposed mitigation measures, the project would have no residual impacts on threatened aquatic fauna.

Freshwater fish

The PMR identifies one fish species, the Lake Eacham rainbowfish which is found in Lake Eachman in the Atherton Tablelands and other moderately flowing streams in the upper reaches of Tully Catchment. The species is highly unlikely to occur in the project site as there is no suitable habitat for the species and it has not been found in waterways below 700m in elevation. Therefore, the project would have no impact on this species.

Marine fish

Four species of marine fish have been identified within the 5km radius of the project site, including the great white shark, dwarf sawfish, green sawfish and the whale shark. These species have a low likelihood of occurring near the project site and the inlet/outlet pipeline corridor due to absence of suitable habitat. Therefore, the project would have no impact on these species.

Conclusion

Residual impacts have not been identified for threatened aquatic fauna. I conclude that the project would not result in unacceptable impacts on threatened aquatic fauna and would not be inconsistent with international conventions, national recovery plan and threat abatement plans. Furthermore, I consider that the project would have a net benefit to the species as a result of improved water quality.

The proponent will be required to comply with stated conditions to avoid and minimise residual impacts on threatened aquatic fauna as follows:

- manage water impacts during construction of the inlet/outlet pipeline
- implement noise mitigation measures for marine mammals
- undertake additional turtle nesting surveys
- implement lighting design in accordance with the *Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting* and *AS1158 – Lighting for Roads and Public Spaces* during construction and operation of the project
- undertake restoration works as part of the environmental management and conservation precinct
- limit the development footprint to avoid disturbing habitat.

6.4 Listed migratory species

In deciding whether or not to approve the proposal for the purposes of section 20 or 20A of the EPBC Act, and what conditions to attach to such an approval, the Commonwealth Minister for the Environment must not act inconsistently with Australia's obligations under the following conventions and agreements:

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
- Japan–Australia Migratory Bird Agreement (JAMBA)
- China–Australia Migratory Bird Agreement (CAMBA)
- Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)
- an international agreement approved under subsection 209(4).

6.4.1 Migratory marine birds

Two migratory marine birds, namely the fork-tailed swift (*Apus pacificus*) and the little tern (*Sterna albifrons*) have been identified in the PMR (refer to Section 22, Table 22-31 of the EIS). The fork-tailed swift has been found on site and their preferred habitat riparian woodland and saltmarsh are available on site. The little tern has not been found on site; however, it could occur due to the presence of preferred nesting habitat including sandy coastal habitats, sand dunes, river mouths, deltas and exposed ocean beaches.

The project could impact on migratory marine birds through the introduction of artificial light, construction noise and impacts on preferred habitat.

The project may have a minor impact on the preferred habitat for the fork-tailed swift, as 0.1ha of woodland may be cleared. The proponent has committed to avoid the clearing of this habitat as far as practicable and utilise already cleared areas instead. As previously discussed the potential impacts on melaleuca woodland habitats due to groundwater disturbance would be avoided by management of construction and operational activities. Refer to section 6.3 (Listed Threatened Species and Ecological Communities) for further melaleuca woodland impacts associated with groundwater.

The introduction of artificial light to the woodland habitats during the operation of the project and increased noise during construction could disturb the behaviour of the fork-tailed swift. Birds could become disoriented by lighting, become trapped and be unable to leave a lit area.

Even though the little tern has not been found on site, the project may result in temporary and localised impacts on its preferred habitat during the construction activities within the mouth of Richters Creek. Furthermore, light shed modelling indicates that lights from higher levels of buildings will be visible from one point at the mouth of Richters Creek. This light could also further disturb the behaviour of the species.

The proponent has committed to restoring 13.7ha of woodland habitat. This would result in a net beneficial impact on the fork-tailed swift as it would provide additional

habitat for the species. This vegetation would also provide a buffer, reducing the penetration of noise impacts during construction and artificial lighting during operation of the project.

To manage lighting impacts, the proponent has committed to plant 20m high vegetation along the eastern boundary of the project site, which would reduce the lighting impacts on mouth of Richters Creek. A range of best-practice lighting methods will also be implemented. Refer to section 6.3 (Listed Threatened Species and Ecological Communities) for further details on lighting methods. Construction noise impacts on the fork-tailed swift and the little tern would be temporary and localised. The works would also be appropriately timed to avoid noise sensitive periods for these species

The TAP for the European red fox identifies the little tern as a species affected by the European red fox. None of the actions in this plan are relevant to the project.

Given the temporary nature of potential impacts and the proposal to implement adequate mitigation measures, the project would have no residual impacts on migratory marine birds.

6.4.2 Migratory terrestrial species

Eight migratory terrestrial species have been identified in the PMR, with six found on site and one that may fly over the site, as follows:

- white-bellied sea eagle
- white-throated needletail
- rainbow bee-eater
- black-faced monarch
- spectacled monarch
- satin fly-catcher
- barn swallow.

There is foraging habitat for these species present within the aquaculture ponds; however, some species may also forage on the clay pans, mangroves and melaleuca woodlands that are found along the boundaries of the project site. The EIS noted that there are other areas of suitable habitat outside the project area such as the Cattana Wetlands and other freshwater reservoirs such as the abandoned sand mine at Holloways Beach.

The project has the potential to affect these species during construction and operation as a result of construction associated noise, artificial lighting during operations and minor vegetation clearing works. These impacts may reduce the quality of the foraging habitat and disturb the species' behaviour.

Clearing of 0.1ha of woodland and 0.4ha of mangroves could be required as part of the project. Loss of melaleuca woodland habitats may also occur due to groundwater disturbance. Refer to section 6.3 (Listed Threatened Species and Ecological Communities) for further melaleuca woodland impacts associated with groundwater.

Noise-intensive activities would be undertaken throughout a three-year construction period, which have the potential to disturb birds' foraging behaviour. Lighting impacts would occur primarily during the operation of the project.

The proponent has committed to avoid clearing woodland habitat as far as practicable by using areas already cleared. The proponent would also restore 13.7ha of woodland habitat and 27.3ha of mangroves on site. These works would result in a net beneficial impact on the migratory terrestrial species, as this would provide additional foraging habitat for the species. The potential lighting impacts would be reduced due to the restoration works serving as a buffer and shielding the species from noise-intensive activities. As discussed previously, the proponent has committed to implement a range of lighting design methods, which would reduce these impacts further.

While the project is likely to have a potential noise impact on the migratory terrestrial species, these impacts are likely to be limited to the construction period. These species occur in an area that is dominated by a highly modified agricultural landscape, subject to regular noise impacts from aircraft using Cairns airport.

The TAP for the European red fox reports that the white-bellied sea eagle and rainbow bee-eater are species which are affected by the European red fox. The TAP identifies five objectives with the following being most relevant to the project:

- prevent foxes occupying new areas in Australia
- increase awareness of all stakeholders of the objectives and actions of the TAP, and of the need to control and manage foxes.

The TAP for the cane toad reports that cane toads may be a threat to the rainbow bee-eater as they occupy the rainbow bee-eater's burrows. Cane toads have been found within the project site and a Pest and Weed Management Strategy will be implemented to manage cane toads during construction and operation of the project. The proponent would be required to adhere to strict hygiene protocols to ensure that no additional cane toads are brought to site when transporting construction materials.

Considering the potential impacts and proposed mitigation measures, the project would have no residual impacts on the migratory terrestrial species.

6.4.3 Migratory wetland species—shorebirds

Twenty-eight migratory wetland species have been identified as part of the PMR: one reptile and 27 migratory birds.

Ten wetland birds have been found on site, a further 12 are considered likely to occur and two may fly over the site. The majority of birds were observed foraging at the five artificial aquaculture ponds, as they provide seasonal freshwater habitat. Other birds were observed foraging at the mouth of Richters Creek, next to mangrove habitats or on the clay pans at the mouth of Richters Creek. The EIS reported that the site is likely to be used temporarily by most species during the migration period as additional foraging habitat is available outside the project site including the Cattana wetlands and freshwater reservoirs at Holloways Beach.

The project site is not identified as an internationally important site for migratory shorebirds. However, the EIS noted that the Cairns foreshore is an internationally important site for some species of migratory birds.

Migratory shorebirds are affected by noise and light and the project has the potential to impact upon shorebirds roosting and foraging during migration periods, from September to April.

The EIS noted that while shorebirds are mainly diurnal, some species forage during the night. The project could affect their foraging behaviour of some species as a result of introduction of artificial light. Modelling indicated that lights from higher levels of buildings (upper level penthouse and roof) will not be visible along most of Yorkeys Knob beach and Holloways Beach, apart from one point at the mouth of Richters Creek.

Light will be visible from near-shore and off-shore waters during the night. This light could disrupt nesting patterns and roost sites. However, artificial lighting could also have a positive impact on the foraging activity of shorebirds due to the increased foraging activity and success due to increased invertebrate activity and visibility.

The proponent has committed to implement lighting design that would reduce light impacts. Restoration works would be undertaken that would provide a 60-metre-wide vegetation buffer to further reduce lighting impacts during construction and operation of the project.

The project would result in minimal impact on the preferred foraging habitat for shorebirds as 0.4ha of mangroves would be cleared. Minor clearing of woodland habitats may occur, but is unlikely as the proponent is committed to avoid clearing this habitat, instead utilising existing cleared areas.

The main foraging habitat is contained within the aquaculture ponds, which will be retained as part of the project.

Noise disturbance from construction of the inlet/outlet pipeline at the mouth of Richters Creek would be undertaken predominantly outside the migration period, therefore reducing the risk of noise-associated impacts. Noise impacts associated with constructing the project's built form would be appropriately managed to avoid noise-sensitive periods. As previously discussed, the proponent has committed to restore 53.2ha of vegetation on site. These works would serve as a buffer and help reduce the noise impacts on shorebirds.

The potential impact of human disturbance on shorebirds would be managed by fencing the boardwalks and implementing educational programs for guests and staff. These programs would inform guests and staff about the environmental values of the site and promote environmental awareness. Given the diversity of suitable habitat outside the project site, the shorebirds are anticipated to relocate to an alternative site nearby and therefore not likely to expel excessive energy.

6.4.4 Migratory wetland species—reptiles

Two crocodiles were found within one of the five aquaculture ponds on project site. The species typically inhabits tidal waters, coastal floodplains and channels, billabongs and swamps. The aquaculture ponds on the site and creeks around the site provide suitable habitat for the species. Salt water crocodiles feed on a wide range of vertebrates and invertebrates, which are present on site. Their preferred nesting habitat is elevated, isolated freshwater swamp that does not experience tidal movements. This type of habitat is not present within the project site. The project would therefore not be likely to impact on any nesting habitat.

The project would have no impact on the crocodiles as the aquaculture ponds will be retained as part of the project. Operation of the artificial lake has the potential to introduce a new habitat for the species, however the proponent has committed to constructing steep sides or vertical banks to discourage entry to the lake.

Given that the project would retain the aquaculture ponds, the project would have no residual impacts on crocodiles.

6.4.5 Migratory marine fauna

A dugong is considered to have a moderate likelihood of occurrence in off-shore areas. The dugong is considered to have a low likelihood of occurrence in the estuarine and near-shore areas surrounding the project site due to the absence of seagrass. The nearest seagrass beds are located 8.5km south-east of the project site in Trinity Inlet.

The Australian snub-fin dolphin and the Indo-pacific humpback dolphin are considered to have a moderate likelihood of occurrence within estuarine areas and off-shore areas of the project site. Both species typically occur in shallow waters and feed on a variety of coastal, estuarine and near-shore fishes.

The construction of the inlet/outlet pipeline at the mouth of the Richters Creek and within offshore waters has potential to result in temporary and localised water quality changes, due to increased turbidity. Given the distance of nearest seagrass beds, sediment plumes generated during the construction of the pipeline are not expected to impact on any seagrass beds and therefore foraging habitat for dugong.

As previously discussed, water quality impacts during construction would be adequately managed by implementing techniques such as backfill for underwater trench operations and silt curtains to reduce the spread of turbid waters. The operation of the project would result in a net beneficial impact on water quality, as the change of existing cane farm land use to an urban development would result in a 45 per cent reduction in nutrient run-off. For further detail, refer to section 5.4 of this report (Water Quality).

These works would also produce temporary underwater noise. As previously discussed, the proponent has committed to establish a nominal 500m exclusion zone before commencing a noise-intensive activity. If marine fauna is observed while conducting works, the noise-sensitive activities would be suspended until 30 minutes of observations have passed since the last sighting. Other measures would also be

implemented, such as soft-start piling and timing activities to avoid noise-sensitive periods for fauna.

Considering the potential project impacts and mitigation measures, the project would have no significant residual impacts on dolphins or dugongs.

6.4.6 Conclusion

I conclude that the project would not result in unacceptable impacts on the listed migratory species and would not be inconsistent with the international conventions, national recovery plans and threat abatement plans. Furthermore, I consider that the project would have a net benefit to the species through improved water quality, restoration of 53.2ha of preferred habitat and retention of aquaculture ponds. The proponent will be required to comply with all stated conditions to avoid and minimise impacts on migratory species as follows:

- limit the development footprint to avoid disturbance to habitat areas
- implement noise mitigation measures for marine fauna
- implement best-practice lighting methods during construction and operation of the project
- minimise impacts on marine water quality during construction and operation of the project
- implement measures to manage cane toads and European red fox on site
- retain aquaculture ponds.

6.5 World heritage properties

Two world heritage properties are relevant to the project site: the GBRWHA and the WTWHA.

6.5.1 Great Barrier Reef World Heritage Area

The GBRWHA is one of the world's largest world heritage properties, which extends 2,000km along the Queensland coastline and covers approximately 348,000km^2 of the north-east continental shelf. The GBRWHA includes the waters of the Yorkeys Creek, Richters Creek and the Thomatis Creek.

The proposed development is located outside of the GBRWHA with the exception of the intake and outlet pipelines which extend 2.2 and 1.4km into the GBRWHA respectively. The GBRWHA also extends into both Richters and Yorkeys Creeks to low water mark, which are adjacent to the site.

The Great Barrier Reef (GBR) is the world's largest coral reef ecosystem, rich in biodiversity, from mangroves and seagrasses to coral reefs and open waters. The GBR is critical to the cultural, economic and social wellbeing of more than one million people who live in its catchment, and is valued by the national and international community.

The GBR was listed as a WHA in 1981 and meets all four natural world heritage criteria which are detailed in the Retrospective Statement of OUV (see Appendix 6 of this report).

The four natural criteria relevant to the GBRWHA are:

- Criterion VII—contains superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance
- Criterion VIII—be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features
- Criterion IX—be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals
- Criterion X—contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

For each criterion, there are a number of attributes for which the property was listed. The *EPBC Act Referral Guidelines for the Outstanding Universal Value of the Great Barrier Reef World Heritage Area* (2014) details the attributes which underpin each criterion. These attributes may not be expressed equally over the whole GBRWHA, and as such only attributes that are relevant to the project have been assessed in this report. Many attributes are relevant to more than one criterion; therefore, these have only been described in detail under one criterion and referred to in other sections to avoid repetition.

Consequential impacts of the project are discussed in section 6.5.1 of this report.

Criterion VII: contains superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance

Attributes under this criterion which are relevant to the project include visual amenity above and below the water and natural coastal values such as vast mangrove forests and aggregations of native fauna such as seabirds and marine turtles.

Exceptional natural beauty above and below the water

The project site forms part of a developed tropical coastline typical of populated centres in Far North Queensland (FNQ). The local landscape is characterised by flat cane fields within the Barron River floodplain and extensive areas of urban development. The distributaries of the Barron River flood plain are generally turbid, as are the inshore waters of Trinity Inlet. Yorkeys and Holloways and beaches are located to the north and the east of the project boundary and form part of the GBRWHA. Within a local context, the WHA adjacent to the project site, including sandy beaches is not considered to be representative of exceptional natural beauty or aesthetic importance.

The regional landscape of Cairns is characterised by the mountains and rainforests of the Great Dividing Range (Macalister and Lamb Ranges) and the Daintree, Malbon-

Thomson, and Bellenden Ranges to the west and north, which are visually prominent from the Coral Sea to the east.

The development would be established across generally flat land with levels ranging from 1m AHD to 5m AHD (refer to Figure 6.3) and set back from the shoreline by 600m. The built form of the project would be 67.5m AHD, with the ground floor being raised on a podium level set at 7.5m AHD. The built form would occupy 40ha of land with the remainder of the 343ha project site consisting of the sports and recreation precinct and the environmental management and conservation precinct. The development would be visible at a number of locations and would introduce light spill at night time.

Source: Flanagan Consulting 2014

Figure 6.3 Rural cane fields and background mountains

Source: Flanagan Consulting 2014

Figure 6.4 Aerial view of the project site

The top floor of the proposed buildings would be visible from the ferry routes to Green Island and Fitzroy Island and from the Green Island jetty, which are within the

GBRWHA. However, the ability to view the built form from these viewpoints would depend on the weather conditions and sea haze, as these viewpoints are up to 25km away from the project site. In addition, other urban developments such as the Cairns Airport and Cairns CBD including the Cairns Aquarius (50m tall) are located to the south of the project site. Therefore, the project's built form would be only a minor contribution to the urbanised landscape when viewed from ferry routes to Green Island or the Fitzroy Island or from Green Island jetty.

The top floors of the project built form would also be visible from the southern portion of Yorkeys Knob beach near the inlet of Richters Creek at a point 300m away from the project boundary. The bottom two-thirds of the built form would also be visible from the mouth of Richters Creek.

The proposed development will be visible from the air, and passengers on commercial flights into and out of Cairns will have brief and high-altitude views of the development.

The project would introduce an additional light source within the Cairns coastline. Modelling indicated that lights from higher levels of buildings (upper level penthouse and roof) will not be visible along most of Yorkeys Knob beach and Holloways Beach, apart from one point at the mouth of Richters Creek. Light will be visible from near-shore and offshore waters during the night, although not distinguishable as the Aquis Resort.

The EIS demonstrated that the visual impacts will be minimal and mitigation measures would further reduce the impacts. Existing vegetation present along the inside of the northern boundary of the project site will be maintained and restored as part of the environmental management and conservation precinct. This vegetation will screen the bottom two thirds of the closest building.

Coastal vegetation (up to 20m high) will ensure the development, including light spill, will not be visible within 240m of the shore. This buffer is likely to be a barrier to light. Lights would also be visible from Green Island and Fitzroy Island. The project impacts would not be significantly different to existing light sources or have regional impacts on the coastline, such as the Cairns airport, red beacons on Mt Whitfield, the flashing lights on navigation channel markers offshore, overhead planes, houses on the Yorkeys Knob hill, and the summertime swimming enclosure at Yorkeys Knob. The proposed best-practice-designed lighting would be consistent with the existing patterns of coastline lights.

The proposed development would result in a limited change to the view from the GBRWHA and minimal light spill, consistent with the existing developed coastline; and the visual impacts of the project occur outside of the GBRWHA. The Aquis Local Plan and development code limits the development in size and scale and therefore minimise impacts on the visual amenity of the area.

Superlative natural phenomena

This attribute relates to water quality and ecological communities including listed species. Water quality has been discussed in section 5.4 of this report. The

assessment concluded that the project would result in a net beneficial impact on the existing water quality of the GBRWHA.

Seabirds, marine turtles and migrating whales are discussed in section 5.6.4 of this report. The assessment concluded that there would be no residual impacts on these species.

Fringing mangroves and small areas of vine forest are located along the northern and eastern perimeter of the project site. The project is unlikely to affect these mangroves as no clearing or disturbance is proposed. These mangroves will be retained as part of the project and an additional 27.3ha of mangrove forest would be restored. Therefore, the project would not result in a residual impact on the mangrove forest.

Consequential impacts

Potential population increases arising from the project are discussed in section 5.1 of this report. In addition, the project is predicted to generate 1.5 million visits to the resort per annum.

Additional visitation to the GBR is expected to occur through existing and expanded tourism operators. The GBR marine park ecotourism strategy and GBRMPA operations, funded by the environmental management charge on visitation to the GBR, is an effective management framework to avoid and mitigate potential impacts resulting from additional visitation to the GBR.

Additional urban development resulting from population increases could place additional stress on the GBR inshore water quality from additional sediment and nutrient loads from treated sewage wastewater and general runoff from urban development. Further urban development in the Cairns region would be regulated by local, state and federal legislation requiring load reductions of suspended sediments and nutrients for changes in land use (detailed in State Planning Policy 2014).

Significant regulatory frameworks are in place to manage both the increase in visitors to the GBR and the inshore water quality. Therefore, the potential consequential impacts of the project would be manageable.

Although there may be residual impacts on the aesthetic values of the GBRWHA, they are not expected to be unacceptable.

Criterion VIII: Be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features

Attributes which underpin this criterion and are relevant to the project site are geomorphological features and geological processes related to formation of the coastline.

Geological and geomorphological features

The key geomorphological feature in the project area is the Barron River delta which forms the basis of the narrow coastal plain extending from Machans Beach to Palm

Cove. The delta extends underwater into, and forms part of, the GBRWHA. Over geological timescales, the beaches adjacent to the Barron River delta have been accreting, although in some cases beaches are affected by local interruptions to the fluvial supply of sand. These fluctuations pre-date the arrival of Europeans and are a natural occurrence.

It is also noted that the close proximity of the Wet Tropics World Heritage Area (WTWHA) to the GBRWHA and the visual connectivity between these two WHAs is further evidence of the land-forming processes and the relationship between GBR and its catchment. The visual connectivity between the two WHAs is discussed on page 89 of this report (Wet Tropics World Heritage Area).

The project site is located within the floodplain of the Barron River delta between Richters and Yorkeys Creeks, approximately 6km north of the Barron River mouth. The site is affected by floods from overbank flows from the Thomatis/Richters Creek distributory. The largest recorded flood in the Barron River occurred in 1977, which is estimated to be a 2 per cent Annual Exceedance Probability (AEP) event. This event resulted in flood depths of 1–2m across the floodplain, including the project site.

The artificial lake would provide increased flood capacity to compensate for the raised resort complex. The flood assessment indicated that the proposed development would generally reduce flood levels across the floodplain upstream of the site, and not cause significant adverse flooding impacts (i.e. no worsening of flood heights or velocities) on existing surrounding urban areas. The reduction is flooding heights are not expected to affect upstream ecology. There would be no change to the existing creeks that distribute the floodwaters as a result of the project. The Aquis Local Plan and Code sets flood standards for the proposal. These standards are also included in stated conditions that would apply to all development on the site, including construction activities.

Residual impacts on the large-scale geomorphological processes within the GBRWHA are not expected.

Criterion IX: Be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals

Attributes which underpin this criterion and are relevant to the project site are ecological processes including diversity of coastal, marine and terrestrial processes.

Coastal ecosystem processes

The coastal area in the vicinity of the project site consists of two beaches: the Yorkeys Beach and the Holloways Beach, which are separated by the mouth of Richters Creek. These areas provide suitable habitat for seabirds, shorebirds and estuarine crocodiles, but are unlikely to be key nesting areas for any species of marine turtles. Further turtle surveys will be completed in the 2014/2015 nesting season to confirm whether there is a key nesting area.

Mangrove forests are located on the north-west and south-east perimeters of the project boundary. This vegetation provides habitat and fisheries resources and assists in filtering land run off. Approximately 22.1ha of mangrove forest is present within the project site. A total of 72 vertebrate species were recorded within or directly adjacent to the mangrove habitats, with 41 species recorded directly within the mangrove vegetation.

The project site provides terrestrial and aquatic connectivity links via Richters Creek, Yorkeys Creek and Half Moon Creek. Richters Creek provides a link between terrestrial and aquatic habitats between the forests at the mouth of Richters Creek and landward parts of the Barron River delta. Yorkeys Creek links the project site to the mangrove forests and Coral Sea and the Half Moon Creek provides a connection between the Half Moon Creek FHA and the Cattana wetlands. These connectivity links are currently degraded by agricultural development and presence of tidal gates and culverts.

Migratory shorebirds are affected by noise and lighting disturbances and the project has potential to impact upon shorebirds roosting and foraging during migration periods, from September to April.

Light will be visible from near-shore and off-shore waters during the night. This light could disrupt nesting patterns and roost sites. However, artificial lighting could also have a positive impact on foraging activity of shorebirds due to the increased foraging activity and success due to increased invertebrate activity and visibility.

The proponent has committed to implementing best practice lighting design that would reduce light impacts.

Threatened and migratory species have been assessed in sections 6.3 and 6.4 of this report respectively. The assessment concludes the project would have no residual impacts on seabirds and marine turtles.

Marine ecosystem processes

The seabed of open waters adjacent to the project site consists of coarse riverine sand deposits with mud. No faunal activity or seagrass was identified at the mouth of Richters Creek. Further offshore, benthic communities consist of polychaete worms and bivalves and low numbers of crustaceans and other invertebrates.

No seagrass is present within the estuarine creeks, the mouth of the creeks or the offshore area where the inlet/outlet pipeline will be established. The closest seagrass has been identified approximately 8.5km south-east of the project site. The nearest coral reefs to the project site are Green Island, 25km away from the site, Haycock Reef and Double Island Reef, approximately 10km north of Richters Creek mouth.

The inlet and outlet pipelines would extend 2.3km and 1.4km offshore respectively. The offshore outlet pipeline would follow the same alignment as the inlet pipeline and would consequently use the same trench. The trench would be excavated to a depth of 3m, a maximum top width of 16m and a bottom width of 4m. The pipelines would be buried to a sufficient depth to reduce the risk of damage. The construction process would result in temporary and localised water quality impacts from increases in turbidity and noise

impacts from trenching and installing pipes. All excavated material from trenching would be transported to the site for treatment and use. Standard measures to limit changes in turbidity would be employed such as: silt curtains, timing of the excavation, and monitoring. Noise impacts on marine fauna and seabirds are discussed in section 6.4.5 of this report. The assessment concludes there are no residual impacts on seabirds and marine turtles. In addition, the pipeline would be reinstated to provide for the same level of ecosystem function prior to construction.

The *GBR Outlook Report 2014* documents degraded water quality within much of the central and southern inshore reef lagoon. Waters in the vicinity of the project site, including Trinity Inlet, are naturally turbid but are also affected by urban and agricultural runoff. The Outlook report identifies concerns with ongoing coastal development, inter alia, as a threat to the ecosystem health of the GBR. The project's construction and operation, along with the consequential increase in the population of the Cairns region, has the potential to affect marine water quality.

Water quality modelling indicated that water discharge from the artificial lake will be comparable to the receiving water quality and would not contain any contaminants of concern. This will ensure the flora and fauna dependent on water quality are not affected. In addition, stormwater modelling indicated that stormwater management would significantly reduce sediment and nutrient loads entering the receiving environment. Changing the land use of the project site from a cane farm to an urban development will result in a pollutant reduction load of at least 76 per cent for total suspended solids (TSS), 61 per cent for total phosphorus (TP) and 46 per cent for total nitrogen (TN).

The GBRMPA (2014) identified nutrients as one of the main stressors to the GBR. Therefore, reducing nutrient run-off will reduce this risk to the OUV of the GBRWHA. For a detailed assessment of water quality impacts refer to section 5.4 of this report (Water Quality).

Implementing mitigation measures would ensure that only minor impacts on water quality and underwater noise impacts on marine fauna would occur. To manage these impacts in the offshore habitat during construction, I have stated conditions for construction of the pipelines. I have also stated conditions for the release of water from the artificial lake, to protect the environmental values of the receiving environment; therefore, residual impacts are not expected for onshore habitats.

Terrestrial ecosystem processes

The project site landward of the GBRWHA consists of woodlands occupying 6.7ha, melaleuca wetlands occupying 12.4ha, and the saltpan/saltmarsh occupying 1.9ha. Although not natural habitat, the abandoned aquaculture ponds (5.4 ha) provide for 73 listed species comprising a range of wetland birds, mammals (microbats) and amphibians. The remainder of the site consists of cane fields, other cleared areas and exotic species which are of limited ecological value.

Approximately 9.2ha of freshwater ponds are located on the north-eastern portion of the project site. These wetlands are associated with melaleuca dominated forests and provide habitat for a number of woodland birds during the wet season.

Potential impacts on threatened and migratory species have been assessed in sections 6.3 and 6.4 of this report. The assessment concluded there are no residual impacts on species utilising onshore habitat.

The project would result in an overall increase in habitat due to the restoration of 53.2ha of vegetation within the project site. For a full assessment of these impacts, refer to sections 6.3 and 6.4 of this report.

The Aquis Local Plan and Code requires mitigation measures to be implemented for a number of impacts including lighting, stormwater quality during construction and operation, and the size of the development. In addition, the Aquis Local Plan and Code requires the environmental management precinct at the site, which includes restoring native vegetation.

Threatened and migratory species have been assessed in section 6.3 and 6.4 of this report respectively. The assessment concludes there are no residual impacts on species utilising onshore habitat.

Consequently, residual impacts on ecological processes are not expected as a result of the project.

Criterion X: Contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of OUV from the point of view of science or conservation

The attributes that underpin this criterion and are relevant to the project are diversity of species (marine and terrestrial).

Diversity of species

The threatened terrestrial and aquatic fauna and migratory species potentially affected by the project are discussed in sections 6.3 and 6.4 of this report. Only minor impacts would occur in coastal habitats during the construction phase. This section also describes that discharge of water from the artificial lake will be comparable to the receiving water quality and would not contain any contaminants of concern. Furthermore, the change in land use will reduce the export of pollutants by at least 76 per cent for TSS, 61 per cent for TP and 46 per cent for TN. Any species dependent on marine water quality would not be affected. Moreover, the project would result in an overall increase to habitat due to the restoration of 53.2ha of native vegetation within the project site. Consequently, no reduction in diversity of species is expected to result from the project.

Integrity of the GBRWHA

Integrity of the GBRWHA is summarised in the statement of OUV and comprises wholeness, intactness and threats (refer to Appendix 6).

The proposed development is located outside of the GBRWHA with the exception of the intake and outlet pipelines which extend 2.3 and 1.4km into the GBRWHA respectively. Accordingly, only temporary construction impacts, changes in the view shed from the GBRWHA, and minor increases in light spill are expected to result from

the project. These impacts are assessed under Criterion VII of this report. The assessment concluded that no unacceptable impacts are apparent. The impacts identified would not, either alone or in combination with other actions, reduce the size or change the boundary of the property. In addition, the project would increase native habitat adjacent to the property and result in reduction of suspended sediment and nutrients loads entering the water quality improvement which would support native species.

The project would improve the integrity of the GBRWHA by increasing the connectivity of habitat along the creeks surrounding the project site. Tidal gates and culverts would be removed to improve tidal flow and native vegetation would be restored to enhance connectivity across the site and along creeks surrounding the site, thus improving the connective between GBRWHA attributes mangrove forests and habitat for threatened and migratory species. The site is not a 'greenfield' development and seeks to redevelop 343ha of farmland.

The project would not introduce additional threats or exacerbate existing threats that could deteriorate the GBRWHA. The potential impacts to the GBRWHA are discussed in the section above and do not identify impacts that could exacerbate existing threats. Rather, the reduction in sediment and nutrient loads and improvement in connectivity to ecosystems adjacent the GBRWHA have been identified.

Management and protection of GBRWHA

The statement of OUV of the GBRWHA identifies that the EPBC Act provides an overarching mechanism for protecting the World Heritage values from inappropriate development, including actions taken inside or outside which could impact on its heritage values. This requires any development proposals to undergo rigorous environment impact assessment processes, often including public consultation, after which the Commonwealth Minister may decide to approve, reject or approve under conditions designed to mitigate any significant impacts.

Other management arrangements that protect matters of state and national significance and support the EPBC Act in protecting the GBRWHA include the following:

- *Marine Park Act 2004*
- *Great Barrier Reef Marine Park Act 1975* (Cwlth)
- *Sustainable Planning Act 2009*
- *Environmental Protection Act 1994*
- *Nature Conservation Act 1992*
- *Transport Operations (Marine Pollution) Act 1995.*

Schedule 5 of the EPBC Regulations identifies the Australian World Heritage management principles which apply to the GBRWHA (refer to Appendix 8 for full list of principles). The three overarching principles are:

(1) management of natural heritage and cultural heritage of a declared World Heritage property must be, in accordance with Australia's obligations under the

World Heritage Convention, to identify, protect, conserve, present, transmit to future generations and, if appropriate, rehabilitate the World Heritage values of the property.

(2) preparation of a management plan for the declared World Heritage property

(3) application of the environmental impact assessment and approval process for projects that are likely to have a significant impact on the World Heritage values of a property (whether the action is to occur inside the property or not).

The project is not inconsistent with principle (1) as the project would have no significant residual impact on the OUV of the GBRWHA. Consequently, the project would also not be inconsistent with the World Heritage Convention. Section 8.5 of my report has evaluated the potential impacts of the project on OUV and has concluded that the project would have no significant residual impacts on the OUV of the GBRWHA.

No management plan exists for the Great Barrier Reef World Heritage property, as such this principle does not apply.

The project is not inconsistent with the principles related to undertaking of environmental impact assessment and approval process. The outcomes of the Coordinator-General's environmental impact assessment process and this evaluation report initiate a series of statutory approval decisions by Commonwealth, state and local governments. The subsequent approvals will include requirements to avoid and minimise impacts on the OUV of the GBRWHA.

Schedule 2 of Appendix 2 contains stated conditions related to the built form of the project. These conditions would ensure that the project is consistent with the above discussed management principles and the World Heritage Convention in relation to OUV of the GBRWHA.

Great Barrier Reef Strategic Assessment

The Australian and Queensland governments have completed a strategic assessment of the Great Barrier Reef World Heritage Area (GBRWHA) and the adjacent coastal zone in accordance with section 146 of the EPBC Act. The objective of the strategic assessment was to review the management arrangements for the WHA to ensure the outstanding universal values (OUV) are appropriately managed.

On 11 August 2014, the Strategic Assessment Programs for the Great Barrier Reef Region Strategic Assessment and the GBR Coastal Zone Strategic Assessment were endorsed under part 10 of the EPBC Act. The reports provide the overarching strategic direction for government's management of the GBR. Environmental outcomes required to protect the GBR and the management measures to achieve them are defined in the program reports.

The protection and management of MNES and OUV are assured through legislative and management commitments. The broad Queensland Government commitments include the following:

- MNES are managed, protected and conserved

- the OUV of Queensland's world heritage properties is identified, protected, conserved, presented and transmitted to future generations
- Queensland's National Heritage places are identified, protected, conserved, presented and transmitted to future generations of Australians
- the survival and conservation status of listed threatened species and ecological communities is promoted and enhanced, including through the conservation of critical habitat to the survival of a species or community and other measures contained in any recovery plans, threat abatement plans or conservation advices
- the survival and conservation status of migratory species and their critical habitat is promoted and enhanced, consistent with Australia's international obligations.

Consistent with the findings of the strategic assessment, all aspects of the project will be subject to Commonwealth, State and local government regulation. The outcomes of the Coordinator-General's environmental impact assessment process and this evaluation report initiate a series of statutory approval decisions. All subsequent approvals will include requirements to avoid and minimise impacts on the OUV of the GBRWHA.

Coordinator General's conclusion

The proponent has appropriately assessed impacts on the attributes of the GBRWHA following the strategic assessments framework. I agree with this assessment approach and findings of a predicted reduction in the release of pollutants to the receiving water and biodiversity values and changes to the visual amenity of the local landscape.

I have accepted the Aquis Local Plan and development code which provides the broad planning framework for the site and controls the development in height, scale and bulk. The Aquis Local Plan and development code also provides performance standards for lighting and glare. Lighted colours that would blend in with the Coral Sea in the background would be used.

The temporary nature of construction related impacts on the construction of marine infrastructure can be managed and I have included conditions in Appendix 2 of this report to address these impacts.

I have also stated conditions on various construction and operational aspects of the project, including:

- implement lighting design in accordance with the *Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting* and *AS1158 – Lighting for Roads and Public Spaces*
- meet water quality standards during construction and operation
- require vegetation restoration as part of the environmental management and conservation precinct and limit clearing
- maintain acceptable flooding outcomes.

These conditions are included in Appendix 2 of this report. As a result of the overlapping state regulatory framework and resultant conditions, no specific conditions are recommended for the approval required under the EPBC Act.

6.5.2 Wet Tropics World Heritage Area

The Wet Tropics World Heritage Area (WTWHA) covers an area of 900,000ha (8,940km^2) extending from Cooktown to Townsville. The area was inscribed on the World Heritage List in 1988 and in 2012, the WTWHA's Indigenous heritage values were also included as part of the existing Wet Tropics of Queensland National Heritage List.

