Australia Pacific LNG Project

Volume 4: LNG Facility

Chapter 6: Land Use and Planning

Contents

6. Land use and planning 5
6.1 Introduction 5
6.1.1 Purpose 5
6.1.2 Scope of work 5
6.1.3 Legislative framework 5
6.2 Methodology 16
6.3 Existing environment 17
6.3.1 Current land use 17
6.3.2 Land tenure 19
6.3.3 Native Title 25
6.3.4 Mineral and petroleum resources 27
6.3.5 Extractive industry resources 29
6.3.6 Infrastructure and services 31
6.4 Potential impacts 31
6.4.1 Regional planning framework 31
6.5 Mitigation and management 49
6.6 Conclusion 49
6.6.1 Assessment outcomes 49
6.6.2 Commitments 52

Figures

Figure 6.1 Boundary of Commonwealth and State Great Barrier Reef Marine Park 8
Figure 6.2 State development area precincts 13
Figure 6.3 Gladstone Port Authority Land Use Plan, 1995 15
Figure 6.4 Land tenure 20
Figure 6.5 Protected areas (Part 1) 23
Figure 6.6 Protected areas (Part 2) 24
Figure 6.7 Native Title claims 26
Figure 6.8 Mining resources 28
Figure 6.9 Extractive resources 30

Tables

Table 6.1 Land tenure and ownership details 19

Table 6.2 Protected areas 21

Table 6.3 LNG facility's consistency with the Central Queensland Regional Plan 31

Table 6.4 Consistency of LNG facility development with CQSS 35

Table 6.5 Consistency of LNG facility with the desired environmental outcomes of the Curtis Coast Regional Coastal Management Plan 41

Table 6.6 Summary of environmental values, sustainability principles, potential impacts and mitigation measures 50

6. Land use and planning

6.1 Introduction

6.1.1 Purpose

This chapter describes the existing land use, land tenure, native title interests, resources and infrastructure affected by the development and operation of the liquefied natural gas (LNG) facility. The planning frameworks applying to this area are also discussed. The potential impacts likely to arise from the development of the LNG facility on the above elements are examined and mitigation measures identified to manage these impacts.

Of Australia Pacific LNG's 12 sustainability principles, the key relevant principles in relation to land use and planning for the LNG facility include:

- Minimising adverse environmental impacts and enhancing environmental benefits associated with Australia Pacific LNG's activities, products or services; conserving, protecting, and enhancing where the opportunity exists, the biodiversity values and water resources in its operational areas
- Respecting the rights, interests and diverse cultures of the communities in which Australia Pacific LNG operates
- Identifying, assessing, managing, monitoring and reviewing risks to Australia Pacific LNG's workforce, its property, the environment and the communities affected by its activities.

6.1.2 Scope of work

The discussion in this section relates to the proposed LNG facility. The discussion relating to the gas fields and the gas pipeline taking the coal seam gas (CSG) to the LNG facility, are presented in Volume 2 and Volume 3 respectively.

The discussion generally addresses the items outlined in Section 3.2.3 of the terms of reference for an environmental impact statement (EIS) – Australia Pacific LNG project, November 2009.

6.1.3 Legislative framework

Planning for the use of land and water required for the LNG facility is guided by a number of planning instruments and Acts. These are discussed below.

The planning instruments comprise regional plans (statutory and voluntary), development scheme for the Gladstone State Development Area (GSDA), town planning schemes for the relevant local authorities, port development plans, applicable state planning policies and Commonwealth plans. The voluntary regional plans were developed before the commencement of statutory regional plans and do not have legislative power.

Great Barrier Reef Marine Park

The Commonwealth *Great Barrier Reef Marine Park Act 1975* established a marine park around the Great Barrier Reef in 1975. The boundaries of this marine park do not include the LNG facility site and hence the management provisions for this park do not apply to this LNG facility. The nearest park boundary to the project site is located on the eastern side of Curtis Island (refer to Figure 6.1).

Great Barrier Reef World Heritage Area

The LNG facility is located within the Great Barrier Reef World Heritage Area. As a result the development triggered the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The project was referred to the Federal Government Minister for the Environment, Water, Heritage and the Arts to determine if the project was a controlled action under this Act. On 3 August 2009, it was determined by the Minister that the project was subject to the controlling provisions of the Act in respect of the following matters of national environmental significance:

- World heritage (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).

Further details on this matter are presented in Volume 4 Chapter 23.

Central Queensland Regional Plan

The Central Queensland Regional Growth Management Framework (CQRGMF) was endorsed by State cabinet in July 2002 as the principal, long term, broad based, integrated regional planning strategy to guide the management, growth and development in the region over the next 20 years. This regional plan focuses on six core themes:

- Resource use, conservation and management
- Economic development
- Infrastructure
- Social and cultural development
- Education, training and research, and
- Planning and governance.

The CQRGMF was prepared under the *Integrated Planning Act 1997*. The framework identifies a number of policy outcomes, strategies and actions to guide development and activities within the region.

Central Queensland Strategy for Sustainability – 2004 and beyond (Fitzroy Basin Association)

The Central Queensland Strategy for Sustainability – 2004 and beyond (CQSS) is directed at the management of the resources and environments of the river catchments of the Central Queensland region. It is a voluntary regional plan. It aims to:

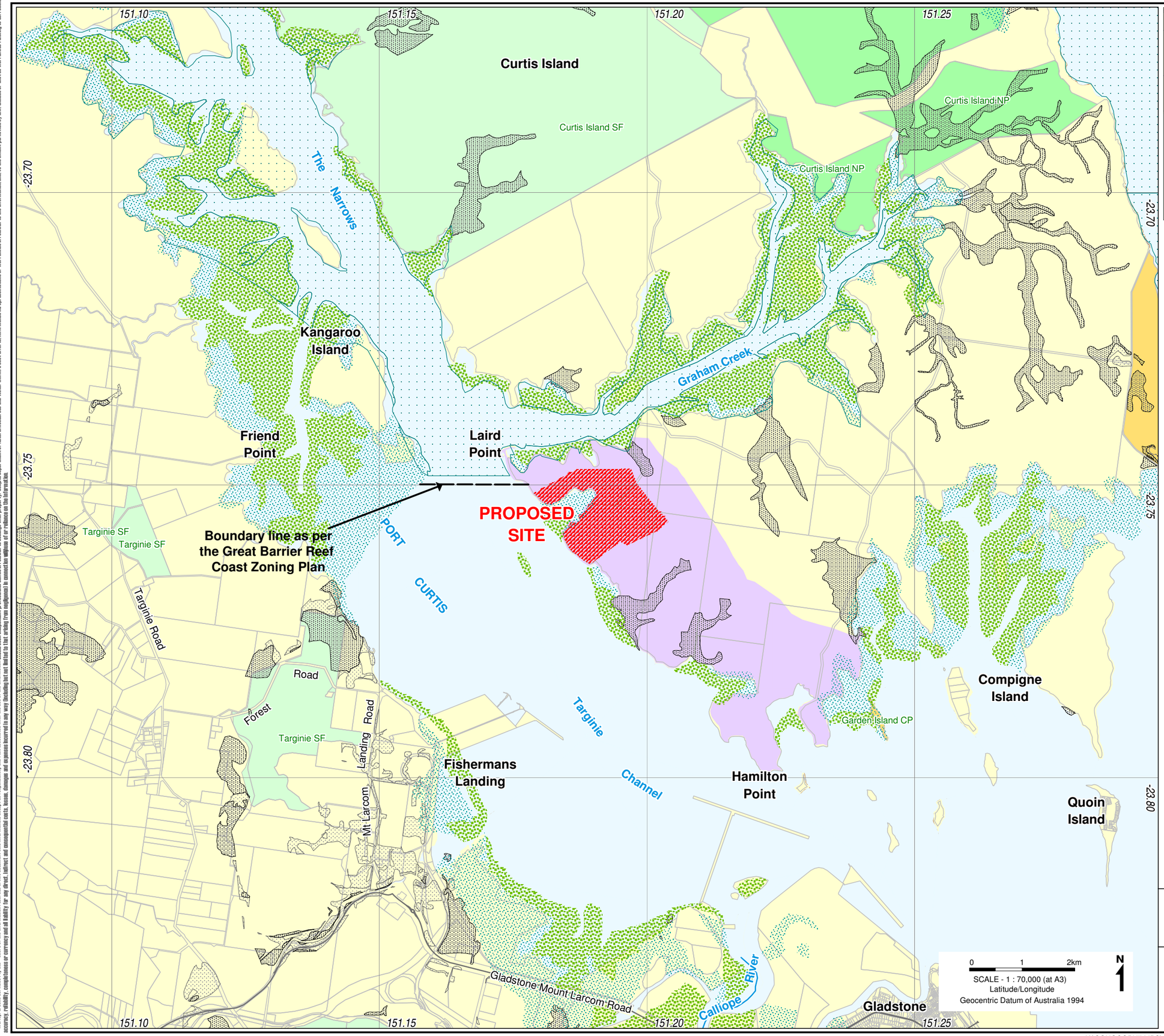
- Provide a framework for achieving continuous improvement towards the sustainable use of natural resources and the protection of the natural environment in Central Queensland
- Encourage the active participation of all stakeholders in natural resource and environmental planning, decision-making and management, and
- Guide investment in natural resources and environmental management in Central Queensland.

The strategy identifies a number of regional aspirations, targets and actions. The Central Queensland region defined for this strategy comprises the Fitzroy River Basin and the adjacent coastal catchments of the Boyne and Calliope rivers.

Marine Parks (Great Barrier Reef Coast) Zoning Plan

The Great Barrier Reef Coast Marine Park is located in The Narrows between Friend Point and Laird Point and encompasses Graham Creek and its wetlands (refer to Figure 6.1). This State marine park was created under the Queensland *Marine Parks Act 2004*. Activities within this park are managed by the provisions of the *Marine Parks (Great Barrier Reef Coast) Zoning Plan 2004*. This zoning plan does not apply to the LNG facility site as it is located in the order of 300m to the south of the boundary of this marine park and no works or operations for the LNG facility will be undertaken within this park.

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LEGEND

- Major drainage
- Cadastral parcel
- LNG facility site
- Road
- Reservoir
- Railway
- **State Marine Park Management Area** *(Parks Division of Environmental Protection Agency)*
- Curtis Island industry precinct
- Endangered regional ecosystems
- Endangered high value regrowth vegetation
- Mangrove flats
- Saline coastal flats

Estate Type

- Conservation Park (CP)
- Forest Reserve (FR)
- National Park Recovery (NC), National Park (NP) and National Park Scientific (NS)
- State Forest (SF)
- Timber Reserve (TR)
- Resources Reserve (RR)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Protected Areas Of Queensland (estate), Queensland Heritage Register Boundaries, Wetlands - Directory of Important
Department of Environment and Resource Management (DERM) 2009

State Marine Parks - QLD
Environmental Protection Agency (EPA) 2009

Packaged digital data - Land, Vegetation and Water 2006
Department of Natural Resources, Mines and Water 2009

Endangered Regional Ecosystems
Regional ecosystems mapping (version 6) and RE descriptions (version 6.0b)
Department of Environment and Resource Management 2009

Endangered High Value Regrowth Vegetation
High value regrowth vegetation (version 2)
Department of Environment and Resource Management 2009

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SCALE - 1 : 70,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994

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AUSTRALIA PACIFIC LNG PROJECT

Volume 4 Chapter 6
Figure 6.1 - Boundary of State Great Barrier Reef Coast Marine Park

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Gladstone Harbour Protection and Enhancement Strategy

The Gladstone Harbour Protection and Enhancement Strategy (EPA 2003) is a strategy document to guide local actions by industry, government and community aimed at maintaining a healthy and functioning harbour. The strategy focuses on practical actions the community can undertake to address issues relating to stormwater, integrated monitoring, key habitats, public access, information sharing and cultural heritage. It has been voluntarily adopted by the organisations involved in its development and is intended to complement the legislation controlling activities in the harbour. In particular it is intended to assist in the implementation of the state coastal plan. The LNG facility site is located in the Graham Creek strategy area as defined by this document.

