

4|Current Port Function



4.0 Current port function

The Port of Gladstone is Queensland's largest multi-cargo port and the fifth largest coal export terminal in the world (by throughput). The Port of Gladstone is a major centre for the import and export of products for the manufacturing, mining and processing industries. Handling more than 1800 vessels annually, it is one of the busiest ports in Australia and plays a vital role in the local, state and national economies.

The port's major functions are to facilitate:

- the export of Queensland resources
- the import of raw material
- the export of finished products from major industry established in Gladstone.

The specific functions of the port authority are defined under the *Transport Infrastructure Act 1994* as outlined within Section 5.3.2 of this report.

Over 30 products are currently handled through the Port of Gladstone and shipped to more than 30 countries. In 2013–14, total trade through Gladstone was 97.66 million tonnes².

By far the largest traded commodity is coal, representing 71 per cent of total cargo throughput in 2013–14, followed by bauxite, alumina, caustic soda, cement products and petroleum products:

- coal – 69,622,499 tonnes (export)
- bauxite – 16,610,286 (import)
- alumina – 5,082,561 tonnes (export)
- caustic soda – 1,854,233 tonnes (import)
- cement/clinker– 1,238,573 tonnes (export)
- petroleum products – 1,185,141 tonnes (import).

All other products handled in 2013–14 were in volumes of less than 500,000 tonnes.

However, as Liquid Natural Gas (LNG) export facilities come online it is expected that LNG exports will also become a significant commodity. Container and break bulk goods, while low compared to the tonnage of other capital city ports, are critical to the operations of industry and development throughout Central Queensland.

² All figures from Department of Transport and Main Roads, (DTMR), February 2015, *Trade Statistics for Queensland Ports, For the 5 years ending 30 June 2014*

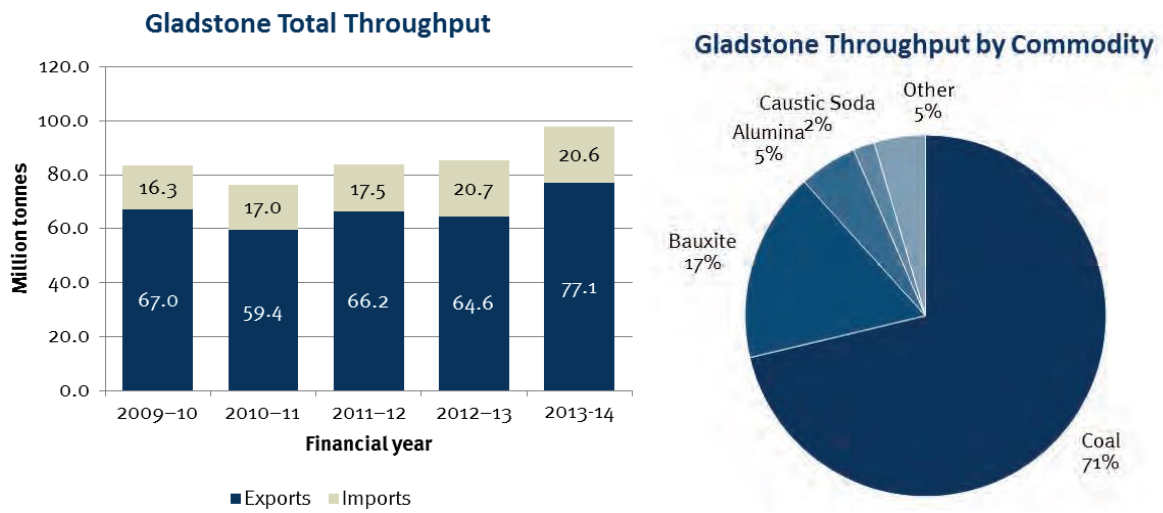


Figure 3 Port of Gladstone total throughput and throughput by commodity

5 | Regulatory and Policy Context



5.0 Regulatory and policy context

5.1 International conventions

A number of international Conventions are relevant to the management of the proposed Port of Gladstone master planned area and surrounding areas of high economic, environmental and cultural significance such as the Great Barrier Reef.

5.1.1 Convention for the protection of the World Cultural and Natural Heritage, 1972 (the World Heritage Convention)

The World Heritage Convention administered by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) is a pillar of the international environmental legal system. It is concerned with the identification, protection and preservation of cultural and natural heritage considered to be of outstanding universal value.