The WTWHA consists of one of the largest rainforest wilderness areas in Australia (located in Daintree River valley) and a combination of fringe coral reefs and rainforest coastline in the Cape Tribulation region. The WTWHA is regulated through the *Wet Tropics World Heritage Protection and Management Act 1993* and the Wet Tropics Management Plan 1998.

The WTWHA is situated approximately 2.5km west of the western boundary of the project site. It is also 8.5km away from the site via the Barron River, Thomatis Creek, Richters Creek and other watercourses.

The project site has a low connectivity to the WTWHA demonstrated by the following:

- natural habitats contained within the site are not of significant biodiversity value due to the cane farming land use
- riparian vegetation, such as the mangrove forests along the Richters Creek and Yorkeys Creek are of local significance and do not extend into the WTWHA
- riparian zone attracting birds that fly between the WTWHA and the site; however, more attractive habitats are located outside the project site—along the Machans Beach and the Trinity Beach.

The WTWHA has been listed on the basis of the four natural criteria, with Criterion VII being of most relevance to the project. The sweeping forest vistas and coastal scenery including terrestrial connectivity between the GBR and the WTWHA are the key attributes relevant to the project site.

Consequential impacts of the project are discussed on page 81 of this report.

Connectivity

The project has the potential to affect the visual connectivity between the GBRWHA and the WTWHA as the site is situated within the view shed of the two WHAs. The Macalister Range forms a visually prominent background to the coastline and is visible from the waters of the GBRWHA. The Macalister Range would be viewed from ferry routes to Green Island and this view would not be affected by the project due to the significant distance of the ferry routes to the WTWHA. Some impact may occur on the view of the WTWHA from the near inshore waters that may be used by fishermen.

A range of existing urban and industrial developments of varying heights are located along the coastline to the north and south of the development. As a result, the project is unlikely to significantly affect the quality of the existing views from this viewpoint. Furthermore, vegetation up to 20m high will be planted along the eastern boundary of the project site, which abuts the waters of the GBRWHA. This vegetation may reduce the impact of the development on the visual connectivity between the two WHAs.

Coastal scenery and forest vistas

The project has the potential to affect the values of appreciation, enjoyment and aesthetics associated with the WTWHA. The view of the existing landscape from the WTWHA is likely to be changed as a result of the project scale. The project would be visible from two viewpoints: the Henry Ross lookout and the Skyrail cable way (refer to Figure 6.5).

Tourists visiting the lookout and using the Skyrail would be able to see the project during day time, while motorists visiting the lookout would be able to see the lights associated with the project built form and Yorkeys Knob Road during night time. The Skyrail is not operated during night time; therefore, no impacts will occur from this viewpoint.

The project would be situated within a landscape that consists of a range of land uses including the Captain Cook Highway, residential areas, cable ski park tourist complex, Cairns Airport and cane fields. The design of the project built form will incorporate a colour scheme that complements the surrounding landscape. Lighter colours that would blend in with the Coral Sea in the background would be used. The proponent is also committed to planting a 7m wide and 20m high vegetation buffer along the Yorkeys Knob road to further reduce these impacts.

Figure 6.5 View of the project from Skyrail

Lighting

Existing night-time views from the lookout over the coastal plain are dominated by lights of the highway and road networks, the airport, and clusters of urban settlements including the city of Cairns in the background, beyond the dark void of Mt Whitfield. Furthermore, narrow strips of lighting in the coastal settlements (Machans and Holloways Beaches, and Yorkeys Knob) define the edge between land and water. The

project will introduce new lighting as a result of the built form, internal road network and the upgrading of the Yorkeys Knob Road. The proponent has committed to implement lighting design to restrict glare within the project site by using downward lighting and directional lighting.

Consequential impacts

As discussed in section 6.8.5 (GBRWHA), the project is predicted to generate 1.5 million visits to the resort per annum. The additional visitation to the WTWHA is anticipated to occur via the existing commercial tours. These tours are regulated through an existing permitting system run by Queensland Parks and Wildlife Services (QPWS). Therefore, the potential consequential impacts of the project would be manageable.

Integrity

Integrity of the WTWHA consists of wholeness, intactness and threats. The project site is located approximately 2.5km west of the western boundary of the project site. It is also 8.5km away from the site via the Barron River, Thomatis Creek, Richters Creek and other watercourses.

The EIS identifies invasive species, fragmentation and altered hydrological and fire regimes as some of the key threats to the integrity of the WTWHA. The project would not introduce or increase any of these threats. The project would include restoration of 53.2ha of habitat on site which is likely to improve the ecological connectivity between the site and the WTWHA. Furthermore, implementation of a pest and weed management strategy has been conditioned.

As previously discussed, the project would not result in significant residual impacts on the visual connectivity between the WTWHA and the GBRWHA, the coastal scenery and the forest vistas. Appropriate vegetation buffers and best-practice lighting methods will be implemented to reduce potential impacts. The built form design and colour will also be limited through the Aquis Local Plan and Code.

As a result, the project is unlikely to have residual impacts on the integrity of the WTWHA.

Conclusion

My assessment is that there would be no significant residual impacts on the WTWHA and that, while the view between WTWHA and GBRWHA may be blocked in limited circumstances, this impact is insignificant.

I have accepted the Aquis Local Plan and development code which provides the broad planning framework for the site and limits the development in height, scale and bulk. The Aquis Local Plan and development code also provides performance standards for lighting and glare. Lighted colours that would blend in with the Coral Sea in the background would be used.

I have also stated conditions to ensure the proponent applies lighting design in accordance with *Australian Standard AS4282-1997 Control of the obtrusive effects of*

outdoor lighting and *AS1158 – Lighting for Roads and Public Spaces* to the development. As a result of my comprehensive state conditioning, no further conditions are recommended for the approval required under the EPBC Act.

Schedule 5 of the EPBC Regulations identifies the Australian World Heritage management principles which apply to the WTWHA (refer to Appendix 8 for full list of principles). The three overarching principles are:

(1) management of natural heritage and cultural heritage of a declared World Heritage property must be, in accordance with Australia's obligations under the World Heritage Convention, to identify, protect, conserve, present, transmit to future generations and, if appropriate, rehabilitate the World Heritage values of the property.

(2) preparation of a management plan for the declared World Heritage property

(3) application of the environmental impact assessment and approval process for projects that are likely to have a significant impact on the World Heritage values of a property (whether the action is to occur inside the property or not).

The project is not inconsistent with principle (1) as the project would have no significant residual impact on the OUV of the WTWHA and the overall World Heritage Convention. Section 8.5 of my report has evaluated the potential impacts of the project on OUV and has concluded that the project would have no significant residual impacts on the OUV of the WTWHA.

The Wet Tropics Management Plan 1998 does not apply to the project, as the project would be developed outside the WTWHA.

The project is not inconsistent with the principles related to undertaking of environmental impact assessment and approval process. The outcomes of the Coordinator-General's environmental impact assessment process and this evaluation report initiate a series of statutory approval decisions by Commonwealth, state and local governments. The subsequent approvals will include requirements to avoid and minimise impacts on the OUV of the GBRWHA.

Schedule 2 of Appendix 2 contains stated conditions related to the built form of the project. These conditions would ensure that the project is consistent with the above discussed management principles and the World Heritage Convention in relation to OUV of the WTWHA.

6.6 National Heritage places

6.6.1 Great Barrier Reef and Wet Tropics

In May 2007, the GBR and the Wet Tropics were placed on the National Heritage List. This list comprises natural and cultural places that contribute to our national identity, providing a tangible link to past events, processes and people. Both places have National Heritage values because they have:

- outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history
- outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history
- outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history
- outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of:
  - a class of Australia's natural or cultural places; or
  - a class of Australia's natural or cultural environments
- outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

The Wet Tropics National Heritage place also has cultural heritage values, because the place has outstanding heritage value to the nation because of the place's:

- importance in demonstrating a high degree of creative or technical achievement at a particular period
- strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history
- importance as part of Indigenous tradition.

A cultural heritage survey was undertaken to identify the presence of Indigenous cultural heritage items on the project site. While items were found in 1991 surveys, none of these were found on the site during the EIS surveys. To avoid any potential impacts on these items, the project footprint has been designed to avoid the areas where these items were found in 1991. In accordance with the Queensland *Aboriginal Cultural Heritage Act 2003*, a Cultural Heritage Management Plan has been agreed to by the proponent and the traditional owners: Yirrganydji (Irukandji). If any cultural heritage items are encountered during construction or operation of the project, appropriate procedures will be followed to avoid impacts.

Many of the heritage values that cause the Wet Tropics and GBR National Heritage places to meet the criteria of National Heritage values are similar to the WHA values described in section 6.5.1. Therefore, the impacts to the Wet Tropics National Heritage place and the GBR National Heritage place are commensurate with the impacts from the project on WTWHA and GBRWHA discussed in section 6.5.1 of this chapter. Mitigation and management measures equally apply to the Wet Tropics and GBR National Heritage places.

Consistent with the discussion on World Heritage properties, the project would have no unacceptable impacts on the GBR and Wet Tropics national heritage places.

A management plan for the GBR national heritage place and the Wet Tropics national heritage place has not been prepared under section 324S of the EPBC Act. I consider that likely impacts on the values of the national heritage places will be avoided and mitigated by the proponent to a reasonable degree under the conditions detailed in Appendix 2.

6.6.2 Great Barrier Reef Marine Park

The Great Barrier Reef Marine Park (GBRMP) stretches along the coast of Queensland and is about 344,400km^2. It has been established under the *Great Barrier Reef Marine Park Act 1975* (Cwlth) and is managed by the Great Barrier Reef Marine Park Authority (GBRMPA) and the Queensland Parks and Wildlife Service (QPWS).

The project site is located approximately 3.5km north-east of the GBRMP, with the offshore inlet/outlet pipeline being 1.9km from the GBRMP boundary. The water quality assessment, undertaken under Criterion VII of this chapter, concludes that the project is anticipated to have a beneficial impact on water quality due to less sediment and nutrients entering the receiving environment. As a result, the project would have no residual impact on the GBRMP.

Consequential impacts

Potential population increases arising from the project are discussed in section 5.1 of this report.

Predicted additional visitation to the GBRMP (1.5 million visits to the resort per annum) is expected to occur through existing and expanded tourism operations. The GBR marine park ecotourism strategy and GBRMPA operations, funded by the environmental management charge on visitation to the GBR, are effective methods of managing potential impacts resulting from additional visits to the GBR.

6.7 Ecologically sustainable development

My assessment of the project has taken into account the principles of ecologically sustainable development, which as defined in Part 1, section 3A of the EPBC Act, are:

- decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making
- improved valuation, pricing and incentive mechanisms should be promoted.

My report has analysed and taken into consideration the information from the EIS and additional material concerning the long-term and short-term economic, environmental, and social considerations that are relevant to the project.

The potential impacts of the project are addressed by conditions that restrict environmental impacts, impose strict monitoring and adopt environmental standards, which if not achieved, require the application of timely response mechanisms to avoid adverse impacts.

The proposed conditions will ensure protection of World Heritage properties, listed threatened species and listed migratory species. These conditions allow for the project to be delivered and operated in a sustainable way to protect the environment for future generations and preserve MNES.

I have considered the importance of conserving biological diversity and ecological integrity in relation to all of the controlling provisions for this project, and the assessment provided within my report reflects that consideration.

The project is not located within or near an area designated by a bioregional plan.

6.8 Coordinator-General's overall conclusions

I have reviewed the EIS and additional material and conclude that the proponent has adequately identified the impacts of the project on the OUV of the GBRWHA, WTWHA, threatened flora and fauna and migratory species listed under the EPBC Act. My conclusion on the mitigation and management measures proposed by the proponent, and the conditions stated in this report is that the project is not inconsistent with any of the international conventions relevant to threatened species and communities, migratory species, the GBRWHA and the WTWHA.

6.8.1 Threatened flora

The proponent has adequately identified the potential impacts that the project poses to threatened flora. I require the proponent to manage impacts through the stated conditions to ensure there are no unacceptable impacts on threatened flora, including:

- limiting the development footprint to avoid disturbance to habitat
- restoring preferred habitat as part of the environmental management and conservation precinct.

6.8.2 Threatened terrestrial fauna

The proponent has adequately identified the potential impacts that the project would have on threatened terrestrial fauna. I require the proponent to manage impacts through the stated conditions to ensure there are no unacceptable impacts to the threatened terrestrial fauna, including:

- limiting the development footprint to avoid disturbance to habitat

- implementing lighting methods during construction and operation of the project in accordance with the Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting and AS1158 – Lighting for Roads and Public Spaces
- restoration of vegetation buffers along areas of potential roosting habitat
- implementing measures to manage cane toads on site.

In light of the proposed mitigation measures and conditions I have stated, I consider the potential impacts to threatened terrestrial fauna to be neither unacceptable nor inconsistent with the national recovery plans for: spectacled flying fox, northern quoll, bare-rumped sheathtail bat and the red goshawk and threat abatement plans for: cane toads, European red fox and feral cats.

6.8.3 Threatened aquatic fauna

The proponent has adequately identified the potential impacts that the project would have to threatened aquatic fauna. I require the proponent to manage impacts through the stated conditions to ensure there are no unacceptable impacts on threatened aquatic fauna, including:

- managing water impacts during construction of the inlet/outlet pipeline
- implementing noise mitigation measures for marine mammals
- avoiding pipeline construction activities during turtle nesting periods
- implementing lighting methods during construction and operation of the project in accordance with the *Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting* and *AS1158 – Lighting for Roads and Public Spaces*
- limiting the development footprint to avoid disturbing habitat
- undertaking restoration and maintenance of vegetation within the environmental management and conservation precinct.

In light of the proposed mitigation measures and stated conditions, I consider that the potential impacts on the humpback whale, marine turtles, marine fish and freshwater fish to be neither unacceptable nor inconsistent with the national recovery plans for: humpback whales and marine turtles, threat abatement plans for: feral pigs, European red fox and marine debris.

6.8.4 Listed migratory species

The proponent has adequately identified the potential impacts that the project would have to listed migratory species. I require the proponent to manage impacts on listed migratory species through conditions stated in this report, including:

- limiting the development footprint to avoid disturbance to habitat areas
- implementing noise mitigation measures for marine fauna
- implementing best-practice lighting methods during construction and operation of the project
- minimising impacts on marine water quality during construction and operation of the project

- implementing measures to manage cane toads and European red fox on site.

In light of the proposed mitigation measures and stated conditions, I consider the impacts to the migratory marine birds, terrestrial species, wetland species and marina fauna to be neither unacceptable nor inconsistent with the international conventions or the threat abatement plans for: the European red fox and cane toads.

6.8.5 Great Barrier Reef World Heritage Area

The proponent has appropriately assessed impacts on the attributes of the GBRWHA following the strategic assessments framework. I agree with this assessment approach and its findings that a reduction in the release of pollutants to the receiving water and biodiversity values and changes to the visual amenity of the local landscape would occur.

I have accepted the Aquis Local Plan and development code which provides the broad planning framework for the site and controls the development in height, scale and bulk. The Aquis Local Plan and Code also provides performance standards for lighting, glare and directs the project to follow a colour scheme that is complementary to the surrounding landscape.

I appreciate the temporary impacts associated with construction of marine infrastructure and have included stated conditions in Appendix 2 of this report to address these impacts. I also require the proponent to manage impacts on OUV during construction and operation, through stated conditions, including:

- implementing lighting methods during construction and operation of the project in accordance with the *Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting* and *AS1158 – Lighting for Roads and Public Spaces*
- meeting water quality standards during construction and operation
- requiring vegetation restoration and limit clearing
- maintaining acceptable flooding outcomes.

In light of the mitigation measures, I consider that the potential impacts on the outstanding universal value of the GBRWHA are not unacceptable and that approving the project would not be inconsistent with Australia's obligations under the World Heritage Convention or the Australian World Heritage management principles.

6.8.6 Wet Tropics of Queensland World Heritage Area

I agree with the proponent's conclusion that there would be no significant residual impacts to the WTWHA. I have accepted the Aquis Local Plan and development code which provides the broad planning framework for the site and limits the development in height, scale and breadth. The Aquis Local Plan and development code also provides performance standards for lighting and glare, and directs the project to follow a colour scheme that complements the surrounding landscape.

I have also stated conditions to ensure the proponent applies effective environmentally sensitive lighting design to the development. As a result of the comprehensive state

conditions in Appendix 2, no further conditions are recommended for the approval required under the EPBC Act.

In light of the mitigation measures, I consider that the impacts on the outstanding universal value of the GBRWHA are not unacceptable and that approving the project would not be inconsistent with Australia's obligations under the World Heritage Convention, the Australian World Heritage management principles or the Wet Tropics Management Plan.

6.8.7 National Heritage Places

The proponent has adequately identified the potential impacts that the project would have on to the Great Barrier Reef National Heritage Place and the Wet Tropics National Heritage Place.

6.8.8 Great Barrier Reef Marine Park

The proponent has adequately identified the potential impacts that the project would have on the Great Barrier Reef Marine Park. I agree that the consequential impacts related to increased visits to the GBRMP would be adequately managed through the GBRMPA operations.

7. Conclusion

The project has undergone a comprehensive environmental impact assessment. In undertaking my evaluation of the EIS, I have considered the following:

- the EIS and AEIS prepared for this project
- submissions on the EIS and AEIS, including agency advice.

I am satisfied that the requirements of the SDPWO Act have been met and that sufficient information has been provided to enable the necessary evaluation of potential impacts, and development of mitigation strategies and conditions of approval.

The environmental assessment commenced with the declaration of this project in August 2013 and has involved a comprehensive body of work by the proponent. More detailed work will occur in the detailed design phase of the project.

The potential impacts identified in the EIS documentation and submissions have been assessed. I consider that the mitigation measures adopted by the proponent and required by the conditions stated in this report would result in acceptable outcomes.

I conclude that the project can deliver significant economic and employment opportunities for Cairns, the far north Queensland region and Queensland. Accordingly, I approve the Aquis Resort at the Great Barrier Reef project, subject to the conditions in Appendix 1, Appendix 2 and Appendix 3. I expect any development to be consistent with the ALP and the development code as assessed in this report. In addition, I request the proponent's commitments to be fully implemented as presented in the EIS documentation and summarised in Appendix 4 of this report.

To proceed further, the proponent will be required to:

- obtain EPBC Act approval
- obtain a preliminary approval under the Sustainable Planning Act
- obtain the relevant development approvals under the Sustainable Planning Act
- obtain environmental authorities for construction aspects of the project under the EP Act
- finalise and implement the construction and operations environmental management plans.

If there are any inconsistencies between the project (as described in the EIS documentation) and the conditions in this report, the conditions shall prevail. The proponent must implement all the conditions of this report.

Section 7 of this report describes the extent to which the material supplied by Aquis Resort at the Great Barrier Reef Pty Ltd addresses the actual or likely impacts on MNES of each controlled action for the project.

Copies of this report will be issued to:

- Australian Government Department of the Environment
- Cairns Regional Council
- Department Environment and Heritage Protection
- Department of Transport and Main Roads
- Department of Agriculture, Forestry and Fisheries.

A copy of this report will also be available on the Department of State Development, Infrastructure and Planning's website at **www.dsdip.qld.gov.au/cg**

This report will lapse three years from the date of this report, or when an approval application is decided for the project, unless a later time is subsequently decided by the Coordinator-General.

Appendix 1. Imposed conditions

This appendix includes conditions imposed by the Coordinator-General under section 54B of the SDPWO Act. The conditions are relevant to applications for development approvals for those parts of the project where there is no relevant approval applicable under other legislation.

All of the conditions imposed in this appendix take effect from the date of this Coordinator-General's report.

These conditions do not relieve the proponent of the obligation to obtain all approvals and licences from all relevant authorities required under any other Act.

Pursuant to section 54D of the SDPWO Act, these conditions apply to anyone who undertakes the project, such as the proponent and an agent, contractor, subcontractor or licensee of the proponent, and any public utility providers undertaking public utility works as a result of the project. The Coordinator-General is designated as the responsible agency for conditions in this appendix.

Schedule 1. Social impact assessment reporting requirements

Condition 1. Social and economic

(a) The proponent will provide an annual report to the Coordinator-General during each year of construction and the first two years of operation for each stage of the project describing the:

- (i) actions and adaptive management strategies in the Housing and Accommodation Plan to avoid, manage or mitigate project-related impacts on local and regional housing markets
- (ii) actions in the workforce development and management plan to enhance local employment, training and development opportunities
- (iii) actions to avoid, manage or mitigate project-related social impacts on local community services, infrastructure and community safety and wellbeing
- (iv) actions in the Community Engagement Plan to inform the community about project impacts and show that community concerns about project impacts have been taken into account when reaching decisions.

Schedule 2. Environmental offsets

Condition 1. Environmental offsets

(a) Prior to commencement of construction activities, the proponent must determine the significant residual impacts to fish habitat areas.

(b) The proponent must prepare a draft offset plan to address any significant residual impacts identified in accordance with Condition 1(a).

(c) The draft offset plan must be lodged with the Coordinator-General prior to commencement of construction activities, or prior to impacting on significant biodiversity values whichever is sooner.

(d) The draft offset plan must be approved by the Coordinator-General and is to include, but is not necessarily limited to:

- (i) a detailed description of the land to which the plan relates, the values affected and the extent and likely timing of impact on each
- (ii) evidence that values to be impacted can be offset
- (iii) the offset delivery mechanism(s) comprising one or more of: land-based offsets; direct benefit management plans; offset transfers and/or offset payments

(iv) a legally binding mechanism that ensures protection and management of offset areas.

(e) The approved offset plan must be implemented within 2 years of commencement of construction, or as directed by the Coordinator-General.

SCHEDULE 2 DEFINITIONS

Significant residual impact is defined in the *Environmental Offsets Act 2014* as:

'an adverse impact, whether direct or indirect, of a prescribed activity on all or part of a prescribed environmental matter that—

(a) remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity; and

(b) is, or will, or is likely to be, significant.

Appendix 2. Stated conditions

This appendix includes Coordinator-General's conditions stated under section 39, 45, 47C, and 49 of the SDPWO Act.

Schedule 1. Sustainable Planning Act (Preliminary Approval)

This schedule includes Coordinator-General's conditions stated under section 39 of the SDPWO Act.

Part A. Local road network impacts

CRC is designated as the agency responsible for conditions in this part.

Condition 1. Transport infrastructure assessment

(a) A transport infrastructure impact assessment is undertaken for each stage of the project by an appropriately experienced registered professional engineer (Qld) (RPEQ) to support development applications.

(b) The transport infrastructure impact assessment:

  (i) identifies the planned transport network and identifies the direct impacts of the Aquis Resort development to achieve a safe and efficient transport network

  (ii) validates the Cairns Strategic Transport model based on the current planning for the Cairns region, and analyses the impact that the development-related traffic (including passenger vehicles, heavy vehicles, buses, pedestrian traffic and cyclists) will have on the road, cycle and pedestrian networks

  (iii) identifies impacts during construction and operational phases of the development

  (iv) makes recommendations for any ameliorative measures required to mitigate any identified impacts of the development, and detail when the measures are to be implemented. The report should support on-site parking arrangements to satisfactorily accommodate the ultimate operations of the development, and detail other operational matters such as public transport services and the use of high occupancy vehicles.

Condition 2. Monitoring and performance

(a) The performance of transport infrastructure upgraded as a direct impact of the Aquis Resort is monitored, validated and managed to ensure corrective action and compliance with the agreed standard of service, is undertaken by the proponent.

(b) Following the commencement of operation of stage 1 of the development, a revised transport infrastructure impact assessment report is provided to support each further application for subsequent stages of the development.

(c) The revised impact assessment is to assess and validate the existing transport network conditions following the commencement of operations of each stage of the development, and analyse the impact that the future development related traffic (including passenger vehicles, heavy vehicles, buses, pedestrian traffic and cyclists) will have on the local road, cycle and pedestrian networks. The impacts are to include future construction and operational phases of the development. The assessment is to make recommendations for any ameliorative measures required to mitigate identified impacts of the development, and detail when the measures are to be implemented.

Condition 3. Internal transport infrastructure network

A detailed internal transport infrastructure network plan is provided with each stage or precinct and accompanies each development application. The plan demonstrates compliance with the relevant standards of service and design standards to achieve a safe and efficient internal transport network.

Condition 4. Construction management plan

(a) A construction traffic management plan is prepared. The plan includes an assessment of the impacts that construction traffic will have on the transport infrastructure network and detail ameliorative measures required to mitigate any identified impacts of the development. The plan is to include a condition assessment of the road pavement for all construction traffic haul routes, before the commencement of any hauling operations, and ongoing condition assessments, as required. The proponent is responsible for all works required to mitigate the impacts of construction traffic.

(b) The travel management plans are completed prior to the issue of a development permit for either operational works or material change of use respectively, to complement the transport infrastructure impact assessment and the stage of development to which the plans are relevant.

(c) The transport infrastructure impact assessment is to be completed prior to the issue of a development permit associated with any development requiring or proposing upgrades to the transport infrastructure networks.

Part B. State road network impacts

DTMR is designated as the agency responsible for conditions in this part.

Condition 5. Traffic impact assessment and road-use management plan

(a) The proponent must prepare a traffic impact assessment (TIA) for each stage of the project to describe impacts on the safety, efficiency and condition of state-controlled and local roads in addition to passenger transport and active transport infrastructure. The TIA must:

  (i) be developed in accordance with the *DTMR Guidelines for Assessment of Road impacts of Development* (2006) (GARID) and include a completed DTMR 'transport generation proforma' detailing project-related traffic and transport generation information or as otherwise agreed in writing with DTMR

  (ii) address the impact of development on passenger transport and active transport infrastructure and networks

  (iii) use DTMR's pavement impact assessment tools or such other method or tools as agreed in writing with DTMR

  (iv) clearly indicate where detailed estimates are not available and document the assumptions and methodologies that have been previously agreed in writing with DTMR, prior to TIA finalisation

  (v) detail the final impact mitigation proposals, including contributions to road works/maintenance and summarising key management strategies.

  (vi) be approved in writing by DTMR prior to the issue of a development permit for material change of use, operational works or reconfiguring a lot, or as otherwise agreed between the proponent, DTMR.

(b) The proponent must prepare or update a road-use management plan (RMP) for each stage of the project. The RMP must:

  (i) be developed in accordance with DTMR's *Guide to Preparing a Road-use Management Plan*, with a view to also optimising project logistics and minimising road-based trips on all state-controlled and local roads

  (ii) include a table listing RMP commitments and provide confirmation that all works and road-use management strategies have been designed and/or will be undertaken in accordance with all relevant DTMR standards, manuals and practices

(iii) be approved in writing by DTMR prior to the issue of a development permit for material change of use, operational works or reconfiguring a lot, or as otherwise agreed between the proponent, DTMR.

Part C. Flooding

CRC is designated as the agency responsible for conditions in this part.

Condition 6. Flooding assessment

(a) Development applications must provide the following information to support the outcomes of the development, consistent with the planning assessment required under the planning scheme and the Aquis Local Plan:

(i) a map showing the extent of the TUFLOW model domain with respect to the 1 per cent AEP, PMF and the 1977 flood extent to ensure that model boundary limits are sufficient to avoid introduced impact irregularities

(ii) hydraulic roughness map showing 'n' values overlaid on the development pattern; and assumptions for all roughness values used

(iii) maps showing flood hazard over public areas inside and outside the development

(iv) sensitivity tests to assess the impacts of increased rainfall intensities (climate variability), variations is roughness, a 1 per cent AEP flood peak occurring at the same time as low tide, accretion in the lake bypass channels, and growth of plantings on the golf course

(v) rates of flood rise and durations of road closure (historic and design events for development proposal)

(vi) a table of existing development in any adversely affected areas, nature of proposed development and afflux at those properties

(vii) maps of modelled storm surge inundation lines

(viii) the strategies for waterway management and siltation management.

(b) Development applications must include additional modelling and information is required to demonstrate the impact of the improvements and the mitigation measures required to avoid or mitigate any impacts resulting from the upgrade of Yorkeys Knob and Dunne roads. The information must also specifically identify the compensatory waterways needed to convey flood waters after its construction.

Part D. Infrastructure

CRC is designated as the agency responsible for conditions in this part.

Condition 7. Potable and Recycled Water Supply and Wastewater Management

Development applications must include a detailed analysis of the project's water and wastewater requirements for all stages of the project in terms of both quantity and quality. The analysis will be supported by a rigorous, best-practice approach drawing on evidence from similar-sized projects or project components to consider:

(a) the project's demand for potable water and classes of recycled water, and wastewater loads during all stages

(b) seasonal variations affecting demand and availability

(c) the interrelationship between potable and classes of recycled water

(d) the proposed sources of potable and recycled water classes and the impacts of losses and infiltration.

Condition 8. Water and wastewater infrastructure impact assessment

(a) Development applications must include a water and wastewater infrastructure impact assessment that:

(i) identifies any infrastructure that may be impacted by the proposed development

(ii) details the impacts of the proposed development on water and wastewater infrastructure

(iii) identifies any mitigation measures required to address identified impacts of the proposed development on existing infrastructure

(iv) identifies any new infrastructure that is required to service the development

(v) identifies an agreed standard of service for the provision of potable water, recycled water and wastewater services consistent with the *Water Supply (Safety and Reliability) Act 2008*.

(b) The proponent must undertake external works and make a contribution towards the cost of mitigating impacts identified in the infrastructure impact assessment across the network as a consequence of the development.

(c) In the event that agreement on any process or consideration cannot be reached between parties, the matter may be referred to the Coordinator General, by either party, for mediation, direction or necessary action.

(d) The proponent must monitor and manage the performance of infrastructure associated with potable water supply, recycled water supply and management, or wastewater management for the Aquis Resort, to ensure corrective action and compliance with the agreed standard of service.

(e) The water and wastewater infrastructure impact assessment is to be completed prior to the issue of a development permit associated with any development requiring connections to the water and wastewater infrastructure.

Part E. Acid sulfate soils

CRC is designated as the agency responsible for conditions in this part.

Condition 9. Acid sulfate soils

(a) Development applications must include an acid sulfate soil management plan (ASSMP) that has been be prepared and endorsed in accordance with the most recent requirements of the *Queensland Acid Sulfate Soil Technical Manual including Soil Management Guidelines*.

(b) The acid sulfate soil management plan (ASSMP) must address the following matters.

(i) Treatment of excavated soils/sediments: If applicable, detail the dredging and hydrocycloning processes, with particular attention to treatment of water and fines from the process.

(ii) The location(s) of any treatment pads on design drawings along with cell/bund design and lime guard layer rates.

(iii) The thickness of each soil layer, soil testing rates per volume of material and the type of analysis to be used. List equipment to be used for application and incorporation of lime. Detail the incorporation method, liming rates and verification of quantities; such as on delivery of the lime e.g. using weighbridge dockets.

(iv) Set out validation testing rate per volume of material. Describe the sampling technique and what type of analysis will be used. Consider the likely turnaround times for full treatment of each layer including drying time so that delays do not result in oxidation and acid discharge. Ensure treatment area is sufficiently large that treated layers are not buried until validation tests show the material has been fully treated.

(v) Establish the rate of treatment and thus duration of these works. Preferably schedule excavation and treatment during the dry season. Establish emergency procedures to cope with inclement weather. If treatment extends into or occurs over a wet season provide alternative methods or modified procedure.

(vi) Outline the roles, responsibilities and how knowledge (as well as oversight) are be conveyed to the contractor/s.

(c) The ASSMP must include a groundwater section that includes:

(i) whether sheet piling or an alternative barrier will be used to control groundwater ingress and what type of barrier will be employed

(ii) the number and location of groundwater monitoring bores around the lake and environmentally sensitive areas and detail of their construction

(iii) a full monitoring checklist including relevant analyses, frequency and critical thresholds for action

(iv) time period for this monitoring inclusive of pre-construction to establish baseline condition, intensive monitoring during construction and some reduced level of operation to ensure that equilibrium has been reached

(v) details of reporting and or action to be undertaken if thresholds are exceeded

(vi) outline contingency planning in the event that lake-bank dewatering occurs including acid water management /treatment, relevant water quality criteria for discharge and point of discharge

(vii) detail emergency response procedures to be activated to protect the environment in the event of inclement weather.

Part F. Pipeline construction

CRC is designated as the agency responsible for conditions in this part.

Condition 10. Tidal works

The following information must be provided in support of an application for a development permit for operational works (tidal works or prescribed tidal works other than dredging) associated with the project:

(a) layout and cross sectional drawings (with engineering certification) of the infrastructure, including levels relative to Australian Height Datum for the final design of the works

(b) details of materials to be used for the construction of the infrastructure

(c) details of construction methodology and any temporary construction works.

Condition 11. Underwater noise

An underwater noise management plan must be provided in support of an application for a development permit (tidal works or prescribed tidal works and dredging), and implemented during construction works to minimise and mitigate any impacts to marine fauna during construction activities.

Condition 12. Pipeline trench

(a) A dredge management plan must:

(i) be provided in support of an application for development permit for operational works (tidal works involving dredging) and

(ii) be submitted to and approved by the Department of Environment and Heritage Protection prior to commencement.

(b) The dredge management plan must include, but not be limited to:

(i) detailed plans showing the extent and depth of dredging for the pipeline trench

(ii) a hydrographic survey of that land below tidal and subtidal waters on lines not more than 20 metres apart

(iii) the location(s) of placement of dredge material, estimated volumes, and details of material containment and dewatering system(s) design, including engineering certification of containment system design

(iv) management strategies and defined actions to ensure that impacts on marine fauna are minimised

(v) characterisation of contaminants in the dredge material in accordance with the *National Assessment Guidelines for Dredging* (NAGD) (DEWHA 2009)

(vi) mapping showing the estimated extent of water quality change, including but not limited to total suspended sediment (TSS) and turbidity, as a result of dredging for the pipeline trench.

Part G. Groundwater

CRC is designated as the agency responsible for conditions in this part.

Condition 13. Groundwater investigation

The desktop groundwater-dependent ecosystem (GDE) assessment for Aquis Resort Project by CDM Smith (Appendix 6 within Appendix G, pp. 255–269), must be provided in support of an application for development applications and be updated to determine the actual and potential changes to groundwater including:

(a) the effects of construction dewatering on the groundwater systems, including the effects of drawdown on the quantity and quality of groundwater and associated potential impacts on GDEs

(b) The effects of density-driven flow on groundwater salinity and environmental values of groundwater, including GDEs. This will necessitate density-coupled flow and transport modelling

(c) The water balance modelling of lake.

Part H. Performance Guarantee Bond

CRC is designated as the agency responsible for conditions in this part.

Condition 14. Performance guarantee bond

(a) A performance guarantee bond for the proposed development (including access roads or other relevant infrastructure) must be provided to Cairns Regional Council prior to commencement of construction.

(b) The bond provides security for the restoration of the site and provision for long-term environmental impact mitigation measures required under environmental approvals, should the proposed development not be completed in accordance with the EIS documentation and commitments made by the proponent.

(c) The amount of and arrangements relating to, the performance guarantee bond for the proposed development should be negotiated with Cairns Regional Council and be in the form of an unconditional bank guarantee, which must cover all aspects of the construction and be valid for 18 months after the estimated works completion date.

Schedule 2. Sustainable Planning Act (material change of use, operational works)

This schedule includes Coordinator-General's conditions stated under section 39 of the SDPWO Act.

Part A. Built form

CRC is designated as the agency responsible for conditions in this part.

Condition 1. Built form

(a) Building heights, including structures in the Resort Complex Precinct as set out in Schedule 2 and 3 of the Aquis Local Plan and Code, are limited to a maximum of 67.5 metres AHD or below the Obstacle Limitation Surface (OLS) for the Cairns airport, whichever is the lesser.

(b) Building heights including structures in the Sport and Recreation and Environment Management and Conservation Precincts Schedule 2 and 3 of the Aquis Local Plan and Code are limited to a maximum of 15 metres above the existing ground level.

(c) Each precinct must be located, designed and integrated in accordance with the Schedule 2 and 3 of the Aquis Local Plan and Code.

(d) Lighting must be designed and installed in accordance with the Australian Standard AS4282-1997 Control of the obtrusive effects of outdoor lighting and AS1158 – Lighting for Roads and Public Spaces.

(e) Lighting is designed to minimise light spill beyond the site boundary with all lights above tree height to be shielded and directed downwards.

(f) The aquaculture ponds described in the Aquis Resort at the Great Barrier Reef environmental impact statement must be retained in accordance with aquaculture pond option 3 specified in the Aquis Report at the Great Barrier Reef environmental impact statement.