Draft Master Plan for the Port of Gladstone Western Basin

The Port of Gladstone Western Basin Master Plan (currently in preparation) will be a strategic plan that considers the future development opportunities for the Port of Gladstone Western Basin and the implementation mechanisms required to achieve an efficient and coordinated development of this locality. This master plan will provide a framework to guide future industrial, port and land development in the Western Basin and will assist the Coordinator-General to make development decisions. The master plan is being prepared in accordance with the *State Development and Public Works Organisation Act 1971* (SDWPO Act).

Under this master plan, the Laird Point site is identified as one of five acceptable areas for the establishment of an LNG facility and associated shipping facilities. The Curtis Island Industry Precinct of the GSDA is to be used for the development of LNG and associated port activities and not for other industry.

The Department of Infrastructure and Planning (DIP) intends to negotiate the future land use of Kangaroo Island with the Gladstone Regional Council under this plan. DIP is seeking to have Kangaroo Island declared an environmental area and to remove the existing airport approvals and related activities currently applying to the island.

The draft master plan also provides the strategic direction for the whole Western Basin channel and reclamation works required to support future LNG and other developments in the Western Basin. In particular, the Port of Gladstone Western Basin Dredging Project EIS is to address the specific investigations, impact assessments and design works needed to encapsulate the key port development and ship access into the Western Basin.

Implementation

It is proposed that the master plan will be implemented by the Coordinator-General using the ‘significant project’ declaration process under the SDWPO Act. The master plan is intended to be used to direct the timing of future ‘significant project’ declarations to ensure that the port capacity of the Western Basin is not exceeded by the individual or cumulative shipping requirements of the proposals.

The Coordinator-General will also make recommendations to Gladstone Regional Council, in relation to the *Sustainable Planning Act 2009* (SPA) applications, and to Gladstone Ports Corporation to ensure that land and port planning and approvals are undertaken at the earliest opportunity to facilitate the shipping requirements of the GSDA, strategic port land and Gladstone Harbour.

The principle of directed development would also be applied to any other proposal within the Western Basin requiring a material change of use (MCU) approval under either the GSDA development scheme or local government planning scheme.

State planning policies (SPPs)

SPP 1/92 – Development and conservation of agricultural land

The Queensland Government considers good quality agricultural land is a finite national and state resource that must be conserved and managed for the longer term. SPP 1/92 states the best and most versatile farming land has a special importance and should not be built on unless there is an overriding need for the development in terms of public benefit and no other site is suitable for the particular purpose. This land is a valuable resource that should, in general, be protected from irreversible development.

Good quality agricultural land (GQAL) is defined as land which is capable of sustainable use for agriculture, with a reasonable level of inputs, and without causing degradation of land or other natural resources. In this context, agricultural land is defined as land used for crop or animal production, but does not include intensive animal uses.

SPP 1/02 – Development in the vicinity of certain airports and aviation facilities

Gladstone airport is a facility of State significance which is subject to the provisions of SPP 1/02. The policy outlines the principles for ensuring development does not impact the operational efficiency of airports and aviation facilities such as navigational beacons and radar facilities.

The LNG facility near Laird Point is situated approximately 14km to the northwest of the existing Gladstone airport, and 4km to the southeast of land reserved for a potential airport at Kangaroo Island. As the site is within the 15km outer horizontal surface (OHS), structures are not to exceed the 164.5m obstacle limitation surface (OLS).

SPP 1/03 – Mitigating the adverse impacts of flood, bushfire and landslide

This SPP sets out the State's interest in ensuring the natural hazards of flood, bushfire, and landslide are adequately considered in developments. A natural hazard is defined as a naturally occurring situation or condition with the potential for loss or harm to the community or environment. The SPP aims to mitigate the adverse impacts of flood, bushfire and landslide for relevant development.

An area with a natural hazard to which the SPP applies is to be compatible with the nature of the natural hazard, unless there is an overriding need for the development in the public interest and no other site is suitable and reasonably available for the proposed development. Development which is not compatible but is generally consistent with the above outcome should minimise as far as practical the adverse effects from the relevant natural hazard and should not result in an unacceptable risk to people and property.

In addition the SPP also applies to development that increases the number of people in a natural hazard area or which involves the manufacture or storage of hazardous goods.

The physical characteristics of the LNG facility trigger a need to consider this SPP.

SPP 2/02 – Planning and managing development involving acid sulfate soils

This SPP sets out the State's interest concerning development involving acid sulfate soils (ASS) in low lying coastal areas. The SPP 2/02 has effect under the SPA and applies to all land, soil and sediment at or below 5m AHD where the natural ground level is less than 20m AHD. Potential acid sulfate soils (PASS) only become a problem when they are disturbed and exposed to air. When PASS are oxidised, sulphuric acid forms and the soil becomes strongly acidic. Strongly acidic soil can mobilise the naturally occurring metals in the soil. These ASS, and any subsequent leachate, can have significant adverse effects due to the presence of abundant acid, iron, aluminium, manganese and other heavy metals.

SPP 2/07 – Protection of extractive resources

SPP 2/07 identifies those extractive resources of State or regional significance where extractive industry development is appropriate in principle, and aims to protect those resources from developments that might prevent or severely constrain current or future extraction when the need for the resource arises.

The nearest key resource areas identified under SPP 2/07 to the LNG facility are located at Taragoola and Yarwun. These resources will not be affected by the LNG facility development.

Curtis Coast Regional Coastal Management Plan

The Curtis Coast Regional Coastal Management Plan is a statutory instrument under the *Coastal Protection and Management Act 1995* and will be treated as if it is a SPP for the purpose of any development applications under the SPA.

The management plan applies to all coastal waters and all areas to the landward side of coastal waters in which there are physical features, ecological or natural processes, or human activities that affect or potentially affect the coast or coastal resources.

The management plan sets out policies for the management of estuarine and marine water quality values and on habitats for significant species such as wading birds, turtle and dugong.

Town planning schemes and other local regulatory provisions

Development scheme for the GSDA

The GSDA is some 28,000ha in area and incorporates lands situated to the northwest of Gladstone and on the southern part of Curtis Island, including the LNG facility site. The GSDA was established to provide land for large-scale industrial development.

The development scheme, which is supported by a number of policies, is a land use planning instrument administered by the Queensland Coordinator-General for the purpose of guiding future development in the GSDA. In addition to guiding future development in the GSDA, the development scheme and policies are intended to ensure that development is well planned and balanced in a way which meets the needs of industry, the Gladstone community and the environment.

The GDSA development scheme provides a land use approval process for the assessment of development proposals. Under this process, an application for a MCU is made and is assessed by the Coordinator-General against the provisions of this development scheme. Generally, all other development under the SPA (unless exempt) is assessed by the relevant assessment manager such as the Gladstone Regional Council or the Gladstone Ports Corporation.

When assessing an MCU application, the Coordinator-General has regard to the intent, objectives and purposes of the land use designations and policies within this development scheme. Figure 6.2 shows the LNG site's relationship to the GSDA. Refer to Section 6.4.1 for an explanation of the relevant precinct of the GSDA, the Curtis Island Industry Precinct.

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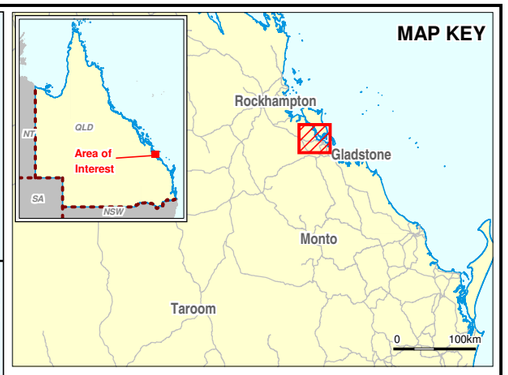
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Curtis Island
The Narrows
Graham Creek
Laird Point
Southend
Hamilton Point
Fishermans Landing
Wiggins Islands
Gladstone
Calliope River
Targinie
Targinie Road
Forest Road
Cullens Road
Mt Larcom
Gladstone Road
Yarwun
Bruce Highway
nt Larcom

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SCALE - 1 : 125,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994

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MAP KEY



LEGEND

- Major drainage
- Cadastral parcel
- LNG facility site
- Road
- Reservoir
- Reclaim area
- Railway

Gladstone State Development Area Precincts

- Aldoga precinct
- Clinton precinct
- Corridor area buffer precinct
- Curtis Island industry precinct
- Environmental management precinct
- Materials transportation & services corridor
- Restricted development precinct
- Stuart Oil Shale Reserve preservation area
- Targinie precinct
- Yarwun precinct
- Proposed Gladstone State Development Area corridor

Callide Infrastructure Corridor State Development Area

- Callide infrastructure corridor

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

State Development Area precincts
© The State of Queensland (Department of Infrastructure and Planning) 2009

Callide Infrastructure Corridor State Development Area
Supplied by Origin Energy 28/10/2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 4 Chapter 6
Figure 6.2 - State Development Area Precincts

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Calliope Shire planning scheme/Gladstone City planning scheme

The LNG facility is situated within the Gladstone Regional Council area. The town planning schemes current for this area are those in force for the former Calliope Shire Council and the former Gladstone City Council. These planning schemes will apply to development until such time as the Gladstone Regional Council prepares and adopts a new town planning scheme for the Gladstone Regional Council area.

Under Schedule 9 of the SPA, development for an activity authorised by the *Petroleum Act 1923*, or the *Petroleum and Gas (Production and Safety) Act 2004* or development for a petroleum activity defined under Section 309A of the *Environment Protection Act 1994*, is exempt from assessment against a town planning scheme. Those project components that do not fall under this exemption may require assessment against a relevant planning scheme. This may include ancillary facilities located on the mainland.

Port of Gladstone Land Use Plan

The current Port of Gladstone Land Use Plan 1999 does not extend to the LNG facility site situated on Curtis Island. It does however apply to the Project facilities located on the mainland.

A mainland location for materials lay-down, barge loading and unloading and passenger ferry terminal is required to service the Project. Such facilities may be located at Fisherman's Landing (both on the existing reclaim area and the proposed northern expansion), or on the Calliope River adjacent to the RG Tanna Coal terminal. The existing Fisherman's Landing location is on strategic port land and is included in this plan. It is anticipated that the northern expansion will also be included in the plan once reclaimed.

Fisherman's Landing is a multi-user/multi-product wharf. The land reclaimed at this location is intended to provide for a variety of industrial uses.

The Gladstone Port Authority Strategic Plan

The purpose of the Gladstone Port Authority Strategic Plan 1997-2047 is to identify the need for additional strategic port land into the future, refer Figure 6.3. The 2008 update of the strategic plan looks 50 years ahead. It indicates the Port of Gladstone Harbour will be able to accommodate up to 300 million tonnes of export product by 2058.

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7370000 7365000 7360000 7355000

Kangaroo Island

Graham Creek

Laird Point

Curtis Island

Southend

Facing Island

Cement Australia

Fisherman's Landing

Targinie Channel

Clinton Coal Wharves 1 & 2

Clinton Bypass Channel

Auckland Point Wharves 1 - 3

Wiggins Island Coal Wharf

Clinton Channel

RG Tanna Coal Terminal

River

Gladstone

Auckland Bypass Channel

Barney Point Wharf

Auckland Channel

Gatcombe Cutting

South Trees Wharf

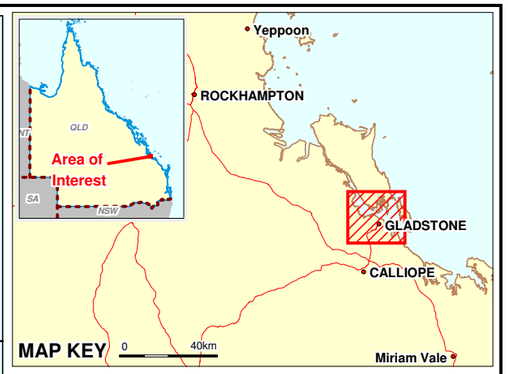
Boyne Smelter Wharf

Calliope

Gatcombe Bypass Channel

South Trees Inlet

Boyne Island



LEGEND

- Main road
- Railway
- Cadastral parcel
- Wharf
- Port Land
- Existing shipping channel

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009
Gladstone Port Authority Land Use
Port Land data source: GPA Document GPA-QS-ENV-Man01 , 1995
Main Roads
Department of Main Roads 2009
Shipping Channels
Digitised from Port of Gladstone Port Limits Channel and Berth Depths produced by Gladstone Ports Corporation

CARGO DATA

Port	Fisherman's Landing	Clinton 1&2	Auckland Point			Barney Point	South Trees			Boyne Wharf
			No.1	No.2	No.3		West	East	Bunkers	
Cargo	Fly Ash Caustic Soda Ammonia Cement Cement Clinker	Coal	Magnesium Calcite Woodchip	Grains	Petroleum LPG Sulphuric Acid Caustic Soda General Cargo Passenger Vessels Containerised Cargo	Coal	Bauxite Caustic Soda Fuel Coal Bunkers	Alumina Caustic Soda Fuel Fuel Bunkers	Bunker Fuel	Aluminium Petroleum
Total (t) (1993/1994)	557,269	17,879,669	181,199	147,184	387,887	2,088,396	7,726,937	3,314,349	Not Recorded	272,558
Utilisation	16.70%	83.11%	16.30%	18.50%	20.50%	19.10%	82.91%	46.56%		18.80%

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Map Grid of Australia Zone 56
Geocentric Datum of Australia 94

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AUSTRALIA PACIFIC LNG PROJECT

Volume 4 Chapter 6
Figure 6.3 Gladstone Port Authority Land Use Plan 1995

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6.2 Methodology

The information provided in this section has been sourced from available government and local authority databases, site visits, and from the interpretation of available air photo and satellite imagery. Geographical information system mapping and spatial analysis has been used to interpret the data and to assist in the assessment of the LNG facility's impact on the Curtis Island site and facility locations on the mainland.