The Convention establishes a list of properties that have outstanding universal value, called the World Heritage List. These properties are part of the cultural and natural heritage of States that are Parties to the Convention. Located within and adjacent to the proposed Port of Gladstone master planned area, the GBRWHA is such a property on the World Heritage List.

5.1.2 Convention on Biological Diversity, 1992 (the Biodiversity Convention)

The Convention on Biological Diversity, 1992 imposes a general obligation on Australia to conserve biodiversity in both terrestrial and marine ecosystems. Article 8 is of particular relevance in the context of the Port of Gladstone in terms of Australia's obligations to 'promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas'.

5.1.3 International Convention for the Prevention of Pollution from Ships, 1973 (the MARPOL 73/78 Convention)

The MARPOL Convention was adopted in 1973 and is administered by the International Maritime Organisation (IMO). The convention is the primary international tool for regulating pollution of marine environments by vessels resulting from accidents or operational waste.

Regulations to prevent pollution from ships in Australian waters are based on the MARPOL Convention and are implemented by both the Australian and Queensland governments. The Australian Maritime Safety Authority (AMSA) is responsible for the application and enforcement of MARPOL in areas of Commonwealth jurisdiction (i.e. to the limit of the 200 nautical mile exclusive economic zone). Maritime Safety Queensland (MSQ) is responsible for enforcement activity in respect of illegal discharges from smaller vessels in the Great Barrier Reef Marine Park.

The Legislation giving MARPOL effect in Australia is the *Pollution Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (Cth) and the *Navigation Act 1912* (Cth), and in Queensland, the *Transport Operations (Marine Pollution) Act 1995*.

5.1.4 The London Protocol

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972, now known as the London Protocol is one of the first global conventions to protect the marine environment from human activities and has been in force since 1975. The aims of the London Protocol are to protect and preserve the marine environment from all sources of pollution and to prevent, reduce and eliminate pollution by controlling the dumping of wastes and other materials at sea. Internationally, guidelines have been developed under the London Protocol and Convention, including guidelines for the implementation of the London Protocol at the national level, specific guidelines for assessment of dredged material, specific guidelines for other waste that may be disposed of at sea, and guidance on action lists and action levels to assist regulators. In Australia, the London Protocol is administered through the *Environment Protection (Sea Dumping) Act 1981* (Cth).

5.2 Australian Government legislation & policy

5.2.1 Reef 2050 Long Term Sustainability Plan (Reef 2050)

The Australian and Queensland Governments released Reef 2050 in March 2015. Reef 2050 builds on the findings of the Great Barrier Reef Strategic Assessment and will guide the sustainable management of the Great Barrier Reef for the next 35 years.

Reef 2050 incorporates the following four elements:

- A vision for the GBRWHA that reflects the diversity of use and interest in the property, protects the outstanding universal value of the reef, sustains its integrity and integrates the three pillars of sustainability (environmental, social and economic).
- An outcomes framework that includes desired outcomes and targets for protection of the GBRWHA's outstanding universal value.
- Adaptive management actions to deliver outcomes and targets (primarily drawn from the two strategic assessments and with a focus on critical areas of new work).
- Integrated monitoring and reporting programs to measure the success of the Plan.

Reef 2050 commits to limiting port-related capital dredging in the GBRWHA to the ports of Abbot Point, Gladstone, Hay Point/Mackay, and Townsville. Additionally, a key action of Reef 2050 is to mandate the beneficial reuse of port-related capital dredge spoil, such as land reclamation in port development areas, or disposal on land where it is environmentally safe to do so (Action WQA19).

Reef 2050 also requires that port master planning be undertaken for the priority ports of Gladstone, Hay Point/Mackay, Abbot Point and Townsville that optimises infrastructure and considers operational, economic, environmental and social relationships as well as supply chains and surrounding land uses.

5.2.2 *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

The EPBC Act is the Australian Government's central environmental legislation. The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the

EPBC Act as matters of national environmental significance (MNES). The Great Barrier Reef Marine Park is listed as a particular MNES.

The EPBC Act is triggered when a development proposal has the potential to have a significant impact on MNES. The provisions of the EPBC Act transcend state, regional and local planning instruments. If a development is likely to have a significant impact on MNES, it triggers referral to the Commonwealth Minister for assessment as a Controlled Action.