Part B. Transport

DTMR and CRC are designated as the agencies responsible for conditions in this part.

Condition 2. State and local road network

(a) The proponent must implement measures to mitigate adverse impacts on the safety, condition and efficiency of state-controlled and local roads for all stages of the project.

(b) An impact mitigation program must be documented and finalised prior to the commencement of each stage of project construction, or such other period agreed in writing with DTMR and or Cairns Regional Council, and may be one or more of the following:

  (i) construction of any required works (including site accesses) as and when stated in a road impact assessment (RIA)

  (ii) payment of any contributions towards the cost of works, rehabilitation or maintenance as and when stated in a RIA

  (iii) undertake or implement any other action as and when stated in a road-use management plan (RMP)

  (iv) actions or payments as otherwise agreed in writing with the Department of Transport and Main Roads (DTMR) and/or Cairns Regional Council (CRC) or in an infrastructure agreement.

(c) In the event that agreement cannot be reached between the proponent and the administering authority, the matter may be referred to the Coordinator-General, by either party, for mediation, direction or necessary action.

Part C. Flood performance

CRC is designated as the agency responsible for conditions in this part.

Condition 3. Flood performance

(a) The Aquis Resort development must not cause adverse flow impacts or actionable nuisance upstream and downstream of the site up to and including the 1 per cent AEP flood events.

(b) The proposed upgrade and increased flood immunity of Yorkeys Knob Road, and any proposed upgrade of Dunne Road, must not adversely affect existing overland flow paths in the upstream and downstream areas along the full length of the roads.

Part D. Lake water quality

CRC is designated as the agency responsible for conditions in this part.

Condition 4. Contaminant release to waters

Contaminants must not be directly or indirectly released to waters except for those releases authorised by conditions of this development approval.

Condition 5. Surface water quality

The controlled release of lake water to receiving estuarine or coastal waters must only occur from the release points specified in Table 1—Lake water release point, sources and receiving waters.

Table 1—Lake water release point, sources and receiving waters

Release point	Contaminant source and location	Receiving waters
RP 1	Lake water released 1.4km into the Coral Sea from the discharge pipeline	Coral Sea
RP 2	Lake water release into the Richters Creek from the lake overflow channel	Richters Creek

(a) The operation and management of the lake must not cause a decline in the ambient quality of receiving waters that is inconsistent with *Barron River Basin Environmental Values and Water Quality Objectives, Basin No.110 and adjacent coastal waters,* published by the Department of Environment and Heritage Protection in November 2014.

(b) Lake waters must not be released to receiving waters if the lake waters:

(i) have any physical or chemical properties that are capable of causing environmental harm to environmental values as set out in the *Barron River Basin Environmental Values and Water Quality Objectives, Basin No.110 and adjacent coastal waters*

(ii) produce any slick or other visible evidence of oil or grease, or contain visible floating oil, grease, scum, litter or other visually objectionable matter.

(c) The effects of the controlled release of lake waters on receiving waters are to be monitored in accordance with a receiving environment monitoring program which has been endorsed by the Department of Environment and Heritage Protection.

(d) Any release of lake waters that is the direct result of overtopping of the levees surrounding the lake due to a flood event is not a controlled release for the purposes of this condition.

(e) The lake must exclude overland flow up to a 50 per cent AEP flood event.

Condition 6. Receiving Environment Monitoring Program

(a) A Receiving Environment Monitoring Program (REMP) must be developed and implemented to monitor, identify, describe and respond to any changes to:

(i) the quality of the receiving water quality, and

(ii) the aquatic flora and fauna of those waters.

(b) The REMP must:

(i) include an assessment of the condition or state of receiving waters in proximity to the discharge points RP1 and RP2 (as specified in Table 1 above) on accurate and reliable monitoring data that takes into consideration temporal variation (e.g. seasonality)

(ii) establish indicators to be monitored including but not limited to turbidity and Total Suspended Solids (TSS), nutrients, metals and metalloids and demonstrate suitability of:

(A) the parameters chosen, and

(B) assumptions and choices made in preparation of the REMP.

(iii) be designed to facilitate assessment against water quality objectives for the relevant environmental values that need to be protected

(iv) detail monitoring locations and water quality indicators pertinent to the sensitive receptor types and locations that have been designed to:

(A) determine the zone of influence

(B) determine the baseline condition of water quality and sensitive environmental values (i.e., corals and seagrass meadows) within the zone of influence of discharges

(C) provide monitoring capability indicators identified under point (ii) above.

(v) specify the frequency and timing of sampling required in order to reliably assess the effect of discharges of lake waters on ambient water quality conditions in receiving waters

(vi) include, where appropriate, monitoring of metals/metalloids in sediments (in accordance with ANZECC & ARMCANZ 2000 and/or the most recent version of Australian Standard 5667.1)

(vii) apply procedures and/or guidelines from ANZECC and ARMCANZ 2000 and other relevant guideline documents

(viii) describe sampling and analysis methods and quality assurance and control

(ix) demonstrate suitability of all assumptions and choices made in preparation of the REMP.

(c) The REMP must commence prior to commencement of construction activities.

Part E. Groundwater

CRC is designated as the agency responsible for conditions in this part.

Condition 7. Groundwater

(a) The lake must be designed to contain any entrained contaminants within the bounds of the lake during both its operational life and including any period of decommissioning and rehabilitation.

(b) The lake must not affect groundwater quality or flow in a way that has an adverse impact on native flora or fauna beyond the lake boundary.

(c) The lake must be monitored for signs of loss of structural or hydraulic integrity.

(d) Remediation actions must be implemented to maintain structural or hydraulic integrity of the lake if loss any of structural or hydraulic integrity is identified.

(e) A suitably qualified person must certify the design and construction of the lake to ensure the lake is suitable for its intended use.

Condition 8. Groundwater monitoring and management plan

(a) A groundwater monitoring and management plan (GMMP) must be developed to monitor and manage any adverse impacts to environmental values of the groundwater, including: groundwater-dependent ecosystems (GDEs), water quality and groundwater levels.

(b) The GMMP must include:

(i) Mapping of the spatial extent of on-site and off-site environmental values based on areas of connectivity with the groundwater as informed by modelling and expert analysis

(ii) Permanent monitoring bores established to detect changes in groundwater flow and quality

(iii) The indicators to be monitored must include, but are not limited to, groundwater level, groundwater quality, ecological indicators (particularly for threatened species, and ecosystem function)

(iv) Specific mitigation measures to be undertaken to manage impacts to environmental values at each stage of the project

(v) detail on the effectiveness of avoidance, mitigation and management actions in managing adverse impacts on environmental values

(vi) any adaptive management initiatives to be implemented.

Part F. Vegetation management

DNRM is designated as the agency responsible for conditions in this part.

Condition 9. Clearing and restoration

(a) Clearing of Melaleuca wetland and woodland habitats must not exceed 0.3ha within the project site as specified in Table 2—Vegetation clearing and restoration.

(b) 53.2ha of native vegetation must be restored and maintained within the area described as the Environmental Management Precinct specified in the Aquis Local Plan and Code as specified in Table 2—Vegetation clearing and restoration.

(c) The restoration of native vegetation specified in part (b) of this condition must commence prior to the commencement of construction activities.

Table 2—Vegetation clearing and restoration

Broad habitat type	Area (ha)			Notes
	Existing	Clearing	Restoration	
Mangroves/fringing mangroves	22.1	0.4	27.3	This planting is designed as a 60m wide band along the Yorkeys Knob and the edge of Richters Creek to reinforce both watercourses and in the case of Richters Creek, help stabilise the banks.
Melaleuca wetland	12.4	0.2	12.2	This planting is designed as a 60m wide band along the northern edge of Lot 4 RP494342 to reinforce the existing forest and buffer the FHA in this area.
Woodland	6.7	0.1	13.7	This planting is designed as a 60m wide band on the project side of the Richters Creek riparian zone (Lot 100) to reinforce the existing woodland. Includes vegetated spray buffers and roadside plantings.
Marine plants (other than mangroves)	10.4	0.0	0.0	No restoration of this habitat type is planned.
Saltpan	1.9	0.0	0.0	No restoration of this habitat type is planned.
TOTAL	**53.4**	**0.7**	**53.2**	
Artificial water bodies (abandoned aquaculture ponds)	5.6	0.0	(33.0—area not included in total)	All ponds to remain.

Part G. Fisheries

DAFF is designated as the agencies responsible for conditions in this part.

Condition 10. Marine plants

(a) Clearing of mangroves must not exceed 0.4ha within the project site.

Condition 11. Fish kills

(a) Provisions must be made to minimise the risk of fish kills arising from the works e.g. arising from entrapment of fish upstream or between works.

(b) All works that have the potential to trap native fish must be undertaken in accordance with the Fisheries Queensland *Fish Salvage Guidelines*.

(c) Fish kills must be reported to the Department of Environment and Heritage Protection on 1300 130 372 as soon as possible, but no later than 24 hours from becoming aware of the fish kill.

Part H. General site construction conditions (MCU, operational works)

CRC is designated as the agency responsible for conditions in this part.

Condition 12. Documentation

(a) Written procedures must be developed to ensure operations and maintenance of the project complies with the conditions of this approval.

(b) All plans, procedures and reports must be:

  (i) certified by a suitably qualified and experienced person

  (ii) kept on record for a minimum of 5 years

  (iii) implemented as appropriate.

(c) All documents required to be prepared, held or kept under this development approval must be provided to the administering authority upon written request within the requested timeframe.

(d) A record of all complaints must be kept including the date, complainant's details, source, reason for the complaint, description of investigations and actions undertaken in resolving the complaint.

Condition 13. Monitoring

(a) All monitoring must be undertaken by a suitably qualified person.

(b) All laboratory analyses and tests must be undertaken by a laboratory that has NATA accreditation for such analyses and tests.

(c) Notwithstanding (b), where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.

(d) Monitoring and sampling must be carried out in accordance with the requirements of the following documents (as relevant to the sampling being undertaken), as amended from time to time:

  (i) for waters and aquatic environments, the Queensland Government's *Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009*

  (ii) for groundwater, *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1)

  (iii) for noise, the Environmental Protection Regulation 2008

  (iv) for air, the *Queensland Air Quality Sampling Manual* and/or *Australian Standard 4323.1:1995 Stationary source emissions method 1: Selection of sampling positions*, as appropriate for the relevant measurement

  (v) for soil, the *Guidelines for Surveying Soil and Land Resources*, 2nd edition (McKenzie et al. 2008), and/or the *Australian Soil and Land Survey Handbook*, 3rd edition (National Committee on Soil and Terrain, 2009)

  (vi) for dust, Australian Standard AS3580.

Condition 14. Contingency plan

Activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

(a) a clear definition of what constitutes an environmental emergency incident or near miss for the activity

(b) consideration of the risks caused by the activity including the impact of flooding and other natural events on the activity

(c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring

(d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused

(e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land

(f) training of staff to enable them to effectively respond

(g) procedures to notify the administering authority, local government and any potentially impacted landholder.

Condition 15. Plant and equipment

All plant and equipment must be maintained and operated in their proper and effective condition.

Condition 16. Environmental nuisance

(a) Activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.

(b) When requested by the administering authority, monitoring must be undertaken to investigate any complaint.

(c) Monitoring results and interpretation to investigate any complaint must be provided to the administering authority within 14 days of the complaint, unless otherwise agreed in writing.

Condition 17. Reporting incidents

The administering authority is to be contacted as soon as practicable and within 24 hours after becoming aware of any release of contaminants not in accordance with the conditions of this approval.

Condition 18. Public notification of works

(a) Public notification of works to be undertaken is carried out in accordance with the community engagement plan.

(b) Signage identifying the location of the project, general layout, contact numbers (including out of office hours emergency numbers) must be provided at all entrance points to the development. All signage must be appropriately positioned, prior to the commencement of any works on the site.

Condition 19. Contaminant release to waters

Contaminants must not be directly or indirectly released to waters unless authorised by conditions of this approval.

Condition 20. Contaminant release to land

Contaminants must not be directly or indirectly released to land unless authorised by conditions of this approval.

Condition 21. Sediment and erosion control

(a) Measures must be implemented and maintained to minimise stormwater entry onto significantly disturbed land.

(b) Sediment and erosion control measures to prevent soil loss and deposition beyond significantly disturbed land must be implemented and maintained.

(c) The measures required by conditions (a) and (b) must be in accordance, to the greatest practicable extent, with the International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control (BPESC) document and the FNQROC Development Manual.

(d) Prior to the controlled release of any water from the site to waterways the water must achieve the design objectives set out in Table 8.2.1 or 8.2.2 of the *Queensland Water Quality Guidelines* (DERM, September 2009) as appropriate unless already authorised by a condition of this approval.

(e) Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters.

(f) Water quality must be monitored in accordance with Section 7.5 of the *Best Practice Erosion and Sediment Control* (IECA Australasia, November 2008) and compared with water quality objectives.

(g) All erosion and sediment control measures must be inspected on a weekly basis and following run-off events until the site is fully stabilised.

(h) A monitoring report must be prepared and retained at the site office and made available to the administering authority upon request.

Condition 22. Earthworks

Earthworks must be constructed in accordance with *Australian Standard 3798-2007, Guidelines on Earthworks for Commercial and Residential Developments*.

Condition 23. Stabilised landform prior to wet season

Prior to each nominal wet season (November to April), significant disturbance to land must be stabilised and be maintained to meet the following acceptance criteria:

(a) contaminated land resulting from activities is remediated and rehabilitated

(b) the significantly disturbed areas are:

  (i) non-polluting

  (ii) a stable landform

  (iii) re-profiled to contours consistent with the surrounding landform

(c) surface drainage lines are maintained or re-established.

Condition 24. Chemical and fuel storage

Chemicals and fuels stored must be effectively contained, and where relevant meet Australian Standards, where such a standard is applicable.

Condition 25. Waste

(a) Measures must be implemented so that waste is managed in accordance with the waste and resource management hierarchy and the waste and resource management principles.

(b) All waste generated in carrying out the activity must be re-used, recycled or removed from the site by a transporter lawfully able to transport it to a facility that can lawfully accept the waste.

Condition 26. Acid sulfate soils

Acid sulfate soils must be treated and managed in accordance with the latest edition of the *Queensland Acid Sulfate Soil Technical Manual*.

Condition 27. Pest and weed management

The holder of this approval must develop and implement a pest and weed control program that includes but is not limited to the following:

(a) identification of areas requiring pest and weed control

(b) control measures to prevent the introduction spread of pest and weed species

(c) measures to eliminate infestations of noxious pest and weed species that may occur.

Part I. Pipeline conditions (operational works)

CRC is designated as the agency responsible for these conditions.

Condition 28. Turtle nesting season

The construction of the pipelines must not occur during the nesting season of turtle species determined to nest on the beaches adjoining the mouth of Richters Creek.

Condition 29. Soft start piling

All pile driving must utilise a 'soft start' procedure, where piling force is increased from minimum force to maximum piling force over a period of not less than three minutes.

Condition 30. Pile driving

(a) Any pile driving at times when the pile is partly or fully submerged in subtidal or tidal waters will be subject to at least the following measures to minimise the impact of underwater noise on marine fauna:

  (i) underwater noise impacts to marine fauna including cetaceans, dugongs and turtles must be minimised to the greatest extent practicable

  (ii) underwater noise tests should be conducted for each specific piling rig prior to commencing operation to determine the distance from the rig at which the underwater noise level reduces to 183dB (referenced to 1µ Pa2.s). That distance plus 50 metres will be the observation distance. Results of noise tests must be verified by an independent third party underwater noise expert

  (iii) in the absence of underwater noise tests for each specific piling rig, the observation distance must be at least 500m from the pile driving works site

  (iv) piling may only commence following an initial 30-minute observation period during which no cetaceans, dugongs and turtles are sighted by an appropriately qualified person within the observation distance (referenced or (c)) of the pile driving works site

  (v) an appropriately qualified person must be positioned in a suitable location to view the entire observation distance during all pile driving works, and must actively monitor the observation distance during all pile driving works

  (vi) if during piling a sighting is made within the observation distance, piling must stop and not recommence until the cetaceans, dugongs and/or turtles are observed to travel beyond the observation distance or a 30-minute period has passed since any cetacean, dugong or turtle was last seen by an appropriately qualified person within the observation distance of the pile driving work site

  (vii) in the absence of the noise tests required in (ii), underwater noise from pile driving must be recorded at a distance not greater than 500m from the pile driving work site, and continually monitored to ensure that noise is below acceptable limits as specified in an underwater noise management plan. If the noise is recorded above 183dB (referenced to 1µ Pa2.s), pile driving must cease until a revised observation distance is implemented in accordance with Condition 6a(ii)

  (viii) the proponent must not undertake pile driving at night or if the full observation distance is not clearly visible to the appropriately qualified person undertaking observations.

(b) Observation distance is a 500m radius, from the centre of the pile to be driven, around pile driving operations for humpback whales, listed dolphin species, listed turtle species and dugongs, which must be visually observed at all times during piling activities, and where piling activities must cease if humpback whales, listed dolphin species, listed turtle species and dugongs are observed within the relevant radius.

Condition 31. Noise monitoring

(a) All noise monitoring and recording required under conditions 30 and 31 must include, but not be limited to:

  (i) effects due to any extraneous factors such as marine traffic noise

  (ii) location, date and time of monitoring

(b) underwater sound level pressure level during pile driving activities as dB (referenced to 1μ Pa2.s).

SCHEDULE 2 DEFINITIONS

Alternative arrangement means a written agreement between the proponent and sensitive receptor about the way in which a particular nuisance impact will be dealt with at a sensitive place, and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.

'**Environmental nuisance'** has the meaning defined in section 15 of the *Environmental Protection Act 1994*.

Infrastructure agreements are negotiated between a proponent and DTMR or CRC. Agreements are intended to formalise arrangements about transport infrastructure works, contributions and road-use management strategies detailed and required under the impact mitigation program. Infrastructure agreement/s may incorporate, but are not limited to, the following:

(a) project-specific works and contributions required to upgrade impacted road infrastructure and vehicular access to project sites as a result of the proponent's use of state-controlled transport infrastructure by project traffic

(b) project-specific contributions towards the cost of maintenance and rehabilitation, to mitigate impacts on state-controlled and road pavements or other infrastructure

(c) infrastructure works and contributions associated with shared (cumulative) use of state-controlled road infrastructure by other projects subject to an environmental impact statement

(d) performance criteria that detail protocols for consultation about reviewing and updating project-related traffic assessments and impact mitigation measures that are based on actual traffic volume and impacts, should previously advised traffic volumes and/or impacts change

(e) the proponent's transport-related commitments as detailed in a table of RMP commitments.

It is recommended that an infrastructure agreement should be in place three (3) months prior to commencement of project construction, or as otherwise agreed in writing between the proponent and DTMR or Cairns Regional Council.

Maintenance is described as ongoing vegetation management to avoid land degradation, maintain or increase biodiversity or maintain ecological processes.

Restoration is defined as the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed and/or the expansion of that ecosystem into previously cleared areas.

Sensitive place means: a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel) a library, childcare centre, kindergarten, school, university or other educational institution a medical centre, surgery or hospital a protected area a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment a work place used as an office or for business or commercial purposes, which is not part of the activity(ies) and does not include employees accommodation or public roads

Significantly disturbed or **significant disturbance to land or areas** means disturbance to land as defined in Schedule 12, section 4 of the Environmental Protection Regulation 2008.

Suitably qualified and experienced person is defined in Part 3, section 564 of the *Environmental Protection Act 1994*.

Schedule 3. Environmental Protection Act

This schedule includes Coordinator-General's conditions stated under section 47C of the SDPWO Act. DEHP is designated as the agency responsible for conditions in this schedule.

Part A. General conditions (ERA 16 activities—site works and pipeline trenching)

Condition 1. Documentation

(a) Written procedures must be developed to ensure operations and maintenance of the project complies with the conditions of this approval.

(b) All plans, procedures and reports must be:

  (i) certified by a suitably qualified and experienced person

  (ii) kept on record for a minimum of 5 years

  (iii) implemented as appropriate.

(c) All documents required to be prepared, held or kept under this development approval must be provided to the administering authority upon written request within the requested timeframe.

(d) A record of all complaints must be kept including the date, complainant's details, source, reason for the complaint, description of investigations and actions undertaken in resolving the complaint.

Condition 2. Monitoring

(a) All monitoring must be undertaken by a suitably qualified person.

(b) All laboratory analyses and tests must be undertaken by a laboratory that has NATA accreditation for such analyses and tests.

(c) Notwithstanding (b), where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.

(d) Monitoring and sampling must be carried out in accordance with the requirements of the following documents (as relevant to the sampling being undertaken), as amended from time to time:

  (i) for waters and aquatic environments, the Queensland Government's *Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009*

  (ii) for groundwater, *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1)

  (iii) for noise, the Environmental Protection Regulation 2008

  (iv) for air, the *Queensland Air Quality Sampling Manual* and/or *Australian Standard 4323.1:1995 Stationary source emissions method 1: Selection of sampling positions*, as appropriate for the relevant measurement

  (v) for soil, the *Guidelines for Surveying Soil and Land Resources,* 2nd edition (McKenzie et al. 2008), and/or the *Australian Soil and Land Survey Handbook*, 3rd edition (National Committee on Soil and Terrain, 2009)

  (vi) for dust, Australian Standard AS3580.

Condition 3. Contingency Plan

Activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

(a) a clear definition of what constitutes an environmental emergency incident or near miss for the activity

(b) consideration of the risks caused by the activity including the impact of flooding and other natural events on the activity

(c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring

(d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused

(e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land

(f) training of staff to enable them to effectively respond

(g) procedures to notify the administering authority, local government and any potentially impacted landholder.

Condition 4. Plant and equipment

All plant and equipment must be maintained and operated in their proper and effective condition.

Condition 5. Environmental nuisance

(a) Activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.

(b) When requested by the administering authority, monitoring must be undertaken to investigate any complaint.

(c) Monitoring results and interpretation to investigate any complaint must be provided to the administering authority within 14 days of the complaint, unless otherwise agreed in writing.

Condition 6. Reporting incidents and complaints

The proponent must ensure that the administering authority is contacted as soon as practicable and within 24 hours after becoming aware of any release of contaminants not in accordance with the conditions of this approval.

Condition 7. Contaminant release to waters

Contaminants must not be directly or indirectly released to waters unless authorised by conditions of this approval.

Condition 8. Contaminant release to land

Contaminants must not be directly or indirectly released to land unless authorised by conditions of this approval.

Condition 9. Waste

(a) Measures must be implemented so that waste is managed in accordance with the waste and resource management hierarchy and the waste and resource management principles.

(b) All waste generated in carrying out the activity must be re-used, recycled or removed from the site by a transporter lawfully able to transport it to a facility that can lawfully accept the waste.

Condition 10. Noise

(a) Noise from the activity must not exceed the levels identified in Table 1—Noise limits when measured in accordance with the associated monitoring requirements.

Table 1—Noise limits

Noise level measured in dB(A)	Monday to Saturday		Sundays and public holidays			
	7am - 6pm	6pm - 10pm	10pm - 7am	9am - 6pm	6pm - 10pm	10pm - 9am
	Noise measured at a nuisance **sensitive place**					
LAeq adj, T	Background + 5	Background + 3	Background +0	Background +5	Background + 3	Background +0
MaxLpA, T	Background + 10	Background + 8	Background + 5	Background + 10	Background + 8	Background + 5
	Noise measured at **commercial place**					
LAeq adj, T	Background + 10	Background + 8	Background + 5	Background + 10	Background + 8	Background + 5
MaxLpA, T	Background +15	Background +13	Background +10	Background +15	Background +13	Background +10

(b) When required by the administering authority, noise monitoring must be undertaken in accordance with the associated monitoring requirements of Table 1—Noise Limits, and the results notified within 14 days to the administering authority. Monitoring must include:

(i) LAeq, adj, T

(ii) Background noise (Background) as LA 90, adj, T

(iii) MaxLpA,T

(iv) the level and frequency of occurrence of any impulsive or tonal noise

(v) atmospheric conditions including wind speed and direction

(vi) effects due to extraneous factors such as traffic noise

(vii) location, date and time of recording.

Condition 11. Pest and weed management

The holder of this approval must develop and implement a pest and weed control program that includes but is not limited to the following:

(a) identification of areas requiring pest and weed control

(b) control measures to prevent the spread of pest and weed species

(c) measures to eliminate infestations of noxious pest and weed species that may occur.

Part B. Dredging (pipeline trenching)

Condition 12. Turtle nesting season

The construction of the pipelines must not occur during the nesting season of turtle species determined to nest on the beaches adjoining the mouth of Richters Creek.

Condition 13. Dredging

(a) Any dredging conducted under this approval must:

(i) comply with a dredge management plan (DMP) approved by the assessing authority prior to commencement of the activity

(ii) be consistent with the *National Assessment Guidelines for Dredging* (NAGD, 2009) and

(iii) for material disposed to land, be consistent with the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland (EPA 1998).

(b) All dredge material extracted must be re-used, recycled or removed from the site by a transporter lawfully able to transport it to a facility that can lawfully accept the waste.

Part C. Extraction and screening

Condition 14. Sediment and erosion control

(a) Measures must be implemented and maintained to minimise stormwater entry onto significantly disturbed land.

(b) Sediment and erosion control measures to prevent soil loss and deposition beyond significantly disturbed land must be implemented and maintained.

(c) The measures required by conditions (a) and (b) must be in accordance, to the greatest practicable extent, with the International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control (BPESC) document and the FNQROC Development Manual.

(d) Prior to the controlled release of any water from the site to waterways, the water must achieve the design objectives set out in Table 8.2.1 or 8.2.2 of the *Queensland Water Quality Guidelines* (DERM, September 2009) as appropriate unless already authorised by a condition of this approval.

(e) Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters.

(f) Water quality must be monitored in accordance with Section 7.5 of the *Best Practice Erosion and Sediment Control* (IECA Australasia, November 2008) and compared with water quality objectives.

(g) All erosion and sediment control measures must be inspected on a weekly basis and following run-off events until the site is fully rehabilitated.

(h) A monitoring report must be prepared and retained at the site office and made available to the administering authority upon request.

Condition 15. Earthworks

(a) Earthworks must be constructed in accordance with Australian Standard 3798-2007, Guidelines on Earthworks for Commercial and Residential Developments.

Condition 16. Stabilised landform prior to wet season

Prior to each nominal wet season (November to April), significant disturbance to land must be stabilised and be maintained to meet the following acceptance criteria:

(a) contaminated land resulting from activities is remediated and rehabilitated

(b) the significantly disturbed areas are:

  (i) non-polluting

  (ii) a stable landform

  (iii) re-profiled to contours consistent with the surrounding landform

(c) surface drainage lines are maintained or re-established.

Condition 17. Chemical and fuel storage

Chemicals and fuels stored must be effectively contained, and where relevant meet Australian Standards, where such a standard is applicable.

Condition 18. Acid sulfate soils

Acid sulfate soils must be treated and managed in accordance with the latest edition of the *Queensland Acid Sulfate Soil Technical Manual*.

Condition 19. Pest and weed management

The holder of this approval must develop and implement a pest and weed control program that includes but is not limited to the following:

(a) identification of areas requiring pest and weed control

(b) control measures to prevent the introduction spread of pest and weed species

(c) measures to eliminate infestations of noxious pest and weed species that may occur.

SCHEDULE 3 DEFINITIONS

Key terms and/or phrases used in these conditions are defined in this section. Applicants should note that where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

24 hour storm event with an average recurrence interval of 1 in 5 years means the maximum rainfall depth from a 24 hour duration precipitation event with an average recurrence interval of once in 5 years. For example, an Intensity-Frequency-Duration table for a 24 hour duration event with an average recurrence interval of 1 in 5 years, identifies a rainfall intensity of 7.09mm/hour. The rainfall depth for this event is therefore 24 hour x 7.09mm/hour = 170.16mm.

Activity means the environmentally relevant activities, whether resource activities or prescribed activities, to which the environmental authority relates.

Administering authority means the Department of Environment and Heritage Protection or its successor or predecessors.

Alternative arrangement means a written agreement between the proponent and sensitive receptor about the way in which a particular nuisance impact will be dealt with at a sensitive place, and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.

Background means noise, measured in the absence of the noise under investigation, as L A90,T being the A-weighted sound pressure level exceeded for 90 per cent of the time period of not less than 15 minutes, using Fast response.

Commercial place means a place used as a workplace, an office or for business or commercial purposes and includes a place within the curtilage of such a place reasonably used by persons at that place.

Dredging includes extraction of mud, sand, coral, ballast, shingle, gravel, clay, earth and other material from the bed of Queensland tidal and non-tidal waters. Dredging does not include the banks of a waterway.

Environmental nuisance has the meaning defined in section 15 of the *Environmental Protection Act 1994*.

LAeq adj,T means the adjusted A weighted equivalent continuous sound pressure level measures on fast response, adjusted for tonality and impulsiveness, during the time period T, where T is measured for a period no less than 15 minutes when the activity is causing a steady state noise, and no shorter than one hour when the approved activity is causing an intermittent noise.

MaxLpA,T means the maximum A-weighted sound pressure level measured over a time period T of not less than 15 minutes, using Fast response.

Measures has the broadest interpretation and includes plant, equipment, physical objects, bunding, containment systems, monitoring, procedures, actions, directions and competency.

NATA means National Association of Testing Authorities.

Noxious means harmful or injurious to health or physical well-being.

Offensive means causing offence or displeasure; is unreasonably disagreeable to the sense; disgusting, nauseous or repulsive.

Prescribed contaminants means contaminants listed within Schedule 9 of the Environmental Protection Regulation 2008.

Release of a contaminant into the environment means to:

- deposit, discharge, emit or disturb the contaminant
- cause or allow the contaminant to be deposited, discharged, emitted or disturbed
- fail to prevent the contaminant from being deposited, discharged emitted or disturbed
- allow the contaminant to escape

- fail to prevent the contaminant from escaping.

Sensitive place means: a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel) a library, childcare centre, kindergarten, school, university or other educational institution a medical centre, surgery or hospital a protected area a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment a work place used as an office or for business or commercial purposes, which is not part of the activity(ies) and does not include employees accommodation or public roads

Sensitive place includes the following and includes a place within the curtilage of such a place reasonably used by persons at that place:

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- a motel, hotel or hostel; or
- a kindergarten, school, university or other educational institution; or
- a medical centre or hospital; or
- a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area; or
- a public thoroughfare, park or gardens, or
- for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2008.

Significantly disturbed or **significant disturbance to land or areas** means disturbance to land as defined in Schedule 12, section 4 of the Environmental Protection Regulation 2008.

Substantial low frequency noise means a noise emission that has an unbalanced frequency spectrum shown in a one-third octave band measurement, with a predominant component within the frequency range 10 to 200Hz. It includes any noise emission likely to cause an overall sound pressure level at a sensitive place exceeding 55dB(Z).

Suitably qualified and experienced person is defined in Part 3, section 564 of the *Environmental Protection Act 1994*.

Vibration is the oscillating or periodic motion of a particle, group of particles, or solid object about its equilibrium position.

Waters includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water, natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

Appendix 3. Coordinator-General's recommended stated conditions

This appendix includes recommended stated conditions, made under section 52 of the SDPWO Act. The stated condition relate to the applications for development approvals for the project.

Schedule 1. Water Act 2000

DNRW is designated as the agency responsible for conditions in this schedule.

Condition 1. Environmental management plan

(a) The proponent shall manage groundwater on the site in accordance with the environmental management plan at all times.

(b) The proponent shall be responsible for undertaking remedial actions on the site.

(c) The proponent shall enter into written agreements with the landowners of the registered bores identified below, which protect the interests of landowners in the event that the registered bores become saline as a consequence of the proposed development (contact details for landowners are available from DNRM):

(i) 148207

(ii) 10900083

(iii) 92542

(iv) 1100047

(v) 45027

(vi) 45037

(vii) 45038

(viii) 45039

Schedule 2. Nature Conservation Act 1992

DEHP is designated as the agency responsible for conditions in this schedule.

(a) Prior to the commencement of construction activities, a suitably qualified and experienced person must develop impact mitigation and management measures that maximise the ongoing protection and long-term conservation of threatened species known or likely to occur within the project area. Mitigation and management measures must:

(i) detail actions and procedures to be followed during the pre-construction, construction, operational and (if appropriate) rehabilitation phases of the project

(ii) be supported by a program of monitoring and reporting to facilitate adaptive management of the action and procedures, should it be required

(iii) be consistent with the provisions of the *Nature Conservation Act 1992* (Qld).

(b) All identified impact mitigation and management and reporting and monitoring measures must be implemented for all stages of the project construction and operations.

SCHEDULE 2 DEFINITIONS

Endangered, in relation to wildlife, means the wildlife falls within a description mentioned in section 77 of the *Nature Conservation Act 1992*.

Suitably qualified and experienced person is defined in Part 3, section 564 of the *Environmental Protection Act 1994*.

Appendix 4. Proponent commitments

Category	Proponent commitment
Environment	1. Adopt best-practice solutions to site drainage and water quality.
	2. Adopt best-practice solutions for the environmental management of: a) ecosystems b) airport operations c) birds and bats (to avoid interfering with aircraft) d) crocodiles and insect vectors e) dust f) lighting g) noise (including helicopter operations) h) visual screening.
	3. Establish environmental management system to accord with *AS/NZS ISO 14001 Environmental Management Systems*.
	4. Adopt sustainable development practices, including: a) green building design b) water harvesting and re-use including of treated wastewater and rainwater c) energy efficiency d) waste minimisation, re-use, and recycling.
	5. Develop interpretive and educational programs to protect and present natural and cultural values and engender a high level of environmental awareness for guests and staff.
	6. Adopt and develop an environmental management plan for both construction and operations. The management plan will include traffic management plans for construction and events which attract significant external patronage. The site-based management plan will include consideration of erosion and sediment control, management of acid sulfate soils, protection of water quality, and waste minimisation, re-use, and recycling.
Community	7. Work closely with CRC, state government agencies and community stakeholders to develop and implement the following management plans prior to the commencement of construction: a) community engagement plan b) workforce development and management plan c) local content plan d) construction management plan e) housing and accommodation plan f) community services and facilities plan g) community health and safety plan cultural development plan h) responsible gaming plan.
	8. Implement the CHMP with the Yirrganydji (Irukandji) People (and any additional signatories from time to time).
	9. Engage with all Indigenous groups in the region for the development and operation of ICH aspects of the Interpretive Centre

Category	Proponent commitment
	10. Maximise local employment opportunities during all stages of the project.
	11. As part of the Local Content Plan, develop a local procurement policy and targets to provide opportunities for local and regional businesses to benefit from the project during all stages of the project.
	12. Construct and implement the community sporting and recreation facility as part of stage 1 of the project as described in the EIS.
Infrastructure	13. Manage the site during construction and the project operations to ensure that there is no major direct environmental disturbance.
	14. Meet any reasonable requirement for environmental management, repairs and rehabilitation in the event of extreme weather events, accident, calamity or financial distress.
	15. Put in place the necessary policies of insurance to underwrite its commitment to repair and rehabilitate the landscape in these circumstances. Where reasonably required, the proponent will negotiate with the Government in good faith to settle the terms upon which additional security/financial guarantees may be provided to better secure the proponent's commitment to meet these (subject to further clarification).
Beneficial re-use of surplus excavation material	16. Following treatment of sands under the ASSMP, any excavated sands not needed on site will be made available free of charge for the following beneficial re-use activities (subject to the practicalities of construction and the development of necessary agreements and approvals): a) beach replenishment (if required by CRC) b) filling and surcharging areas earmarked for future development under the Cairns Airport Land Use Plan (if required by NQA) c) embankment filling for external connections d) filling voids in the Barron delta.
Worker transport	17. Operate a staff reward programme to encourage car-pooling, higher private vehicle occupancy and active transport.
	18. Provide purpose built end-trip facilities for staff to secure bicycles, and to shower and change as a means of encouraging active transport.
Construction water	19. Minimise demands on the potable water supply through targeted utilisation of non-potable water sources.
Public use of foreshore	20. The development of the project will not impede public access to the foreshore.
	21. Access to the public foreshore by Aquis Resort guests will not be provided and will be prevented by fencing, signage, and education.
Sinking fund	22. Aquis will contribute to a sinking fund to stabilise the Thomatis Creek bifurcation should the Queensland Government and CRC decide that such a project is warranted.
Pipeline infrastructure	23. Locate the inlet sump and pump station valve infrastructure to minimise the potential for infrastructure being impacted by any migration of Richters Creek mouth.
Increase flood immunity	24. Upgrade Yorkeys Knob Road.