The relevant databases searched for this assessment are:

- Fish habitat areas and dugong protection areas, Primary Industries and Fisheries, DEEDI, 2009
- World heritage areas, Australian Government, Department of Environment, Water, Heritage and the Arts (DEWHA)
- Cadastre and Casements, Department of Environment and Resource Management (DERM), Queensland, 2009
- Aircraft Facility Point, Powerline and Railway Stop Point, Commonwealth of Australia (Geoscience Australia) 2009
- Pipelines, Mines and Energy, DEEDI, MERLIN mining tenures system and database (MTDB), 2009, Commonwealth of Australia (Geoscience Australia) 2009
- Key Resource Areas, Mines and Energy, DEEDI, MERLIN MTDB, 2009
- Mines, Mines and Energy, DEEDI, MERLIN MTDB, 2009
- Geology, Mines and Energy, DEEDI, 2008
- Central West Region - Good Quality Agricultural Lands, DERM, Queensland 2009
- Land Resource Data Reports and Maps, DERM, Queensland, 2008
- Queensland Land Use Mapping Program (QLUMP), Department of Natural Resources & Mines, Queensland Government, 1999
- Mining Resources, Mines and Energy, DERM, MERLIN MTDB, 2009
- Native Title, Indigenous Land Use Agreements, Commonwealth of Australia (National Native Title Tribunal, Geoscience Australia), 2009
- Indigenous Protected Areas, DEWHA, 2009
- Protected Areas Of Queensland (estate), Queensland Heritage Register Boundaries, Directory of Important Wetlands, DERM, 2009
- Nature Refuges and Coordinated Conservation Areas, Environmental Protection Agency, DERM, 2009
- Packaged digital data - Land, Vegetation and Water 2006, Department of Natural Resources, Mines and Water, 2009 (DERM)
- Australian Land Disturbance Database - Wilderness Quality, DEWHA, 2009
- Restricted Land, Mines and Energy, DEEDI, 2009

- Building Points and Homesteads, Commonwealth of Australia (Geoscience Australia), 2009
- Planning Schemes, DERM, Queensland 2009, Gladstone Regional Council, Queensland, 2009
- Watercourses (based on 250k topography), Commonwealth of Australia (Geoscience Australia), 2009
- Wetlands, DERM, 2009

6.3 Existing environment

6.3.1 Current land use

Land use in the area and surrounding the LNG facility comprises a mixture of port activities, large-scale industry, forestry, nature conservation, urban and rural activities. Figure 6-2 illustrates the location of these activities. The data in this is drawn from the QLUMP 1999 database provided by the DERM. The predominant land uses are discussed below.

Agriculture

The predominant former land use over the LNG facility site and adjacent properties on Curtis Island is cattle grazing based on natural vegetation. In line with the new industrial designation of the Curtis Island Industry Precinct, agricultural land uses on the site is ceasing.

Forestry

No forestry activities are evident on the southern part of Curtis Island. Production forestry activities are carried out in the Curtis Island State Forest some 5km to the north of the LNG facility, and on the mainland at Targinie and Yarwun, some 6km to 10km away from the LNG facility.

Industrial/commercial uses

No industrial uses are currently established on the southern portion of Curtis Island. Several LNG facilities are proposed. The surrounding area, however, supports several major industrial uses. These are located on the mainland to the west and southwest of the LNG facility and include the Cement Australia cement plant, the Stuart Oil Shale Project (Queensland Energy Resources of Australia), the Rio Tinto Yarwun alumina plant, the Orica Ltd chemical plant, and the GPC Fisherman's Landing port facilities. Several quarries are also located in the general area.

The Gladstone urban area is located approximately 11km to the southeast of the LNG facility on the southern side of Port Curtis. The area has an estimated population of approximately 30,000 persons. The Gladstone region supports a population of some 48,800 persons (2008 estimate). Gladstone has an industrial base which provides a range of products and services for the area's heavy industry, and acts as a regional service centre.

The port provides for the import and export of bulk materials, fuel, and container cargoes. The current port can accommodate vessels up to 220,000 deadweight tonnage.

Mining and petroleum activities

The LNG facility is not located near or adjacent to any existing mining or petroleum activities. The Stuart Oil Shale project area is situated on the mainland to the southwest of the LNG facility. Queensland Curtis LNG and Gladstone LNG have identified sites on the western side of Curtis Island

for proposed LNG facilities. Shell Australia LNG has identified a site on the southern extent of Curtis Island. LNG Ltd (now Arrow Energy) is planning an LNG facility on Fisherman's Landing.

Extractive industry

No quarries are located on or near to the LNG facility on Curtis Island. The nearest existing operating quarry is located on the mainland at Yarwun.

Residential uses

There are no residential dwellings located within or near the LNG facility. The nearest dwellings are located at the settlement of South End on the island, on islands within Port Curtis, and in the Targinie locality on the mainland, the nearest of which is located approximately 7km away.

The South End settlement is located at the south eastern end of Curtis Island, at least 10km east of the LNG facility. South End contains approximately 100 dwellings, the majority of which are weekend/holiday homes. A few dwellings are permanently occupied. The settlement also supports an accommodation lodge, restaurant, and a fuel and food outlet.

Conservation and recreation

The South End settlement provides a base for outdoor recreational opportunities including fishing and bushwalking. Curtis Ferry Services operate a vehicular ferry with regular services connecting the settlement to Gladstone. The ocean beaches at the southern end of Curtis Island are a turtle rookery which attracts visitors.

Curtis Island and surrounding waters contains several conservation areas which provide for a range of nature based recreation activities. The Curtis Island National Park is 8,500ha in size and contains a variety of vegetation types including heath, grassland, low melaleuca woodland, open eucalypt forest and large areas of dry rainforest. The park contains several camping areas. Other conservation reserves include the Cape Capricorn Conservation Park, the Garden Island Conservation Park, the Curtis Island Conservation Park, the Curtis Island Nature Refuge, and the Curtis Island State Forest. The Great Barrier Reef Coast Marine Park situated in The Narrows and Graham Creek is a habitat protection area.

An informal camping and beach area exists on the northern tip of Laird Point. This locality is used occasionally for recreational purposes.

Commercial and recreational fishing

Net and crab fisheries are the principal commercial fisheries operating in the Port Curtis area, although some beam trawling for prawns has been known to occur on occasions. The crab fishery is focused on the mud crab. Most of the commercial mud crab fishery is concentrated in The Narrows and the creeks that drain into The Narrows such as Graham Creek. The key target species in the net fishery include various species of shark, blue threadfin salmon, mullet, barramundi, and grey mackerel.

The recreational fishery is largely confined to the estuarine and inshore areas of Port Curtis. Whiting, mullet, bream, dart and school mackerel are the main species caught. Of these, whiting is the dominant fish caught. Boat based, recreational fishing is a major leisure activity in the Gladstone area. It is estimated that some 8,000 recreational boat trips per year occur from the Gladstone public boat ramp. While the number of vessels utilising the Laird Point and Graham Creek area is unknown,

the Graham Creek area is recognised as a very important anchorage area for recreational vessels and as an important area for recreational fishing, particularly mud crabbing.

Heritage features

The Cape Capricorn light station and Sea Hill Point lighthouse are known items of heritage significance on Curtis Island. Both lighthouses are over 30km from Laird Point.

Heritage features of local significance comprise the remains of a jetty located 1.2km to the northeast of the proposed LNG facility site on the southern shore of Graham Creek, and old pastoral station fence-lines which are partly located on the LNG facility site.

The jetty remnants are associated with the early pastoral industry on the island. The jetty was used to unload materials brought from the mainland. Approximately 2.6km of fence lines occur on the LNG facility site. The fence posts are locally significant due to their connection with the pastoral industry on Curtis Island in the late nineteenth and early twentieth centuries.

Indigenous cultural heritage features are known to exist on Curtis Island. Several sites of Aboriginal significance are located on the western side of Curtis Island, although not near the proposed LNG facility site.

Preliminary studies of the Indigenous cultural heritage resources of the LNG facility site have been undertaken by the Port Curtis Coral Coast Native title claimants supported by their technical advisor. These investigations identified the presence of some artefacts. The findings of these investigations are confidential. It is intended these findings will form the basis for negotiations to develop an approved Cultural Heritage Management Plan (CHMP) for this project component (refer to Volume 4 Chapter 18 for further details).

6.3.2 Land tenure

The LNG facility is located within the Gladstone Regional Council area and Port Curtis. The tenure and ownership details are outlined in Table 6.1.

Table 6.1 Land tenure and ownership details

Parcel description	Current tenure	Proposed tenure	Current owner
Lot 3, SP225924	Freehold	Freehold	Minister for Industrial Development of Queensland
Reclaim areas	Unallocated state land	Freehold	State of Queensland
Seabed area	Unallocated state land	Lease	State of Queensland
Un-named road and esplanade on Lot 3, SP225924	State land	Freehold	State of Queensland

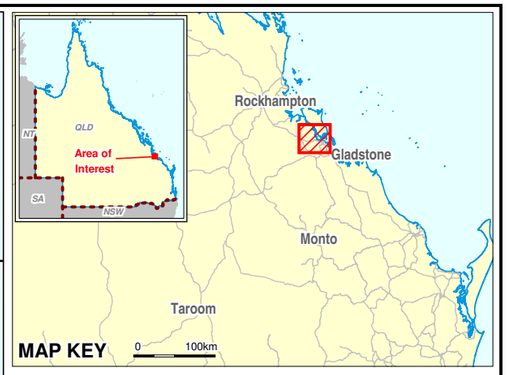
The land tenure of areas surrounding the LNG facility is presented in Table 6.1. The land surrounding the LNG facility is freehold land and forms part of the GSDA.