5.2.3 Great Barrier Reef Marine Park Act 1975 (GBRMP Act)

The GBRMP Act is the primary legislation relating to the protection of the Great Barrier Reef Marine Park and is administered by the Great Barrier Reef Marine Park Authority (GBRMPA). The GBRMP Act provides a framework for the management and protection of the Great Barrier Reef Marine Park and prohibits particular activities including mining exploration and extraction within the park. A key aspect of the GBRMP Act is the designation of shipping routes and compulsory pilotage areas for large vessels navigating through the Great Barrier Reef Marine Park into ports, as shown in Figure 4.

An important function of the GBRMPA in administering the Act is the provision of a framework for planning and management of the Marine Park, including through zoning plans, plans of management and a system of permissions. The Act outlines the requirements for permit and management plans for port development and provides an investigation regime, including the appointment of inspectors and powers of investigation for those inspectors. It also provides mechanisms for enforcement including criminal enforcement action, civil penalties, administration action, infringement notices and emergency powers³.

³ Great Barrier Reef Marine Park Authority 2015, Legislation, <http://www.gbrmpa.gov.au/about-us/legislation-regulations-and-policies/legislation>



Figure 4 Designated shipping routes within the Great Barrier Reef Marine Park

5.2.4 *Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (ATSIHP Act)*

The purpose of the ATSIHP Act is the preservation and protection from injury or desecration of areas and objects that are of particular significance to Aboriginal and Torres Strait Islander people in accordance with their traditions in Australia and in Australian waters. The ATSIHP Act allows the Environment Minister, on the application of an Aboriginal person or group of persons, to make a declaration to protect an area, object or class of objects from a threat of injury or desecration.

5.2.5 The Burra Charter

The Burra Charter adopted by the Australia International Council on Monuments and Sites in 1979, is a set of principles that provide a best practice standard for managing and conserving cultural heritage places in Australia. The Charter was initially designed for the conservation and management of historic heritage. However, after the addition of further guidelines that defined cultural significance and conservation policy, use of the charter was extended to include Indigenous and non-Indigenous places of cultural significance.

Under the Charter 'conservation' is defined as the process of looking after a place so as to retain its cultural significance'. A 'place' is considered significant if it possesses aesthetic historic, scientific or social value for past, present or future generations. All four stated values are reflected in the criteria used to determine the cultural heritage significance under the *Queensland Heritage Act 2003*. The Charter is periodically updated to reflect developing understanding of the theory and practice relating to cultural heritage management and conservation.

5.2.6 Native Title Act 1993

Under the *Native Title Act 1993*, the Federal Court of Australia is responsible for the management and determination of all application relating to native title in Australia. The *Native Title Act 1993* sets out the role of the Court in native title matters and establishes a framework for the protection and recognition of native title. The Act also outlines procedures which determine where native title exists, how future activity impacting upon native title may be undertaken and to provide compensation where native title is impaired or extinguished.

5.2.7 Historic Shipwrecks Act 1976 (Historic Shipwrecks Act)

The Historic Shipwrecks Act administered by the Department of Environment protects all shipwrecks and associated relics that are at least 75 years old, regardless of whether their physical location is known. However, more recent shipwrecks may be declared as historic under the Historic Shipwrecks Act by the Minister for the Environment. The Historic Shipwrecks Act aims to ensure that historic shipwrecks are protected for their heritage values and maintained for recreational and educational purposes. It also regulates activities that may result in the damage, interference, removal or destruction of an historic shipwreck or associated relics. The Historic Shipwrecks Act also provides for protected zones (which can cover up to 200 hectares) to be declared in order to protect historic shipwrecks and relics which are of special significance or sensitivity or at risk of interference. Permits are required to enter protected zones. Currently in Queensland there are 10 shipwrecks located in protected zones.

5.2.8 Environment Protection (Sea Dumping) Act 1981

Dumping of waste or incineration at sea of radioactive material, wastes and other material from any vessel, aircraft or platform in Australian waters is prohibited under this Act, unless a permit has been issued. Permits are most commonly issued for dredging operations and the creation of artificial reefs. Permits have also been issued for dumping of vessels, platforms or other man-made structures and for burials at sea. This Act also fulfils Australia's international obligations under the London Protocol (to prevent marine pollution by controlling dumping of wastes and other matter. The act was made pursuant to the London Convention and applies

to all vessels, aircraft and platforms in Australian waters and Australian vessels, aircraft and platforms in international waters. The Act is administered by the Department of Environment and the GBRMPA (where sea dumping takes place within the Great Barrier Reef Marine Park).