Category	Proponent commitment
Adopt water-sensitive urban design	25. All stormwater drainage will adopt Water-Sensitive Urban Design (WSUD) principles to limit the export of sediments and nutrients. This will include appropriate stormwater quality improvement devices (SQIDs).
Hazard management	26. Develop and implement in consultation with QFES and QAS an Integrated Emergency Management Plan, specific to the project and tailored to the cultural background and demographic of the visitors.
	27. Examine opportunities to provide shelter facilities for Yorkeys Knob residents.
	28. Include in Emergency Management Plan risk assessment and associated design and management responses.
EMP (planning)	29. Develop EMP (Planning) based on expanding the details on environmental management strategies (Table 23-2), namely: a) acid sulfate soil management strategy b) airport safety strategy c) contingency strategy d) crocodile management strategy e) fauna management strategy f) indigenous cultural heritage strategy g) integrated water management strategy interpretation strategy h) lake management strategy i) landscape and habitat strategy j) non-indigenous cultural heritage strategy restoration and rehabilitation strategy k) social strategies l) sustainability strategy m) waste management strategy n) water quality management and stormwater management strategy o) weed and pest management strategy p) insect vector management strategy q) contingency strategy.
	30. Work closely with relevant government agencies and stakeholders in the developing these strategies.
	31. Identify detailed tasks to be undertaken during: a) planning b) detailed design c) construction d) operation and maintenance.
EMP (construction)	32. Develop EMP (Construction) based on recommendations of EMP (Planning) for the construction phase and contractor input.
	33. Require all contractors to develop suitable detailed contractor's EMPs.
	34. Work closely with the relevant State Government agencies and stakeholders in the development of the EMP (Construction)
EMP (operation & maintenance)	35. Develop EMP (Operation & Maintenance) based on recommendations of EMP (Planning) for the operation phase and operator input.

Category	Proponent commitment
	36. Require all operators to develop suitable detailed Operational Management Plans.
	37. Work closely with the relevant State Government agencies and stakeholders in the development of the EMP (Operation & Maintenance).
Infrastructure agreement—transport	38. Enter into Infrastructure Agreements with DTMR and CRC to ensure that necessary state and local transport infrastructure is provided in accordance with applicable standards, on the basis that: a) the cost of works required to maintain the safety and efficiency of the State and Local Controlled Road network as a direct consequence of the Aquis development will be met by the proponent b) the proponent will contribute its proportionate share of the cost of the upgrades to the State and Local Controlled Road Network taking into account existing thresholds for upgrades required to meet planned future growth in Cairns c) cost sharing arrangements would be identified for shared trunk infrastructure and for accelerated deterioration of pavement assets.
General transport commitments	39. Upgrade Yorkeys Knob Road and Dunne Road to maintain an appropriate level of service during all stages of the project.
	40. Consult with CRC and DTMR to complete a detailed analysis of the potential impacts of each stage of the project on all relevant sections and intersections of the state controlled road network during the detailed design stage of the project.
	41. Consult with DTMR to prepare Traffic Impact Assessment Plans and Road Use Management Plans for each stage of the project based on the outcomes of the detailed analysis of potential impacts.
	42. Reduce traffic generation during peak periods by: a) establishing a dedicated fleet of high occupancy vehicles (HOV) for guest transfers and staff transport, and operating these services in a manner that complements existing public transport services. b) staggering shift arrangements for construction and operational staff c) providing end-of-trip facilities including secure storage and change rooms and showers to encourage active transport modes d) implementing incentive schemes to encourage workers to carpool and use public transport.
	43. Provide adequate onsite car parking facilities for construction and operational staff, and visitors accessing the resort complex, sport and recreation facilities and environmental management and conservation precinct.

Category	Proponent commitment
Infrastructure agreement—services	44. Enter into an Infrastructure Agreement with the CRC for potable water, reuse water and wastewater to ensure that the necessary service infrastructure is provided in accordance with applicable standards, on the basis that: a) the development is considered as separate to and independent of the Council Trunk Infrastructure Contribution Policy b) the cost of dedicated trunk infrastructure to connect the development to the existing water supply network where it has capacity is met by the proponent c) cost sharing arrangements would be identified for shared trunk infrastructure.
	45. Enter into an agreement with CRC for the purchase of Class A (or A+) recycled water (if Class A then treat to Class A+) and reticulate throughout site as a potable water substitute.
General infrastructure commitments	46. Consult with CRC to complete a detailed analysis of the project's potable, re-use and wastewater needs during the detailed design stage of the project.
	47. Develop a total water management plan based on the detailed analysis of need with strategies to reduce potable water demand including the capture and reticulation of roof and runoff water, and the use of treated re-use water from the Marlin Coast wastewater treatment plant.
Ecological monitoring	48. Undertake 2014/2015 wet season terrestrial ecology survey.
	49. Undertake 2014/2015 wet season aquatic ecology survey (including turtles).
Mangrove monitoring	50. Undertake quarterly monitoring (October 2014, January 2015 (extend as warranted).
Groundwater monitoring	51. Undertake monthly monitoring until February 2015 (extend as warranted).
Bore monitoring	52. Undertake monitoring of surrounding (off-site) bores during construction and following lake operation until a pattern emerges.
Transmissivity (groundwater quarantining solution)	53. Investigate transmissivity of low permeability layer beneath lake as input to groundwater quarantining solution. (In the vertical direction, the vertical permeability and continuity of the stiff clay layer needs to be confirmed to be 0.001 m/d (~10-8 m/s) or lower.)
Water quality monitoring (a)	54. Undertake monthly monitoring until February 2015 (extend as warranted) to support the development application.
Water quality monitoring (b)	55. Undertake ongoing monitoring as required by the lake management plan (see commitment 55) to support the development application.
Lake management plan	56. Expand on lake management strategy to create a detailed lake management plan.
Best-practice lighting design	57. Design project lighting to: a) comply with CairnsPlan and any additional NQA/ASA requirements b) best-practice lighting design (general) c) best-practice lighting design (biological aspects).
Best-practice	58. Limit noise emissions that could affect native fauna (design).

Category	Proponent commitment
noise mitigation	59. Limit noise emissions that could affect native fauna (construction management).
	60. Consider timing of construction works, particularly during the migration period to avoid noise impacts on migratory shorebirds.
Shorebirds	61. Provide adequate fencing of boardwalks to reduce human disturbance on shorebirds.

Appendix 5. Social impact mitigation measures

Housing and Accommodation Plan

Overview

Housing markets in urban and regional areas consist of a series of sub-markets with different characteristics that determine how housing is developed and consumed. Sub-markets are typically determined on the basis of location and spatial attributes (such as proximity to services, transport, employment, amenity features), dwelling supply attributes (such as dwelling type, tenure, price) and household attributes (such as income, household size and type, employment status). These factors influence the price and shape of the communities that form in those areas. The spectrum of a community's housing needs is represented in Table A1.

Table A1. The housing spectrum

	Social housing		Affordable housing		Private market housing	Short-term/tourist accommodation
Housing Type:	Crisis & Transitional housing	Long Term Housing: Public & Community rental	Sub-market rental	Sub-market purchase	Private rental and ownership	Commercial
Target Group:	Homeless/Households in Crisis High social needs	Very low income/ATSI High social needs	Low–Moderate income High self sufficiency	Low–Moderate income High self sufficiency	Middle–high income workers High self sufficiency	Tourists/short-stay workers

Aquis has the potential to significantly impact local and regional housing markets, both prior to and during the peak construction and following commencement of operations. An influx of workers from beyond Cairns may require housing within a reasonable commuting distance of Aquis. Accommodating this additional demand for housing may impact on the available supply of tourist accommodation, or require consolidation and renewal in adjacent suburbs at the expense of older stock that may represent an important source of lower cost housing for members of the community. Speculation and redevelopment ahead of increased demand arising from the project could affect housing supply and affordability in other sub-markets throughout Cairns.

Both scenarios could lead to increased housing stress and the displacement of vulnerable households. Housing stress is a widely used term used to describe the circumstances where the lowest 40 per cent of households spend more than 30 per cent of their income to meet their housing costs. Exceeding this threshold, can reduce the availability of income for other essential household expenditure such as food, health care and education).

Benchmark rents

The Department of Housing and Public Works (DHPW) considers housing to be affordable when:

- the dwelling is appropriate to the needs of low-income households in terms of design, location and access to services and facilities; and

- as a guide, the out-of-pocket rent (i.e. total rent less any applicable Australian Government Rent Assistance) paid by households, in the lowest 40 per cent of the income distribution, does not exceed 30 per cent of gross household income.

Benchmark rents includes only the rental component of an 'affordable housing' outcome and provides indicative rents for different sized dwellings and possible tenant profiles, within income bands.

Very low-income benchmarks are derived from the income levels of persons or households receiving the basic income support payment (New Start plus Family Tax Benefit where applicable) without any additional income. The very low-income category provides a better understanding of the range of households likely to be facing affordability problems.

Low-income benchmarks are based on aged pension payments (plus Family Tax Benefit where applicable) plus the maximum amount of additional income that a person or household may earn without losing any entitlements.

The Benchmark Rent ranges are summarised in Table A2 with details in the attached schedules. While the very low-income and low-income categories and the associated Benchmark Rents are based on the entitlements of households receiving benefits, other households derive similar incomes from other sources including:

- full-time, part-time and casual employment
- other Centrelink benefits, or
- a combination of the above.

The benchmark rents are arranged by dwelling size and gross household income to provide indicative affordable rent ranges for households who rely on similar incomes to meet their housing needs. The rents are updated annually and published by DHPW.

The Benchmark Rents may be used as a performance indicator for establishing and monitoring the proportion of affordable rental housing in an area. This can be achieved by measuring the proportion of rental stock falling above and below the Benchmark Rents for each dwelling size category, using actual rent levels and stock numbers for an area.

Table A2. Benchmark rents

Dwelling size	Very low-income		Low-income	
	Gross household income range ($/week)	Benchmark affordable rent range ($/week)	Gross household income range ($/week)	Benchmark Affordable Rent Range ($/week)
1 bedroom	250.50 – 452.30	**137 – 194**	453.85 – 704.60	**198 – 270**
2 bedrooms	357.15 – 624.50	**180 – 260**	552.25 – 901.40	**238 – 343**
3 bedrooms	443.25 – 710.60	**206 – 295**	650.65 – 999.80	**268 – 382**
4 bedrooms	615.45 – 796.70	**267 – 321**	847.45 – 1,098.20	**336 – 412**

Purpose

Aquis acknowledges these and other potential impacts on local and regional housing markets, and commits to developing a Housing and Accommodation Plan prior to the commencement of construction of the project that addresses the project's planning and development, construction and operational phases. The Plan will be guided by the following principles:

- project impacts will be managed through strategies and actions designed to enable local and regional housing markets to operate effectively and efficiently in delivering timely supply across the housing spectrum (including meeting the needs of vulnerable people and households)
- implementation of the Plan will be a shared responsibility between the relevant private, community and public sector agencies in partnership with the project proponent
- the actions of the proponent and other stakeholders in responding to housing impacts will be timely, evidence-based and threshold driven (where practical)

- the effectiveness of the Plan in managing housing impacts will be regularly monitored and reviewed, and supported by adaptive management responses
- effective engagement will occur with a range of stakeholders to develop, implement, monitor and adapt the Plan as needed.

Housing markets may be influenced by a range of factors (such as fiscal and monetary policies of government, investor confidence, demographic trends) that are largely external to any one project or initiative. As such, the primary focus of the Housing and Accommodation Plan will be on responding to any impacts that are directly linked to the project. The involvement of a range of stakeholders with the monitoring and reporting mechanisms identified in the Plan will provide a basis for identifying broader market trends.

Objectives

The Housing and Accommodation Plan will provide a framework for managing the impacts of Aquis on local and regional housing markets so that they can operate effectively and efficiently in meeting resident, visitor and short-term worker populations housing and affordability needs.

The Plan will articulate the proponent's commitment to the following objectives:

- assess the likely impacts of Aquis on the Cairns and regional housing markets taking into account cumulative impacts associated with other major projects, impacts on potential supply constraints (including land capacity and construction workforce considerations) and housing affordability
- provide a collaborative planning and implementation framework for mitigating and / or managing the project's housing impacts through strategies for action by the relevant project partners (such as Council, State Government, private sector and community sector agencies, in partnership with the project proponent), including identifying roles, responsibilities and timing
- establish a robust baseline from which to predict and monitor project impacts on local and regional housing markets
- establish a regular monitoring and reporting framework to:
  - support implementation of the Plan in relation to any threshold actions;
  - review the Plan's effectiveness in addressing housing impacts (including the identification of associated remedial strategies).
- identify opportunities for collaboration and innovation in responding to identified housing impacts, including drawing on local and regional resources, capabilities and related planning and development processes
- establish an independent governance arrangement for the development, implementation, monitoring and reviewing of the Plan

Governance arrangements

The Housing and Accommodation Plan will be developed by Aquis under the guidance of a Housing Steering Group with membership from potential partner agencies and key stakeholders, including CRC and the Co-ordinator General.

The Plan will be developed in consultation with the key stakeholders), while general information about the process will be communicated to the wider community through the Aquis Community Engagement Plan. Engagement with the general public is not otherwise envisaged.

Findings of the Plan will inform and be informed by the development of the Workforce Development and Management Plan in investigating and responding to the potential impacts of Aquis on labour force availability. This will be achieved through internal project team mechanisms as well as by reporting to the Housing Steering Group and the relevant reference group(s) established through the Aquis Community Engagement Plan.

Baseline monitoring of existing local and regional housing market conditions would begin immediately following release of the Co-ordinator General's Evaluation Report, with an initial monitoring report provided to CRC and the DPWH within 8 weeks.

The Housing and Accommodation Plan will be finalised prior to issue of a development permit for MCU, Operational works or ERA (whichever comes first).

Key Stakeholders and Potential Partner Agencies

Partner agencies are those agencies that would take a lead role in helping to implement the Housing and Accommodation Plan and will be determined in consultation with CRC and the Office of the Co-ordinator General upon project commencement.

The Housing and Accommodation Plan will be developed in consultation with key stakeholder and partner agencies, including the following:

- Aquis
- Cairns Regional Council
- Department of Housing and Public Works
- Department of State Development, Infrastructure and Planning
- Department of Communities, Child Safety and Disability Services
- Department of Education, Training and Employment
- TAFE
- JCU
- Development and construction sector (including peak bodies: UDIA, HIA, MBA)
- Real estate sector (including peak body: REIQ)
- Tourism industry sector (including peak body: Queensland Tourism Industry Council)
- Community and Indigenous housing providers
- Human service providers (housing and homelessness support agencies).

Housing and Accommodation Plan Development

The proposed elements of the Housing and Accommodation Plan are outlined in Table A3.

Table A3. Plan development

Plan element	Timing/external inputs
Project description and content • Details about project staging, projected workforce size and composition at each stage, and other relevant information that could impact on housing (such as inward migration of workers, shift patterns and tenure of employment). • Identify other major projects that might generate cumulative impacts on local and regional housing markets • Investigate comparative projects to inform the understanding of likely housing market impacts • Confirmation of stakeholder engagement strategy and formation of Housing Steering Group • Initial engagement with key stakeholders to help ascertain up to date information, identify market opportunities and constraints and capture stakeholder buy-in to the process	**Timing:** Formation of Housing Steering Group: prior to lodgement of MCU Development Permit **Inputs:** CRC and CG confirmation of Housing Steering Group membership and Terms of Reference and Stakeholder Engagement Strategy Preliminary stakeholder engagement
Local and Regional Housing Market Baseline Reporting	
Define measures and document supply and demand baselines for key local and broader regional housing markets at project commencement, including: • Demographic profile (Census augmented by CRC community profiles and other relevant information) • Dwelling mix, building completions, development approval rates over the previous year and supply constraints • Government and NGO-funded affordable housing agency presence	**Timing:** Completion of first monitoring report within 6 weeks of OCG's Evaluation Report **Input:** CRC and DHPW

Plan element	Timing/external inputs
• Social and community housing supply, waitlist and trends • Tourist accommodation (short term accommodation) supply • Median weekly rent and household purchase prices • Private market rental vacancy and new bond lodgement rates • House sale volumes and clearance rates • Rental affordability, and the amount and proportion of affordable housing stock in an area (using the DHPW Benchmark Affordable Housing Rents) • Homelessness data (based on Counting the Homeless Census) • Construction labour force supply • Other relevant industry trends and drivers impacting on housing supply and demand (such as tourism industry movements)	endorsement of proposed baseline data for reporting DPWH assistance with baseline monitoring
Assess Housing Impacts • Develop population projection scenarios based on likely direct and indirect workforce projections for: 1) baseline trend growth; 2) trend plus Aquis (low and high growth scenarios); 3) Aquis and other major projects (if relevant). • Conduct land capability analysis and assess likely future housing supply across the housing spectrum (including affordable housing, social and community housing, private market housing and short term accommodation). • Generate housing projections for baseline trend and Aquis-related housing demand (and Aquis and other major projects if relevant), reporting housing demand across the housing spectrum. • Conduct demand and supply gap analysis and determine indicative housing impacts, opportunities and / or issues (including any relevant constraints on supply such as construction labour availability, Council development assessment capacity and other constraint). • Identify critical thresholds to trigger housing impact mitigation and/or management strategies (as point in time and/or trend-based thresholds).	**Input**: OESR population projections Stakeholder and Housing Steering Group validation of gap analysis findings and proposed critical thresholds
Strategies and Actions	**Input:**
• In consultation with key stakeholders and potential partner agencies, develop and evaluate preferred options, strategies and actions for responding to identified impacts (addressing impacts across the housing spectrum as well as industry impacts and/or Council capacity impacts as relevant). • Define and agree partner agency roles, responsibilities and indicative timing for actions, including actions by the proponent (which may involve monitoring actions as well as workforce accommodation or other mitigation actions as relevant).	Stakeholder and Housing Steering Group engagement in options, and development of strategies and actions development Housing Steering Group endorsement of roles, responsibilities and indicative timing

Plan element	Timing/external inputs
Monitoring and Reporting • Develop key performance indicators to monitor: – Plan implementation: monitoring to identify when threshold actions need to be triggered – Impact mitigation: the effectiveness of strategies outlined in the Plan (including defining corrective action to be taken if the strategies are found to not be effective) • Reporting frequency: – Impact mitigation monitoring during construction phase and first two years of operation phase (Stage 1 & Stage 2): Quarterly reporting – Implementation of housing strategies (Stages 1 & 2): half yearly reporting during construction phase; annual reporting in first 5 years of operation	**Input**: Housing Steering Group endorsement of roles, responsibilities and indicative timing DPWH assistance with monitoring
Plan Documentation and Adoption	
Document the outcomes from the process described above in a Housing and Accommodation Plan. Documentation, including: • Strategies and actions, responsibilities and indicative timing • The monitoring and reporting framework • An implementation strategy outlining commitments, roles and timeframes for implementation by the prospective partner agencies (including provision for annual review and adjustment of the Plan as required to respond to changed circumstances).	**Input:** Housing Steering Group review of Draft Plan **Timing:** Lodgement of Final Plan to issue of a development permit for MCU, Operational works or ERA.

Community Engagement Plan

Aquis notes that some community submissions raised issues about the representativeness, inclusiveness and transparency of the community engagement process employed during the preparation of the EIS. In response, Aquis commits to conduct community engagement during project implementation and operation consistent with best practice and in accordance with the IAP2's Code of Ethics. The IAP2 is the pre-eminent international organisation promoting best practice in community engagement.

The Aquis Resort is a significant and complex project to be developed over a period of up to 10 years. The Social Impact Assessment conducted as part of the EIS identified the need for the development of a series of mitigation and management plans to address potential social impacts. The EIS also identified the requirements for the preparation of additional management plans including a Cultural Heritage Management Plan and Environmental Management Plans for the planning, construction, operation and management of the resort project.

The development and implementation of all of these plans will involve engagement with a number of different communities of interest and other stakeholders across an extended time frame (commencing immediately at project approval and continuing into the operations of Stage 2 and beyond). Community Engagement for these plans will need to occur across the project's three key stages: project planning, project construction and project operations.

Stakeholder engagement

The Aquis Community Engagement Plan will provide the vehicle for engagement with the general community, which will complement the targeted stakeholder engagement involved in each of the mitigation and management plans. The Aquis Community Engagement Plan will provide information to the general public about each of these plans as they are developed, with appropriate engagement as relevant.

Purpose and objectives

The purpose of the Aquis Community Engagement Plan is to facilitate a process through which the interests and concerns of all affected stakeholders can be understood and taken into account, as part of decision making associated with project implementation. As the project's overarching engagement with the community, that the targeted engagement associated with the development of each of the mitigation and management plans will be integrated with and co-ordinated through the Aquis Community Engagement Plan. The Plan will articulate the proponent's commitment to:

- build confidence and trust with the community
- provide accurate information to the community about the project and its progress, including project impacts and how they are being responded to
- provide the opportunity for dialogue with the Cairns community about the Aquis project, enabling issues and impacts to be understood and responded to where appropriate
- be accountable by reporting outcomes from consultation processes to participants
- adopt inclusive consultation processes that recognise and involve the multiple publics and groups affected
- respect and maximise efficient use of participants' time by ensuring community engagement processes are integrated and co-ordinated.

The Plan will be guided by the following principles:

- the people, communities and other relevant stakeholders that are affected by Aquis have the right to be informed and to contribute to the decision making process
- community engagement will commence early in the planning and decision making processes and will be adequately resourced
- sufficient and accurate information will be provided to participants so that they can contribute in a meaningful way
- the purpose of community engagement and the extent of participants' influence in the decision making process will be clearly communicated to all parties participating
- engaging with the community represents a commitment to take action and to inform participants how their input has influenced the outcome
- community engagement will be inclusive, providing an opportunity for all relevant stakeholders to be involved
- the level of engagement will be commensurate to the level of anticipated impact or concern

Scope of Community Engagement

The Aquis Community Engagement Plan will be informed by the International Association for Public Participation AP2 Spectrum, as a basis for representing how the general public will be engaged in the project's implementation.

Engagement for the Aquis project will involve a broad community of interest. To help provide advisory input on decision making, Aquis proposes to establish a series of thematic (environment, social and economic) and locality based (Yorkeys Knob) reference groups. These groups will be determined in consultation with the community and would have an advisory role, providing input to the formulation of solutions and recommendations within the defined scope of interest for each group.

Because of the transformative nature of the impact of Aquis on the social, economic and built form of Cairns and its region, Aquis considers that it is important for the community to have an independent mechanism for project overview in the form of a regional community consultative committee or other appropriate body. The role of this body would be to advise on overall project performance and accountability, for community engagement. Such a body may be established and have the potential to play a role in the Strategic Change Management Strategy. It is highly desirable that representation on such a body include local, city-wide and regional groups, across a range of social, economic and environment stakeholder interests, including vulnerable groups. This should be a wholly independent body, neither established nor led by Aquis. Aquis would report regularly to the body on project progress and performance.

Table A4 provides an overview of how Aquis intends to engage with the community in the development of the project.

Table A4. Community engagement strategies

Project element/ **phase**	Inform **(one-way information flow)**	Consult **(two-way information flow)**	Involve **(active involvement)**	Collaborate **(partnership)**	Empower **(their decision)**
		PLANNING PHASE			
Construction works (external and site) - *Stage 1 & 2*	Provide information about the construction management planning process and how to get involved, likely construction impacts and how they will be responded to.	Identify community concerns about construction and seek feedback about proposed strategies to minimise disturbance.	Work closely with the affected local community to seek feedback and advisory input to inform decisions.	Nil	Nil
Resort - *Stage 1*	Provide regular information about the project, its progress, impact management, reporting and how to get involved.	Seek feedback from the community on proposed solutions for addressing issues of significance. Seek periodic feedback on the effectiveness of the community engagement process.	Work closely with the community through structured processes to understand issues, seek feedback and invite advisory input to inform decisions.	Nil	Nil
Resort - *Stage 2*	Provide regular information about the project, its progress, impact management, reporting and how to get involved.	Seek feedback on the effectiveness of the community engagement process for Stage 1 and review the process for Stage 2 accordingly. Seek feedback from the community on proposed solutions for addressing issues of significance, including periodic feedback on the community engagement process.	Work closely with the community through structured processes to understand issues, seek feedback and invite advisory input to inform decisions.	Nil	Nil

Project element/ **phase**	Inform **(one-way information flow)**	Consult **(two-way information flow)**	Involve **(active involvement)**	Collaborate **(partnership)**	Empower **(their decision)**
Yorkeys Knob Community Facility -	Provide regular information about the proposed community facility, the engagement process and how to get involved.		Identify community aspirations and preferences for the facility.	Work together to determine an appropriate purpose and design for the facility; manage any impacts associated with the facility's operation; and determine workable governance and asset management arrangements. (Note the CRC will be a key stakeholder in this process)	Nil
			CONSTRUCTION PHASE		
Construction works (external and site) – *Stage 1 & 2*	Inform affected communities of forthcoming disturbances (such as road closures, movement of large equipment, other); about complaints mechanisms; and how complaints have been responded to.	Seek feedback on community experience during construction and proposed solutions (if relevant).	Work closely with the local community to seek feedback and advisory input to inform decisions.	Nil	Nil
Resort - *Stage 1*	Provide regular information about the project, its progress, impact management, reporting and how to get involved.	Seek feedback from the community on proposed solutions for addressing issues of significance. Seek periodic feedback on the effectiveness of the community engagement process.	Work closely with the community through structured processes to understand issues, seek feedback and invite advisory input to inform decisions.	Nil	Nil
Resort - Stage 2	Provide regular information about the project, its progress, impact management, reporting and how to get involved.	Seek feedback on the effectiveness of the community engagement process for Stage 1 and review the process for Stage 2 accordingly. Seek feedback from the community on proposed solutions for addressing issues of significance, including periodic feedback on the community engagement process.	Work closely with the community through structured processes to understand issues, seek feedback and invite advisory input to inform decisions.	Nil	Nil

Project element/ **phase**	Inform **(one-way information flow)**	Consult **(two-way information flow)**	Involve **(active involvement)**	Collaborate **(partnership)**	Empower **(their decision)**
Yorkeys Knob Community Facility-	Provide regular information about the construction program for the facility and how to access further information or lodge any complaints.			Work together to oversee facility construction and related impact management.	Nil
OPERATION PHASE					
Resort - *Stage 1*	Provide regular project monitoring and performance reporting. Provide information on how to participate, make an enquiry or register a complaint.	Seek feedback from the community on proposed solutions for addressing issues of significance. Seek periodic feedback on the effectiveness of the community engagement process.	Work closely with the community through structured processes to understand issues, seek feedback and invite advisory input to inform decisions.	Nil	Nil
Resort - Stage 2	Provide regular project monitoring and performance reporting. Provide information on how to participate, make an enquiry or register a complaint.	Seek feedback on the effectiveness of the community engagement process for Stage 1 and review the process for Stage 2 accordingly. Seek feedback from the community on proposed solutions for addressing issues of significance, including periodic feedback on the community engagement process.	Work closely with the community through structured processes to understand issues, seek feedback and invite advisory input to inform decisions.	Nil	Nil
Yorkeys Knob Community Facility					Establishment, in conjunction with CRC a Yorkeys Knob Community Sorts and Recreation Association

Project element/ **phase**	Inform **(one-way information flow)**	Consult **(two-way information flow)**	Involve **(active involvement)**	Collaborate **(partnership)**	Empower **(their decision)**
WHO:	<u>All project elements:</u> Yorkeys Knob and Holloway Beach communities, Cairns urban area and regional communities.	<u>Resort:</u> Communities of interest impacted by the issues being addressed. <u>Construction Works:</u> Yorkeys Knob and Holloways Beach communities.	<u>Construction Works & Community Facility:</u> Yorkeys Knob and Holloway Beach communities	<u>Community Facility:</u> Yorkeys Knob community	<u>Community Facility Operations</u> Management Committee
HOW:	<u>All project elements:</u> Newsletters, information displays, website, telephone hotline, local media, advertisements, social media	<u>Resort:</u> Public comment, public displays, focus groups, surveys <u>Construction works:</u> Community meetings, public displays and public comment with Yorkeys Knob and Holloways Beach communities.	Issues and locality based community reference groups, workshops, search conference, local community polling.	<u>Community Facility:</u> Locality based community reference group	

Community Engagement Performance Management

Table A5 provides details on performance management for community engagement in the project.

Table A5. Project engagement

Objective	To ensure the Cairns local and regional communities are well informed about and have the opportunity to be engaged in the implementation of the Aquis project. To ensure the interests and concerns of affected stakeholders are understood and taken into account as part of decision making associated with project implementation. To adopt engagement processes which are inclusive, accountable and transparent.
Performance Criteria	Submission of half yearly community engagement performance reports to CRC. Establishment of community reference including defining clear and agreed terms of reference and balanced and representative membership. Development of a Grievance and Dispute Resolution Policy setting out the process for resolving a dispute, grievance or complaint directly associated with the project's implementation. Establishment of a Complaints Register. Employment of a range of engagement methods targeting a diversity of stakeholders, supported by responses that are appropriate and clearly communicated to participants. Responsiveness to changing project and community needs in line with performance review findings.
Scope of Issues	Overall project development and impact management Natural environment impact management Social, economic and cultural impact management Regional impact management Effectiveness of community engagement processes
Monitoring and Auditing	Half yearly performance review of the Aquis Community Engagement y based on feedback from the general community, stakeholder groups and agencies and CRC.
Reporting and Corrective Action	Implement the mechanism for grievance and dispute resolution (the Grievance and Dispute Resolution Policy referenced above), including the recording grievances and related corrective responses in a Complaints Register. Submit half yearly performance monitoring reporting on community engagement. Following half yearly performance monitoring, renegotiate the community engagement strategy as required.
Timing	Approval of the Aquis Community Engagement Strategy within 3 months of receipt of the S242 Preliminary Approval and prior to the commencement of construction.

Table A6 provides details on performance management for community engagement in relation to construction works.

Table A6. Engagement during construction

Objective	To minimise disturbance during project construction to and promote positive relationships with surrounding communities (including communities on haulage routes) and users of impacted road networks.	
Performance Criteria	Consultation with Yorkeys Knob and Holloways Beach communities, Cairns Regional Council (CRC) and Dept. of Transport and Main Roads in developing the Construction Management Plan (including complaints management plan). Approval of detailed community engagement strategy as part of the draft Construction Management Plan by CRC prior to each Operational Works Permit approval.	
Scope of Issues	Noise and dust Light spill Traffic and transport disruption Visual impacts	Flood Mitigation Ground Water Quality Environmental concerns
Monitoring and Auditing	Complaints, non-compliance and reported incidents and related corrective actions and timing will be recorded in the Complaints Register.	
Reporting and Corrective Action	The Complaints Register will be monitored and reported to CRC on a monthly basis.	
Timing	Approval of the Aquis Community Engagement Strategy within 3 months of receipt of the S242 Preliminary Approval and prior to the commencement of construction.	
Approving Authority	CRC and OCG to approve the Aquis Community Engagement Strategy (including the Grievance and Dispute Resolution Policy).	

Table A7 provides details on performance management for community engagement in relation to the Yorkeys Knob Community Facility.

Table A7. Yorkeys Knob Community Facility

Objective	To work with the community to determine the type of facility most appropriate to meet the community's needs; its design; and its governance and use arrangements. (Note: if CRC is determined to be the owner of the facility, the ultimate decision about the type of facility and its governance and use arrangements will rest with CRC).
Performance Criteria	Community support for the facility determined to be needed.
Scope of Issues	Ensuring the facility is relevant to the social, cultural and / or recreational needs of the Yorkeys Knob community Resolution of facility ownership and asset maintenance Resolution of governance arrangements for the management and operation of the facility Potential impacts of the facility on the local community (including near neighbours)
Monitoring and Auditing	Public display of the options proposed (including nomination of the preferred option) for feedback from the local community, followed by a community polling process. Overview of the community engagement process by the Yorkeys Knob Community Reference Group.
Reporting and Corrective Action	Reporting grievances received (through the Aquis Community Engagement grievance procedures) and responses taken to the Yorkeys Knob Community Reference Group

Timing	Approval of the Aquis Community Engagement Strategy within 3 months of receipt of the S242 Preliminary Approval and prior to the commencement of construction.

Workforce Development and Management Plan

Aquis is expected to generate substantial employment opportunities during project construction and operation phases, through direct jobs as well as in jobs generated indirectly through supply chain and other business development opportunities. There will be a need to ensure that the local labour force is sufficiently 'skill ready', equipped with the required technical and other skills (including Mandarin and other language skills) to access the new jobs generated.

There will be a need to ensure that the project 'draw' from the local labour force does not disadvantage labour supply to existing business including hospitality, tourism, retail and construction. The proponent will prepare a Workforce Development and Management Plan with a focus on ensuring the local workforce is skill ready, that recruitment practices prioritise local employment whilst ensuring the sustainability of the local labour supply for other businesses (such as hospitality, retain and construction). The plan will:

- assess the capacity of the regional labour market to supply the workforce needs of the project, including the assessment of any risks to the sustainability of labour supply for other local businesses and industries
- develop labour force strategies as appropriate, to ensure maintenance of expected levels of service in the Cairns region taking into account any risks identified in the preceding assessment
- maximise access for employment opportunities by the local and regional community (including for unemployed people, young people, Indigenous people and women), including: identifying skills development and other training needs and opportunities, and school based and further education needs (including education in the Mandarin language)
- develop recruitment policies that support the employment of local and regional people, including through awarding apprenticeships, traineeships and scholarships
- establish a code of conduct for the Aquis labour force, including cultural awareness, equal opportunity, change of shift practices and behaviour in the community
- develop strategies to support workers and their families who relocate to Cairns to integrate and settle in the local community.

The proposed elements of the Workforce Development and Management Plan are outlined in Table A8.

Table A8. Workforce Development and Management Plan

Outcomes sought	Work opportunities for people living in the Cairns region are maximised

	through effective training and skill development and recruitment practices. The ability of the local labour supply to sustain the labour needs of established businesses (such as hospitality, retail and construction) is maintained. Newcomers moving to Cairns to work integrate successfully and behave in culturally appropriate ways.
Performance measures	Completion and implementation of a Workforce Development and Management Plan developed in consultation with key stakeholders.
Responsibility	The proponent is responsible for completion of the Workforce Development and Management Plan. The proponent, in partnership with other relevant stakeholder agencies, is responsible for implementation.
Timing	Plan to be finalised prior to the commencement of construction.
Monitoring	A monitoring program for this response will be included in the Workforce Development and Management Plan.
Key Stakeholders	Department of Education, Training and Employment, TAFE, construction contractors

Local Content Plan

Aquis presents a significant opportunity for local and regional business growth and development through the direct supply of goods and services to Aquis, as well as through indirect business development of opportunities.

To help facilitate opportunities for local and regional businesses to benefit from Aquis, the proponent will develop a Local Content Plan to optimise opportunities at both construction and operational stages for local businesses to supply goods and services to the project, while maintaining expected levels of service to the Cairns community. The Plan will:

- develop a local procurement policy and target for Aquis Resort
- anticipate and manage the impact of supply on maintaining levels of services and supply in Cairns
- identify and mitigate potential barriers to supply for local and regional businesses
- develop the capacity of local and regional businesses to participate in Aquis' procurement processes.

The proposed elements of the Local Content Plan are outlined in Table A9.

Table A9. Local Content Plan

Outcomes sought	Opportunities for local and regional business development are maximised through local supply practices, whilst maintaining expected levels of service to the Cairns community.
Performance measures	Development and implementation of a Local Content Plan
Responsibility	The proponent is responsible for the development and implementation of the Local Content Plan.
Timing	Plan to be finalised prior to the commencement of construction.
Monitoring	A monitoring program will be included in the Local Content Plan.

Construction Management Plan

The project is expected to cause disruptions to resident mobility and amenity at periods during each stage of construction associated with earth works, haulage, vehicle movements and other construction related disturbances. The proponent will develop a Construction Management Plan to minimise disruptions to the affected community, taking into account the effects of traffic, noise, air quality and light pollution.

This Plan will outline the requirements for construction contractors to manage these impacts so that they cause minimal disturbance to the residents of Yorkeys Knob and other affected communities. The Construction Management Plan will align with the Community Engagement Plan in relation to communicating forthcoming disturbances and traffic management arrangements as well as the management of complaints.

The proposed elements of the Construction Management Plan are outlined in Table A10.