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Curtis Island
The Narrows
Kangaroo Island
Graham Creek
Laird Point
Southend
Hamilton Point
Fishermans Landing
Wiggins Islands
Targinie
Targinie Road
Forest Road
Cullens Road
Mt Larcom
Mt Larcom Road
Landing Road
Gladstone
Yarwun
Bruce Highway
Calliope River



LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- LNG facility site

Land Tenure

- Freehold (FH)
- State Forest (SF)
- Port and Harbour Boards (PH)
- Reserve (RE) and Forest Reserve (FR)
- Housing Lease (HL)
- Railway (RY)
- Industrial Estates (ID)
- Road (R)
- Lands Lease (LL)
- Easement
- State Land (SL)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

0 2 4km

SCALE - 1 : 125,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994

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AUSTRALIA PACIFIC LNG PROJECT

Volume 4 Chapter 6
Figure 6.4 - Land Tenure

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Protected areas estate

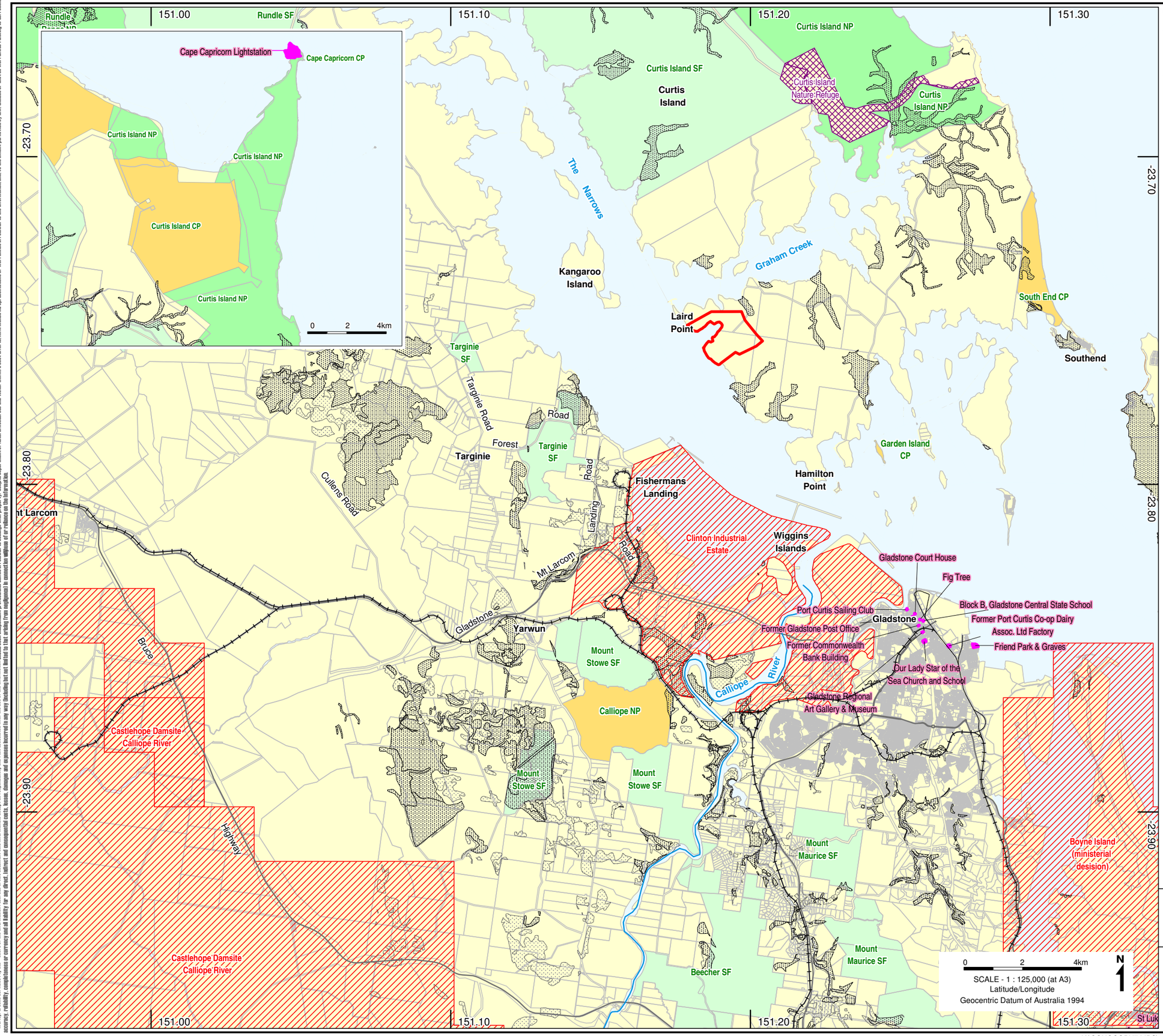
Items of the protected areas estate that are situated in the general vicinity of the LNG facility or affect the LNG facility are listed in Table 6.2 and are depicted in Figure 6.5 and Figure 6.6.

Table 6.2 Protected areas

Estate item	Location
National parks/state forests	
Curtis Island National Park	7.5km to the northeast of the LNG facility
Curtis Island State Forest	5.3km to the north of the LNG facility
Targinie State Forest	4.8km to the west of the LNG facility
Conservation areas	
Curtis Island Conservation Park	16km to the north of the LNG facility
Garden Island Conservation Park	6.7km to the southeast of the LNG facility
Cape Capricorn Conservation Park	30.2km to the north of the LNG facility
South End Conservation Park	8.8km to the east of the LNG facility
Curtis Island Nature Refuge	8km to the northeast of the LNG facility
Marine parks	
Great Barrier Reef Marine Park (Commonwealth)	Ocean side of Curtis Island
Great Barrier Reef Coast Marine Park (Qld)	Intersects the west coast of Curtis Island at a point 300m to the north of the LNG facility – incorporates the marine areas of Graham Creek and The Narrows
Matters of national environmental significance*	
Great Barrier Reef World Heritage Area	Site is included in this World Heritage Area (refer Volume 4 Chapter 23 for details)
Port Curtis wetland	The marine portion of the LNG facility is located in the Port Curtis wetland which is listed in the Directory of Important Wetlands (QLD019). The wetlands are habitat for species listed under the EPBC Act
Dugong protection area	The marine portion of the LNG facility is located in the Rodds Bay Dugong Protection Area in Port Curtis ('Dugong Protection Area 'B'). Dugongs are a protected species under the EPBC Act
Fish habitat areas	
Fitzroy River (FHA-072)	23km to the north of the LNG facility
Areas of significance Curtis Coast regional coastal management plan	

Estate item	Location
Scenic coastal landscapes	Wetlands within and adjacent to the LNG facility
Natural resources – endangered regional ecosystems	150m to the northeast of the LNG facility
Natural resources – significant coastal wetlands	Wetlands within and adjacent to the LNG facility
National heritage register	
101513 Sea Hill Point lighthouse	Approximately 35km north from the LNG facility
Queensland Heritage Register	
601723 Cape Capricorn light station	30.2 km to the north of the site

*Note: For information on matters of national environmental significance under the EPBC Act refer to Volume 4 Chapter 23



LEGEND

- Major drainage
- Cadastral parcel
- LNG facility site
- Road
- Reservoir
- Railway

Protected Area

- Nature refuge & coordinated conservation area
- Queensland heritage registered place
- Endangered regional ecosystems
- Endangered high value regrowth vegetation
- Restricted land

Estate Type

- Conservation Park (CP)
- Forest Reserve (FR)
- National Park Recovery (NC), National Park (NP) and National Park Scientific (NS)
- State Forest (SF)
- Timber Reserve (TR)
- Resources Reserve (RR)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Protected Areas Of Queensland (estate), Queensland Heritage Register Boundaries, Wetlands - Directory of Important
Department of Environment and Resource Management (DERM) 2009

Nature Refuges and Coordinated Conservation Areas
Environmental Protection Agency (EPA) 2009

Packaged digital data - Land, Vegetation and Water 2006
Department of Natural Resources, Mines and Water 2009

Restricted Land
Department of Mines and Energy 2009

Endangered Regional Ecosystems
Regional ecosystems mapping (version 6) and RE descriptions (version 6.0b)
Department of Environment and Resource Management 2009

Endangered High Value Regrowth Vegetation
High value regrowth vegetation (version 2)
Department of Environment and Resource Management 2009

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SCALE - 1 : 125,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994

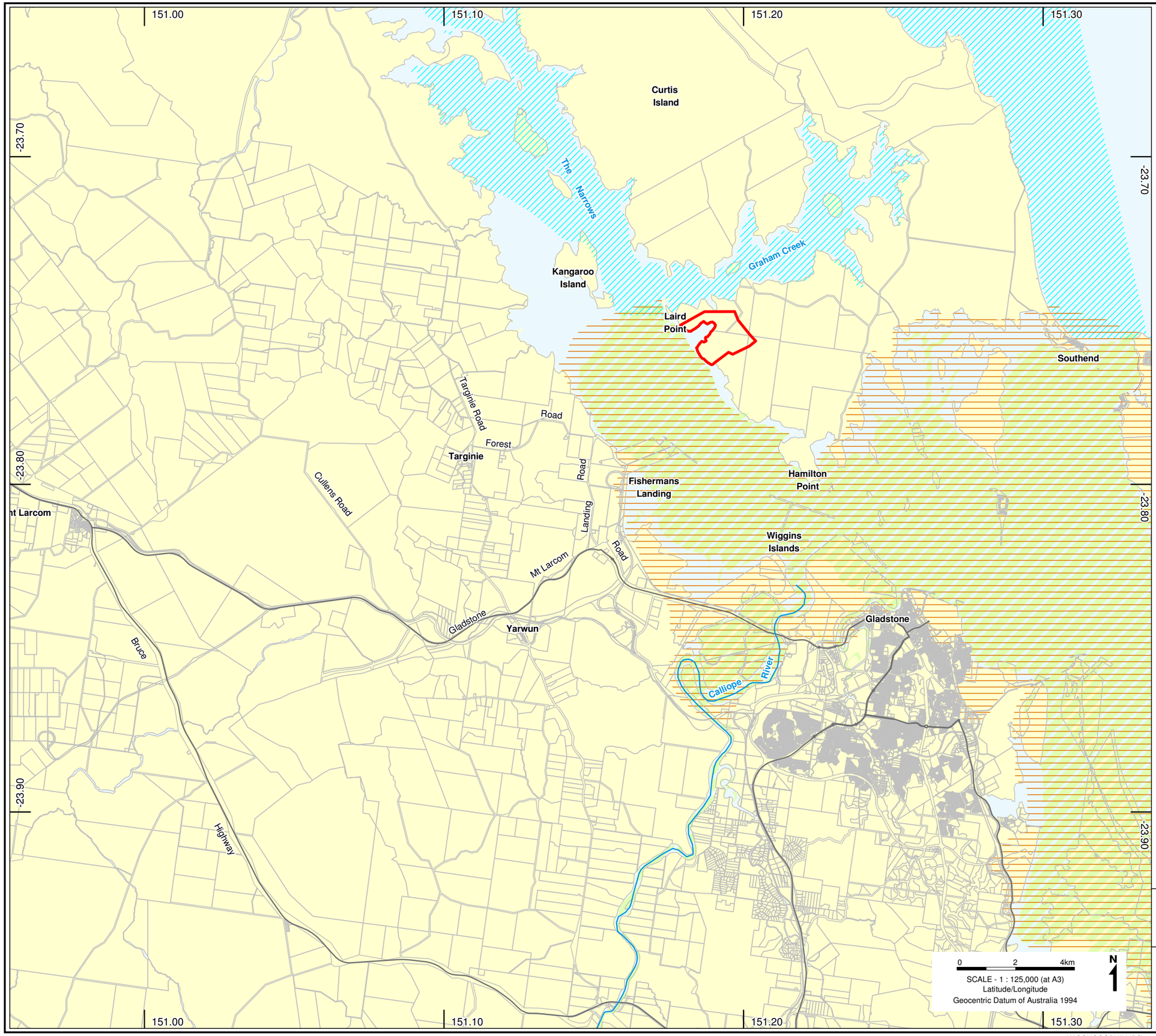
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AUSTRALIA PACIFIC LNG PROJECT

Volume 4 Chapter 6
Figure 6.5 - Protected Areas

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LEGEND

- Major drainage
- Cadastral parcel
- LNG facility site
- Road
- Reservoir
- Railway

Protected Area

- Dugong protection area
- Directory of Important Wetlands - Port Curtis
- Great Barrier Reef Coast Marine Park

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Dugong Protection Areas (DPIF)
Department of Primary Industries and Fisheries 2009

World Heritage Areas (Australia)
Australian Government Department of the Environment, Water, Heritage and the Arts 2009

State Marine Parks (QLD)
Environmental Protection Agency 2009

Wetlands - Directory of Important
Department of Environment and Resource Management (DERM) 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 4 Chapter 6
Figure 6.6 - Protected Areas

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Stock routes

No stock routes occur on or near the LNG facility.

6.3.3 Native Title

A Native Title claim exists over an area of 19,850km^2 which incorporates the regional centres of Gladstone and Bundaberg, and the Capricorn group of islands. This claim includes the LNG facility, but does not include the waters of Gladstone Harbour below high water mark.