5.2.9 Sea Installations Act 1987

The construction, operation and decommissioning of offshore installations in Australian waters outside State coastal waters (from the 3 nautical mile State limit to the outermost limits of Australian waters) is regulated under this Act. It applies to any human-made structure attached to the seabed other than those used for exploring or exploiting natural mineral resources (including petroleum).

5.2.10 Protection of the Sea (Prevention of Pollution from Ships) Act 1983

The discharge into the ocean of oil, noxious substances, packaged harmful substances, sewage and garbage from ships (including aircraft) is prohibited by this Act. It implements the MARPOL Convention and applies to all vessels within Australian waters but allows State and territory legislation to be accredited for coastal waters. This Act is administered by AMSA.

5.2.11 National Ports Strategy (NPS)

The NPS was published by Infrastructure Australia in 2011 and endorsed by the Council of Australian Governments (COAG). The NPS sees “ports and related land-side logistics chains [as being] critical to the competitiveness of Australian businesses, which rely on them to deliver business imports and to take exports to the global market”. The overarching purpose of the NPS is “to drive the development of efficient, sustainable ports and related freight logistics that together support the needs of a growing Australian community and economy and the quality of life aspirations of the Australian people”.

The NPS provides a nationally coordinated approach to the future development and planning of Australia’s port and freight infrastructure. It provides a national action plan and a number of recommended actions, which include:

- governments to recognise the central role of ports and related freight supply chains to trade and thus to Australia’s future;
- state governments to prepare State plans that recognise key maritime spaces and landside access routes of strategic importance; and
- ports to prepare precinct plans that reflect the challenges of a port and demonstrate how the port capacity will be provided to meet forecast needs with an outlook horizon of a minimum of 15 to 30 years.

5.3 Queensland Government legislation & policy

5.3.1 Sustainable Ports Development Act 2015 (SPD Act)

The purpose of the *Sustainable Ports Development Act 2015* is to provide for the protection of the GBRWHA through managing port-related development in and adjacent to the area. The Act gives effect to the government’s commitments made in Reef 2050 to better manage

the impacts of port development on the environment, particularly on the GBRWHA, while allowing Queensland's economy, jobs and regions to grow. The Act was passed by the Queensland Parliament on 12 November 2015 and enacted on 20 November 2015.

The purpose of the Act is to:

- protect greenfield areas by restricting new port development in and adjoining the GBRWHA to within current port limits
- restrict capital dredging for the development of new or expansion of existing port facilities to within the regulated port limits of Gladstone, Hay Point/Mackay, Abbot Point and Townsville (to optimise the use of infrastructure at these long established major bulk commodity ports)
- prohibit the sea-based disposal of material into the GBRWHA generated by port-related capital dredging
- mandate the beneficial reuse of port-related capital dredged material, such as for land reclamation, or disposal on land where it is environmentally safe to do so
- require master plans at the long-established major bulk commodity ports of Gladstone, Hay Point/Mackay, Abbot Point and Townsville to optimise the use of existing port infrastructure and address operational, economic, environmental and social relationships as well as supply chains and surrounding land uses.

5.3.2 *Transport Infrastructure Act 1994 (TIA)*

The TIA establishes the regime under which port authorities plan for the future development of strategic port land and for the identification of port marine operational areas. Specifically, the functions and powers of port authorities under the TIA (Part 3, s.275) are –

- a) to establish, manage, and operate effective and efficient port facilities and services in its port; and
- b) to make land available for –
 - i. the establishment, management and operation of effective and efficient port facilities and services in its port by other persons; or
 - ii. other purposes consistent with the operations of its port; and
- c) to provide or arrange for the provision of ancillary services or works necessary or convenient for the effective and efficient operations of its port; and
- d) to keep appropriate levels of safety and security in the provision and operation of the facilities and services; and
- e) to provide other services incidental to the performance of its other functions or likely to enhance the usage of the port.

Land Use Plans are required by all port authorities as the principal tool for development assessment. Development within strategic port land is not regulated by local government planning schemes. The extent of land currently subject to the provisions of the Gladstone Ports Corporation Land Use Plan is illustrated on Figure 5.

Land Use Plans prepared under TIA are required to:

- contain details of strategic port land;
- coordinate and integrate the 'core matters' relevant to the Land Use Plan;
- identify Desired Environmental Outcomes (DEOs) for the strategic port land; and
- include measures to achieve the DEOs.

As part of the formal approval process established under the TIA for Land Use Plans, the Minister for Transport must also be satisfied that State interests will not be adversely affected.