Table A10. Construction Management Plan

Outcomes sought	Minimal disturbance to resident mobility and amenity during each stage of construction. Effective communication to the community about construction works. Responsive and effective management of community complaints during construction.
Performance measures	Completion and implementation of a Construction Management Plan.
Responsibility	The proponent is responsible for the preparation and implementation of the Construction Management Plan.
Timing	Plan to be finalised prior to the commencement of construction.
Monitoring	A monitoring program will be included in the Construction Management Plan.
Key Stakeholders	CRC, Department of Main Roads, construction contract companies

Community Services and Facilities Plan

Community infrastructure is provided by a range of government and not-for-profit agencies and requires integrated planning and co-ordination. The development of physical facilities (such as hospitals, schools, child care centres) requires significant lead time to put into effect.

The proponent will develop a Community Services and Facilities Plan to support the provision of quality and timely community services and facilities commensurate with any demand from the project. The plan will take into account demands on medical, emergency and policing services and tourist infrastructure directly associated with the construction and operation of the project.

The plan will assess the capacity of existing community infrastructure to meet expected growth in demand and develop a framework for use by provider agencies for addressing identified gaps to facilitate the timely and co-ordinated provision of infrastructure commensurate with expected growth. The plan will be developed in consultation with the relevant provider agencies and local communities where appropriate.

The proposed elements of the Community Services and Facilities Plan are outlined in Table A11.

Table A11. Community Services and Facilities Plan

Outcomes sought	Plan for and respond to increased demand for community services and facilities associated with Aquis, including project construction, operation and population growth.
Performance measures	Completion and implementation of a Community Services and Facilities Plan outlining a framework for the provision of relevant infrastructure to meet expected growth in demand associated with Aquis, developed in consultation with relevant provider agencies.
Responsibility	The proponent is responsible for developing the Community Services and Facilities Plan. Implementation of the Community Services and Facilities Plan will be the responsibility of individual provider agencies.
Timing	Plan to be finalised prior to the commencement of construction.
Monitoring	A program for monitoring the effectiveness of this response will be included in the Community Services and Facilities Plan.
Key Stakeholders	CRC, Department of Communities, Child Safety and Disability Services, Department of Education, Training and Employment, Department of Health, Department of Aboriginal and Torres Strait Islander and Multicultural Affairs, Department of Local Government, Community Recovery and Resilience, relevant NGOs

Community Health and Wellbeing Plan

The project could generate additional demand on health and emergency services during the construction and operational stages.

The proponent will develop a Community Health and Wellbeing Plan to reduce and offset demands on health and emergency services from workers and guests. It will also seek to promote community safety in relation to the operation of the resort and ensure that worker and guest behaviour does not impact on community safety and perceptions of community safety.

The Plan will reduce and offset demands on health and emergency services through a combination of on-site management practices and the provision of facilities and services, and will seek to

- adopt compliant workplace health and safety policy and practices and safe driver practices
- provide appropriate first point of medical care on-site
- develop an emergency response plan with local health, emergency response and other relevant agencies
- promote healthy lifestyle to workers (including shift work fatigue management)
- promote appropriate behaviour and safe conduct by contractors in the Cairns community
- provide free counselling for workers and immediate family members as needed to help them manage stress-related issues (associated with workplace, relocation or other personal matter).
- extend access to the Aquis Refuge (storm surge shelter) to residents of Yorkeys Knob
- provide a medical facility at the Resort, supported by 24/7 on-site general practice and other relevant health practitioners for use by guests and staff
- extend policing services to the resort, including the provision of a police station facility
- provide child care facilities at the resort to support the childcare needs of staff (aligned to support staff rosters and shift workers)
- establish local access arrangements for residents to all public use areas and recreation facilities at the resort (including the golf course and other outdoor sports facilities, theatres, restaurants and casinos)
- develop emergency response plans with local health, emergency response and other relevant agencies to address illness breakout or other emergency

- provide free counselling for workers and immediate family members as needed to help them manage stress-related issues (associated with workplace, relocation or other personal matter).
- promote appropriate and safe conduct in the Cairns community for staff and guests
- provide interpretation support to assist guests to access required external health, personal and support services.
- integrate the principles of Crime Prevention through Environmental Design (CPTED) in all aspects of site design to promote community safety throughout the site.

The proposed elements of the Community Services and Facilities Plan are outlined in Table A12.

Table A12. Community Health and Wellbeing Plan

Outcomes sought	To minimise demands on health and emergency services through a combination of on-site provision of facilities and services and management practices. To promote community safety across the Aquis development for guests, staff and the general public through applying the principles of Crime Prevention through Environmental Design (CPTED) to the development.
Performance measures	Completion and implementation of a Community Health and Wellbeing Plan outlining initiatives on-site to reduce demand on the community's health and emergency services. Application of CPTED principles through the proposed Aquis Precinct Plan and Aquis Concept Master Plan and related development codes.
Responsibility	The proponent is responsible for the development of the Community Health and Wellbeing Plan and the integration of CPTED principles into the developed site.
Timing	Plan to be finalised prior to the commencement of construction.
Monitoring	A monitoring program for this response will be included in the Community Health and Wellbeing Plan.
Key Stakeholders	Queensland Health, Workplace Health and Safety Queensland, Cairns Base Hospital, Construction contract companies, CRC, State Emergency Service, Dept. of Emergency Services (Ambulance Service, Fire and Rescue Service, Emergency Management Queensland), Queensland Police Service

Cultural Development Plan

The project represents an opportunity for significant cultural exchange between Chinese, Australian, Indigenous and other cultures present in the Cairns region. There will also be a need to promote cross-cultural awareness and understanding of customs and behaviours. Cultural awareness and access to language skills will be important for prospective employees of Aquis and businesses catering to its guests.

The proponent will prepare a Cultural Development Plan to support the mutual appreciation for and exchange of Asian, European, Indigenous and other cultures with a significant presence in Cairns, including the development of Mandarin language skills in the community. The Plan will be developed in consultation with key stakeholders including Indigenous and multi-cultural agencies and networks.

The Plan will investigate the cultural resources and opportunities within the Cairns region associated with the development of Aquis and develop strategies to foster cultural exchange through information, education, cultural activities and cultural tourism development.

The proposed elements of the Cultural Development Plan are outlined in Table A13.

Table A13. Cultural Development Plan

Outcomes sought	Mutual appreciation for the different cultures with a significant presence in Cairns and capture of cultural development opportunities. Access to education in Mandarin language.
Performance measures	Completion and implementation of a Cultural Development Plan.
Responsibility	The proponent is responsible for the development of the Cultural Development Plan, in consultation with key stakeholders. Key stakeholder agencies will be responsible for implementation of the Plan in partnership with the proponent.
Timing	Plan to be finalised prior to the commencement of construction.
Monitoring	A monitoring program will be included in the Cultural Development Plan.
Key Stakeholders	Local Indigenous groups, local cultural and tourism groups, Department of Education, Training and Employment, Department of Health, Department of Aboriginal and Torres Strait Islander and Multicultural Affairs

Responsible Gaming Plan

The development of the casinos at the resort will increase the availability of jobs and inject significant revenue into the regional and Queensland economies. Negative impacts associated with the casinos may include an increased risk of problem gambling (particularly for 'at risk' groups), increased consumption of alcohol, financial problems and indebtedness and increased crime, depending on the volume of local patronage.

The proponent will develop a Responsible Gaming Plan to mitigate the potential negative impacts associated with the casinos. The Plan will adopt an evidence-based approach to developing strategies to minimise the potential for problem gambling in the local and regional population. The Plan will be developed in consultation with the relevant stakeholder agencies.

The Plan will assess the risks associated with the operation of the proposed casinos to the Cairns regional community, including 'at risk' groups and develop appropriate responses to mitigate the likely impacts. Mitigations will focus on the prevention of problem gambling and associated problem behaviours through a range of strategies, including the development of responsible gambling policies, public health approaches such as public awareness raising and treatment services, support for community adaptation to the presence of gambling and other strategies as appropriate. Subject to the advice of the Office of Liquor and Gaming, the Responsible Gaming Plan will also address the requirements normally associated with liquor and gaming licensing applications.

The proposed elements of the Cultural Development Plan are outlined in Table A14.

Table A14. Responsible Gaming Plan

Outcomes sought	Minimise the development of problem gaming within the region's community associated with the operation of the resort's two casinos.
Performance measures	Completion and implementation of the Responsible Gaming Plan in consultation with key stakeholder agencies (incorporating Community Impact Statements as required under Queensland's liquor licencing laws).
Responsibility	The proponent is responsible for the preparation of the Responsible Gaming Plan. Key stakeholder agencies will be responsible for implementation of the Plan in partnership with the proponent.
Timing	Subject to the requirements of the Office of Liquor and Gaming.
Monitoring	A monitoring program will be included in the Responsible Gaming Plan.
Key Stakeholders	Office of Liquor and Gaming Regulation, Queensland Health, CRC, Dept. of Emergency Services (Ambulance Service, Fire and Rescue Service, Emergency Management Queensland), Queensland Police Service, relevant NGOs.

Appendix 6. Statement of Outstanding Universal Value

Brief synthesis

As the world's most extensive coral reef ecosystem, the Great Barrier Reef is a globally outstanding and significant entity. Practically the entire ecosystem was inscribed as World Heritage in 1981, covering an area of 348,000 square kilometres and extending across a contiguous latitudinal range of 14^{o} (10^{o}S to 24^{o}S). The Great Barrier Reef (hereafter referred to as GBR) includes extensive cross-shelf diversity, stretching from the low water mark along the mainland coast up to 250 kilometres offshore. This wide depth range includes vast shallow inshore areas, mid-shelf and outer reefs, and beyond the continental shelf to oceanic waters over 2,000 metres deep.

Within the GBR there are some 2,500 individual reefs of varying sizes and shapes, and over 900 islands, ranging from small sandy cays and larger vegetated cays, to large rugged continental islands rising, in one instance, over 1,100 metres above sea level. Collectively these landscapes and seascapes provide some of the most spectacular maritime scenery in the world.

The latitudinal and cross-shelf diversity, combined with diversity through the depths of the water column, encompasses a globally unique array of ecological communities, habitats and species. This diversity of species and habitats, and their interconnectivity, make the GBR one of the richest and most complex natural ecosystems on earth. There are over 1,500 species of fish, about 400 species of coral, 4,000 species of mollusk, and some 240 species of birds, plus a great diversity of sponges, anemones, marine worms, crustaceans, and other species. No other World Heritage property contains such biodiversity. This diversity, especially the endemic species, means the GBR is of enormous scientific and intrinsic importance, and it also contains a significant number of threatened species. Attime of inscription, the IUCN evaluation stated "… if only one coral reef site in the world were to be chosen for the World Heritage List, the Great Barrier Reef is the site to be chosen".

Criterion (vii): The GBR is of superlative natural beauty above and below the water, and provides some of the most spectacular scenery on earth. It is one of a few living structures visible from space, appearing as a complex string of reefal structures along Australia's northeast coast.

From the air, the vast mosaic patterns of reefs, islands and coral cays produce an unparalleled aerial panorama of seascapes comprising diverse shapes and sizes. The Whitsunday Islands provide a magnificent vista of green vegetated islands and spectacular sandy beaches spread over azure waters. This contrasts with the vast mangrove forests in Hinchinbrook Channel, and the rugged vegetated mountains and lush rainforest gullies that are periodically cloud-covered on Hinchinbrook Island.

On many of the cays there are spectacular and globally important breeding colonies of seabirds and marine turtles, and Raine Island is the world's largest green turtle breeding area. On some continental islands, large aggregations of over-wintering butterflies periodically occur.

Beneath the ocean surface, there is an abundance and diversity of shapes, sizes and colours; for example, spectacular coral assemblages of hard and soft corals, and thousands of species of reef fish provide a myriad of brilliant colours, shapes and sizes. The internationally renowned Cod Hole near Lizard Island is one of many significant tourist attractions. Other superlative natural phenomena include the annual coral spawning, migrating whales, nesting turtles, and significant spawning aggregations of many fish species.

Criterion (viii): The GBR, extending 2,000 kilometres along Queensland's coast, is a globally outstanding example of an ecosystem that has evolved over millennia. The area has been exposed and flooded by at least four glacial and interglacial cycles, and over the past 15,000 years reefs have grown on the continental shelf.

During glacial periods, sea levels dropped, exposing the reefs as flat-topped hills of eroded limestone. Large rivers meandered between these hills and the coastline extended further east. During interglacial periods, rising sea levels caused the formation of continental islands, coral cays and new phases of coral growth. This environmental history can be seen in cores of old massive corals.

Today the GBR forms the world's largest coral reef ecosystem, ranging from inshore fringing reefs to mid-shelf reefs, and exposed outer reefs, including examples of all stages of reef development. The processes of geological and geomorphological evolution are well represented, linking continental islands, coral cays and reefs. The varied seascapes and landscapes that occur today have been moulded by changing climates and sea levels, and the erosive power of wind and water, over long time periods.

One-third of the GBR lies beyond the seaward edge of the shallower reefs; this area comprises continental slope and deep oceanic waters and abyssal plains.

Criterion (ix): The globally significant diversity of reef and island morphologies reflects ongoing geomorphic, oceanographic and environmental processes. The complex cross-shelf, longshore and vertical connectivity is influenced by dynamic oceanic currents and ongoing ecological processes such as upwellings, larval dispersal and migration.

Ongoing erosion and accretion of coral reefs, sand banks and coral cays combine with similar processes along the coast and around continental islands. Extensive beds of Halimeda algae represent active calcification and accretion over thousands of years.

Biologically the unique diversity of the GBR reflects the maturity of an ecosystem that has evolved over millennia; evidence exists for the evolution of hard corals and other fauna. Globally significant marine faunal groups include over 4,000 species of molluscs, over 1,500 species of fish, plus a great diversity of sponges, anemones, marine worms, crustaceans, and many others. The establishment of vegetation on the cays and continental islands exemplifies the important role of birds, such as the Pied Imperial Pigeon, in processes such as seed dispersal and plant colonisation.

Human interaction with the natural environment is illustrated by strong ongoing links between Aboriginal and Torres Strait Islanders and their sea-country, and includes numerous shell deposits (middens) and fish traps, plus the application of story places and marine totems.

Criterion (x): The enormous size and diversity of the GBR means it is one of the richest and most complex natural ecosystems on earth, and one of the most significant for biodiversity conservation. The amazing diversity supports tens of thousands of marine and terrestrial species, many of which are of global conservation significance.

As the world's most complex expanse of coral reefs, the reefs contain some 400 species of corals in 60 genera. There are also large ecologically important inter-reefal areas. The shallower marine areas support half the world's diversity of mangroves and many seagrass species. The waters also provide major feeding grounds for one of the world's largest populations of the threatened dugong. At least 30 species of whales and dolphins occur here, and it is a significant area for humpback whale calving.

Six of the world's seven species of marine turtle occur in the GBR. As well as the world's largest green turtle breeding site at Raine Island, the GBR also includes many regionally important marine turtle rookeries.

Some 242 species of birds have been recorded in the GBR. Twenty-two seabird species breed on cays and some continental islands, and some of these breeding sites are globally significant; other seabird species also utilize the area. The continental islands support thousands of plant species, while the coral cays also have their own distinct flora and fauna.

Integrity

The ecological integrity of the GBR is enhanced by the unparalleled size and current good state of conservation across the property. At the time of inscription it was felt that to include virtually the entire Great Barrier Reef within the property was the only way to ensure the integrity of the coral reef ecosystems in all their diversity.

A number of natural pressures occur, including cyclones, crown-of-thorns starfish outbreaks, and sudden large influxes of freshwater from extreme weather events. As well there is a range of human uses such as tourism, shipping and coastal developments including ports. There are also some disturbances facing the GBR that are legacies of past actions prior to the inscription of the property on the World Heritage list.

At the scale of the GBR ecosystem, most habitats or species groups have the capacity to recover from disturbance or withstand ongoing pressures. The property is largely intact and includes the fullest possible representation of marine ecological, physical and chemical processes from the coast to the deep abyssal waters enabling the key interdependent elements to exist in their natural relationships.

Some of the key ecological, physical and chemical processes that are essential for the long-term conservation of the marine and island ecosystems and their associated biodiversity occur outside the boundaries of the property and thus effective conservation programs are essential across the adjoining catchments, marine and coastal zones.

Protection and management requirements

The GBR covers approximately 348,000 square kilometres. Most of the property lies within the GBR Marine Park: at 344,400 square kilometres, this Federal Marine Park comprises approximately 99 per cent of the property. The GBR Marine Park's legal jurisdiction ends at low water mark along the mainland (with the exception of port areas) and around islands (with the exception of 70 Commonwealth managed islands which are part of the Marine Park). In addition the GBR also includes over 900 islands within the jurisdiction of Queensland, about half of which are declared as 'national parks', and the internal waters of Queensland that occur within the World Heritage boundary (including a number of long-established port areas).

The World Heritage property is and has always been managed as a multiple-use area. Uses include a range of commercial and recreational activities. The management of such a large and iconic world heritage property is made more complex due to the overlapping State and Federal jurisdictions. The Great Barrier Reef Marine Park Authority, an independent Australian Government agency, is responsible for protection and management of the GBR Marine Park. The Great Barrier Reef Marine Park Act 1975 was amended in 2007 and 2008, and now provides for “the long term protection and conservation ... of the Great Barrier Reef Region” with specific mention of meeting "... Australia's responsibilities under the World Heritage Convention".

Queensland is responsible for management of the Great Barrier Reef Coast Marine Park, established under the Marine Parks Act 2004 (Qld). This is contiguous with the GBR Marine Park and covers the area between low and high water marks and many of the waters within the jurisdictional limits of Queensland. Queensland is also responsible for management of most of the islands.

The overlapping jurisdictional arrangements mean that the importance of complementary legislation and complementary management of islands and the surrounding waters is well recognised by both governments. Strong cooperative partnerships and formal agreements exist between the Australian Government and the Queensland Government. In addition, strong relationships have been built between governments and commercial and recreational industries, research institutions and universities. Collectively this provides a comprehensive management influence over a much wider context than just the marine areas and islands.

Development and land use activities in coastal and water catchments adjacent to the property also have a fundamental and critical influence on the values within the property. The Queensland Government is responsible for natural resource management and land use planning for the islands, coast and hinterland adjacent to the GBR. Other Queensland and Federal legislation also protects the property’s Outstanding Universal Value addressing such matters as water quality, shipping management, sea dumping, fisheries management and environmental protection.

The Federal Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) provides an overarching mechanism for protecting the World Heritage values from inappropriate

development, including actions taken inside or outside which could impact on its heritage values. This requires any development proposals to undergo rigorous environmental impact assessment processes, often including public consultation, after which the Federal Minister may decide, to approve, reject or approve under conditions designed to mitigate any significant impacts. A recent amendment to the EPBC Act makes the GBR Marine Park an additional 'trigger' for a matter of National Environmental Significance which provides additional protection for the values within the GBR.

The GBR Marine Park and the adjoining GBR Coast Marine Park are zoned to allow for a wide range of reasonable uses while ensuring overall protection, with conservation being the primary aim. The zoning spectrum provides for increasing levels of protection for the 'core conservation areas' which comprise the 115,000 square kilometres of ‘no-take’ and ‘no-entry’ zones within the GBR.

While the Zoning Plan is the 'cornerstone' of management and provides a spatial basis for determining where many activities can occur, zoning is only one of many spatial management tools and policies applied to collectively protect the GBR. Some activities are better managed using other spatial and temporal management tools like Plans of Management, Special Management Areas, Agreements with Traditional Owners and permits (often tied to specific zones or smaller areas within zones, but providing a detailed level of management not possible by zoning alone). These statutory instruments also protect the Outstanding Universal Value of the property.

Many Aboriginal and Torres Strait Island peoples undertake traditional use of marine resource activities to provide traditional food, practice their living maritime culture, and to educate younger generations about traditional and cultural rules and protocols. In the GBR these activities are managed under both Federal and Queensland legislation and policies including Traditional Use of Marine Resource Agreements (TUMRAs) and Indigenous Land Use Agreements (ILUAs). These currently cover some 30 per cent of the GBR inshore area, and support Traditional Owners to maintain cultural connections with their sea country.

Similarly non-statutory tools like site management and Industry Codes of Practice contribute to the protection of World Heritage values. Some spatial management tools are not permanently in place nor appear as part of the zoning, yet achieve effective protection for elements of biodiversity (e.g. the temporal closures that are legislated across the GBR prohibit all reef fishing during specific moon phases when reef fish are spawning).

Other key initiatives providing increased protection for the GBR include the comprehensive Great Barrier Reef Outlook Report (and its resulting 5-yearly reporting process); the Reef Water Quality Protection Plan; the GBR Climate Change Action Plan; and the Reef Guardians Stewardship Programs which involve building relationships and working closely with those who use and rely on the GBR or its catchment for their recreation or their business.

The 2009 Outlook Report identified the long-term challenges facing the GBR; these are dominated by climate change over the next few decades. The extent and persistence of damage to the GBR ecosystem will depend to a large degree on the amount of change in the world’s climate and on the resilience of the GBR ecosystem to such change. This report also identified continued declining water quality from land-based sources, loss of coastal habitats from coastal development, and some impacts from fishing, illegal fishing and poaching as the other priority issues requiring management attention for the long-term protection of the GBR.

Emerging issues since the 2009 Outlook Report include proposed port expansions, increases in shipping activity, coastal development and intensification and changes in land use within the GBR catchment; population growth; the impacts from marine debris; illegal activities; and extreme weather events including floods and cyclones.

Further building the resilience of the GBR by improving water quality, reducing the loss of coastal habitats and increasing knowledge about fishing and its effects and encouraging modified practices, will give the GBR its best chance of adapting to and recovering from the threats ahead, including the impacts of a changing climate.

Appendix 7. Threat abatement plans, species recovery plans and conservation advices

The following threat abatement plans and recovery plans relate to MNES as discussed in section 8 of my report.

Species Recovery Plans

Part A. National recovery plan for the spectacled flying fox *Pteropus conspicillatus*

The overall objectives of recovery are to secure the long term protection of the spectacled flying fox through a reduction in the impact of threats to species' survival and to improve the standard of information available to guide recovery by:

(1) Researching practicable and cost effective flying fox deterrent systems for commercial fruit growers by:

- (a) Investigating the effectiveness and economic viability of non-lethal flying fox deterrent systems, including new applications for technology such as long wavelength lasers and intelligent systems for crop protection, and other innovative systems. Testing to be conducted at a range of sites within the species' range, and under varying conditions. The impact of such technology on impacts on flying fox behaviour in the vicinity of the deterrent systems should also be documented.
- (b) Investigating the feasibility of planting native food species (e.g. eucalyptus) for the spectacled flying-fox adjacent or near to orchards as an alternative food supply, and determine whether this is a viable means of mitigating the damage to orchard fruit crops.
- (c) In partnership with all stakeholders, design and implement practicable methods to obtain robust quantitative data on:
  - (i) The nature and locality of commercial fruit industries impacted by the spectacled flying fox
  - (ii) Frequency, seasonality, degree of crop damage and other trends regarding impacts of flying foxes on fruit crops on an orchard by orchard basis
  - (iii) Aggregated industry-wide levels and trends of flying fox damage to commercial fruit crops
- (a) Investigating the effectiveness of netting systems in terms of cyclone damage, deterioration by UV radiation, tear/chew resistance, materials used, type of netting system, and extent of crop coverage, period of installation of nets (e.g. permanent or seasonal), and level of bat deterrence provided.

(2) Identifying and protecting native foraging habitat critical to the survival of the spectacled flying fox by:

- (a) Continuing telemetry studies of individuals from different camps, including Cape York Peninsula, to accurately identify and map key foraging areas and vegetation communities used by the spectacled flying fox through an annual cycle. Outcomes of these studies to be compared with data obtained from Action 1b regarding alternative food supplies adjacent to or near commercial fruit crops
- (b) Building on the outcome of Action 2a, identifying opportunities to protect important foraging resources in native vegetation communities that are poorly represented within current reserves
- (c) Building on the outcome of Action 2a, identifying opportunities to protect priority foraging habitats on private land using for example, voluntary conservation

agreements such as the Queensland Department of Environment and Resource Management Nature Refuges Program.

(3) Accurately assess the short and long term population size and population trends of the spectacled flying fox by:

(a) Conducting monthly daytime counts of camps by experienced observers using standardised, readily repeatable methods, to derive an understanding of the variability of camp occupancy over time, including gender ratio, and the proportion of other flying fox species utilising these camps. Comparing these results with the data collection from daytime remote sensing activities (Action 2a)

(b) Conducting systematic surveys in known and potential *P. conspicillatus* habitat on Cape York Peninsula between October and December to locate and document maternity camps

(c) Promoting participation in locating previously unrecorded spectacled flying fox camps, including on Cape York Peninsula

(d) Identifying the frequency of occupancy of satellite camps to provide the basis of forming a correction factor when making overall population estimates and investigating population trends

(e) Using outcomes of Actions 3a to 3d, determining whether changes in the southern extent of this species' range are occurring.

(4) Improving the public perception of the spectacled flying fox and the standard of information available to guide recovery by:

(a) Promoting understanding and awareness of the spectacled flying fox through field days, regular items in print, electronic, radio and television media regarding the role of the spectacled flying fox in the ecosystem and challenges for management, including techniques to minimise entanglements in backyard drape nets and barbed-wire fences

(b) Developing information packages for local government planners and other land managers aimed at encouraging protection of flying fox camps including through maintenance of appropriate buffer zones in proximity to permanent camps. Promoting the value of this approach to local councils, NRM regional groups, and other stakeholders. Including information on flying fox biology, issues of community concern such as noise and disease, and summaries of recent management experiences at flying fox camps. Ensuring all information aligns with the *Far North Queensland Regional Plan 2009-2031.*

(c) Commercial growers, Traditional owners and the community encouraged to participate in on-ground management actions for the protection of spectacled flying foxes.

(d) Continuing actions associated with the DERM policy on managing flying fox colonies in urban areas.

(5) Increasing knowledge of *P. conspicillatus* roosting requirements and protecting important camps

(a) Characterising roosts, including landscape features, aspect, whether within urban, peri-urban, rural or undeveloped landscape, mircroclimate, floristic composition, vegetation structure, distance to man-made objects including buildings and to utility/transport corridors, to provide a better understanding of roost locations and assist in the protection of potential habitat

(b) Identify camps critical to the survival of the spectacled flying fox and investigate the appropriateness of adopting the camp protection criteria used for the closely related grey-headed flying fox (Eby 2005):

(i) Is used as a camp either continuously or seasonally in >50 per cent of years

(ii) Has been used as a camp at least once in the last ten years and is known to have contained >10 000 individuals, or

(iii) Has been used as a camp at least once in the last yen years and is known to have contained >5000 individuals, including reproductive females during the final stages of pregnancy, lactation or the period of conception (i.e. September–May).

(6) Improving understanding of incidence of tick paralysis and actions to minimise paralysis mortality in flying foxes by:
   (a) Investigating environmental climatic and physiological conditions associated with the incidence of tick paralysis, including an investigation of the importance of wild tobacco and an assessment of whether tick paralysis in *P. conspicillatus* is limited to the Atherton Tableland.

(7) Implementing strategies to reduce incidence of electrocution and entanglement of *P. conspicillatus* by:
   (a) Promoting methods of protecting backyard fruit crops outlined in Saunders (2004) to minimise entanglement of flying foxes in backyard drape nets and investigate additional techniques to reduce mortality (Available at: **http://www.epq.qld.gov.au/nature_conservation/wildlife/living_with_wildlife/flyingfoxes/netting_fruit_trees/** Accessed: 2009 05-06)
   (b) Working together with landowners to increase the visibility of fences in areas where spectacled flying fox entanglements occur
   (c) Encouraging landowners erecting new fences in north-eastern Queensland, particularly at the Wet Tropics region, to use plain wire on the top strand instead of barb-wire to reduce the incidence of flying fox entanglement
   (d) Encouraging electricity suppliers to increase the spacing between individual wires on overhead transmission lines when replacing/upgrading infrastructure.

(8) Investigating the causes of birth abnormalities such as cleft palate syndrome by:

Assessing the impacts of birth abnormalities such as cleft palate syndrome on spectacled flying fox populations. Undertaking research to identify the likely causes of these abnormalities.

Part B. National recovery plan for the northern quoll

The overall objective of the plan is to minimise the rate of decline of the northern quoll in Australia, and ensure that viable populations remain in each of the major regions of distribution into the future by:

(1) Protecting northern quoll populations on offshore islands from invasion and establishment of cane toads, cats and other potential invasive species by:
   (a) Maintaining biosecurity of important offshore islands through quarantine invasion and establishment of cane toads, cats and other potential invasive species
   (b) Monitoring offshore islands supporting quoll populations to detect the presence of cane toads, cats and any other potential invasive predator
   (c) Developing and, where required, implementing a strategy for rapid-response control of cane toad or cat outbreaks on offshore islands occupied by northern quolls

(2) Fostering the recovery of northern quoll sub-populations in areas where the species has survived alongside cane toads by:
   (a) Determining which factors affect survival and recovery of northern quolls in areas with cane toads
   (b) Using information from Action 2a to assist surviving populations to recover in sympatry with cane toads
   (c) Identify potential refuge habitats in Western Australia and the Northern Territory where quolls might be most likely to persist in the long term alongside cane toads

(3) Halting northern quoll declines in areas not yet colonised by cane toads
   (a) Collecting baseline data on population densities and monitor trends of quolls at a series of key sites not currently occupied by cane toads
   (b) Investigating factors causing declines in northern quoll populations not yet affected by cane toads
   (c) Managing key quoll populations in areas not currently affected by cane toads to halt population declines

(d) Identify the effect of pastoral land management practices on northern quoll persistence

(e) Interim fire management at potential key quoll populations

(f) Refine models of the current and expected distribution of cane toads and northern quolls, incorporating predictions of climate change

(4) Halting declines in areas recently colonised by cane toads

(a) Continuing research into the susceptibility of quolls to cane toad poisoning

(b) Testing the efficacy of control measures for cane toads and whether they allow local persistence of quoll populations

(5) Maintaining secure populations and source animals for future reintroductions/introductions, if they become appropriate by:

(a) Managing translocated populations of northern quolls on Astell and Pobassoo Islands

(b) NT and WA to maintain captive breeding population(s) or northern quolls

(c) Protection of key secure populations through protection of habitat in National Parks and Conservation Agreements

(d) NT and WA to determine the status of northern quolls on islands with suitable habitat and assess the potential for future translocations to these islands

(6) Reducing the risk of northern quoll populations being impacted by disease by:

(a) increasing knowledge and monitoring for disease in northern quoll populations

(7) Reducing the impact of feral predators on northern quolls by:

(a) Assessing the impacts of feral predators on populations of northern quolls

(b) Implementing efforts to protect key northern quoll populations from the impacts of feral predators

(8) Raising public awareness of the plight of northern quolls and the need for biosecurity of islands and WA by:

(a) Developing new and promoting existing materials for educating the public on the need for quarantine measures at important island habitat for quolls and along major routes westward into Western Australia

(b) Providing materials and support to Indigenous rangers and other groups responsible for habitat critical to the survival of northern quolls to educate their communities on the importance of cane toad and cat control and quarantine measures

(c) Implementing a broader public education awareness campaign on quolls and feral species (particularly cane toads and cats)

(9) Developing and implementing public education and awareness campaigns on land management threats to quolls.

Part C. National recovery plan for the red goshawk *Erythrotriorchis radiatus*

The overall objective of the plan is to maintain populations of red goshawk across their range and implement measures to promote recovery of the species by:

(1) Identifying and mapping important red goshawk habitat by:

(a) collating information on known nest sites from the past 25 years

(b) producing descriptive maps of important habitat for the red goshawk.

(c) conducting searches to identify previously unknown pairs of red goshawks, nest sites, and habitats critical for red goshawk survival

(2) Protecting and appropriately managing important habitat areas to ensure long-term survival of the red goshawk by:

(a) Providing specific information and advice to government agencies and non-government organisations to assist with the identification, acquisition and management of important red goshawk habitat.

(b) Reducing the effects of habitat fragmentation and habitat degradation by encouraging land owners to enter into voluntary conservation covenants/agreements in areas were red goshawks are located to protect both the birds and their habitat.

(c) Conducting research to understand the relationship between fragmentation, prey density and population persistence to better inform management.

(d) Monitoring red goshawk habitat.

(3) Increasing knowledge about the red goshawk's productive success and its survival by:

(a) Monitoring at least 20 nest sites each year to determine territory occupancy and productivity, and use DNA analyses of feathers to determine adult survival rates.

(b) Training personnel from state and local government to identify and understand the threats to red goshawk habitat.

(4) Identifying important populations of red goshawks by:

(a) Identifying important populations and nest sites of red goshawks and use the information to inform monitoring programs and state and federal government planning frameworks.

(b) Ensuring location information about red goshawk nest sites is secure.

(5) Increasing community awareness about the red goshawk and the conservation of the species by:

(a) Producing and distributing information / educational materials on the conservation status and habitat requirements of the red goshawk.

(b) Providing feedback to the public and agency personnel on progress of red goshawk recovery.

(c) Reviewing the effectiveness of the community awareness program.

Part D. National recovery plan for the bare-rumped sheathtail bat

The overall objective of the plan is to secure the long-term protection of the bare-rumped sheathtail bat by reducing the impact of threatening processes and increasing the amount of information available to guide recovery. Specific objectives and relevant actions are detailed below.

(1) To develop more effective detection techniques (including obtaining echolocation reference calls) and undertake systematic surveys to enable a more comprehensive assessment of distribution, population size, status and habitat preferences by:

(a) Obtain voucher echolocation calls from individuals confirmed to be the bare-rumped sheathtail bat through the collection of calls from flying individuals, the fly-out of individuals from roosts or released individuals that have been captured.

(b) Where reliable voucher calls are obtained and the echolocation call is determined to be diagnostic, review libraries of reference calls of bats collected in the north-eastern Queensland and the Top End of the Northern Territory for the presence of this species.

(c) Conduct targeted surveys using a range of non-lethal techniques during the wet season (when the majority of records have been obtained), concentrating sampling effort around recent localities and in areas of north-eastern Queensland identified by the BIOCLIM analyses as occurring within the predicted distribution.

(d) Increase public and landholder awareness of the species through the production and distribution of an information sheet to assist in the location of roosts.

(2) To increase protection of known roosts both on and outside reserved lands by:

(a) Protect all roosts located within and outside conservation reserves through ensuring all known roosts are recorded on WildNet and Northern Territory Wildlife Atlas databases and through discussions and information sessions with relevant land managers and landholders.

(b) On availability, supply researchers, departmental staff and consultants with voucher echolocation calls to assist with the assessment of the potential presence of this bat in

proposed development areas within the predicted distribution in north-eastern Queensland and in the Darwin-Mary River area of the Northern Territory.

(3) To better determine roosting requirements and document foraging requirements of the species, including potential seasonal and distributional differences and the identification of threatening processes by:

   (a) Determine the roosting requirements during both the non-breeding and breeding seasons. Compare roosts used with available roosting habitat to investigate roost site selection.

   (b) Identify the diet in the dry and wet seasons by analysing droppings collected from trapped individuals or collected at roosts and identify foraging habitat by the identification of feeding buzzes recorded using a bat detector.

(4) To establish monitoring sites to investigate population trends in the species by:

   (a) Dependent on the location of roosts and the results of targeted surveys, establish sites for bi-annual monitoring to document the seasonality of occurrence of the species in the dry and wet season. This monitoring should be conducted twice yearly beyond the life of the plan to assess population trends.

(5) To clarify the taxonomic status of the species by:

   (a) Conduct a genetic study investigating the taxonomic status of populations in north-eastern Queensland and the Northern Territory by the use of existing material, in addition to material collected in Action 1.1, and molecular techniques.

(6) Taxonomic relationship of the Australian populations and extralimital populations is resolved by:

   (a) Conducting a genetic study comparing the taxonomic status of Australian populations with those from New Guinea, Timor and elsewhere within the species' distribution using existing (e.g. museum specimens) material and molecular techniques. This investigation is recommended to be undertaken by, or in conjunction with, an experienced bat taxonomist.