This claim was filed in the Federal Court on the 25 July 2001 and registered as a claim on the 27 February 2002 (National Native Title Tribunal claim number QC01/29). The registered Native Title claimant is the Port Curtis Coral Coast People. This claimant group was formed through the amalgamation of four previously registered claim groups - the Bailai, the Gooreng Gooreng, the Taribelung Bunda and the Gurang.

No Indigenous land use agreements (ILUAs) apply to the subject site above the high water mark. Two ILUAs, however, are current for lands on the western side of the harbour. These relate to the Stuart Oil Shale project (Tribunal no: QI2003/063) and the Enertrade gas pipeline project (Tribunal no: QI2006/051).

Figure 6.7 shows the location of the current Native Title claim area.

The LNG facility site, described as lot 3 on SP225924, is held in freehold title; therefore Native Title has been extinguished in this area. Australia Pacific LNG will be required to obtain tenure for proposed reclamation areas required for seabed leases.

Australia Pacific LNG will seek to negotiate and register an ILUA for areas where Native Title rights and interests may exist. In parallel with this process, Australia Pacific LNG will seek to have some project facilities declared as infrastructure facilities of significance pursuant to the SDPWO Act.

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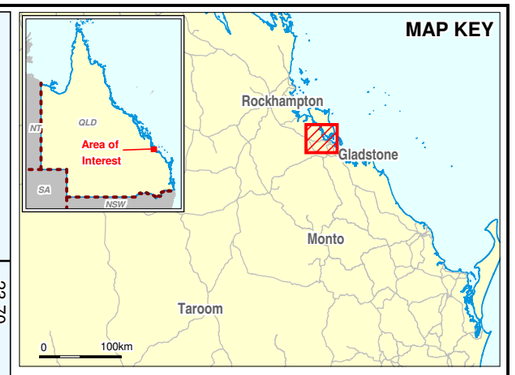
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Curtis Island
The Narrows
Kangaroo Island
Graham Creek
Laird Point
Southend
Hamilton Point
Fishermans Landing
Wiggins Islands
Targinie Road
Forest Road
Targinie
Cullens Road
Mt Larcom
Gladstone
Yarwun
Bruce Highway
Calliope River

0 2 4km
SCALE - 1 : 125,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994

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MAP KEY



LEGEND

- Major watercourses
- Railway
- Road
- Cadastral parcel
- LNG facility site

Native Title Claim Areas

- Port Curtis Coral Coast (QC01/29)

Source Information

Native Title Claims
National Native Title Tribunal (2009) extracted in November 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 4 Chapter 6
Figure 6.7 - Native Title Claims

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6.3.4 Mineral and petroleum resources

No mining leases are located over the LNG facility site.

The nearest mining leases are situated on the mainland to the west of the LNG facility site, and are associated with the Stuart Oil Shale project. Queensland Energy Resources Limited, the project owner, retains a mining lease over the oil shale deposit and a mineral development licence over a more extensive area. A demonstration scale oil shale processing plant commenced operation at this site in 1999 and ceased production in 2004.

An exploration permit minerals application (EPM18190) was lodged on 14 July 2009 in the name of M.A. Gilbert. This application was subsequently modified by government action to preclude the Curtis Island Industrial Precinct, within which the LNG facility site is situated.

There are no petroleum resources identified for the LNG facility site or the surrounding area.

Figure 6.8 shows the location of existing mining tenures. Note the dataset is not yet updated and therefore shows exploration permit minerals application (EPM18190) over the Curtis Island Industry Precinct.

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6.3.5 Extractive industry resources

No deposits of economic extractive resources are known to exist within the Curtis Island Industry Precinct of the GSDA.

Sand and gravel resources exist in the watercourses of the Calliope and Boyne Rivers. Hard rock quarry resources are available in the local region. The Yarwun Key Resource Area is the main hard rock resource nearest to the LNG facility site. A second key resource area identified under SPP 2/07 is located at Taragoola to the south west of Gladstone.

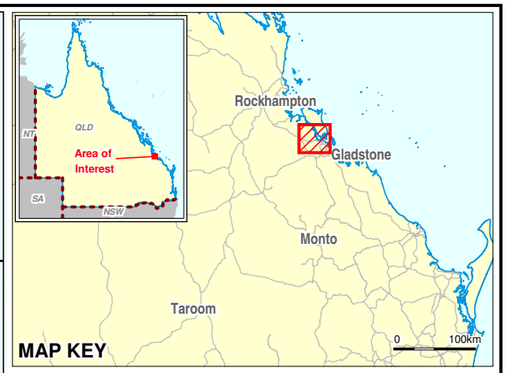
Figure 6.9 shows the location of existing known extractive industry resources. The Yarwun Key Resource area is identified in red on this figure.

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White Rock
Rundle
Curtis Island
The Narrows
Kangaroo Island
Graham Creek
Laird Point
Southend
Unnamed 212652
Targinie Road
Forest Road
Unnamed 088679
Targinie
Stuart Oil Shale
Fishermans Landing
Hamilton Point
Unnamed 226678
Turtle Island
Unnamed 226678
Unnamed 252648
Wiggins Islands
Cullens Road
Landing Road
Mt Larcom
Hurcom
Yarwun (GPA)
Gladstone
Yarwun
H & R Quarry
Yarwun
H & R Quarrying Pty Ltd
Gladstone
Calliope River
Bruce Highway
East End
nt Larcom



MAP KEY

LEGEND

- Major drainage
- Cadastral parcel
- LNG facility site
- Road
- Reservoir
- Reclaim area
- Railway

Extractive Resources

- Mine
- Abandoned mine
- Quarry

Key Resource Area

- Transport route
- Separation area
- Resource

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Key Resource Areas
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Mines
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Quarries
Department of Mines and Energy, Queensland 2009

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SCALE - 1 : 125,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994

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AUSTRALIA PACIFIC LNG PROJECT

Volume 4 Chapter 6
Figure 6.9 - Extractive Resources

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6.3.6 Infrastructure and services

There is no road access from the mainland to Curtis Island. A vehicle ferry runs between Gladstone and South End. No constructed road access to the LNG facility site from South End exists. A rough track system suitable for 4WD vehicles crosses the area, and enables access around the LNG facility site. Vehicle access to Laird Point off Graham Creek, adjacent directly to the LNG facility site can be gained by barge during favourable tides and weather conditions.

The site is not serviced by any reticulated gas, electricity, water, sewer or telecommunications infrastructure.

6.4 Potential impacts

6.4.1 Regional planning framework

Consistency with Central Queensland Regional Plan

The Central Queensland Regional Plan 2002 (comprising the Central Queensland Regional Growth Management Framework (CQRGMF)) identifies a number of policy outcomes, strategies and actions to guide development and activities within the region. Table 6.3 examines the LNG facility's consistency with this framework. In summary, the proposed LNG facility development generally supports the policy outcomes of this regional plan.

Table 6.3 LNG facility's consistency with the Central Queensland Regional Plan

CQRGMF policy outcome	CQRGMF strategies and actions	Consistency assessment
Theme: Resource conservation and management		
Socio-economic and environmentally sustainable waste management practices are adopted within the region	Facilitate the development of best practice approaches to waste management	The LNG facility is designed to minimise process wastes. Any wastes produced will be disposed of in accordance with DERM requirements
Air quality is maintained at levels which ensure sustainable regional communities, protection of the natural environment and opportunities for continuing economic growth	Protect air quality in areas subject to industrial and urban growth through the use of appropriate air quality standards, air emission standards and emission control technologies	The LNG facility's emissions will meet air quality goals for NO_2, PM_{10}, CO, VOC and odour Refer to Volume 4 Chapter 13 for further details
Development takes place with a focus on efficiency to achieve economic progress with minimisation of greenhouse emissions and with an understanding of the potential impact of climatic conditions	Continue the development and implementation of practices and technology to minimise (on a per production basis) greenhouse gas emissions	The LNG facility will ultimately (at full production capacity) generate approximately 5.5 kt CO_2-e / y of reportable greenhouse emissions Refer to Volume 4 Chapter 14 for further details
Fisheries resources and fish	Encourage the implementation of	LNG facility construction is not

CQRGMF policy outcome	CQRGMF strategies and actions	Consistency assessment
habitats are managed for sustainable economic and recreational use and conservation of biodiversity	planning and management measures to conserve fisheries habitats Investigate the need for additional Fish habitat areas, including the Fitzroy delta, The Narrows and associated catchments	expected to interfere with the fisheries resources in The Narrows Refer to Volume 4 Chapter 10 for details
Biodiversity in terrestrial, freshwater, marine and estuarine ecosystems is maintained, with native species and communities conserved and linked by viable networks of wildlife habitat across the landscape	Biodiversity in terrestrial, freshwater, marine and estuarine ecosystems is maintained, with native species and communities conserved and linked by viable networks of wildlife habitat across the landscape	LNG facility construction may have the potential to affect the abundance and species richness of the benthic assemblage, with potential flow on effects to fisheries production Refer to Volume 4 Chapter 10 and Volume 4 Chapter 23 for details
The region's coastal resources and values have been identified and promoted to ensure they are used in a sustainable manner	Facilitate effective planning, management and rehabilitation practices, where required, to ensure the region's coastal ecosystems and natural processes are protected and the social, economic and environmental values of the coastal resources are maintained and enhanced	An environmental management plan (EM Plan) and social impact management plan have been developed to address the impacts identified through the environmental and social assessments documented in this EIS Refer to Volume 4 Chapter 24 for details
Theme: Economic development		
The region supports existing and emerging industries and encourages diversification ensuring growth and a viable and ecologically sustainable economy in the region	The region supports existing and emerging industries and encourages diversification ensuring growth and a viable and ecologically sustainable economy in the region	The LNG facility supports this strategy as part of an emerging, energy industry that will add to the economic base and diversity of the Gladstone industrial centre and the greater region
	Actively promote industry diversification to support economic stability and growth across the region	As above
The presence of a culture of innovation in the region which encourages the development of versatile, creative individuals and organisations	Stimulate continuous improvement of current technologies, the development and adoption of new technologies and practices to improve productivity and competitiveness and to take advantage of emerging	The use of LNG for energy generation overseas will enable a reduction in greenhouse gas emissions during the life cycle when compared to coal as an energy source

CQRGMF policy outcome	CQRGMF strategies and actions	Consistency assessment
	opportunities including, but not limited to, electronic service delivery, biotechnology, greenhouse gas mitigation and dry land farming	The technology used in the LNG facility includes innovations to reduce emissions and improve facility efficiency
The provision of a flexible and skilled workforce meeting industry requirements which is capable of responding to both industry and personal changes	Through labour force planning, identify current and future labour market supply and demand characteristics of the region and its communities and encourage the sourcing of labour and skills within the region	Australia Pacific LNG will develop and use methods to attract people local to the region to the workforce. It will continue to collaborate on programs with government, training and educational groups that build local skills base
	Maximise employment opportunities for the Aboriginal and Torres Strait Islander workforce through appropriate skills development / training / management strategies	Australia Pacific LNG will develop and use methods to attract under represented groups to the workforce. It will continue to collaborate on programs with government, training and educational groups that build local skills base
It is recognised there is an increased capacity of the region to engage directly with international markets which increases our global perspective and enhances the viability of organisations based in the region	Identify and develop international, interstate and inter regional markets for Central Queensland's current and potential goods and services	Australia Pacific LNG has a marketing team which has considerable expertise in the Asian and North Pacific LNG markets
The provision of a flexible and skilled workforce meeting industry requirements which is capable of responding to both industry and personal changes	Through labour force planning, identify current and future labour market supply and demand characteristics of the region and its communities and encourage the sourcing of labour and skills within the region	Australia Pacific LNG will develop and use methods to attract people local to the region to the workforce. It will continue to collaborate on programs with government, training and educational groups that build local skills base
	Maximise employment opportunities for the Aboriginal and Torres Strait Islander workforce through appropriate skills development / training / management strategies	Australia Pacific LNG will develop and use methods to attract under-represented groups to the workforce. It will continue to collaborate on programs with government, training and educational groups that build local skills base
Theme: Infrastructure		