Regulations under TIA establish the marine-based limits of each port.

5.3.3 Sustainable Planning Act 2009 (SPA)

The SPA forms the overarching framework for Queensland's planning and development system and sets out categories of assessable development. The SPA gives effect to a range of planning instruments such as State Planning Regulatory Provisions, the State Planning Policy, Regional Plans and Local Government Planning Schemes. The SPA confirm that port authorities are the assessment manager for all assessable development on strategic port land.

The SPA is supported by the *Sustainable Planning Regulation 2009* (SP Reg) which provides detailed guidance regarding the application of the SPA's purpose. Key matters identified in the Regulation include exempt and assessable types of development and matters requiring referral to State agencies. The Department of Infrastructure, Local Government and Planning has released the draft planning bills for public consultation which is to replace the *Sustainable Planning Act 2009* and be implemented in late 2016.

5.3.4 Queensland State Planning Policy 2014

The State Planning Policy (SPP) is an integral component of Queensland's land use planning system which enables development, protects our natural environment and allows communities to grow and prosper. The SPP defines the Queensland Government's policies about matters of state interest in land use planning and development which notably includes strategic ports, strategic airports and state transport infrastructure. The SPP Ports state interest not only seeks to protect key transport corridors to ports and protect ports from encroachment by incompatible development, it also seeks to protect sensitive uses from port generated emissions.

The State interest – strategic ports protects the operation of the Gladstone port and enables its growth and development by ensuring that the Gladstone Regional Council Planning Scheme 2015 appropriately integrates the state interest through:

- 1) identifying strategic ports and associated strategic port land and core port land, and
- 2) facilitating development surrounding strategic ports that is compatible with, depends upon or gains significant economic advantage from being in proximity to a strategic port, or supports the strategic port's role as a freight and logistics hub, and
- 3) ensuring sensitive development is appropriately sited and designed to mitigate adverse impacts on the development from environmental emissions generated by port operations, and

- 4) identifying and protecting key transport corridors (including freight corridors) linking strategic ports to the broader transport network, and
- 5) considering statutory land use plans for strategic ports and the findings of planning and environmental investigations undertaken in relation to strategic ports.

5.3.5 State Development and Public Works Organisation Act 1971 (SDPWOA)

The primary purpose of the *SDPWOA* is to support the coordinated development of major infrastructure and development projects in Queensland. The Act gives the Coordinator-General powers including the ability to declare a major project a 'coordinated project' and oversee the environmental impact assessment process for the project. The Act also allows the Coordinator-General to establish State Development Areas (SDAs) to promote economic development in Queensland. SDAs typically take the form of industrial hubs, multi-user infrastructure corridors and major public infrastructure sites. Within declared SDAs, the Coordinator-General assesses and decides development applications in accordance with the approved development scheme.

5.3.6 Environmental Protection Act 1994 (EP Act)

The EP Act is Queensland's key environmental legislation. The EP Act is focused on fostering ecologically sustainable development through the maintenance of an integrated management program that develops and implements effective environmental strategies. The EP Act establishes an assessment regime for the consideration and approval of environmentally relevant activities (ERA).

5.3.7 Queensland Heritage Act 1992 (QHA)

The QHA provides the framework for assessing the significance of items and places of cultural heritage value in Queensland, and is administered by the Department of Environment and Heritage Protection. It makes provision for the conservation of Queensland's cultural heritage by protecting all places and areas listed on the Queensland Heritage Register (QHR).

5.3.8 Aboriginal Cultural Heritage Act 2003 (ACH Act)

Section 4 of the ACH Act defines its main purpose as providing effective recognition, protection and conservation of Aboriginal cultural heritage. The ACH Act defines Aboriginal cultural heritage as anything that is either: a significant Aboriginal area in Queensland; a significant Aboriginal object, or; significant archaeological or historical evidence of Aboriginal occupation of an area of Queensland. The ACH Act also imposes requirements for development under SPA (s. 89).

5.3.9 Native Title (Queensland) Act 1993

The main objects of the *Native Title (Queensland) Act 1993* are to ensure that Queensland law is consistent with standards set by the Commonwealth Native Title Act for future dealings affecting native title and to validate past acts, and intermediate period acts, invalidated because of the existence of native title and to confirm certain rights in accordance with the Commonwealth *Native Title Act 1993*.