Part E. Recovery plan for marine turtles in Australia (2003)

The overall recovery objective of the Marine Turtle Recovery Plan (for the green, flatback, leatherback, olive ridley, loggerhead and hawksbill turtle species) is to reduce detrimental impacts on Australian populations of marine turtles and hence promote their recovery in the wild. The Marine Turtle Recovery Plan noted the continued decline of the eastern Australian population of the loggerhead turtle and identified the need for its conservation to be implicit in all actions. The specific objectives, and a summary of their recovery actions, identified in the Marine Turtle Recovery Plan are as follows:

(7) To reduce the mortality of marine turtles and, where appropriate, increase natural survivorship, including through developing management strategies with Aboriginal and Torres Strait Islander communities for the sustainable use of marine turtles by:

   (a) reducing bycatch of marine turtles in fisheries

   (b) facilitating sustainable harvesting of turtles and eggs by Aboriginal and Torres Strait Islander people

   (c) reducing levels of marine debris

   (d) reducing mortality of marine turtles during shark control activities

   (e) reducing incidences of boat strike on marine turtles

   (f) reducing lighting impacts and entanglement incidences from Pearl Farming and other Aquaculture activities

   (g) reducing potential impacts from Department of Defence activities.

(8) To develop programs and protocols to monitor marine turtle populations in Australia, assess the size and status of those populations, the causes of their mortality and address information gaps by:

   (a) monitoring key populations and strandings of marine turtles

(b) measuring recovery

(c) facilitating the genetic identification of Australian marine turtle populations and their ecology.

(9) To manage factors that affect marine turtle nesting by:

(a) reducing light pollution in the marine environment

(b) ensuring minimal impacts on turtle habitat (including nesting beaches) from tourism and recreational activities

(c) managing vehicle access to nesting beaches

(d) minimising faunal predation of marine turtle eggs.

(10) To identify and protect habitats that are critical for the survival of marine turtles by:

(a) ensuring that activities impacting land use and water quality on or in proximity to marine turtle habitat are subject to an environmental impact assessment and the development of best practice coastal management guidelines across Queensland

(b) protecting critical marine turtle benthic and seagrass habitats

(c) managing of oil spills and operational discharges by lead agencies and appropriate environmental assessment of related activities

(d) ensuring soft start procedures are implemented in seismic surveys and monitoring literature on the effect of noise on marine turtles.

(11) To communicate the results of recovery actions and involve and educate stakeholders by:

(a) reviewing the Marine Turtle Recovery Plan and evaluating its effectiveness

(b) raising awareness and involvement of the community

(c) raising awareness in northern Australian Indigenous communities.

(12) To support and maintain existing agreements and develop new collaborative programs with neighbouring countries for the conservation of shared turtle populations by:

(a) the Commonwealth Government maintaining existing and developing new bilateral or multilateral agreements to ensure that international conservation and management of marine turtles is consistent with domestic policies and international treaty obligations.

Part F. Humpback Whale Recovery Plan 2005–2010

The overall objective of the *Humpback Whale Recover Plan 2005-2015* (DEH, 2005c) (Humpback Whale Recovery Plan) is to outline the measures necessary to ensure recovery of the Australian populations of Humpback Whales. The specific objectives, and a summary of their recovery actions, identified in the Humpback Whale Recovery Plan are as follows:

- the objectives are:
  - the recovery of populations of humpback whales utilising Australian waters so that the species can be considered secure in the wild
  - a distribution of humpback whales utilising Australian waters that is similar to the pre-exploitation distribution of the species
  - to maintain the protection of humpback whales from human threats.
- the actions are:
  - implement a program to measure population abundance, trends and recovery for Australian populations
  - implement a program to better define the characteristics (spatial, temporal and physical) of calving, resting, feeding and migratory areas
  - prevent commercial whaling and move to ban scientific whaling
  - protect habitat important to the survival of the species
  - monitor and manage the potential impacts of prey depletion due to over harvesting
  - monitor climate and oceanographic change.

Threat abatement plans

Part G. Threat abatement plan for predation by the European red fox

The goal of the European red fox TAP is to minimise the impact of foxes on biodiversity in Australia and its territories by protecting affected native species and ecological communities, and preventing further species and ecological communities from becoming threatened. The specific objectives and action items to achieve this are as follows:

(1) Prevent foxes occupying new areas in Australia and eradicate foxes from high-conservation-value 'islands' by:
   (a) collating data on offshore islands and isolated mainland 'islands', assess their conservation value, the likelihood of significant biodiversity impacts from foxes and, if there are no foxes present, rank the level of risk of foxes being introduced and establishing populations
   (b) developing management plans to prevent, monitor and, if incursions occur, contain and eradicate any fox incursion, for 'islands' with high conservation values
   (c) implementing management plans for high-conservation-value 'islands', including prevention and monitoring actions, and containment or eradication actions if incursions occur
   (d) eradicating established populations of foxes from 'islands' with high conservation values (including Tasmania) where this is cost-effective, feasible and a conservation priority.

(2) Promote maintenance and recovery of threatened species and ecological communities that are affected by fox predation by
   (a) identifying priority areas for fox control based on:
      (i) the significance of the population of the affected native species or of the ecological community
      (ii) the degree of threat posed by foxes to species and ecological communities relative to other threats
      (iii) the cost-effectiveness of maintaining fox populations below an identified 'damage threshold' in the region, and
      (iv) the feasibility of effective remedial action
   (b) conducting and monitoring regional fox control, through new or existing programs, in priority areas identified in Action 2.1
   (c) applying incentives (other than bounties), partnerships and negotiated agreements to promote and maintain on-ground fox control on private or leasehold lands within or adjacent to priority sites identified in Action 2.1.

(3) Improve knowledge and understanding of fox impacts and interactions with other species and ecological processes by:
   (a) developing simple and cost-effective methods for monitoring populations of foxes and the impacts of foxes, including reliable methods for monitoring foxes and key native species at different densities, including very low densities
   (b) investigating interactions between foxes and native carnivores to identify the significance of competition and predation by foxes to these native species
   (c) determining the nature of interactions between foxes, feral cats, wild dogs and rabbits to effectively integrate fox control activities for all four species
   (d) Identifying any unintended effects that fox control may have if conducted in isolation from other management activities
   (e) developing means for estimating the environmental and other associated costs of impacts arising from foxes.

(4) Improve the effectiveness, target specificity, integration and humaneness of control options for foxes by:

(a) conducting research and extension to improve the effectiveness, target specificity and humaneness of existing toxin-bait media and baiting methods

(b) conducting further work on the development of new, or improvements to existing, control techniques

(c) testing and disseminating information on exclusion fence designs and other control methods regarding their cost-effectiveness for particular habitats or topography

(d) investigating the feasibility of control techniques to target foxes, but not dingoes, in some areas

(e) developing training programs to help land managers identify locally appropriate control method(s) and when (i.e. circumstances and times) to apply them in controlling foxes

(f) ensuring that habitat rehabilitation and management of potential prey, competitors and predators of foxes are considered in fox control programs

(g) continuing to promote the adoption and adaptation of the model codes of practice and standard operating procedures for humane management of foxes.

(5) Increase awareness of all stakeholders of the objectives and actions of the TAP, and of the need to control and manage foxes by:

(a) promoting:

(i) broad understanding of the threat to biodiversity posed by foxes and support for their control

(ii) support for the actions to be undertaken under this plan

(iii) the use of humane and cost-effective fox control methods

(iv) best-practice effective fox control in all tenures

(v) understanding of predation by foxes as a key threatening process.

Part H. Threat abatement plan for predation by feral cats

The goal of the feral cat threat abatement plan (TAP) is to minimise the impact of cats on biodiversity in Australia and its territories. The squatter pigeon is listed as a species of concern under this TAP. The five main objectives and associated recovery actions in order to achieve this goal are as follows:

(1) Prevent feral cats occupying new areas in Australia and eradicate feral cats from high-conservation-value 'islands' by:

(a) collating data on offshore islands and developing and implementing management plans to prevent, monitor, contain and eradicate any cat incursions

(b) working with communities to prevent incursion

(c) monitoring native prey species in areas eradicated of cats.

(2) Promote the maintenance and recovery of native species and ecological communities that are affected by feral cat predation by:

(a) identifying priority areas for cat control and conducting and monitoring regional cat control in these areas

(b) applying incentives to promote and maintain on private or lease hold land within or adjacent to priority areas.

(3) Improve knowledge and understanding of feral cat impacts and interactions with other species and other ecological processes by:

(a) developing simple and cost effective methods for monitoring populations and impacts of foxes

(b) investigating interactions between foxes and native carnivores

(c) determining the nature of interactions between foxes and other pest animals

(d) determining impacts of cat-borne diseases

(e) identifying unintended effects of fox control conducted in isolation.

(4) Improve effectiveness, target specificity, humaneness and integration of control options for feral cats by:

(a) developing an effective toxin-bait for cats

(b) determining appropriate baiting strategies

(c) ensuring habitat rehabilitation and management of potential prey

(d) testing and disseminating information on exclusion fence designs regarding cost-effectiveness

(e) continuing to promote the adoption and adaptation of model codes of practice and standard operating procedures for the humane management of feral cats.

(5) Increase awareness of all stakeholders of the objectives and actions of the TAP, and of the need to control and manage feral cats by:

(a) promoting understanding of the threat to biodiversity posed by feral cats and support for their control, including the use of humane and best-practice cost-effective controls

(b) developing communication campaigns to accompany the release of new broad scale cat control techniques.

Part I. Threat abatement plan for predation, habitat degradation, completion and disease transmission by feral pigs

The pig TAP sets out a national framework to guide the coordinated implementation of the objectives and actions considered necessary to manage the environmental damage caused by feral pigs to species and ecological communities affected by the process. The five main objectives and associated recovery actions in order to achieve this goal are as follows:

(1) To prevent feral pigs from establishing in areas where they currently do not occur or are in low eradicable numbers, and where they are likely to pose a threat to biodiversity, especially where they would impact on nationally listed threatened species and ecological communities by:

(a) identifying areas currently free from feral pigs or where they are eradicable

(b) verifying presence or absence of feral pigs in priority areas and developing and implementing management strategies to remove feral pigs from priority areas

(c) providing awareness programs to recreational hunters, bushwalkers and land managers

(d) reviewing the adequacy and effectiveness of existing legislation.

(2) To integrate feral pig management plans and their implementation into natural resource planning and investment at the regional, state and territory, and national level through consultation and liaison with key stakeholders by:

(a) coordination between the department and relevant state and territory agencies to set out key concerns and issues to be included in natural resource management plans and to establish protocols and use funding and other relevant mechanisms to improve the consistency and coordination of actions across tenures and jurisdictions.

(3) To increase awareness and understanding of land managers and the general community about the damage that feral pigs cause and management options by:

(a) assessing the adequacy of available information and dissemination of appropriate material to target groups

(b) supporting the completion, dissemination and adoption of the pest management component of the Conservation and Land Management Training Package being developed by the National Training Authority.

(4) To quantify the impacts feral pigs have on biodiversity (especially nationally listed threatened species and ecological communities) and determine the relationship between feral pig density and the level of damage by:

(a) identifying priority areas under threat by feral pigs

(b) developing and implementing appropriate studies that aim to determine the impact of feral pigs on listed species and the level of control required to reduce the impact to a significant level.

(5) To improve the effectiveness, efficiency and humaneness of techniques and strategies for managing the environmental damage due to feral pigs by:

(a) assessing the need for the development of more effective and humane techniques and strategies when managing feral pigs

(b) assessing these techniques and strategies through an analysis of costs and benefits, safety, potential impact on non-target species, legal issues and any other practical considerations, and formulate a regional best practice approach.

Part J. Marine Debris Threat Abatement Plan

The aim of the Marine Debris TAP is to provide a coordinated national approach to the implementation of measures to prevent and mitigate the impacts of harmful marine debris on vertebrate marine life. The four main objectives and associated recovery actions in order to achieve this goal are as follows:

(1) Contribute to the long-term prevention of the incidence of harmful marine debris by:

(2) improving waste management practices on land and at sea through collaboration between, state, territory and Australian Governments, industry, non-government organisations and Indigenous communities

(3) state and territory governments considering to review legislation to ensure that details of waste reception facilities for ships are included in port environment plan

(4) state and territory governments to investigate how Australia's obligations under MARPOL (International Convention for the Prevention of Pollution from Ships) (i.e. to provide adequate waste reception facilities for ship waste) are encompassed in domestic legislation and policies.

(5) Remove existing harmful marine debris from the marine environment and monitor the quantities, origins and impacts of marine debris and assess the effectiveness of management arrangements over time for the strategic reduction in marine debris by:

(a) development of a national approach to information collection and management

(b) improvement of the understanding of the origins of harmful marine debris.

(6) Mitigate the impacts of harmful marine debris on marine species and ecological communities by:

(a) facilitating implementation of wildlife research

(b) identifying measures to promote the use of biodegradable and oxodegradable plastic in marine-based industries.

Part K. Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads

The goal of the cane toad TAP is to address the key threatening process (lethal toxic ingestion) of this species on native fauna in a feasible, effective and efficient manner. The three main objectives and associated recovery actions in order to achieve this goal are as follows:

(1) Identifying priority native species and ecological communities at risk from the impact of cane toads by:

(a) identifying native species, ecological communities and off-shore islands currently known to be at high to moderate risk

(b) identifying the ways in which cane toads impact the native species and ecological communities listed in (a)(i)

(c) establishing and supporting research where impacts are unknown but may be high, to further understand the impact of cane toads on the native species and ecological communities. Where appropriate, research ways to assist with the recovery of priority native species and ecological communities

(d) developing a prioritisation tool to guide allocation of resources for protection of native species and communities. Apply it to native species and ecological communities identified: first from (a)(i), then from (a)(iii)

(2) Reducing the impact of cane toads on populations of priority native species and ecological communities by:

(a) focusing the management of cane toad impacts by Australian Government agencies on designated high priority native species and ecological communities, and seek cooperative action on priorities by jurisdictions and other stakeholders

(b) implementing and monitoring emergency management of cane toad impacts for known high priority native species and ecological communities using currently available tools and techniques (e.g. trapping, fencing of small areas, manual removal from designated sites)

(c) implementing or adjusting the management of cane toad impacts using available tools and techniques as new species and communities are added to the list of priority native species and ecological communities. Additional tools and techniques will become available with the registration of toxins for euthanasia of captured toads and development of other impact management or cane toad control techniques. Codes of practice and standard operating procedures for cane toad control will provide guidance on these techniques

(d) preparing guidelines, including codes of practice and standard operating procedures that can be applied to both emergency responses and on-going management for high priority native species and ecological communities for endorsement by the VPC

(e) preparing and implementing management plans, (including identifying and addressing gaps in management techniques and tools) for designated high priority species and ecological communities on land managed by Australian Government agencies

(f) providing the guidelines for emergency and on-going cane toad management to all stakeholders. Liaising with responsible jurisdictions/agencies to encourage the preparation and implementation of such plans in their areas of responsibility. Where mutual obligations exist the Australian Government will work cooperatively to prepare such plans

(g) monitoring the development and implementation of guidelines and cane toad management plans for designated high priority species and ecological communities

(h) monitoring the literature about the spread and impact of the cane toad and review/amend guidelines and develop new management plans as required

(i) establishing guidelines for humane management actions to control cane toads for VPC and Animal Welfare Committee endorsement

(j) distributing guidelines to all Australian Government agencies with land management responsibilities

(k) seek cooperative adoption of guidelines by states/territories including incorporation in state based regulations as appropriate.

(3) Communicating information about cane toads, their impacts and the TAP by:

(a) implementing a one-stop-shop webpage on the Department of Environment website with links to jurisdictional and stakeholder information on cane toads and including information on:

(i) the threat cane toads pose to biodiversity

(ii) management actions to limit this threat

(iii) guidelines for cane toad management

(iv) information to help identify cane toads from other amphibians

(v) codes of practice and standard operating procedures

(vi) management plans (as they are developed) for areas designated as high priority.

(b) encouraging monitoring, evaluation and reporting on cane toad management actions is maintained and communicated to stakeholders

(c) ensuring Australian Government fact sheets and other communications material on cane toads are current and reflect the strategy developed in this TAP.

Conservation advices

Part L. Approved conservation advice for the ant plant *Myrmecodia beccarii*

Research priorities that would inform future regional and local priority actions include:

(1) Design and implement a monitoring program or, if appropriate, support and enhance existing programs.

(2) More precisely assess population size, distribution, ecological requirements and the relative impacts of threatening processes.

(3) Undertake survey work in suitable habitat and potential habitat to locate any additional populations/occurrences/remnants.

(4) Undertake seed germination and/or vegetative propagation trials to determine the requirements for successful establishment, including mycorrhizal association trials.

(5) Investigate the potential and efficacy of DNA-based or other approaches for the identification of individual plants and/or populations to provide a means for detecting and prosecuting illegal collection from the wild (for example see Palsboll et al., 2006).

The following regional and local priority recovery and threat abatement actions can be done to support the recovery of M. beccarii:

(1) Habitat loss, disturbance and modification
   (a) Monitor known populations to identify key threats.
   (b) Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
   (c) Identify populations of high conservation priority.
   (d) Ensure road widening and maintenance activities (or other infrastructure or development activities) involving substrate or vegetation disturbance in areas where *M. beccarii* occurs do not adversely impact on known populations.
   (e) Control access routes to suitably constrain public access to known sites on public land.
   (f) Suitably control and manage access on private land.
   (g) Minimise adverse impacts from land use at known sites.

(2) Conservation information:
   (a) Raise awareness of M. beccarii within the local community.

(3) Enable recovery of additional sites and/or populations
   (a) Undertake appropriate seed and mycorrhizal fungi collection and storage.
   (b) Investigate options for linking, enhancing or establishing additional populations.

Implement national translocation protocols (Vallee et al., 2004) if establishing additional populations is considered necessary and feasible.

Appendix 8. Australian World heritage management principles

1 General principles

1.01 The primary purpose of management of natural heritage and cultural heritage of a declared World Heritage property must be, in accordance with Australia's obligations under the World Heritage Convention, to identify, protect, conserve, present, transmit to future generations and, if appropriate, rehabilitate the World Heritage values of the property.

1.02 The management should provide for public consultation on decisions and actions that may have a significant impact on the property.

1.03 The management should make special provision, if appropriate, for the involvement in managing the property of people who:

(a) have a particular interest in the property; and

(b) may be affected by the management of the property.

1.04 The management should provide for continuing community and technical input in managing the property.

2 Management planning

2.01 At least 1 management plan should be prepared for each declared World Heritage property.

2.02 A management plan for a declared World Heritage property should:

(a) state the World Heritage values of the property for which it is prepared; and

(b) include adequate processes for public consultation on proposed elements of the plan; and

(c) state what must be done to ensure that the World Heritage values of the property are identified, conserved, protected, presented, transmitted to future generations and, if appropriate, rehabilitated; and

(d) state mechanisms to deal with the impacts of actions that individually or cumulatively degrade, or threaten to degrade, the World Heritage values of the property; and

(e) provide that management actions for values, that are not World Heritage values, are consistent with the management of the World Heritage values of the property; and

(f) promote the integration of Commonwealth, State or Territory and local government responsibilities for the property; and

(g) provide for continuing monitoring and reporting on the state of the World Heritage values of the property; and

(h) be reviewed at intervals of not more than 7 years.

3 Environmental impact assessment and approval

3.01 This principle applies to the assessment of an action that is likely to have a significant impact on the World Heritage values of a property (whether the action is to occur inside the property or not).

3.02 Before the action is taken, the likely impact of the action on the World Heritage values of the property should be assessed under a statutory environmental impact assessment and approval process.

3.03 The assessment process should:

(a) identify the World Heritage values of the property that are likely to be affected by the action; and

(b) examine how the World Heritage values of the property might be affected; and

(c) provide for adequate opportunity for public consultation.

3.04 An action should not be approved if it would be inconsistent with the protection, conservation, presentation or transmission to future generations of the World Heritage values of the property.

3.05 Approval of the action should be subject to conditions that are necessary to ensure protection, conservation, presentation or transmission to future generations of the World Heritage values of the property.

3.06 The action should be monitored by the authority responsible for giving the approval (or another appropriate authority) and, if necessary, enforcement action should be taken to ensure compliance with the conditions of the approval.

Appendix 9. Draft Aquis Local Plan

TABLE OF CONTENTS

1.0 THE AQUIS LOCAL PLAN (ALP)

1.1 Short Title

This document may be cited as the *Aquis Local Plan (ALP)*.

1.2 Land to which the Aquis Local Plan applies

The *ALP* applies to that part of the Cairns Regional Council Local Government Area which is subject to the Preliminary Approval to vary the effect of the Planning Scheme, identified on the land described in **Schedule 1** (*Aquis Local Plan "ALP" Area*).

1.3 Purpose of the ALP

The purpose of the *ALP* is to provide a planning framework for assessing development within the Aquis Local Plan Area including:-

(1) a *Precinct and Structure Plan* nominating the location of Precincts within the ALP Area and the framework for development;(**Schedule 2**)

(2) an *Aquis Master Plan* (**Schedule 3**)

(3) a *Vision* and *Development Principles* providing context for the implementation of this Local Plan;

(4) a *Table of Assessment* identifying levels of assessment and assessment criteria for development within each Precinct; and

(5) a *Code* containing performance criteria and acceptable outcomes for certain land uses and infrastructure in the ALP area.

1.4 Vision

Aquis Resort will be the pre-eminent integrated resort and entertainment complex in Queensland.

The built form and setting of the Aquis Resort, including its landscaping and protected natural areas, will be distinctive, readily recognisable and develop a strong international identity.

To be built in stages, the development will provide the accommodation needs of visitors to the FNQ region, and provide integrated entertainment, recreational and support facilities on site. The resort will provide infrastructure and all services to support the approved uses across the whole site in a manner that promotes self-containment.

Development of the site will be in a form and scale, and of a design, that is responsive to its setting and natural context. The design, construction and management of all components of the integrated resort will promote ecologically sustainable development.

Development will be designed, constructed and maintained to Australian best practice standards.

1.5 Relationship to Cairns Regional Council Planning Scheme

(1) The ALP varies the effect of the Cairns Regional Council Planning Scheme.
(2) Where there is conflict between the ALP and the Cairns Regional Council Planning Scheme, the ALP prevails to the extent of any inconsistency.

2.0 PRELIMINARY APPROVAL

2.1 Preliminary Approval

(1) This *ALP* functions as part of the Preliminary Approval, varying the effect of the Cairns Regional Council Planning Scheme as it relates to a development known as the *Aquis Resort at The Great Barrier Reef (Aquis Resort)*, pursuant to section 242 of the *Sustainable Planning Act* (SPA) *2009*, by:-

(a) stating levels of assessment for development in the *ALP* Area that are different to the levels of assessment stated for the land in the Cairns Regional Council Planning Scheme;

(b) identifying applicable Codes that are different to Codes included in the Cairns Regional Council Planning Scheme;

(c) in all other respects relying on the applicable codes included in the Cairns Regional Council Planning Scheme. , Where there is a different, or amended planning scheme in effect after the preliminary approval takes effect, the relevant codes applicable to uses apply to the development as outlined in the tables of assessment. To remove doubt, section 1.6(2) applies in any case; and

(d) identifying definitions that are applicable to the ALP.

2.2 Relevant Period

(1) In accordance with section 341(1) (b) of the SPA, the *relevant period* for the Approval is ten (10) years from the date the approval takes effect.

2.3 Effect of Preliminary Approval

(1) To remove any doubt:

a) the ALP does not vary the effect of the SPA 2009 or the SPR 2009 in any way, including in relation to type of assessment, or to referral agencies or their jurisdiction[1];

[1] Including in relation to tidal works, prescribed tidal works or native vegetation clearing.

b) assessment of any development applications should give weight to the evaluation of the Declared Coordinated Project under the *State Development and Public Works Organisation Act 1971*;

c) the assessment and approval of the preliminary approval varying the effect of the Planning Scheme and the Coordinator General's published evaluation report, considered all relevant Commonwealth and State Assessment criteria, including the State Planning Policy July 2014 (SPP 2014) and its relevant assessment requirements (Interim Development Assessment Requirements & State Development Assessment Provisions); and

d) this ALP includes relevant SPP (July 2014) assessment criteria for uses contemplated in each precinct where requiring code or impact assessment. The State Planning Policy will be amended from time to time. In line with the planning act, the State Planning Policy in effect prevails to the extent of any inconsistency.

3.0 INTERPRETATION

3.1 Terms defined in the *Sustainable Planning Act 2009*

(1) Terms defined in the *Sustainable Planning Act 2009* which are used in the ALP have the meaning given in the *Sustainable Planning Act 2009*.

3.2 Terms defined in the ALP

(1) The dictionary at **Schedule 4** defines the additional terms and use definitions applicable to the ALP.

3.3 Terms defined in the Cairns Regional Council Planning Scheme

(1) Terms defined in the Planning Scheme which are used in the ALP have the meaning given in the Planning Scheme, other than the use definitions in **Schedule 4** or unless identified otherwise.

(2) As per 1.6 (2) of this ALP, where there is conflict between the ALP and the Cairns Regional Council Planning Scheme, the ALP prevails to the extent of any inconsistency.

4.0 COMPLIANCE

4.1 Assessment Generally

(1) Every use facilitated by this local plan is attributed a level of assessment (see Section 6).

(2) In general, development may only proceed where an application is made to and approved by the Cairns Regional Council for code or impact assessable development.

(3) To remove any doubt, no development the subject of this ALP is self-assessable.

4.2 Code Assessment

(1) The following provisions apply in determining compliance with the applicable code:

(a) where acceptable outcomes are identified for performance outcomes, development which complies with the acceptable outcomes complies with the performance outcomes and Code overall outcomes;

(b) development which complies with the performance outcomes of the ALP Code complies with the Code overall outcomes and the purpose of the Code; and

(c) development which complies with the overall outcomes of the ALP Code complies with the purpose of the Code.

4.3 Impact Assessment

(1) For Impact assessable development, any such application is to be assessed against the entire ALP and the Cairns Regional Council Planning Scheme, as deemed relevant by the assessment manager.

5.0 PRECINCTS

5.1 Precinct and Structure Plan

(1) The *Precinct and Structure Plan* is attached at **Schedule 2.** This plan shows precincts within which use rights and potential development criteria apply as well as the framework for development.

(2) The Precincts are:

- Resort Complex;
- Sport and Recreation; and
- Environmental Management and Conservation.

5.2 Resort Complex Precinct Intent

(1) The Resort Complex Precinct is the main feature of the Aquis Resort at The Great Barrier Reef and comprises the built form of the resort complex surrounded by an artificial lake. The intent for this precinct is to operate as the main 'hub' of activity. Development will be clustered within the precinct and have a built form presented as a series of buildings, separated and having a horizontal elevation and scale. Landscaping is integrated throughout the precinct and its buildings. Standards for water quality, flood management, mobility, and all environmental operations are to be best practice. Development in this precinct is a substantial built environment, off-set by the extensive open space and landscaped areas in the balance precincts of the Aquis site.

(2) The Precinct will feature:

a) Accommodation for up to 12,000 guests (at peak occupancy) in 7,500 hotel rooms and suites configured in 8 towers, with a total GFA of 625,000m^2;
b) A casino with a total GFA of 40,000m^2;
c) Two (2) 600 seat theatres with a total GFA of 5,000m^2;
d) 10,000m^2 of retail, restaurants, bars and food and drink outlets;
e) An aquarium with a total GFA of 2,250m^2 and a rainforest with a total GFA of 2,500m^2 (architectural features of the site and not stand-alone uses);
f) A 12.4 hectare reef lagoon as a central feature;
g) A 25,000m^2 convention and exhibition centre;

h) A cultural heritage centre;
i) Circulation, shared space, back-of-house and services, with a total GFA of 350,000m^2;
j) Guest and staff parking for 1,400 vehicles, with a total GFA of 80,000m^2; and
k) Landscaping, lagoons, pools and entry water features with a total GFA of 110,000m^2.

5.3 Sports and Recreation Precinct Intent

(1) The Sports and Recreation Precinct will include both indoor and outdoor recreation uses including an 18-hole golf course (including driving range and clubhouse), a tennis centre, equestrian facilities and other outdoor sports and recreation activities generally surrounding the Resort Complex Precinct. The Precinct also includes car parking facilities.

(2) In recognition of the limited sports and recreation facilities currently available to the community at Yorkeys Knob, the precinct will include the development of a community sports and recreation facility on land north of Dunne Road and west of Yorkeys Knob Road.

(3) Landscaping and vegetated buffers are to be provided to screen development in the Precinct from Yorkeys Knob Road and to reduce impacts on, or from, adjacent agricultural land and other uses.

5.4 Environment Management and Conservation Precinct Intent

(1) The Environment Management and Conservation Precinct includes the protection and preservation of 53 ha of native vegetation and ecological restoration works involving planting of natural vegetation around the perimeter of the site, along Yorkeys Creek and adjacent to Yorkeys Knob Road. These restoration works provide significant protection and enhancement of biodiversity values by:
- predominantly retaining and maintaining existing natural vegetation;
- providing restoration works as buffers to existing natural vegetation; and
- the removal of waterway barriers to improve connectivity of Yorkeys Creek through to the Cattana Wetlands.

(2) The remainder of the Precinct will provide opportunity for the interpretation and appreciation of biological and cultural heritage values of the site through the provision of walkways, viewing platforms and interpretative displays.

6.0 TABLES OF ASSESSMENT

6.1 Interpretation

(1) The following table identifies the levels of assessment for material change of use, operational works, and reconfiguring a lot development applications in the ALP Precinct areas.

(2) Consistent with the definition of *use* in SPA, activities which are incidental to and necessarily associated with a predominant use are considered to be part of that use and will not require a separate development application. This includes maintenance activities, but not incremental change in intensity or scale of the use.

6.2 Material Change of Use Table of Assessment

Resort Complex Precinct		
Level of Assessment	**Use**	**Assessment Criteria**
Exempt	Park	NIL
Self-Assessment	NIL	NIL
Code Assessment	Caretakers Accommodation Parking Station Resort Complex Utility installation	• Aquis Local Plan Code • Flood Management Code • Operational Aspects of the Cairns International Airport Code • Potential or Actual Acid Sulfate material Code • Vegetation Conservation and Significant Waterway Code • Development Near Major Transport Corridors and Facilities Code • Excavation and Filling Code • Landscaping Code • Parking and Access code
Impact Assessment	All other uses & undefined uses	• Aquis Local Plan Code • Cairns Regional Council Planning Scheme

Sport & Recreation precinct		
Level of Assessment	**Use**	**Assessment Criteria**
Exempt	Park	NIL
Self-Assessment	NIL	NIL
Code Assessment	Caretakers Accommodation Club Food and Drink Outlet Indoor Sport and Recreation Outdoor Sport and Recreation Parking Station Resort Complex Utility installation	• Aquis Local Plan Code • Flood Management Code • Operational Aspects of the Cairns International Airport Code • Potential or Actual Acid Sulfate material Code • Vegetation Conservation and Significant Waterway Code • Development Near Major Transport Corridors and Facilities Code • Excavation and Filling Code • Landscaping Code • Parking and Access Code
Impact Assessment	All other uses & undefined uses	• Aquis Local Plan Code • Cairns Regional Council Planning Scheme

Environmental Management and Conservation Precinct		
Level of Assessment	**Use**	**Assessment Criteria**
Exempt	Park	NIL
Self-Assessment	NIL	NIL
Code Assessment	Environmental Facility	• Aquis Local Plan Code • Flood Management Code • Operational Aspects of the Cairns International Airport Code • Potential or Actual Acid Sulfate material Code • Vegetation Conservation and Significant Waterway Code • Development Near Major Transport Corridors and Facilities Code • Excavation and Filling Code • Landscaping Code Parking and Access code
Impact Assessment	All other uses & undefined uses	• Aquis Local Plan Code • Cairns Regional Council Planning Scheme

6.3 Other Development Table of Assessment

Other Development		
Level of Assessment	**Use**	**Assessment Criteria**
Exempt	NIL	NIL
Self-Assessment	NIL	NIL
Code Assessment	Operational Work Reconfiguring a Lot	• Aquis Local Plan Code • Flood Management Code • Operational Aspects of the Cairns International Airport Code • Potential or Actual Acid Sulfate material Code • Vegetation Conservation and Significant Waterway Code • Development Near Major Transport Corridors and Facilities Code • Excavation and Filling Code • Landscaping Code • Parking and Access code • Reconfiguring a lot Code*(for reconfiguring a lot only)*
Impact Assessment	NIL	NIL

7.0 THE CODE

7.1 Applicability

(1) This code applies to assessing development in the Aquis Local Plan area.

(2) The criteria that will be used in assessment of any application pursuant to this code are grouped as follows:
   a) Assessment criteria applicable to development in all precincts (Section 7.3);
   b) Assessment criteria applicable to development in the Resort Complex Precinct (Section 7.4);
   c) Assessment criteria applicable to development in the Sport and Recreation Precinct (Section 7.5);
   d) Assessment criteria applicable to development in the Environment Management and Conservation Precinct (Section 7.6).

7.2 Purpose

7.2.1 All precincts

(1) The purpose of the Aquis Local Plan Code is to ensure development results in a pre-eminent integrated resort and entertainment complex.

(2) The purpose of the Code will be achieved through the following overall outcomes:

Environmental Values and Attributes

a) Development footprint and setting achieves separation from nearby residential communities and sensitive receiving environments, and a resort layout which provides space between major use components, and the opportunity for extensive deep landscaping;
b) Development facilitates the flow of water through the floodplain and does not cause adverse impacts on neighbouring properties;

c) Development features best-practice ecological sustainability principles and does not impact on coastal processes or nearby Great Barrier Reef World Heritage Area values;
d) Areas having ecological significance, both on site and adjoining the site, are protected and where practicable, enhanced;
e) Impacts from the development are managed to ensure the quality of the receiving environments is maintained, enhanced or improved;
f) Finished floor levels are constructed to achieve immunity to extreme natural hazard events and risk;
g) Works necessary to protect the function of development from natural processes are undertaken where they result in no adverse impacts on matters of environmental significance and water quality objectives; and
h) The quality of water entering and discharging from the site is maintained to the standard necessary for the receiving environment to not cause an adverse impact on ecological values and functions.

Built Form

i) Development results in a built form that:
    i) is located, designed and integrated generally in accordance with the Aquis Master Plan (**Schedule 3**)
    ii) has a distinct and iconic tropical design and articulation resulting in recognisable architecture with unique attributes for each building;
    iii) protects longer views to the site by a low and horizontal profile, particularly when viewed from the Great Barrier Reef Marine Park;
    iv) protects the operations of the Cairns Airport;
    v) defines edges and gateways, using architectural and landscaping features, to contribute to the quality of landmarks and entry points and experience of the resort;
    vi) ensures separation between buildings achieve permeability for air flow, solar benefits and view lines, and achieve substantial landscaping to define ground floor and spaces between buildings;
    vii) is oriented towards visitors and guests on the ground level with a focus on pedestrian comfort, scale and amenity, and integrates with transport and pedestrian connectivity;

viii) is dominated by a landscaped form, green walls, green roofs, vertical gardens, atriums, deep planting areas and use of water features;

ix) ensures multi-functional spaces are provided within, between and external to buildings for gathering and recreational events;

x) incorporates best practice energy efficiency and sustainable design and construction techniques;

j) Walkways and connections are designed for visitor, guest and staff comfort having regard to the climate of the region;

k) Development is defined by landscaping that:

i) responds to the tropical climate and natural features of the site and its regional context;

ii) contributes to the appearance and experience of the built form;

iii) enhances the local environment, and assists in minimising the footprint and visual impact of development.

Connectivity, Infrastructure and Development Sequencing

l) Entertainment and recreational facilities and activities are accessible to the community, including workers and local residents;

m) Public access and use of entertainment and recreational facilities is encouraged;

n) Access points are clear, logical and well defined, providing for appropriate and safe intersection treatments and pavement design having regard to the modes of transport servicing development and shared environments;

o) Development provides necessary external infrastructure upgrades to connect to trunk infrastructure networks and makes infrastructure contributions for the capacity of trunk infrastructure required to cater for the demands imposed on those networks; and

p) Construction of development is sequenced to ensure the timely and efficient provision of external and necessary public infrastructure.

7.2.2 Resort Complex Precinct

In addition to the 7.2.1, the overall outcomes for the Resort Complex Precinct are:

a) The Resort Complex Precinct contains the most intensive built form and widest range of land uses within the Aquis Local Plan area;

b) Development within this precinct is surrounded by an artificial lake with the built form presented as a series of buildings, separated and having a low and horizontal profile;

c) Development within this precinct comprises the following:

   i) Accommodation for up to 12,000 guests (at peak occupancy) in 7,500 hotel rooms and suites configured in 8 towers, with a total GFA of 625,000m^2;
   ii) A casino with a total GFA of 40,000m^2;
   iii) Two (2) 600 seat theatres with a total GFA of 5,000m^2;
   iv) 10,000m^2 of retail, restaurants, bars and food and drink outlets;
   v) An aquarium with a total GFA of 2,250m^2 and a rainforest with a total GFA of 2,500m^2 (architectural features of the site and not stand-alone uses);
   vi) A 12.4 hectare reef lagoon as a central feature;
   vii) A 25,000m^2 convention and exhibition centre;
   viii) A cultural heritage centre;
   ix) Circulation, shared space, back-of-house and services, with a total GFA of 350,000m^2;
   x) Guest and staff parking for 1,400 vehicles, with a total GFA of 80,000m^2; and
   xi) Landscaping, lagoons, pools and entry water features with a total GFA of 110,000m^2.