CQRGMF policy outcome	CQRGMF strategies and actions	Consistency assessment
Air transport infrastructure and services that meet the needs of industry and the community and facilitate improved connectivity beyond the region	Protect existing infrastructure from encroachment by development	The emissions from the LNG facility are predicted to have a vertical velocity in excess of 4.3m/s at the Obstacle Limitation Surface for the Gladstone Airport. Australia Pacific LNG is in consultation with CASA for the affected air space Refer to Volume 4 Chapter 13 for further details
Port infrastructure that meets the needs of industry and the community while minimising the potential for detrimental environmental impacts	Maintain, upgrade and expand where necessary, the existing port infrastructure at Gladstone Port and Port Alma to meet the current and future needs of users of the ports	The Project through its environmental management activities will support the GPC in its endeavours towards sustainable port development The Project is working with the GPC to plan for future expansion of channels and berth areas to meet the development requirements of the LNG industry
Provision of safe, effective and sustainable domestic, industrial and regulated waste management infrastructure for the region	Promote effective and coordinated planning of waste management infrastructures	The LNG facility is designed to minimise wastes. The waste hierarchy of – avoid, reduce, re-use, recycle, dispose – will be implemented. Any wastes for disposal will be disposed of in accordance with DERM requirements Refer to Volume 4 Chapter 16 for further details
Theme: Social and cultural development		
Safe, secure housing that is affordable, appropriate, and designed efficiently, reflecting the climate, culture and character of the area, is located throughout the region in relation to services, open space, recreation and employment	Encourage a range of residential development options meeting the demographic and socio-economic needs of the area, and are appropriate to the climate and lifestyle attributes	Australia Pacific LNG will provide housing for non-local construction staff and contractors in temporary accommodation facilities and will consult with stakeholders including the local council as part of the site selection process for these facilities Australia Pacific LNG will work through committees established under the sustainable resource communities policy to identify housing market issues, forecasts

CQRGMF policy outcome	CQRGMF strategies and actions	Consistency assessment
		and possible responses
The region has implemented a plan that encourages individuals and families to relocate into the region in order to build and/or replace the community skills base	Create employment opportunities that attract and retain young people and families	The LNG facility will provide a range of employment opportunities for the local community over the life of the Project

Consistency with the Central Queensland Strategy for Sustainability

The Central Queensland Strategy for Sustainability – 2004 and beyond (Fitzroy Basin Association) (CQSS) is a non-statutory regional plan. Compliance with the provisions of this strategy is voluntary. Table 6.4 examines the consistency of the LNG facility with relevant strategy items.

Table 6.4 Consistency of LNG facility development with CQSS

Strategy issue	Strategy targets	Consistency assessment
Weeds and pest animals		
Certain plants and animals are declared as pests, and as such must be controlled Targets compliment the *Land Protection (Pest and Stock Route Management) Act 2002*	100% control of outbreaks of new agricultural and environmental pest plants and animals, including pests of aquatic environmental significance (ongoing target) Impact of agricultural and environmental pest plants and animals (class 2 and 3) is contained within five years and trend reversed within ten years	The LNG facility EM Plan will incorporate weed and pest management measures The project will follow Australian Quarantine Inspection Services quarantine requirements for imported materials and equipment
Climate change		
Development to minimise greenhouse emissions and to return carbon to the soil. Rockhampton and Gladstone City Councils, and Calliope Shire Council are participating in the Cities for Climate Protection Program	Practices and technology developed and implemented to minimise net greenhouse gas emissions within ten years Uptake of energy efficient practices and technology by consumers	The Project will ultimately (at full production capacity) generate approximately 5.5 million tonnes CO_2-e / y of reportable greenhouse emissions LNG is a significantly less greenhouse gas intensive fuel than coal for producing electricity The Australia Pacific LNG project will consume, at full production capacity, around 10% of the 270PJpa per train of feed to the facility. The natural gas will be used to fuel the power generation and refrigeration turbines, instead of grid

Strategy issue	Strategy targets	Consistency assessment
		electricity The energy efficiency of the LNG production process will be ~90% based on energy inputs compared with energy outputs The greenhouse gas emission mitigation measures are included in Volume 4 Chapter 14
Air quality		
There are atmospheric discharge limits beyond which human health effects occur. Development to undertake measures to limit discharges	Air pollutant emissions maintained at 2004 levels or reduced to improve air quality Introduce alternative technologies and systems, where possible, to reduce pollution and emissions, in existing and new developments Develop site-by-site plans to reduce fugitive emissions	The LNG facility's emissions will meet air quality goals for NO_2, PM_{10}, CO, VOC and odour Refer to Volume 4 Chapter 13 for further detail
Acid sulfate soils		
Disturbance of acid sulfate soils, usually during earthworks for development may cause the release of sulphuric acid to surrounding waterways, affecting water quality, aquatic ecosystems and built infrastructure	Implement SPP 2/02 and supporting technical guidelines Avoidance of ASS hazard areas identified in local government planning schemes Where ASS have already been disturbed, implement appropriate remediation / management to limit negative environmental impacts	A detailed ASS management plan is to be prepared prior to construction. The plan will outline the techniques to be used for ASS management For further details refer to Volume 4 Chapter 5
Coasts and estuaries		
In the Port Curtis area, stormwater run-off in coastal areas associated with growing urban, industrial and port land uses, is a major source of contaminants. Suspended solids from exposed land in urban and rural areas are a primary source of contaminants to Gladstone Harbour. Increased sediments in coastal waters can adversely affect seagrass beds and marine	Coastal development is consistent with the Reef Water Quality Protection Plan-September 2009 (developed by the Australian and Queensland Governments), State Coastal Management Plan: Queensland's coastal policy (2001), and Curtis Coast Regional Coastal Management Plan – September 2003	The Project intends to manage stormwater runoff from the LNG facility to ensure that discharges from the site, should they occur, are within water quality objectives agreed with DERM. This will be achieved by constructing detention basins, erosion and sediment control devices and separating contaminated stormwater during all phases of the Project

Strategy issue	Strategy targets	Consistency assessment
biodiversity		For further details refer to Volume 4 Chapter 11
Cultural heritage		
European and Indigenous cultural heritage (landscape values, artefacts, historical sites etc) may easily be damaged or lost through insensitive planning, resource use, or development in ignorance of their existence	No land and sea management, planning or development impacts in culturally (Indigenous and non-indigenous) sensitive areas unless under an approved CHMP Development and implementation of cultural heritage protection program to protect all cultural heritage (material and non-material) within 5 years	The LNG facility will be subject to an approved CHMP negotiated with the relevant Traditional Owners, and hence will support this aspect of the CQSS Refer to Volume 4 Chapter 18 for further details
Native Title		
While Native Title rights do not supersede other property rights, there is a widespread lack of understanding of how resource management activities impinge on Native Title	Land management and planning activities allow for full expression of Native Title rights Native Title rights, and/or access, and any necessary compensation agreed and implemented	Native Title agreements with relevant Aboriginal parties will be put in place to manage this issue with respect to those lands where native title is found to exist
Soil salinity		
Dryland salinity is an emerging problem in the Fitzroy Basin as vegetation clearance changes the water balance in the soils	Reduction of deep drainage and runoff Maximising water transpiration by plants Revegetation of cleared recharge areas to restore natural water balances	The Project intends to keep vegetation clearance to the minimum necessary to construct the LNG facility Disturbed lands no longer required after LNG facility construction will be managed in accordance with Volume 4 Chapter 5.
Integrity of remnant vegetation		
Approximately 95% of remnant vegetation in the Curtis catchment remains	Voluntary protection of remnant vegetation on freehold lands Regeneration of non-remnant native vegetation on private lands to re-establish wildlife corridors particularly in riparian areas	Where the clearance of remnant vegetation is unavoidable, it is intended that disturbed areas be managed in accordance with the measures outlined in Volume 4 Chapter 8
Aquatic habitats		
Modification of in-stream, near stream, and wetland habitats can	Increase the length of functional riparian areas by 20% in 10 years	There are no perennial water bodies within the LNG facility site,

Strategy issue	Strategy targets	Consistency assessment
disrupt the functioning of aquatic ecosystems and lead to deterioration in water quality	Maintenance of existing areas of high ecological value Protection and restoration of significant wetlands Removal of in-stream barriers to species movement in the waterways	however, ephemeral drainage lines and small melaleuca swamp areas will be removed as a result of project development A stormwater management plan will be developed to address impacts to aquatic values Refer to Volume 4 Chapter and Volume 4 Chapter for further details
Water quality		
Water resources valued by the community for a variety of purposes. Need to ensure that water quality is improved for river health and human activities	A measurable improvement in water quality over 15 years Maintenance of electrical conductivity levels consistent with ANZECC guidelines while region-specific standards are developed	No impact to existing river water quality is anticipated. Discharges are to marine environment only There will be potential for eroded soils / sediments and contaminants to enter waterways during the construction and operation stages Measures will be implemented in a stormwater management plan
Water availability		
Water resources plans have been developed under the *Water Act 2000* to ensure the health of flow-dependant ecosystems and to provide adequate water for human uses	Achievement of environmental flow objectives for the area's waterways The Central Queensland region to achieve high efficiency water use in ten years 50% industrial and urban water users to be practicing efficient water use within 5 years	The LNG facility footprint will have low impact on environmental flow for any local tributaries, although ephemeral drainage lines will be removed as a result of site development The design includes measures to reduce water consumption and the EM Plan documents water management measures for construction and operation Refer to Volume 4 Chapter 11 and Volume 4 Chapter 24 for further details
Economy		
By 2050 the region has a robust and well-balanced economy which is economically, socially and ecologically sustainable, and able to withstand external pressures	All industries in the region to have a clear natural resource management policy incorporating commitment to continuous improvement and / or best management practices for local conditions within 5 years	The LNG facility will operate under a proven health, safety and environment management system which incorporates the principles of continual improvement The Project will incorporate energy

Strategy issue	Strategy targets	Consistency assessment
	Identify and implement appropriate and cost effective sustainable technologies and practices within 10 years	efficient technology which reduces energy usage in comparison to other global LNG facility practices
Social		
By 2050, the region supports a range of viable, resilient and cohesive rural and urban communities By 2050, all regional stakeholders are participating in effective natural resource allocation, decision-making and management	Levels of Indigenous and youth employment increased by 20% within 10 years	Australia Pacific LNG will develop and use methods to attract under-represented groups to the workforce. It will continue to collaborate on programs with government, training and educational groups that build local skills base

Consistency with state planning policies

The consistency of the Project with the state planning policies (SPPs) is examined below.

SPP 1/92 – Development and conservation of agricultural land

There is an absence of published GQAL data for Curtis Island. In order to determine the applicability of this policy to the LNG facility site, an agricultural land capability assessment of the site and surrounds has been undertaken (refer to Volume 4 Chapter 5). This assessment was based on the procedures outlined in Guideline 1 - The identification of good quality agricultural land. The investigations undertaken classified the majority of the area as class 3c pasture land - suitable for light grazing only. The remainder of the area investigated comprised the tidal areas which were classed as being class D – unsuitable for agriculture.

Based on the above findings, the LNG facility component of the Project will not affect GQAL.

SPP 1/03 – Mitigating the adverse impacts of flood, bushfire and landslide

Flooding

The site is traversed by a local creek system comprising three ephemeral tributaries that discharge from the site into Port Curtis approximately 1.3km south of Laird Point. The local creek catchment covers the proposed facility site and extends to the southeast, and comprises an area of 284ha.

The proposed LNG facility site also extends onto tidal flats extending over an area of approximately 25ha between the mangroves at the mouth of the creek to near the bases of the hills. The flats are subject to occasional tidal inundation on higher spring tides. The maximum level for tidal inundation corresponds to highest astronomical tide (HAT) level which is RL 2.56m Australian Height Datum (AHD). The tidal flats and corridors are 60 to 80m wide along the creek tributaries are prone to inundation in the 100 years average recurrence interval design flood event.

It is proposed to fill the tidal flats and to construct a number of benches on the hillsides in order to provide flood-free platforms for the LNG facility and ancillary facilities. The proposed LNG facility is to be constructed in stages and will extend over an area of approximately 156ha. It is proposed to fill the tidal flats to RL 6m AHD and to construct a number of benches between RL 8m AHD and RL 35m

AHD (refer to Volume 4 Chapter 11). These levels will ensure that the facility footprint area is not likely to be affected by flooding from tides, storm surges or stormwater runoff.