5.3.10 *Nature Conservation Act 1992 (NCA)*

The NCA establishes a framework for the creation and management of protected areas, for example national parks, and the protection and management of native flora and fauna. Under NCA there are 13 classes of protected areas and flora and fauna are listed as being one of the following five classifications; extinct in the wild, endangered, vulnerable, near threatened, and least concern.

5.3.11 *Marine Parks Act 2004*

The Marine Parks Act 2004 is the marine equivalent of the *Nature Conservation Act 1992*. It provides a framework for the creation of marine parks and the protection of marine species. Three marine parks have been created under the Act: Great Barrier Reef (GBR) Coast Marine Park; Great Sandy Marine Park; and Moreton Bay Marine Park. The GBR Coast Marine Park complements (in adjacent State waters) the GBR Marine park created under the *Great Barrier Reef Marine Park Act 1975* (Cth). The Act creates zoning plans for multiple-use management and a permit system for activities within marine parks such as collecting marine products or commercial whale watching.

5.3.12 *Transport Operations (Marine Pollution) Act 1995*

Marine pollution from ships in Queensland coastal waters is regulated under the Transport Operations (Marine Pollution) Act 1995. The Act is administered by MSQ and complements the Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (Cth), which regulates marine pollution in Australian waters.

5.3.13 *Work Health and Safety Act 2011*

The *Work Health and Safety Act 2011* (WHS Act) provides a framework to protect the health, safety and welfare of all workers. The WHS Act also provides protection for the general public so that their health and safety is not at risk by work performed by a particular business or industry.

Workplace Health and Safety Queensland regulates Major Hazard Facilities (MHF) in accordance with the WHS Regulation 2011 and the nationally endorsed key principles for MHP regulation. Due to the nature of chemicals stored at MHFs, the WHS Regulation 2011 requires that all MHFs are to be licensed.

5.3.14 *Forestry Act 1959*

The *Forestry Act 1959*, amongst other matters, regulates the administration and uses of the State forests and timber reserves as well as the commercial harvesting or extraction of forest products and extractive materials where owned by the State. These resources are known to exist, or have the potential to be on areas of State forest and other Crown land, and other parcels of freehold land where the ownership of the quarry material is reserved to the State, within the proposed master planned area boundary. Where development within the master planned area uses quarry materials that belong to the State, authorities are likely to be required under the *Forestry Act 1959* to extract, remove and/or use this quarry material.

5.4 Local planning framework

Detailed land use planning throughout the region is delivered through a combination of the Gladstone Regional Council Planning Scheme, the Port of Gladstone Land Use Plan, the Gladstone State Development Area Development Scheme and Queensland Government Priority Development Area development schemes.

The application and effect of these instruments is described Table 1 and the geographic extents of the land use plans are shown in Figure 5.