7.2.3 Sport and Recreation Precinct

In addition to the 7.2.1, the overall outcomes for the Sport and Recreation Precinct are:

a) The Sport and Recreation Precinct surrounds and supports the Resort Complex Precinct by providing indoor and outdoor sport and recreation uses including, but not limited to, the following:
   i) an 18-hole golf course (including a driving range and clubhouse);
   ii) a tennis centre;
   iii) equestrian facilities; and
   iv) a community sports and recreation facility that is accessible to the Yorkeys Knob community located on land North of Dunne Road and west of Yorkeys Knob Road.

b) Public access and use of the recreational facilities within this precinct is encouraged; and

c) Landscaping and vegetated buffers are provided to screen development in the precinct from Yorkeys Knob Road and reduce impacts on, or from, adjacent land uses (including agricultural uses).

7.2.4 Environment Management and Conservation Precinct

In addition to the 7.2.1, the overall outcomes for the Environment Management and Conservation Precinct are:

a) The Environment Management and Conservation Precinct protects and preserves areas of environmental significance and provides a vegetated buffer to sensitive receiving environments surrounding the Resort Complex Precinct, Sport and Recreation Precinct and the wider Aquis Local Plan Area;

b) Rehabilitation and restoration works are undertaken in this precinct to provide significant protection and enhancement of biodiversity values and includes:

   i) predominantly retaining and maintaining existing natural vegetation;
   ii) restoration works as buffers to existing natural vegetation; and
   iii) the removal of waterway barriers to improve connectivity of Yorkeys Creek through to the Cattana Wetlands.

c) Development within this precinct is limited to facilities that provide for the interpretation and appreciation of environmental, and cultural heritage values of the site through the provision of walkways, viewing platforms and interpretative displays.

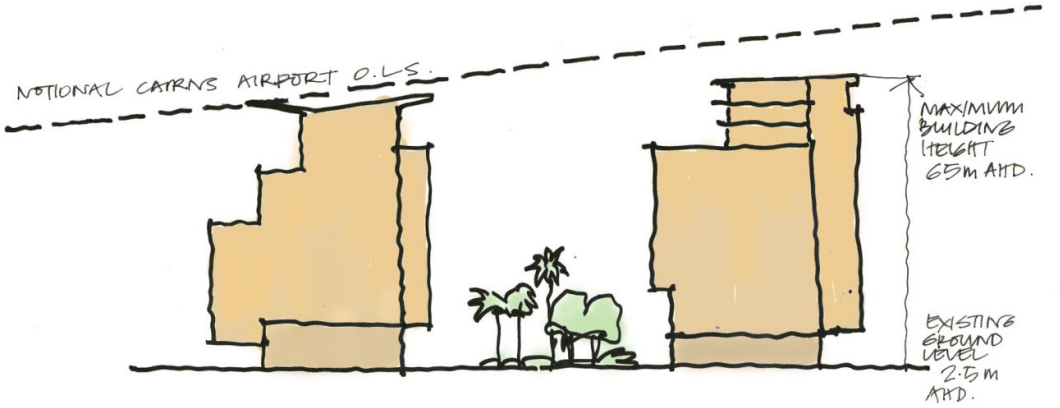
7.3 Assessment Criteria for all Precincts

The following outcomes apply to development in all precincts within the ALP area:

Performance outcome	Acceptable outcomes
All Approvals	
PO1 Development is consistent with all approvals, environmental authorities, including their conditions, and infrastructure agreements	**AO1.1** All development located in the Aquis Local Plan area must be carried out in accordance with: i) The framework for development described in the Precinct and Structure Plan (**Schedule 2**); ii) the recommendations and operational framework of the site Environmental Impact Statement for Aquis Resort at the Great Barrier Reef Pty Ltd; iii) The conditions attached to the Preliminary Approval given under section 242 of the *Sustainable Planning Act 2009*; and iv) the approved Environmental Management Plans for all activities in the: o construction; o operation; and o maintenance; phases of the development.
Integrated Resort Development	
PO2 Development delivers an integrated resort that consists of the following components: a) Accommodation for up to 12,000 guests (at peak occupancy) in 7,500 hotel rooms and suites configured in 8 towers, with a total GFA of 625,000m^2; b) A casino with a total GFA of 40,000m^2; c) Two (2) 600 seat theatres with total GFA of 5,000m^2;	**AO2.1** Development is designed to be generally in accordance with the layout of the Aquis Master Plan (refer Schedule 3). **AO2.2** A staging plan demonstrating staging and achievement of the integrated resort.

Performance outcome	Acceptable outcomes
d) 10,000m^2 of retail, restaurants, bars and food and drink outlets; e) An aquarium with a total GFA of 2,250m^2 and a rainforest with a total GFA of 2,500m^2 (architectural features of the site and not stand-alone uses); f) A 12.4 hectare reef lagoon as a central feature; g) A 25,000m^2 convention and exhibition centre; h) A cultural heritage centre; i) Circulation, shared space, back-of-house and services, with a total GFA of 350,000m^2; j) Guest and staff parking for 1,400 vehicles, with a total GFA of 80,000m^2; k) landscaping, lagoons, pools and entry water features with a total GFA of 110,000m^2; l) an 18-hole golf course (including a driving range and clubhouse); m) a tennis centre; n) equestrian facilities; o) a community sports and recreation facility; and p) environment facilities.	
PO3 The distribution of land use in all Precincts is to be generally in accordance with the Precinct Plan (Schedule 3).	**AO3.1** The general dimensions and shape of the precincts are to be in accordance with those shown on Schedule 2.
	AO3.2 The Resort Complex Precinct comprises the built form of the resort complex surrounded by an artificial lake (refer Schedule 3).
	AO3.3

Performance outcome	Acceptable outcomes
	The Sports and Recreation Precinct comprises sport and recreation facilities including an 18 hole golf course (refer Schedule 3) .
	AO3.4 The Environment Management and Conservation Precinct comprises protection and preservation of native vegetation and ecological restoration works of natural vegetation around the perimeter of the site, along Yorkeys Creek, and adjacent to Yorkeys Knob Road (refer Schedule 3).
Operation of the Cairns International Airport	
PO4 Development is designed and constructed to protect the operations of the Cairns Airport, including during construction by avoiding: a) encouraging wildlife; b) causing nuisance, turbulence, reduction of visibility nor light nuisance; c) incompatible intrusions which compromise aircraft safety in operational airspace; d) increasing public risk or reduced amenity; and e) creating or causing emissions into operational airspace.	**AO4.1** Building heights including structures in the Resort Complex Precinct are limited to a maximum of 65 metres above the existing ground level (2.5 metres AHD) or below the Obstacle Limitation Surface (OLS) for the Cairns airport, whichever is the lesser (refer Figure a).
	AO4.2 Building heights including structures in the Sport and Recreation Precinct are limited to a maximum of 15 metres.

Performance outcome	Acceptable outcomes
 Figure a	
	AO4.3 Building heights including structures in the Environment Management and Conservation Precinct are limited to a maximum of 15 metres.
	AO4.4 Buildings and structures do not encroach into the airport's operational airspace.
	AO4.5 Cranes or other equipment used during construction do not encroach into the airport's operational airspace.
	AO4.6 Landscaping does not include vegetation that at maturity will encroach into the airport's operational airspace.
	AO4.7 Development involving transient activities such as parachuting, hot air ballooning and hang-gliding will not occur within the airport's operational airspace.

Performance outcome	Acceptable outcomes
	AO4.8 Development within the lighting buffer zone for the Cairns airport does not include any of the following types of outdoor lighting: i) straight parallel lines of lighting 500m to 1000m long ii) flare plumes iii) upward shining lights iv) flashing lights v) laser lights vi) sodium lights vii) reflective surfaces .
	AO4.9 Development within the lighting buffer zone for the Cairns airport does not emit light that will exceed the maximum light intensity specified for the area.
	AO4.10 Development does not emit smoke, dust, ash or steam into the airport's operational airspace. **Or** Development does not emit a gaseous plume into the airport's operational airspace at a velocity exceeding 4.3m per second. **Or** Development emitting smoke, dust, ash, steam or a gaseous plume exceeding 4.3m per second is designed and constructed to mitigate adverse impacts of emissions upon operational airspace.
	AO4.11 Development does not involve uses associated with increases in wildlife strikes, hazards and includes measures to reduce the potential to attract birds or bats.

Performance outcome	Acceptable outcomes
	AO4.12 Development does not create: i) permanent or temporary physical obstructions in the line of sight between antennas; ii) an electrical or electromagnetic field that will interfere with signals transmitted by the facility; and iii) reflective surfaces that could deflect or interfere with signals transmitted by the facility. **Or** Development is designed and constructed to mitigate adverse impacts on the function of aviation facilities.
	AO4.13 Development is designed and constructed to attenuate aircraft noise by achieving the indoor design sound levels specified in *Table E:Desirable indoor sound levels for sensitive land uses of the SPP Guideline: Strategic airports and aviation facilities* as it applies to short term accommodation.
	AO4.14 Development does not include permanent residential accommodation uses, except for caretaker's residence.

Performance outcome	Acceptable outcomes
Landscape Design	
PO5 The landscape should reflect and enhance the tropical character of the region by: a) respecting and celebrating the regional context; b) being appropriate for the climate, soil conditions, water regime and other local environmental conditions; c) using local and locally appropriate species and design approaches which celebrate the tropical conditions; and d) enhancing the local environment, and assisting in minimising the environmental footprint.	**AO5.1** Landscaping: i) celebrates the unique regional values of reef and rainforest; ii) reflects the coastal character of the region; iii) seamlessly integrates with the built form and moderates the impact of engineering structures; iv) protects and enhances key vistas and the regional visual character, including at night and when viewed from the sea; and v) restores and protects the natural values of existing water bodies.
	AO5.2 A Landscaping Plan ensures landscaping is designed and implemented to: i) integrate landscaping into the built form; ii) integrate the built form into the landscape; iii) ensure landscape is viewed and appreciated from locations off-site including screening, where appropriate, from sensitive viewing locations; iv) suit local climatic conditions and water availability; v) celebrates tropical plant material and design opportunities which provide for a tropical lifestyle; vi) screen development from surrounding areas;

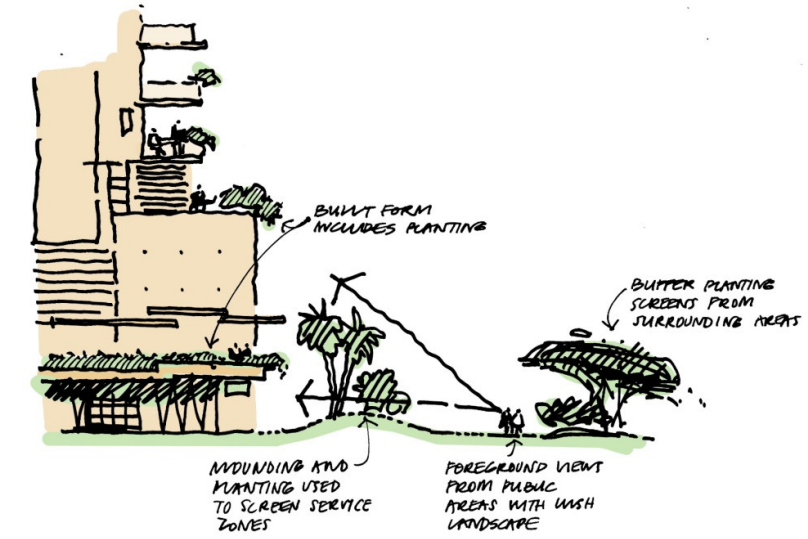
Performance outcome	Acceptable outcomes
	vii) be appropriate for the local climate conditions and resilient to extremes of weather; viii) incorporate local native flora; ix) provide a variety of habitat for local fauna species; x) incorporate integrated stormwater management; and xi) encourage exploration and be accessible to all visitors including those with disabilities. Refer Figure b
PO6 The landscape design minimises risk to persons and property.	**AO6.1** The landscape design incorporates: i) planting that does not restrict opportunities for casual surveillance; ii) lighting that is designed and installed in accordance with the *Australian Standard AS1158 – Lighting for Roads and Public Spaces*; iii) legible artwork and furniture placements; and iv) legible universal signage.
	

Figure b

Performance outcome	Acceptable outcomes
Energy Efficiency and Building Sustainability	
PO7 Development incorporates best practice energy efficiency and sustainable design and construction techniques.	**AO7.1** Buildings are to be designed to maximise the use of natural lighting and ventilation.
	AO7.2 Buildings are designed to 5-6 star rating standards for energy conservation including: i) light and motion sensors and timers to switch on lighting (including external / pathway lighting); ii) energy efficient light bulbs; iii) solar hot water; iv) solar electric panels; v) reticulated gas; and vi) energy efficient and water efficient appliances.
	AO7.3 Golf Course operations : i) minimise the need for irrigation by use of salt water tolerant plant and grass species; and ii) use low energy lighting equipment for any golf driving range or on-course lighting.
Waste management	
PO8 The collection, storage and disposal of waste ensures the site, receiving waters and surrounding land are protected from potential environmental and amenity impacts.	**AO8.1** Waste storage areas / collection facilities are to be screened or enclosed within a service yard or enclosed space.
	AO8.2 Service facilities are not to be visible from open space areas and any public road.
	AO8.3 Waste management systems consistent with the *Draft Queensland Waste Avoidance and Resource Productivity Strategy 2014-2024* are to be employed during the construction and

Performance outcome	Acceptable outcomes
	operational stages of the development.
	AO8.4 A Waste Management Strategy is to be submitted to Council prior to the commencement of onsite works and approved prior to the commencement of use.
Infrastructure	
PO9 The development is connected to a reticulated water supply and provided with a potable water supply including water supply for firefighting purposes that is adequate for the needs of the development.	**AO9.1** Water supply infrastructure is to be designed and constructed in accordance with the *FNQROC Regional Development Manual* (or equivalent).
PO10 The development is to be connected to a wastewater system that is appropriate for the level of demand generated by the development.	**AO10.1** Wastewater supply infrastructure is to be designed and constructed in accordance with the *FNQROC Regional Development Manual* (or equivalent).
PO11 The development is provided with an energy supply.	**AO11.1** Development is connected to a reticulated electricity supply in accordance with the standards of the relevant energy supply authority.
PO12 The development is provided with an adequate telecommunications supply that is appropriate to the current and future demands of the development.	**AO12.1** Development is connected to telecommunications infrastructure in accordance with the standards of the relevant telecommunications provider.
PO13 Surrounding local road networks are to be capable of accommodating the traffic demand generated by the development and existing communities.	**AO13.1** External road works are to be improved and maintained to meet the demand and standards of service required for the needs of local communities and the Aquis Resort.

Performance outcome	Acceptable outcomes
Connectivity and Movement	
PO14 Pedestrian links and internal pathways achieve a consistent high quality urban design and pedestrian comfort.	**AO14.1** Artwork, street furniture and functional decorative footpath pavement features are used throughout the development as approved in the Landscaping Plan.
PO15 Pedestrian links and internal pathways include appropriate access and mobility infrastructure.	**AO15.1** Development is provided with pedestrian links and internal pathways that: i) are well defined; ii) comply with CPTED principles; iii) cater for mobility and visually impaired persons; and iv) accommodate the operations of emergency vehicles and other service vehicles
Visual, Lighting and Noise Management	
PO16 Development protects the amenity of surrounding residential uses and is separated from sensitive noise receptors.	**AO16.1** Lighting is designed to restrict glare with all lights above tree height to be shielded and downwards directed.
	AO16.2 The location of ventilation and mechanical plant ensures that prevailing breezes do not direct noise toward nearby residential uses.
	AO16.3 Distance is to be maximised between construction activities and sensitive noise receptors, and vegetated buffers are established between construction activities and nearby sensitive noise receptors.

Performance outcome	Acceptable outcomes
	AO16.4 Noise and vibration emissions are to comply with *Australian Standard AS2436-2010 – Guide to noise and vibration control on construction, demolition and maintenance sites.*
Air Quality	
PO17 Development is designed to avoid or otherwise minimise adverse impacts from emissions on surrounding residential land and other sensitive receptors.	**AO17.1** Construction / work areas are to be sprayed with water during dry weather.
	AO17.2 A vegetated buffer zone is to be established between the golf course and the nearby Yorkeys Knob residential area during construction.
	AO17.3 An Environmental Management Plan (EMP – Construction) is to be submitted to and approved by all relevant authorities prior to the commencement of onsite works.
Construction Management	
PO18 Site works are undertaken in a manner that does not cause impacts on the amenity of the surrounding area.	**AO18.1** Construction is to be confined to the development site.
	AO18.2 Construction activities are undertaken to meet the noise and air quality standards under the *Environmental Protection Act 1994*; and Acoustic and Air Quality objectives of *Appendix 6 State Planning Policy 2014.*
	AO18.3 Works to be carried out in accordance with an Environmental Management Plan (EMP – Construction) approved by all relevant authorities prior to the commencement of onsite works.

Performance outcome	Acceptable outcomes
	AO18.4 Any traffic associated with construction including haulage off site of excavated material, which may be required to occur outside normal work hours, is to have regard to the relevant noise standards under the *Environmental Protection Act 1994* and Acoustic and Air Quality objectives of *Appendix 6 State Planning Policy 2014.*
Environment Management	
PO19 Impacts from development on surrounding sensitive receptors during construction and operation are to be minimised.	**AO19.1** The following Environmental Management Plans are to be submitted to and approved by Council prior to the commencement of onsite works: • Disaster and Natural Hazard Strategy; • Environmental Management Plan (EMP – Construction); • Landscape and Habitat Strategy; • Restoration and Rehabilitation Strategy; • Sustainability Strategy; • Waste Management Strategy.
	AO19.2 All construction and on-going management is to be in accordance with the approved EMP.
Water Quality	
PO20 Development does not discharge wastewater to a waterway or off-site unless demonstrated to be best practice environmental management.	**AO20.1** Development meets the stormwater management design objectives of *Appendix 2 Table A Construction Phase - State Planning Policy 2014.*

Performance outcome	Acceptable outcomes
	AO20.2 Development meets the stormwater management design objectives of *Appendix 2 Table B Post Construction Phase - State Planning Policy 2014*.
Reconfiguring of a Lot	
PO21 The reconfiguration of lots, including long term lease arrangements, ensures that: a) the areas and dimensions of lots can accommodate land uses that are consistent with the overall outcomes; b) the Aquis Resort continues to operate as a single integrated resort complex; c) appropriate separation between development and adjoining land uses and sensitive receiving environments can be achieved; d) the conditions of the Coordinator General's Evaluation Report can be met; and e) the conditions attached to the Preliminary Approval given under section 242 of the *Sustainable Planning Act 2009* can be met.	**AO21.1** No acceptable outcomes are provided.

7.4 Assessment Criteria for Resort Complex Precinct

The following outcomes apply to development in the Resort Complex Precinct.

Performance outcomes	Acceptable outcomes
Built Form	
PO1 Development has a built form that: a) has a distinct and iconic tropical design and articulation resulting in recognisable architecture with unique attributes for each building;	**AO1.1** No acceptable outcomes are specified. Note: Figures c, d, e, f and g, provide guidance on design that assists in interpreting and complying with the performance outcome.

Performance outcomes	Acceptable outcomes
b) protects longer views to the site by a low and horizontal emphasis, particularly when viewed from the Great Barrier Reef Marine Park; c) defines edges and gateways, using architectural and landscaping features, to contribute to the quality of landmarks and entry points and experience of the resort; d) ensures separations between buildings achieve permeability for air flow, solar benefits and view lines, and achieve substantial landscaping to define ground floor and spaces between buildings; e) is oriented towards visitors and guests on the ground level with a focus on pedestrian comfort, scale and amenity, and integrates with transport and pedestrian connectivity; f) is dominated by a landscaped form, including green walls green walls, green roofs, vertical gardens, atriums, deep planting areas and use of water features; and g) ensures multi-functional spaces are provided within, between and externally for gathering and recreational events.	**AO1.2** A detailed 'Resort Complex Precinct Development Plan' is submitted to the Cairns Regional Council for approval prior to issue of the first development permit for development in the precinct; This Plan is to demonstrate: i) Staging/sequencing ii) Key infrastructure links iii) Specific land use clusters (e.g. casino/convention/hospitality/retail/short term accommodation) iv) Layout of built, landscaped, recreation areas/facilities and integration v) Public/non-public areas and design outcomes vi) More 3D form based outcomes vii) Specific built outcomes (e.g. Active frontages, design around a gateway/node etc.) viii) Integration between activities (e.g. back of house compared to front of house in a 3D podium).

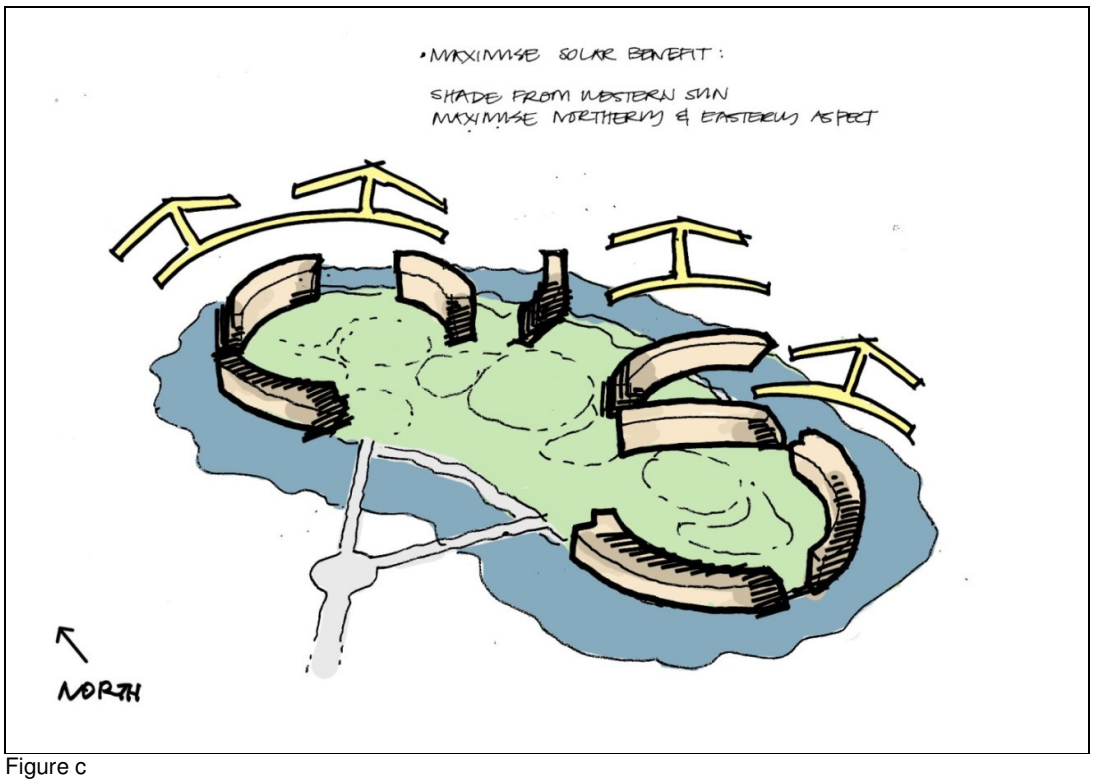

• MAXIMISE SOLAR BENEFIT :
SHADE FROM WESTERN SUN
MAXIMISE NORTHERN & EASTERLY ASPECT
NORTH

Figure c

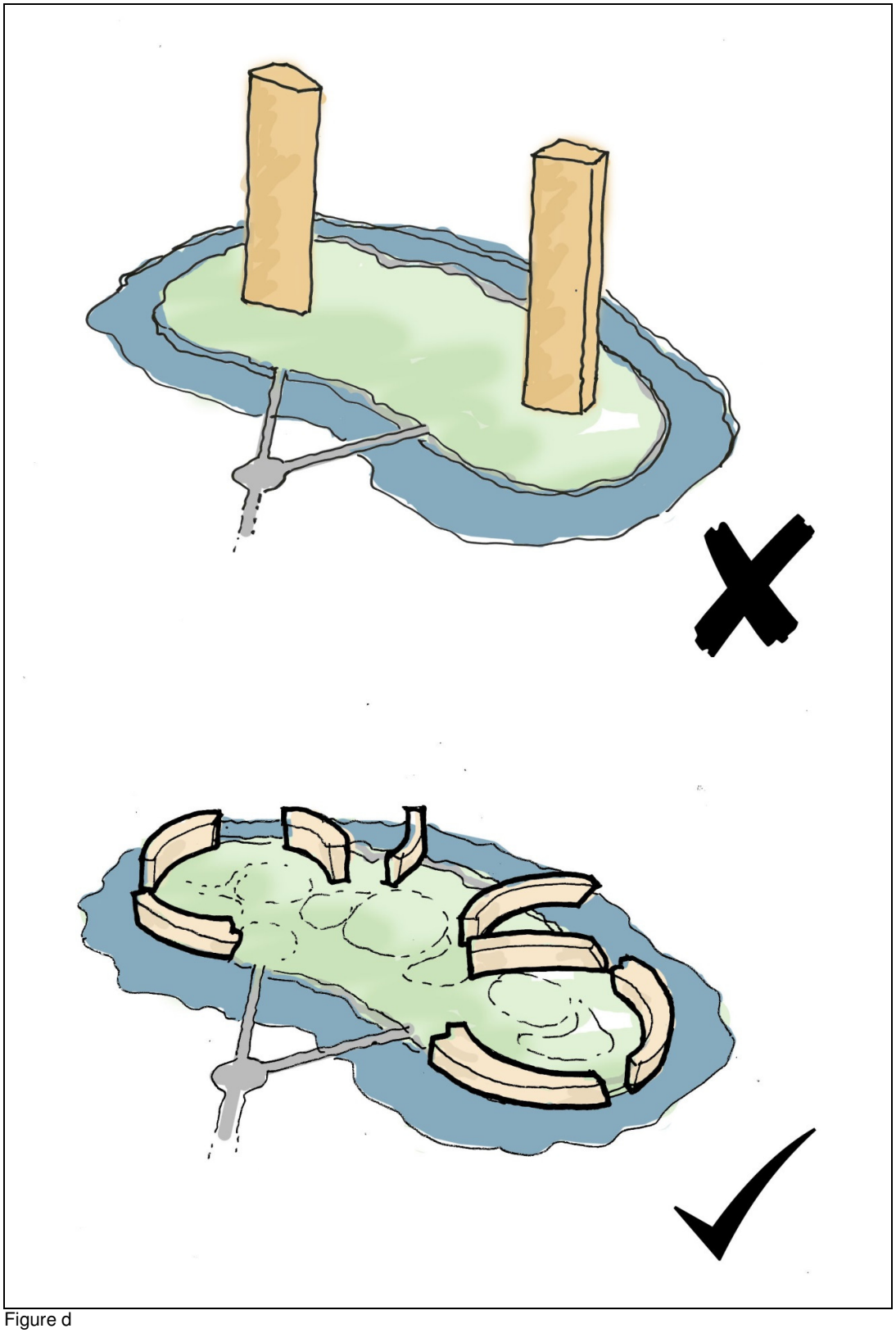


Figure d

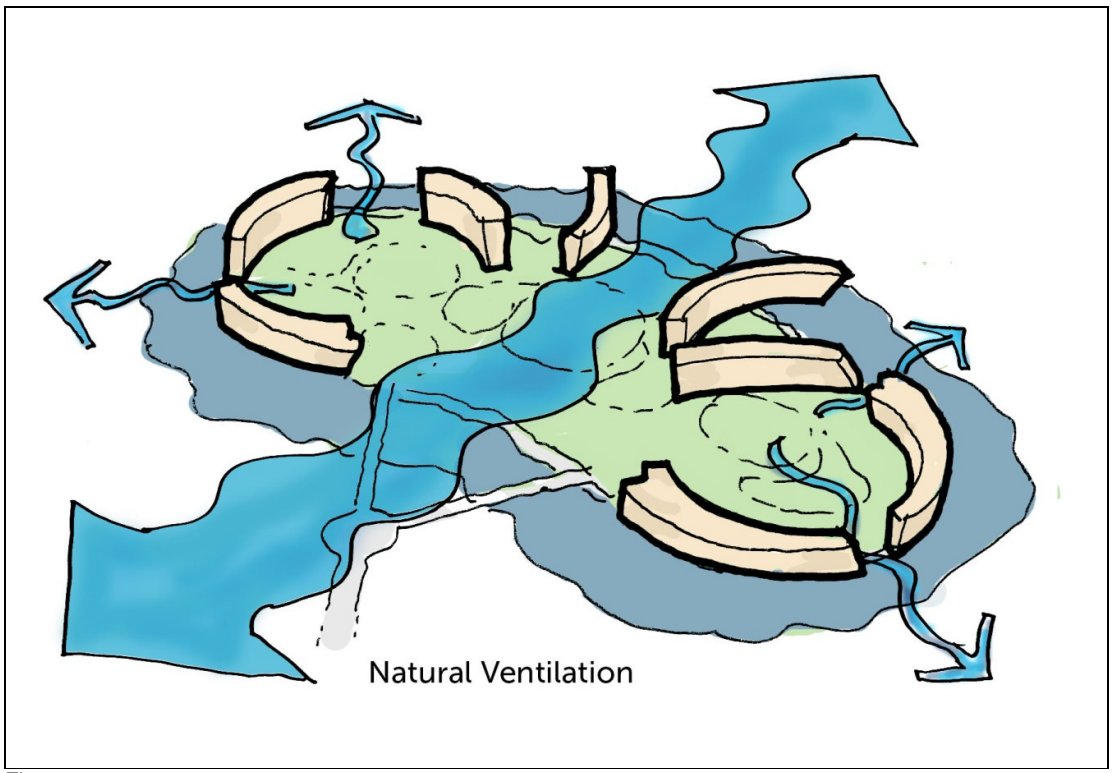


Figure e

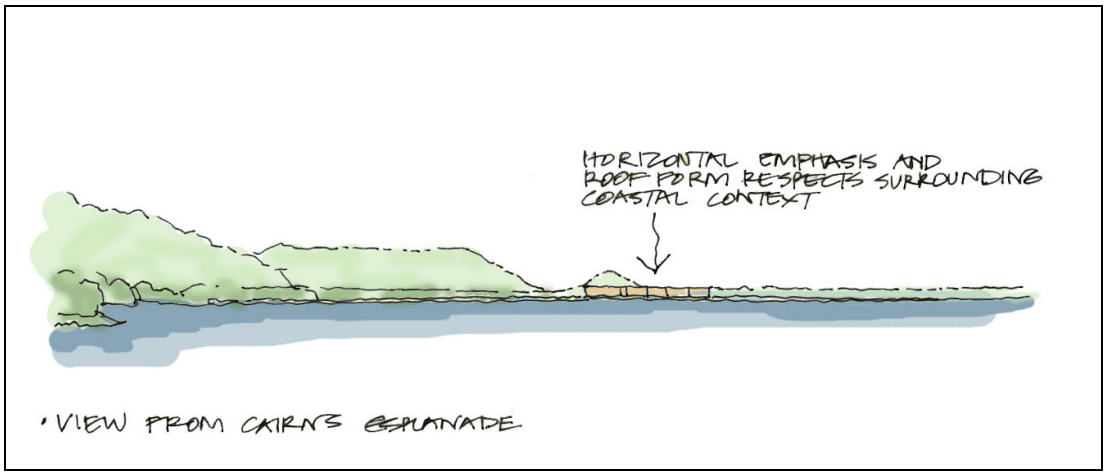


Figure f

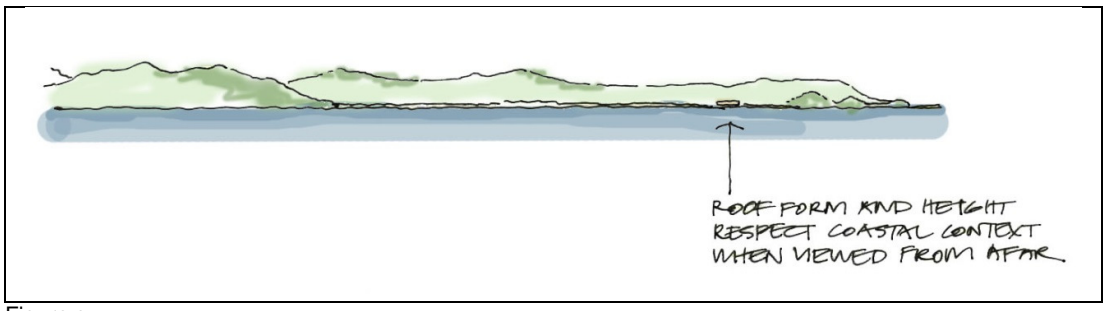


Figure g

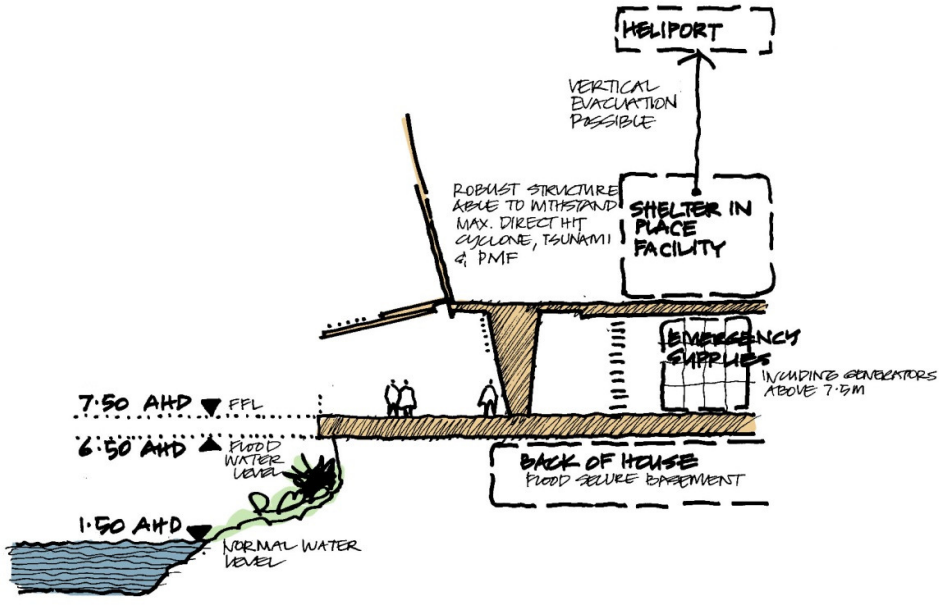
Performance outcomes	Acceptable outcomes
PO2 Development provides immunity to and safe refuge from extreme natural hazard events and risk.	**AO2.1** The ground floor level is on a podium level established at a level of 7.5 metres AHD which is above the Probable Maximum Flood (PMF) for the Barron River Delta Floodplain, storm tide inundation PMF and tsunami level. Refer Figure h
	AO2.2 The Resort Complex is constructed over a flood secure basement which incorporates back-of-house support facilities. Refer Figure h
	AO2.3 Safe refuge is provided for guests and staff based on a 'shelter-in-place' strategy, supported by emergency power, stores, medical facilities, water supplies, waste storage, and access for emergency vehicles where practicable. Refer Figure h
	AO2.4 One (1) heliport is accessible above the safe refuge level (6.5m AHD). Refer Figure h
	

Figure h

Performance outcomes	Acceptable outcomes
Accommodation Density and Type	
PO3 The accommodation density of the development reflects an integrated resort catering for short stay tourists.	**AO3.1** The development does not include any permanent residents other than a caretaker residence or residences.
	AO3.2 The maximum accommodation density is 33pph (at 1.5 persons / bedroom).
	AO3.3 Accommodation is available for a maximum of 12,000 guests in a maximum of 7,500 rooms and does not exceed 625,000m^2 GFA.
Commercial Density and Function	
PO4 The Resort Complex supports the role and hierarchy of Activity centres in the Cairns region, as described in the Cairns Regional Planning Scheme.	**AO4.1** The scale of resort complex commercial uses does not exceed: Casino floors – 40,000m^2 GFA Convention and Exhibition – 23,000m^2 GFA Theatres – 5,000m^2 GFA Retail & hospitality – 10,000m^2 GFA
	AO4.2 Retail and theatre uses are to be designed and operated to optimise use by resort visitors.
	AO4.3 No single use or mix of uses is in a form of a supermarket, discount department store or department store.
Other Uses Density	
PO5 The Resort Complex complements the role of existing tourist attractions in the greater Cairns area.	**AO5.1** The resort includes an aquarium and rainforest as architectural features of the.
	AO5.2 The scale of aquarium and rainforest features is approximately: Aquarium – 2,250m^2 GFA Rainforest – 2,500m^2 GFA

Performance outcomes	Acceptable outcomes
Flood Management	
PO6 Development facilitates the flow of water through the floodplain such that there is a no worsening of flood events or velocities caused on adjoining land upstream, downstream or adjacent to the site.	**AO6.1** The artificial lake provides increased flood conveyance capacity to compensate for the raised resort complex.
	AO6.2 The lake is 'quarantined' from adjacent groundwater through the use of a cut-off barrier of low permeability, to limit interference with groundwater level and quality.
Vehicle and Cycle Parking Accessibility and Servicing	
PO7 Provision is made for on-site vehicle parking to meet the demand generated by the development.	**AO7.1** Car parking is provided to cater for day guests, visitors and staff.
	AO7.2 Car parking is available in the basement of the Resort Complex for a maximum of 1,400 spaces.
	AO7.3 Car parking is provided in stages at 1 space per 6 rooms accommodation.
	AO7.4 Bus set down and parking is available within the built form and basements.
	AO7.5 High quality end-of-trip bicycle facilities are provided for patrons and staff of the resort in accordance with *Austroads Guide to Traffic Management Part 11 Parking* including Queensland Transport Cycle Note C4 End-of-Trip Facilities.
PO8 Loading facilities and storage areas cater for the demand generated by the development and protect the amenity of the site and adjoining premises.	**AO8.1** Hall spaces in the Convention and Exhibition Centre can be directly accessed by service vehicles to allow for the direct and efficient loading/unloading of goods.