Bushfire management

The LNG facility and surrounding area is rated as a medium bushfire hazard area by the Calliope Shire town planning scheme 2007. The SPP requires that development maintains the safety of people and property by either avoiding areas of high or medium bushfire hazard or by mitigating the risk through the:

- Design and the siting of buildings
- Inclusion of adequate firebreaks
- Provision of access for fire-fighting/other emergency vehicles
- Provision of an adequate and accessible water supply for fire-fighting purposes
- Periodic controlled burns of the surrounding areas.

The LNG facility design incorporates firebreaks and a whole-of-site firewater storage and reticulation system. The facility also incorporates an emergency shut down system. Emergency shut down valves will be installed at critical points within the process, product lines to the LNG storage tanks, and the vessel loading lines. Gas detectors and fire detection systems will be installed at key areas in the LNG facility. Signals from the detection systems will either activate the appropriate emergency shut down valves or alert the operators so that they can take appropriate action. Volume 4 Chapter 22 provides further detail on bushfire risk.

Landslide

Part of the site contains areas with slopes in excess of 15% and consequently these lands may constitute a landslide natural hazard management area under this SPP. The earthworks associated with the development will be designed to ensure such slopes are stable and do not constitute a landslide hazard.

SPP 1/02 – Development in the vicinity of certain airports and aviation facilities

The LNG facility is located approximately 13km to the northwest of the existing Gladstone airport. At this distance, the site is outside the OLS for the airport as defined in the Calliope Shire town planning scheme 2007, which plateaus at a height of 164.5m until it hits the 15km OHS. The highest component of the LNG facility is expected to be well within the OLS applying to the site. Hence, the facility should not pose an obstacle hazard to aircraft using Gladstone airport.

The LNG facility is not located within or near to existing navigational buffer zones, and hence should not interfere with the operation of these navigational facilities.

The facility's effects on aircraft operations due to air emissions plume rise are separately examined in Volume 4 Chapter 13. The Commonwealth Civil Aviation Regulations 1988 and Civil Aviation Safety Regulations 1988 provide the Civil Aviation Safety Authority (CASA) with the power to regulate the height of plumes which may pose a hazard to aircraft operations. Aviation authorities have established that an exhaust plume with a vertical gust in excess of 4.3m/s may interfere with aircraft when flying at low levels.

The LNG facility lighting and its potential to interfere with night flying operations is a matter that is also regulated by CASA. The design of facility lighting would be undertaken in accordance with CASA guideline 'Lighting in the vicinity of aerodromes: Advice to lighting designers'.

SPP 2/02 Planning and managing development involving acid sulfate soils

The preliminary ASS investigations for the LNG facility identified the presence of PASS. The clay soils encountered within the intertidal and supra-tidal flats exhibited noticeable sulphide content. It is expected that acid formation could potentially occur in these soils as a result of soil disturbance during LNG facility construction.

SPP 2/02 states the expected development outcome for lands containing ASS is the release of acid and associated metal contaminants into the environment is avoided by either:

- Not disturbing acid sulfate soils when excavating or otherwise removing soil or sediment, extracting groundwater or filling land, or by
- Treating and, if required, undertaking ongoing management of any disturbed ASS and drainage waters.

Details of the PASS investigations and the management measures to be applied to control ASS impacts are presented in Volume 4 Chapter 5.

Curtis Coast Regional Coastal Management Plan

The Curtis Coast Regional Coastal Management Plan is a statutory instrument under the *Coastal Protection and Management Act 1995* and will be treated as if it is a SPP for the purpose of any development applications under the SPA. This plan sets out a series of desired coastal outcomes for key coastal sites (and localities) within the plan area. The proposed LNG facility has the potential to impact on three of these coastal sites – namely Curtis Island, Gladstone Harbour and The Narrows. The LNG facility site is located within the southwest locality of the Curtis Island key coastal site. Since the establishment of this coastal management plan, part of the south western locality of Curtis Island has been included within the Curtis Island Industry Precinct of the GSDA as an industrial precinct for several LNG projects. The LNG facility is located within this industrial precinct.

The management plan sets out policies for the management of estuarine and marine water quality values and on habitats for significant species. The general area is identified as:

- Containing a regionally important and state-significant coastal wetland
- Containing a regionally important, dry tall mature eucalypt coastal habitat
- Being within a dugong protection area
- Containing a state significant, scenic coastal landscape.

Table 6.5 below examines the facility's consistency with the desired coastal outcomes for the key coastal sites.

Table 6.5 Consistency of LNG facility with the desired environmental outcomes of the Curtis Coast Regional Coastal Management Plan

Desired coastal outcome	Consistency assessment
Curtis Island - coastal locality – southwest	
Planning for future development appropriately identifies	An EM Plan has been developed to address the

Desired coastal outcome	Consistency assessment
and takes into consideration the values of areas of high conservation significance including the cumulative impacts of associated development on these values	impacts identified through the environmental assessments documented in this EIS, which included terrestrial and marine ecology and areas of conservation significance The LNG facility footprint does not impact upon "endangered" regional ecosystems. The site clearing will remove an "of concern" regional ecosystem from the LNG facility site. The proposed marine reclamation will remove tidal flats and may result in the removal of some mangroves within the LNG facility site. The loss of remnant vegetation, mangroves and wetland areas will be compensated for through appropriate offsets Refer to Volume 4 Chapter 8, Volume 4 Chapter 10 and Volume 4 Chapter 24 for details Refer to cumulative impacts in Volume 4 Chapter 25
Planning for future development considers the design and location of development ensuring any impacts on the scenic coastal landscape values associated with the island are minimised	The coastal ranges in this locality are a significant scenic coastal landscape feature. They are able to be viewed from the mainland and form part of the coastal landscape. The LNG facility will not disturb the main strike ridge system that runs along the western side of Curtis Island in this location. Project construction will result in disturbance of the marine foreshore and will reduce the length of continuous mangrove vegetation. Efforts will be made to minimise the visual break created by such works and to rehabilitate temporarily disturbed areas. Refer to Volume 4 Chapter 7 for details.
The Narrows	
Protection of the area's integrity and ecological functioning from incompatible development, land uses and activities	The Narrows is a near pristine area which exhibits high ecological and scenic values. The LNG facility through the discharge of treated stormwater, desalination plant effluent (brine) and treated sewage has the potential to adversely impact on the water quality of The Narrows with subsequent impacts on marine biodiversity Refer to Volume 4 Chapter 11 for further details Stormwater, process water and brine discharges from the site will be designed to meet DERM requirements
Monitoring of water quality to detect any adverse impacts on marine and estuarine biodiversity from contaminants including suspended solids	As part of the LNG facility's EM Plan a regular program of marine and terrestrial water quality monitoring will be undertaken Refer to Volume 4 Chapter 24 for further details

Desired coastal outcome	Consistency assessment
Gladstone Harbour	
Management of the harbour providing for a range of uses, while ensuring conflicts between these uses are managed and adverse impacts on coastal resources and their values are minimised	The LNG facility has been designed to lessen or avoid impacts on coastal resources where possible. The marine elements of the Project will impact to a limited degree on tidal wetlands, mangrove communities, and shorebird roosting areas
Continued development of the Port of Gladstone in an ecologically sustainable manner avoiding the location of port infrastructure in areas of high conservation significance, where possible	The wetlands along the harbour frontage of the LNG facility site and North Passage Island are of habitat importance. The marine area of the site incorporates a dugong protection area. There will be some disturbance to these locations through the construction of LNG ship loading facilities and the MOF although the site footprint and construction strategy seek to minimise the impacts. The EM Plan addresses potential impacts Refer Volume 4 Chapter 24 for more details
Recognition of the importance of the undeveloped inner-harbour islands in providing public access, recreation, biodiversity and scenic amenity to the regional community and avoidance of development with the potential to compromise these values	The LNG facility is examining two alternative sites for the establishment of LNG ship loading facilities. Option 1b involves a jetty crossing North Passage Island. The construction of this facility would involve the clearing of a narrow corridor of vegetation and subsequent piling to support the jetty structure. This will not be required for Option 2a (Australia Pacific LNG's preferred option) where the berths are located between North Passage Island and close to the Curtis Island coast
Inclusion of inner-harbour islands within open space areas where appropriate	North Passage Island is tidal land and has no tenure. See comment above
Coordination of management approaches among land and marine resource managers in relation to monitoring the health of the harbour in regards to water quality, managing increasing vessel use and minimising impacts to shorebirds, turtles and dugong	Australia Pacific LNG will participate in relevant regional water quality, and marine flora and fauna monitoring programs to assist in the management of the harbour resource Maritime Safety Queensland and the GPC manage shipping in the port. Australia Pacific LNG will participate in the development of LNG vessel transit plans and protocols in consultation with other port users and other stakeholders APLNG is also a contributing member of the Port Curtis integrated monitoring program; a collaborative holistic monitoring program for assessing the ecosystem health of Port Curtis

Town planning schemes and other regulatory provisions

Consistency with the development scheme for the Gladstone State Development Area

The GSDA is divided into a number of land use designations which identify preferred land uses for the lands included in the designation. The LNG facility site is located within the Curtis Island Industry Precinct designation. The purpose of this precinct is:

- To provide for the establishment of LNG facilities for processing operations (including liquefaction and storage) of national, state or regional significance that require access to export wharf facilities
- To provide for establishment of infrastructure associated with LNG facilities including transport linkages to wharf facilities
- To have regard to the physical characteristics of the land when considering the location of the industrial development
- To prevent the establishment of uses that may be incompatible with, adversely affect, or constrain existing or future LNG processing operations within the Curtis Island Industry Precinct
- To provide for the physical separation of significant industrial and infrastructure activities within the Curtis Island Industry Precinct from the adjoining Environmental Management Precinct.

Given the above, the proposed LNG facility use is consistent with the purpose of the precinct.

One of the alternative mainland dock facility options is located on the Calliope River adjacent to the RG Tanna coal terminal on land in the Clinton Precinct of the GSDA. This precinct provides for the establishment of port related activities and activities that support industrial development elsewhere in the GSDA. The proposed mainland dock facility is consistent with this purpose.

Material change of use

The Project will require approval for a MCU under the GSDA development scheme. An application for MCU is assessed by the Coordinator-General under the provisions of this development scheme. All development under the SPA other than a MCU is assessed under the SPA.

Schedule 7 of the GSDA development scheme identifies uses that are highly likely to be an acceptable use in the Curtis Island Industry Precinct. These uses are:

- High impact industry limited to natural gas (liquefaction and storage)
- Infrastructure facility
- Local infrastructure
- Materials transport infrastructure.

The proposed development generally meets the definition of a high impact industry limited to natural gas.

Part of the Project will involve the housing of the construction workforce in a temporary accommodation facility within the LNG facility site on Curtis Island. This ancillary facility will be in place to service the construction of the proposed four trains. This facility, whilst not being identified as a preferred use in the precinct, is an essential part of the LNG facility's construction phase.

GSDA policies

Four policies have been established to assist in the management, development and promotion of the GSDA. These policies are:

- Policy 1 – Information collection for the GSDA
- Policy 2 – Environmental management in the GSDA
- Policy 3 – Public notification
- Policy 4 – Ecologically valuable land.

These policies outline the goals, standards and guidelines for environmental management that will apply to projects seeking development approval within the GSDA. The LNG facility design incorporates features which address these policy requirements and the EM Plan provided in Volume 4 Chapter 24 outlines the management measures to ameliorate the Project's impacts.

Consistency with Gladstone Harbour Protection and Enhancement Strategy

The Gladstone Harbour Protection and Enhancement Strategy (EPA, 2003) seeks to implement local aspects of the State Coastal Plan. It specifically identifies two goals of relevance to the LNG facility. These are:

- To manage, maintain, and improve the quality of stormwater entering Gladstone Harbour
- To protect and enhance key coastal habitats within Gladstone Harbour.

Australia Pacific LNG intends to manage stormwater runoff from the LNG facility to ensure that discharges are within the agreed water quality requirements. The LNG facility will incorporate a stormwater system designed to capture stormwater on the site for use in the facility in the first instance. Runoff from major storm events in excess of system capture capacity will discharge to the harbour. Some process water will be discharged to the harbour following treatment. All discharges will be managed to ensure the quality meets the DERM requirements. The EM Plan will address stormwater, sediment and water discharge measures (refer Volume 4 Chapter 11 and Volume 4 Chapter 24).