Table 1 Applicable planning instruments

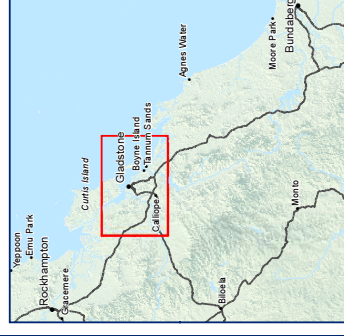
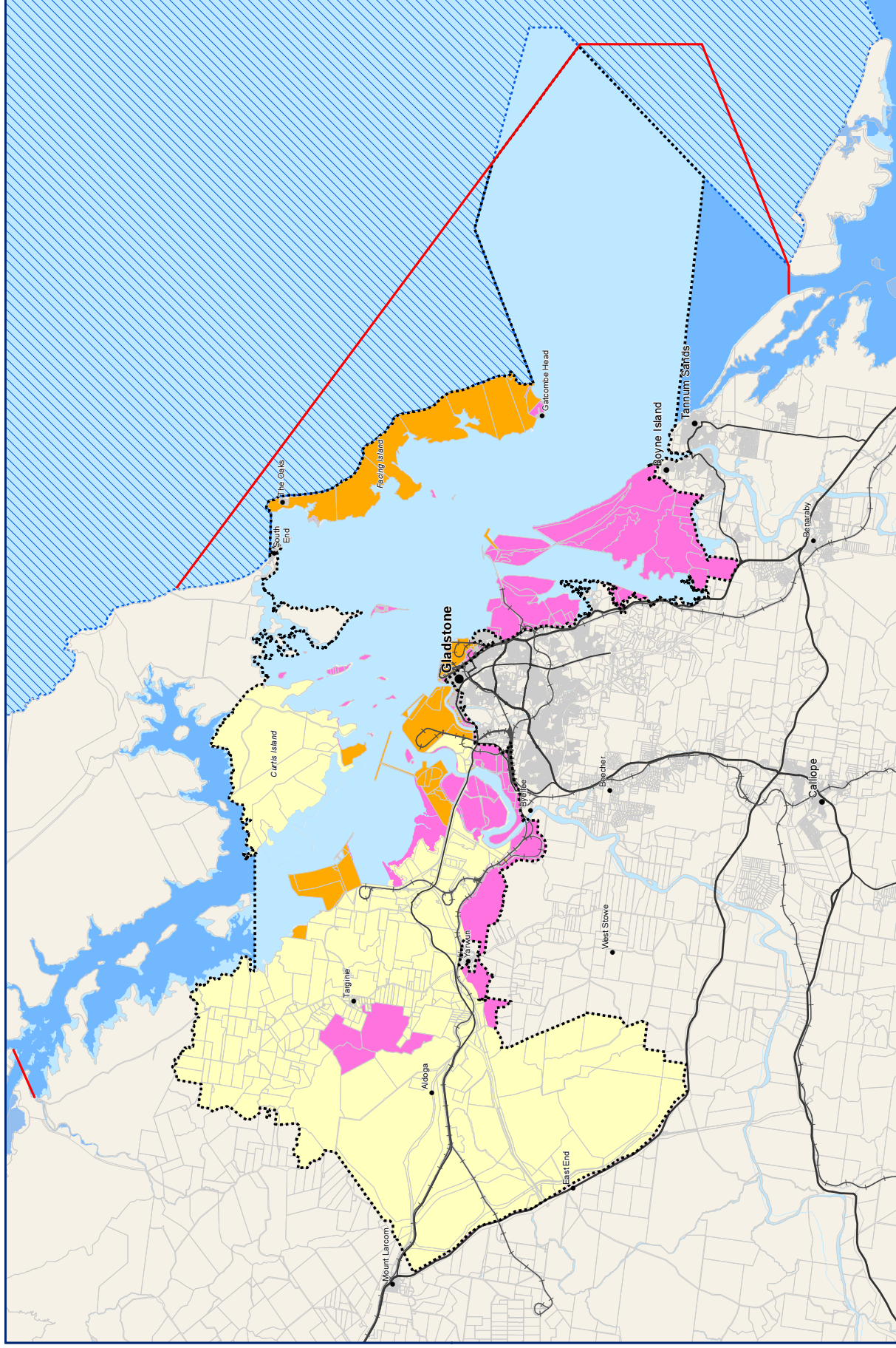
Jurisdiction	Instrument	Application and effect
Gladstone Ports Corporation	Gladstone Ports Corporation Land Use Plan 2012	Applies to all Gladstone Ports Corporation Strategic Port Land in Gladstone and Port Alma, including all premises, roads, waterways and tidal areas within Strategic Port Land boundaries. Any land owned by GPC which is not identified in the plan is subject to the planning provisions of relevant local or state government authorities.
Queensland Government	Gladstone State Development Area Development Scheme 2015	Applies to applications for material change of use within the Gladstone State Development Area (GSDA). Applications seeking approval for reconfiguration of a lot or operational work remain assessable under the relevant local government planning scheme.
	Tannum Sands Urban Development Area Development Scheme 2012	Applies to all development (material change of use, operational work and reconfiguring a lot) within 171 hectares of land located approximately 25 km south east of the Gladstone city centre.
	Clinton PDA Development Scheme 2010	Applies to all development (material change of use, operational work and reconfiguring a lot) within 26 hectares of land located approximately 6 km south west of the Gladstone city centre.
	Toolooa PDA Development Scheme 2013	Applies to all development (material change of use, operational work and reconfiguring a lot) within 180 hectares of land located approximately 6 km south of the Gladstone city centre in the suburb of Toolooa.
Gladstone Regional Council	Gladstone Regional Council Planning Scheme 2015	The Gladstone Regional Council Planning Scheme was adopted by Council on 6 October 2015 and took effect on 12 October 2015. The planning scheme supersedes the previous planning schemes for Gladstone City, Calliope Shire and Miriam Vale Shires providing a consolidated planning document for all planning and development across the region. The planning scheme does not apply on land which is strategic port land for the purposes of the Port of Gladstone Land Use Plan 2012 or land within a priority development area.