Performance outcomes	Acceptable outcomes
	AO8.2 Back-of-house facilities are separated from front-of-house facilities.
	AO8.3 Storage is available in back-of-house areas for Expo booths and all ancillary components required for the operation of the Expo facility, without a need for open air storage.
	AO8.4 All meeting spaces and ballrooms are serviced via adjacent back-of-house storage facilities.
Environmental Management	
PO9 The artificial lake is designed, constructed and maintained to achieve high water quality standards and objectives.	**AO9.1** The lake incorporates a tidal exchange system connected to the Coral Sea via an inlet located 2.2km off-shore, remote from the turbid zone of the near-shore waters with a diffused outlet discharge.

7.5 Assessment Criteria for Sports and Recreation Precinct

The following outcomes apply to development in the Sports and Recreation Precinct.

Performance outcomes	Acceptable outcomes
Built Form	
PO1 The built form of the development reflects the unique location of the site and responds sympathetically to the tropical climate.	**AO1.1** The facilities are orientated and shaped to create a gateway to the Resort Complex and the Yorkeys Knob community. **AO1.2** A detailed 'Sports and Recreation' Precinct Development Plan is submitted to the Cairns Regional Council for approval prior to issue of the first development permit for development in the precinct;

	This Plan is to demonstrate: i) Staging/sequencing ii) Key infrastructure links iii) Specific land use clusters (e.g. Golf course, Equestrian facilities, outdoor recreation facilities) iv) Layout of built, landscaped, recreation areas/facilities and integration v) Public/non-public areas and design outcomes vi) Specific built outcomes (e.g. Active frontages, design around a gateway/node etc.) vii) Integration between activities
	AO1.3 The golf club house is located a minimum of 200 metres from the nearest residential area of Yorkeys Knob (Refer Schedule 2).
	AO1.4 The distribution of sport and recreation uses is to be generally in accordance with Schedule 3.
	AO1.5 Public access and use of the sport and recreation facilities is encouraged.
Performance outcomes	**Acceptable outcomes**
Parking Accessibility and Servicing	
PO2 The development provides sufficient parking spaces to cater for the likely demand to be generated by the development.	**AO2.1** A total of 3,000 staff car parking spaces are provided in stages in the Sport and Recreation Precinct.
	AO2.2 Where parking is provided at grade the surface area is to be surrounded by deep landscaping and inter-spaced with large areas of open space and planting to create the impression of a series of separate car parks not one mass. Refer Figure i

	AO2.3 Where parking is provided over a number of levels, the number of levels should not exceed two (2) aboveground, and each level of the parking structure is edged with planting that forms a green edge to the structure. Refer Figure j
Community Facilities	
PO3 Community sport and recreation facilities are provided at Yorkeys Knob to meets the needs of the Yorkeys Knob community.	**AO3.1** Land to the north of Dunne Road and west of Yorkeys Knob Road is to be developed for sport and recreation purposes open to the public.

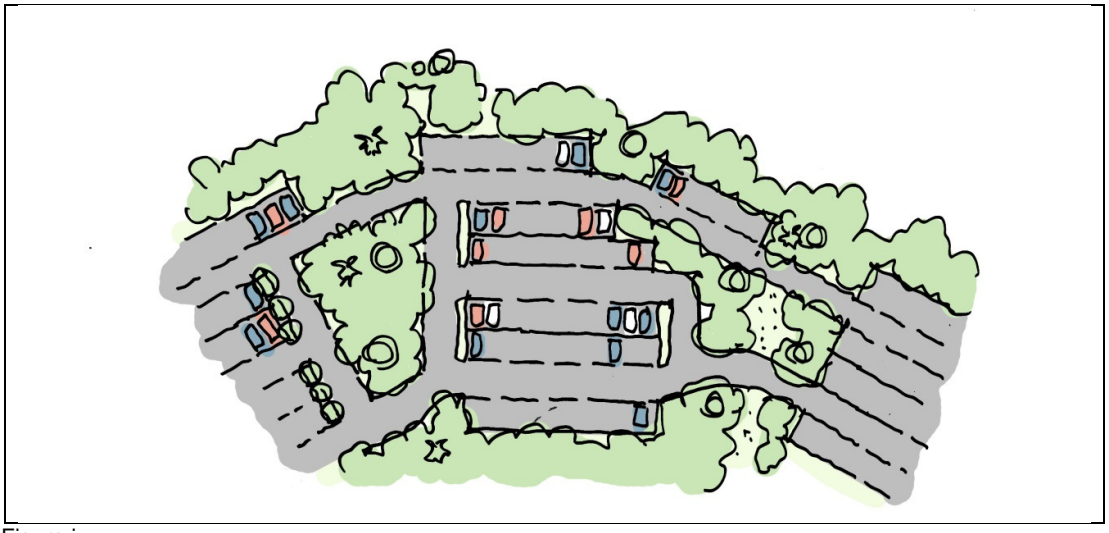


Figure i

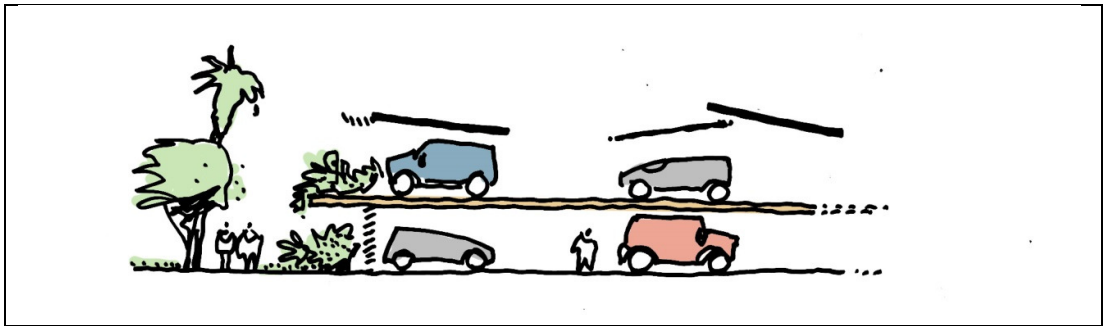


Figure j

7.6 Assessment Criteria for Environment Management and Conservation Precinct

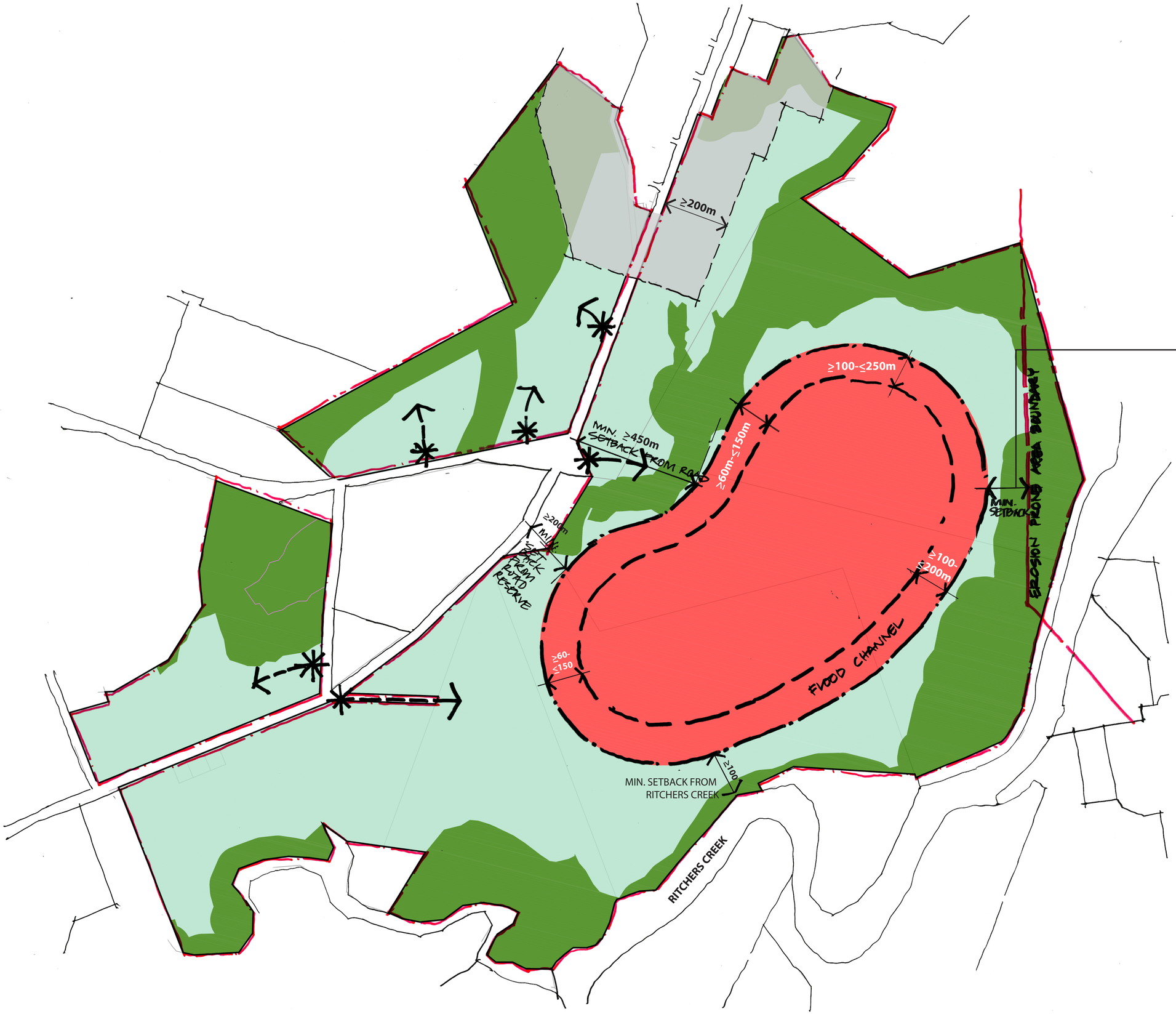
The following outcomes apply to development in the Environment Management and Conservation Precinct.

Performance outcomes	Acceptable outcomes
Environmental Management	
PO1 Development is sympathetic to the native vegetation and ecological values of the site.	**AO1.1** Environment facilities, including boardwalks, viewing platforms, and interpretative facilities, established in the Precinct provide an experience for guests and visitors. **AO1.2** A detailed 'Environment Management and Conservation Precinct Development Plan' is submitted to the Cairns Regional Council for approval prior to issue of the first development permit for development in the precinct; this Plan is to demonstrate: i) Staging/sequencing ii) Key infrastructure links iii) Public/non-public areas and design outcomes iv) Integration between activities
	AO1.3 Connectivity of Yorkeys Creek through to the Cattana Wetlands is to be improved by the removal of existing waterway barriers on Yorkeys Creek.
PO2 Rehabilitation and restoration works are maintained to ensure ecological values are retained and enhanced.	**AO2.1** Maintenance and weed control is to be carried out on a regular basis, and in accordance with the Environmental Management Plan (Operation and Maintenance).

SCHEDULE 1

LOT AND PLAN DETAILS	AREA
Lot 100 on NR3818 Title Ref: 20983091	121.001ha
Lot 1 on RP800898 Title Ref: 21449027	40.835ha
Lot 2 on RP800898 Title Ref: 21449028	46.35ha
Lot 2 on RP745120 Title Ref: 21343157	26.7596ha
Lot 60 on RP835486 Title Ref: 21027116	43.24ha
Lot 4 on RP713690 Title Ref: 20503245	3.88ha
Lot 1 on RP724792 Title Ref: 20864025	2173m^2
Lot 2 on RP746114 Title Ref: 21360116	2515m^2
Lot 3 on RP746114 Title Ref: 21360117	2000m^2
Lot 4 on RP746114 Title Ref: 21360118	28.266ha
Lot 4 on RP749342 Title Ref: 21418082	30.74ha

SCHEDULE 2



LEGEND

- ACCESS POINTS
- EXCLUSION AREA FOR STRUCTURES
- RESORT COMPLEX
- SPORT AND RECREATION
- ENVIRONMENTAL MANAGEMENT AND CONSERVATION

≥150m from Department of Environment and Heritage Protection Erosion Prone Area maps for Cairns Region LGA CTS06692/14 Plan No: CAR2A Map 3 declared 7 May 2014

FLANAGAN CONSULTING GROUP

AQUIS GREAT BARRIER REEF RESORT

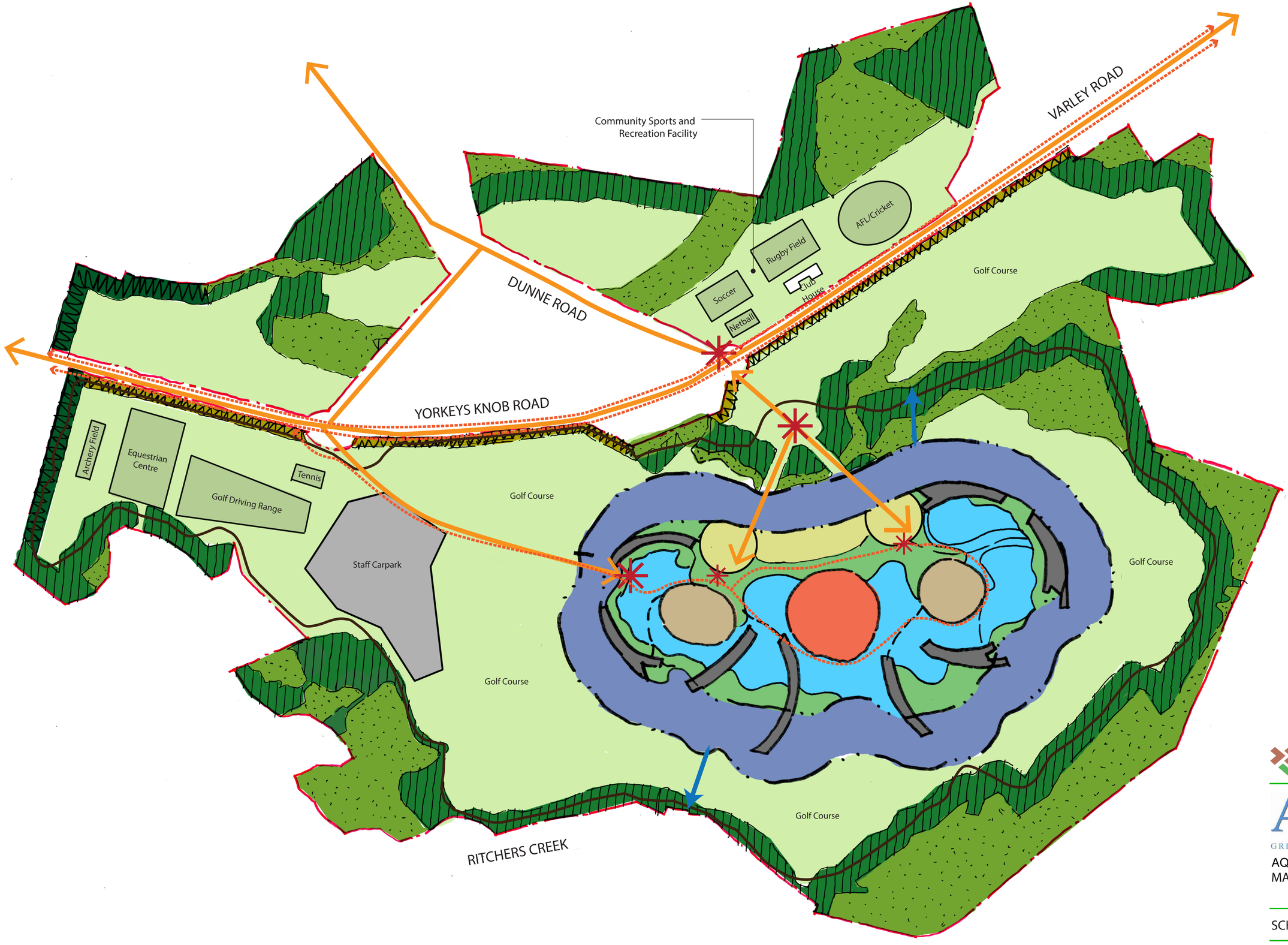
AQUIS LOCAL PLAN
PRECINCT AND STRUCTURE PLAN

SCHEDULE 2

NTS
A1 Full Size

3 November 2014

SCHEDULE 3



LEGEND

- 20m SCREENING VEGETATION
- 40m SPRAY BUFFER
- REHABILITATION PLANTING
- NATIVE VEGETATION
- SPORTS AND RECREATION
- CONVENTION CENTRE / EXPO
- CASINO
- HOTELS
- PUBLIC REALM
- ARRIVAL PLAZA
- LAGOON
- LAKE
- LAKE OVERFLOW
- ROAD
- PEDESTRIAN / CYCLE
- WALKING / EQUESTRIAN PATHS
- ARRIVAL NODE / GATEWAY

FLANAGAN CONSULTING GROUP

AQUIS GREAT BARRIER REEF RESORT

AQUIS LOCAL PLAN
MASTER PLAN

SCHEDULE 3 — NTS
A1 Full Size

3 November 2014

SCHEDULE 4

USE DEFINITIONS

Column 1 Use	Column 2 Definition	Column 3 Examples Include	Column 4 Does not include the following examples
Caretaker's accommodation	A dwelling provided for a caretaker of a non-residential use on the same premises		Dwelling house
Club	Premises used by persons associated for social, literary, political, sporting, athletic or other similar purposes for social interaction of entertainment. The use may include the ancillary preparation and service of food and drink.	Club house, guide and scout clubs, sporting club.	Hotel, nightclub entertainment facility, place of worship, theatre,
Environment Facility	Facilities used for the conservation, interpretation and appreciation of areas of environmental, cultural or heritage value.	Nature based attractions, walking tracks, seating, shelters, boardwalks, observation decks, bird hides.	
Food and drink outlet	Premises used for preparation and sale of food and drink to the public for consumption on or off the site. The use may include the ancillary sale of liquor for consumption on site/	Bistro, café, coffee shop, drive-through facility, kiosk, milk bar, restaurant, snack bar, take-away, team room	Bar, club, hotel, shop, theatre, nightclub entertainment facility.
Indoor sport and recreation	Premises used for leisure, sport or recreation conducted wholly or mainly indoors.	Amusement parlour, bowling alley, gymnasium, squash courts, enclosed tennis court.	Cinema, hotel, nightclub, entertainment facility, theatre.
Major sport, recreation and entertainment	Premises with large scale built facilities designed to cater for large scale events including major sporting, recreation, conference and entertainment events.	Convention and exhibition centres, entertainment centres,	Indoor sport and recreation, local sporting field, motor sport park, outdoor sport and recreation.
Nightclub entertainment facility	Premises used to provide entertainment, which may include cabaret, dancing and music. The use generally includes the sale of liquor and food for consumption on site.		Club, hotel, tavern, pub, indoor sport and recreation, theatre, concert hall.

Outdoor sport and recreation	Premises used for a recreation or sport activity that is carried on outside a building and requires areas of open space and may include ancillary works necessary for safety and sustainability.	Driving range, golf course, swimming pool, tennis courts, football grounds, cricket oval Equestrian facilities (stables and arenas)	Major sport, recreation and entertainment facility, motor sport park,
Resort Complex	Premises used for tourist and visitor short-term accommodation that includes integrated leisure facilities including: • air services • child care centre • club • community use • educational establishment • emergency services • food and drink outlet • health care services • indoor sport and recreation • nightclub entertainment facility • non-resident workforce accommodation • place of worship • restaurants and bars • meeting and function facilities • service industry • shop • shopping centre • substation • sporting and fitness facilities • staff accommodation • theatre • transport facilities directly associated with the tourist facility such as ferry terminal and air service	helipad crèche cultural centre gallery training facilities evacuation centre in-house medical centre chapel laundry	
Telecommunications facility	Premises used for the provision of telecommunications services.		

Temporary workforce accommodation	Premises used to provide accommodation for construction workers. The use may include provision of recreational and entertainment facilities for the exclusive use of residents and their visitors.	Contractor's camp or, construction camp,	Relocatable home park, short term accommodation, tourist park.
Theatre	Premises used for providing on-site entertainment, recreation or similar facilities for the general public.		Hotel, major sport, recreation and entertainment facility, nightclub entertainment facility.

TERMS

Horizontal elevation and scale	Means a combined profile and building mass that is wider than it is high.
Preliminary Approval	Means the approval issued pursuant to S.242 SPA dated….for Application No…..

Acronyms and abbreviations

Acronym	Definition
AASS	actual acid sulfate soils
AEP	Annual exceedence probability
AEIS	Additional information to the environmental impact statement
ACH Act	Aboriginal Cultural Heritage Act 2003 (Qld)
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment Conservation Council
AS/NZS	Australian Standard/New Zealand Standard
ASS	acid sulfate soils
ASSMP	Acid sulfate soil management plan
Bonn	Convention on the Conservation of Migratory Species of Wild Animals
CAMBA	China–Australia Migratory Bird Agreement
CASA	Civil Aviation Safety Authority
CEMP	construction environment management plan
CHMP	cultural heritage management plan
CRC	Cairns Regional Council
DAFF	Department of Agriculture, Forestry and Fisheries
DATSIMA	Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
dB(A)	Decibels measured at the 'A' frequency weighting network
DCS	Department of Community Safety
DETE DEHP	Department of Education, Training and Employment Department of Environment and Heritage Protection
DE	Australian Government Department of the Environment
DHPW	Department of Housing and Public Works
DCCSDS	Department of Communities, Child Safety and Disability Services (Qld)
DMP	Dredge Management Plan
DSDIP	Department of State Development, Infrastructure and Planning
DTMR	Department of Transport and Main Roads (Qld)
DNPRSR	Department of National Parks, Recreation, Sport and Racing
DNRM	Department of Natural Resources and Mines
EA	environmental authority
EIS	environmental impact statement
EMP	environmental management plan
EMR	Environmental Management Register
EP Act	Environmental Protection Act 1994 (Qld)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EPP	Environmental Protection Policy (water, air, waste, noise)

Acronym	Definition
EPP (Air)	Environmental Protection (Air) Policy 2008
EPP (Noise)	Environmental Protection (Noise) Policy 2008
EPP (Water)	Environmental Protection (Water) Policy 2009
ERA	environmentally relevant activity
ESA	environmentally sensitive area
FHA	fish habitat area
FNQROC	Far North Queensland Regional Organisation of Councils
FTE	full-time equivalent
GARID	Guideline for the assessment of road impacts of development
GBRMP	Great Barrier Reef Marine Park
GBRWHA	Great Barrier Reef World Heritage Area
GDEMP	Groundwater Dependant Ecosystem Management Plan
GL	Gigilitre
HEV	High ecological value
IAS	initial advice statement
ICLR	independent community liaison representative
IECA	International Erosion Control Association
ISQG	Interim sediment quality guidelines
JAG	Queensland Department of Justice and Attorney-General
LOR	Limit of reporting
MCU	material change of use
ML	megalitres
MNES	matters of national environmental significance
MRA	Mineral Resources Act 1989 (Qld)
NAGD	National Assessment Guideline for Dredging
NC Act	Nature Conservation Act 1992 (Qld)
NCWR	Nature Conservation (Wildlife) Regulation 2006
NEPC	National Environmental Protection Council
NEPM NHP	national environment protection measure National heritage place
OLS	Obstacle Limitation Surface
OUV	Outstanding Universal Value
PASS	Potential acid sulfate soils
PMF	probable maximum flood
PMR	Protected Matters Search Report
QASSIT	Queensland Acid Sulfate Soils Investigation Team
QASSMAC	Queensland Acid Sulfate Soils Management Advisory Committee
QGEOP	Queensland Government Environmental Offsets Policy

Acronym	Definition
QH	Queensland Health
QTT	Queensland Treasury and Trade
QWQG	Queensland Water Quality Guidelines 2009
RE	regional ecosystem
REDD	Regional Ecosystem Description Database
RIA	road impact assessment
RMP	road-use management plan
SDPWO Act	State Development and Public Works Organisation Act 1971 (Qld)
SDWPO Regulation	State Development and Public Works Organisation Regulation (Qld)
TIA	Traffic Impact Assessment
SIA	social impact assessment
SIAU	Social Impact Assessment Unit
SPA	Sustainable Planning Act 2009 (Qld)
SPP	state planning policy
TEC	Threatened ecological community
TMP	traffic management plan
TOR	terms of reference
TSS	total suspended solids
TN	total nitrogen
TP	Total phosphorous
VM Act	Vegetation Management Act 1999 (Qld)
WRP	water resource plan
WTWHA	Wet Tropics World Heritage Area
WWTP	wastewater treatment plant

Glossary

Term	Definition
annual exceedance probability	The likelihood of occurrence of a flood of a given size or larger in any one year; usually expressed as a percentage.
assessment manager	For an application for a development approval, means the assessment manager under the *Sustainable Planning Act 2009* (Qld).
australian height datum	The datum that sets mean sea level as zero elevation. Mean sea level was determined from observations recorded by 30 tide gauges around the coast of the Australian continent for the period 1966 to 1968.
best practice environmental management	Is defined in the Queensland Environmental Protection Act 1994 as the best practice environmental management of an activity to achieve an ongoing minimisation of the activity's environmental harm through cost effective measures assessed against the measures currently used nationally and internationally for the activity.
benthic macroinvertebrate	Small animals living among the sediments and stones on the bottom of streams, rivers and lakes. Insects comprise the largest diversity of these organisms.
coastal erosion	Coastal erosion means the wearing away of land or the removal of beach or dune sediments by wave or wind action, tidal currents and water flows.
conservation advice	When a native species or ecological community is listed as threatened under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999, conservation advice is developed to assist its recovery. Conservation advice provides guidance on immediate recovery and threat abatement activities that can be undertaken to ensure the conservation of a newly listed species or ecological community.
construction areas	The construction worksites, construction car parks, and any areas licensed for construction or on which construction works are carried out.
controlled action	A proposed action that is likely to have a significant impact on a matter of national environmental significance; the environment of Commonwealth land (even if taken outside Commonwealth land); or the environment anywhere in the world (if the action is undertaken by the Commonwealth). Controlled actions must be approved under the controlling provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).
controlling provision	The matters of national environmental significance, under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth), that the proposed action may have a significant impact on.
Convention on Conservation of Nature in the South Pacific (Apia Convention)	The objective of the convention is to take action for the conservation, utilisation and development of the natural resources of the South Pacific region through careful planning and management for the benefit of present and future generations.

Term	Definition
convention on international trade in endangered species of wild fauna and flora (CITES)	Is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
convention on migratory species (BONN convention)	Is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme, concerned with the conservation of wildlife and habitats on a global scale. The convention aims to conserve terrestrial, aquatic and avian migratory species throughout their range.
coordinated project	A project declared as a ' coordinated project' under section 26 of the SDPWO Act. Formerly referred to as 'significant projects'.
Coordinator-General	The corporation sole constituted under section 8A of the *State Development and Public Works Organisation Act 1938* and preserved, continued in existence and constituted under section 8 of the SDPWO Act.
dredged material	Dredged material means mud, sand, coral, ballast, shingle, gravel, clay, earth and other material removed by dredging from the bed of tidal waters.
dredging	Dredging means the mechanical removal of dredged material from below tidal water.
environment	As defined in Schedule 2 of the SDPWO Act, includes: a) ecosystems and their constituent parts, including people and communities b) all natural and physical resources c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).
environmental effects	Defined in Schedule 2 of the SDPWO Act as the effects of development on the environment, whether beneficial or detrimental.
environmentally relevant activity (ERA)	An activity that has the potential to release contaminants into the environment. Environmentally relevant activities are defined in Part 3, section 18 of the *Environmental Protection Act 1994* (Qld).
essential habitat	As defined in the *Vegetation Management Act 1999*, essential habitat, for protected wildlife, means an area of vegetation shown on the regional ecosystem map or remnant map as remnant vegetation: (a) that has at least three essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or (b) in which the protected wildlife, at any stage of its life cycle, is located
foraging	Search for food

Term	Definition
highest astronomical tide	The highest level which can be predicted to occur under average meteorological conditions and any combination of astronomical conditions. In Australia HAT is calculated as the highest level from tide predictions over the tidal datum epoch (TDE), this is currently set to 1992 to 2011.
imposed condition	A condition imposed by the Queensland Coordinator-General under section 54B of the SDPWO Act. The Coordinator-General may nominate an entity that is to have jurisdiction for the condition.
initial advice statement (IAS)	A scoping document, prepared by a proponent, that the Coordinator-General considers in declaring a coordinated project under Part 4 of the SDPWO Act. An IAS provides information about: • the proposed development • the current environment in the vicinity of the proposed project location • the anticipated effects of the proposed development on the existing environment • possible measures to mitigate adverse effects.
maintenance of vegetation	Maintenance is described as ongoing vegetation management to avoid land degradation, maintain or increase biodiversity or maintain ecological processes.
matters of national environmental significance	The matters of national environmental significance protected under the *Environment Protection and Biodiversity Conservation Act 1999*. The eight matters are: a) world heritage properties b) national heritage places c) wetlands of international importance (listed under the Ramsar Convention) d) listed threatened species and ecological communities e) migratory species protected under international agreements f) Commonwealth marine areas g) the Great Barrier Reef Marine Park h) nuclear actions (including uranium mines).

Term	Definition
matter of state environmental significance	Matters of state environmental significance means the following natural values and areas protected under state environmental legislation: a) protected area estates (including all classes of protected area except nature refuges and coordinated conservation areas) under the *Nature Conservation Act 1992* b) marine parks (including 'marine national park', 'marine conservation park', 'scientific research', 'preservation' and 'buffer' zones) under the *Marine Parks Act 2004* c) fish habitat areas A and B under the *Fisheries Act 1994* d) threatened species (including plants, animals and animal breeding places) under the *Nature Conservation Act 1992* e) regulated vegetation under the *Vegetation Management Act 2009* f) high preservation areas of wild rivers under the *Wild Rivers Act 2005* g) high conservation value wetlands under the *Environment Protection Act 1994* h) legally secured offset areas.
marine debris	Maintenance is described as ongoing vegetation management to avoid land degradation, maintain or increase biodiversity or maintain ecological processes.
nesting	use or build a nest
nominated entity (for an imposed condition for undertaking a project)	An entity nominated for the condition, under section 54B(3) of the SDPWO Act.
piling activity/ies	Driving one and/or multiple structural supports into the ground below the waterline
properly made submission (for an EIS or a proposed change to a project)	Defined under section 24 of the SDPWO Act as a submission that: a) is made to the Coordinator-General in writing b) is received on or before the last day of the submission period c) is signed by each person who made the submission d) states the name and address of each person who made the submission e) states the grounds of the submission and the facts and circumstances relied on in support of the grounds.
proponent	The entity or person who proposes a coordinated project. It includes a person who, under an agreement or other arrangement with the person who is the existing proponent of the project, later proposes the project.
protected matters	A 'matter protected' as that term is defined in section 34 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth)) by a provision of Part 3 of the EPBC Act for which this approval has effect.

Term	Definition
recovery plans	Recovery plans set out the research and management actions necessary to stop the decline of, and support the recovery of, listed threatened species or threatened ecological communities. The aim of a recovery plan is to maximise the long term survival in the wild of a threatened species or ecological community.
reduced levels	The height or elevation above the point adopted as the site datum for the purpose of establishing levels.
restoration of vegetation	process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed and/or the expansion of that ecosystem into previously cleared areas.(Society for Ecological Restoration)
roosting	Settle or congregate for rest or sleep.
sediment plumes	Suspension of sediments and sand in the water column.
significant project	A project declared (prior to 21 December 2012) as a 'significant project' under section 26 of the SDPWO Act. Projects declared after 21 December 2012 are referred to as 'coordinated projects'.
soft start procedures	Initiated at the commencement of all marine piling activities by piling at low energy levels and then build up to full impact force. The first five impacts from the piling activity must be at no more than 50% of full hammer weight (e.g. a hammer with an adjustable stroke height of 0.6 metres at least 5 times during a 'soft start procedure), to encourage animals to move away from subsequent blows.
stated condition	Conditions stated (but not enforced by) the Coordinator-General under sections 39, 45, 47C, 49, 49B and 49E of the SDPWO Act. The Coordinator-General may state conditions that must be attached to a: • development approval under the *Sustainable Planning Act 2009* • proposed mining lease under the *Mineral Resources Act 1989* • draft environmental authority (mining lease) under Chapter 5 of the *Environmental Protection Act 1994* (EPA) • proposed petroleum lease, pipeline licence or petroleum facility licence under the *Petroleum and Gas (Production and Safety) Act 2004* • non-code compliant environmental authority (petroleum activities) under Chapter 4A of the EPA.
spud barge	A spud barge, or jack up barge is a type of vessel which is capable of providing a solid work platform in offshore, inland and coastal construction operations. Each "spud" consists of heavy-duty pipe or other fabricated cylindrical object, which is driven into the sea floor or river bottom for increased stability.
tertiary treatment	Tertiary treatment is often referred to as advanced wastewater treatment and essentially involves any further treatment after primary (physical) and secondary (usually biological) that further reduces the nutrient or organic load of the treated effluent.

Term	Definition
threat abatement plan	Threat abatement plans provide for the research, management, and any other actions necessary to reduce the impact of a listed key threatening process on native species and ecological communities. Implementing the plan should assist the long term survival in the wild of affected native species or ecological communities.
tidal gate	A gate through which water flows when the tide is in one direction and that closes automatically when the tide is in the opposite direction.
turbidity	A measure of water clarity how much the material suspended in water decreases the passage of light through the water. Suspended materials include soil particles (clay, silt, and sand), algae, plankton, microbes, and other substances.
water quality objectives (WQOs)	The numerical concentration limits, mass or volume limits per unit of time or narrative statements of indicators established for waters to enhance or protect the environmental values for those waters set out in: a) the Environmental Protection (Water) Policy 2009 schedule 1 for water mentioned in the policy b) otherwise the Queensland Water Quality Guidelines 2009.
works	Defined under the SDPWO Act as the whole and every part of any work, project, service, utility, undertaking or function that: a) the Crown, the Coordinator-General or other person or body who represents the Crown, or any local body is or may be authorised under any Act to undertake, or b) is or has been (before or after the date of commencement of this Act) undertaken by the Crown, the Coordinator-General or other person or body who represents the Crown, or any local body under any Act, or c) is included or is proposed to be included by the Coordinator-General as works in a program of works, or that is classified by the holder of the office of Coordinator-General as works.

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