Key coastal habitats identified as requiring protection in the vicinity of the LNG facility are mangroves, salt marsh, salt flats, and tidal mud flats. North Passage Island is utilised as a local bird roost site (refer Volume 4 Chapter 8). The construction of the facility and its marine facilities will result in the loss of some wetland and mangrove habitat. It is intended that such loss would be offset by a variety of measures as agreed with the responsible agencies (refer Volume 4 Chapter 8 and Volume 4 Chapter 10).

The Project, through the implementation of the above measures, should be generally consistent with the intent of this strategy document.

Consistency with the Port of Gladstone Land Use Plan

The GPC is in the process of revising the Port of Gladstone Land Use Plan 1999 for the port. A statement of proposals has been prepared which outlines the GPC's vision for the future development of the port. Under this vision it is intended that the established operations at the Auckland Point wharves will continue, and that vacant land to the north of the railway will provide for the expansion of the port's activities including container handling. This area is also intended to be a storage area particularly for the resources coming to/from the GSDA.

In addition, the planning vision reconfirms the use of land at Fisherman's Landing for the import and export of cargoes associated with major industrial developments. The statement of proposals also identifies a need for land to be set aside on Curtis Island at Hamilton Point to service potential development situated in the GSDA on the island.

The Project activities proposed for the mainland are consistent with GPC's vision for the future development of these localities.

Consistency with the Gladstone Port Authority Strategic Plan

The Project proposals are generally consistent with the intent of the Gladstone Port Authority Strategic Plan, 1997 – 2047.

The 2008 update of the strategic plan states that Laird and Friend Points could provide for six new berths for Panamax size vessels. The LNG facility proposes to establish two new berths at Laird Point to enable the shipment of LNG, and to use the MOF for the shipment of workers, materials and wastes to and from the Island.

The mainland location for materials lay-down, barge loading and unloading and passenger ferry terminal has yet to be determined. It is probable that such facilities may be located at Fisherman's Landing. This location incorporates existing or proposed future strategic port land. The strategic plan indicates that Fisherman's Landing is intended to be developed into an eleven berth complex comprising additional reclaimed land and new wharves.

Consistency with Calliope Shire and Gladstone City town planning schemes

The development of LNG facility components which are not classified as petroleum activities and which are not located within the GSDA or on strategic port land, may require town planning approval under a town planning scheme.

At this stage of project development, no known project components fall into this category. However, the need to establish workers car parks and material storage facilities in the vicinity of Auckland Point, Fisherman's Landing or the RG Tanna coal terminal may trigger a town planning application against a planning scheme depending on the location of suitable land.

Impacts on existing land uses

Agriculture

The LNG facility site was formerly used for cattle grazing. This activity has ceased and will be replaced by LNG production and storage.

The land to be removed from a pastoral use is not considered to be GQAL as defined by SPP 1/92 (refer to Volume 4 Chapter 5 for details).

Residential and urban uses

The Project is not expected to impact on the few residential premises on the harbour islands, the South End settlement on Curtis Island, or premises on the mainland. The closest premises to the site are located approximately 7km from the LNG facility site. The potential for air and noise emissions to impact on these residential premises is discussed in Chapters 13 and 15.

The Project proposes to house a proportion of its construction workforce on site for the duration of the construction phase of the LNG facility which may extend for a period of 10 years at various levels of

intensity. It is proposed that the movement of people, goods and services between Gladstone and the site will be direct and will not involve any facilities at South End. To help ensure that South End is not detrimentally affected by project activities, none of the LNG facility workforce will be housed either permanently or temporarily at the settlement. The existing farm tracks that connect the site to South End will not be utilised by the Project.

The Project intends that the dwelling stock in the Gladstone/Calliope locality be utilised to provide housing for a proportion of the construction workforce and the facility's permanent operational workforce. The demand created by the Project for permanent housing may generate a need for the release of additional allotments for housing purposes. This outcome is discussed further in Volume 4 Chapter 20.

Conservation and recreation

The Project's primary impact on current conservation and recreational land and water uses on and in the vicinity of the LNG facility site directly involves habitat removal as a result of land reclamation activities associated with facility construction. Although minimised through design and construction mitigation measures, the destruction of a portion of the marine habitat is unavoidable. The Australia Pacific LNG approach to compensatory measures to address the loss of marine habitat is discussed in Volume 4 Chapter 10.

The Project is not expected to impact on recreational activities associated with the informal camping and beach area at Laird Point as the camping area is shielded from the effects of LNG site activities (e.g. noise and dust) by the intervening terrain.

The facility's construction and operational activities may also alter the quality and integrity of items of the protected areas in the locality. These items are identified below:

- The Great Barrier Reef World Heritage Area (water quality)
- The Great Barrier Reef Coast Marine Park (water quality)
- The Port Curtis wetland (water quality, habitat removal)
- The Rodds Bay dugong protection area in Port Curtis (seagrass bed disturbance, boat strike, noise disturbance)

Further discussion on these potential conservation and recreation impacts is provided in Volume 4 Chapter 8, Volume 4 Chapter 10 and Volume 4 Chapter 23.

Forestry

The LNG facility will not impact on the operations of existing state forests on Curtis Island or the mainland. The clearing of site vegetation during the LNG facility construction phase may involve some usable timber. Prior to the commencement of clearing operations, Australia Pacific LNG intend carry out an assessment of the timber on the site, and to harvest this timber resource as appropriate. Vegetation which is not suitable for timber production will be mulched and stockpiled for use in site rehabilitation and revegetation activities.

Commercial and recreational fishing

The establishment of the proposed marine facilities will impact access to marine waters by recreational and commercial fishermen. Recreational boating will be excluded from areas around the LNG loading facility and the MOF for safety and security reasons. A 250m exclusion zone around each jetty is

proposed. Public access to foreshore areas within the LNG facility site will also be prohibited for facility security and public safety reasons.

The establishment of the facility's marine facilities (Option 1b, refer to Figure 3.9 in Volume 4 Chapter 3) would prevent private boats from accessing the waters between North Passage Island and the western shore of Curtis Island. Marine traffic under and around the jetty would not be permitted for safety and security reasons. Australia Pacific LNG has a preference for marine facility Option 2a as discussed in Volume 4 Chapter 3. Option 2a would allow recreational boating between an LNG vessel at berth and North Passage Island.

Industrial and commercial uses

The Project will undertake substantial expenditure on the purchase of local goods and services during both the construction and operational phases. This will support existing local suppliers and will expand their customer base. The injection of a substantial newcomer workforce into the Gladstone economy will increase household expenditure on such items as housing, consumption goods, and personal services. The economic effects of the project on existing commercial and industrial uses are discussed further in Volume 4 Chapter 21.

Infrastructure services

The provision of the infrastructure services needed to construct and operate the facility and facilities at the Curtis Island site will be undertaken by Australia Pacific LNG directly and will not require existing public utilities to supply water, power, waste disposal services, sewage disposal services or road access to the site.

The LNG facility intends to supply its own water needs though a combination of site stormwater harvesting and sea water desalination. Electrical power will be provided by diesel generators during LNG facility construction and by gas turbine generator sets during operation. Sewage wastes will generally be treated on site. Solid wastes will be collected and shipped by barge to the mainland for disposal and/or recycling at appropriate waste facilities. A telecommunications network for the LNG facility will be provided by a private supplier.

The disposal of LNG facility wastes at mainland landfills and waste treatment facilities is not expected to require the expansion of existing facilities or the creation of new facilities. Hence changes to land usage and possibly tenure are not expected to be occasioned by waste disposal activities.

Native Title

The proposed Australia Pacific LNG plant site, described as Lot 3, SP225924, is held in freehold title; therefore native title has been extinguished in this area. Australia Pacific LNG will also be required to obtain tenure for the proposed reclamation area and the area required for a seabed lease. Australia Pacific LNG will seek to negotiate and register an ILUA for these areas. Should ILUA negotiations not be successful, Australia Pacific LNG will approach the Coordinator-General pursuant to Section 82 of the SDPWO Act, to resume Native Title rights and interests, if any exist in those areas, on the basis that those areas form part of the GSDA.

Indigenous cultural heritage

The project will not cause any impacts to registered Indigenous cultural heritage sites. However, the preliminary survey of the proposed LNG facility site identified Indigenous cultural heritage traces throughout the site, particularly along the coastline, around the estuarine mud flats and in the northern portion of the lease. These locations are likely to be impacted by the proposed LNG facility.

In addition to the impacts to identified sites and isolated stone artefacts, there is the potential for previously undetected heritage sites to be revealed during further site investigations and impact mitigation work to be undertaken prior to construction. In accordance with the wishes of the Port Curtis Coral Coast Aboriginal Corporation (PCCC), the exact location of these sites will remain confidential.

Measures to manage impacts to Indigenous cultural heritage items and sites in the Laird Point area will be addressed by the development of CHMPs. A number of meetings have already been held between the PCCC and Australia Pacific LNG. Further meetings are planned and it is expected that a CHMP will be agreed by May 2010. Negotiations with the endorsed Aboriginal Parties for the marine areas of the project are ongoing and are expected to be completed by May 2010.

6.5 Mitigation and management

The management of land and natural resources seeks to ensure that the health of our land, water and vegetation is improved, long term productivity is enhanced, and that regional communities are resilient and prosperous. The stewardship of both natural and human resources is of prime importance for sustainable agriculture, forest management and marine and coastal environmental protection.

To ensure the proper management of land and natural resources, Australia Pacific LNG will strive to align the Project as far as practical with existing planning legislation and policies.

6.6 Conclusion

6.6.1 Assessment outcomes

Table 6.6 lists land use sustainability objectives and project mitigation measures that support these objectives. The objectives and mitigation measures relevant to the marine environment and matters of national environmental significance are reported in Volume 4 Chapter 10, Volume 4 Chapter 12 and Volume 4 Chapter 23.

The table also includes the residual risk levels for land use and infrastructure. A risk assessment has been undertaken to identify potential risks, causes and consequences from gas pipeline activities. Mitigation measures to reduce the risk have been nominated and the residual risk has been assessed. Further details on the risk assessment methodology are provided in Volume 1 Chapter 4.

Table 6.6 Summary of environmental values, sustainability principles, potential impacts and mitigation measures

Environmental values	Sustainability principles	Potential impacts	Possible causes	Mitigation and management measures	Residual risk level
Diversity of ecological processes and associated ecosystems.	Minimising adverse environmental impacts and enhancing environmental benefits associated with Australia Pacific LNG's activities, products or services; conserving, protecting, and enhancing where the opportunity exists, the biodiversity values and water resources in its operational areas.	Loss of, or disturbance to, lands and waters with important conservation values.	Habitat removal as a result of land reclamation activities and marine facilities construction.	Site project facilities and infrastructure to reduce impact on ecologically sensitive areas. Implement compensatory measures to address the loss of marine and intertidal habitat. Refer Chapters 8, 10, & 23 for details.	Low
Life, health and wellbeing of people.	Respecting the rights, interests and diverse cultures of the communities in which it operates.	Disruption to existing lifestyles and businesses. Increase in mainland demand for land for residential uses with consequential upward pressure on land and house prices. Restriction of commercial and recreational fishing opportunities compensatory measures to address the loss of marine habitat.	The location, construction and operation of mainland project facilities. The establishment of safety exclusion zones around project jetties.	Implement measures to ensure that sufficient serviced land is available to meet the forecast needs in a timely manner.	Medium

Environmental values	Sustainability principles	Potential impacts	Possible causes	Mitigation and management measures	Residual risk level
Management of finite resources – land resource.	Identifying, assessing, managing, monitoring and reviewing risks to Australia Pacific LNG's workforce, its property, the environment and the communities affected by its activities.	Non-use of site timber resource. Introduction of animal and plant pests.	Land clearing to enable LNG plant construction. Introduction of materials and plant to the project site	Harvest usable site timber and mulch other vegetation for use in site rehabilitation. Develop a biosecurity management plan in association with the Gladstone Regional Council and the Gladstone Ports Corporation that addresses animal and plant pests.	Low

6.6.2 Commitments

Australia Pacific LNG will continue to consult with Gladstone Regional Council, Gladstone Ports Corporation, and State and Australian government departments to develop the Project consistent with the planning objectives of the relevant jurisdictions.