Figure 5

Existing planning instruments

Legend

- Cities
- Urban centres
- Local centres
- Railway
- Highways
- Secondary Roads
- Property boundaries
- Port limits
- Proposed Gladstone port master planned area boundary
- Great Barrier Reef Marine Park
- Great Barrier Reef Coast Marine Park
- Gladstone State Development Area
- Development Scheme
- Gladstone Ports Corporation Land Use Plan
- Gladstone Regional Council Planning Scheme



10 November 2015



0 1.25 2.5 5 7.5 10
Kilometres

Coordinate System: GCS GDA 1984
Datum: GDA 1984
Units: Degree

6 | Land Use and Infrastructure



6.0 Land use and infrastructure

The Port of Gladstone is located within a diverse region which contains a range of established urban communities, major industrial precincts, resource activities and valuable environmental areas. Over time, the planning arrangements for land and marine areas in the Gladstone region have become increasingly complex and there has been unprecedented growth in the region. Due to the expansion of the resource sector and subsequent additional port expansion, there has been increased urban expansion of many of the existing communities.

The fragmented nature of planning jurisdictions covering the Gladstone Port and its surrounds (refer to Figure 5) creates a complex setting for coordinating appropriate land use planning outcomes. The preparation of a master plan for the Gladstone Port provides an opportunity to coordinate a holistic approach to land use planning matters within the boundary of the proposed master planned area.

6.1 Shipping and marine infrastructure

6.1.1 Shipping channels and external anchorages

Vessels arriving off the Port of Gladstone will be assigned a designated anchorage position by vessel traffic service (VTS) and will then need to await berthing instructions. There are a number of regulated anchorage positions located adjacent to the Fairway.

Port of Gladstone shipping channels are shown on Figure 6 and include:

- Outer Harbour Channel (L 22.45km W 183m D 16.1m)
- Inner Harbour Channel – Auckland (L 8.7km W 180m D 15.8m)
- Inner Harbour Channel – Clinton (L 2.2km W 180m D 16.0m)
- Inner Harbour Channel – Clinton Bypass (L 3.6 W 200m D 13.0m)
- Inner Harbour Channel – Targinie (L 6.1km W 120m D 10.6m).

Gladstone Ports Corporation is seeking to develop the existing Gatcombe and Golding Cutting shipping channels to accommodate a predicted increase in shipping traffic as a result of ongoing industrial growth within the Port. Existing channel depths and anchorage locations are shown on Figure 7.

The duplicate channel is proposed to be developed adjacent to the existing shipping channel. This represents approximately two thirds of the length of the outer harbour channel. The development will be undertaken in two stages and will allow deep draft Panamax and light draft Capes to pass deep draft Capes in at the completion of the first phase. The proposed duplicate channel will be approximately 14.0km long. Dredging is proposed to be undertaken to an ultimate depth of RL-16.1m and a channel width of 200m (toe to toe). Approximately 12 million cubic metres of seabed material will be removed during the dredging programme. This will reduce the bottleneck that may be created as a result of an increase in the total number of vessels handled annually in order to meet the committed trade.

Since the commencement of shipping from the Wiggins Island Coal Terminal (WICT) it has also been identified that there is a need to deepen the existing Clinton Bypass channel to allow the safe passage of Capesize vessels passing the RG Tanna Coal Terminal wharf in

the Port of Gladstone. The project would result in the area being deepened from around 12 metres to 16 metres to allow Capesize vessels to use the channel without impacting the vessels berthed at the RG Tanna Coal Terminal.

6.1.2 Limitations of existing channels

The existing shipping channels are essentially one way operation with limited passing capacity. Passing in the Gatcombe and Golding Channels is possible through the use of natural depths adjacent to these channels in the outer harbour.

6.1.2.1 Tidal influences

The tide plays a significant influence of the alignment of channels and berths. The tidal velocity within the Port of Gladstone can be as high as four knots on spring tides with a tidal range up to 4.83m.

For Capesize vessels, manoeuvrability is tidally constrained with assistance of the tidal range of up to 4.83m being relied upon to transit deep draft vessels. Dependent on the draft of the vessels and the tidal range, a tidal window for sailing may be limited to a couple of hours around high water. Growth in the use of Capesize vessels may be a limiting factor for the capacity of the Port. Currently all Capesize vessels are only used for the export of coal from RG Tanna Coal Terminal and Wiggins Island Coal Terminal.

In the event that product is imported in Capesize vessels, then severe constraints are imposed on the capacity of the Port in that both inbound and outbound vessels are tidally constrained for transit in a one way channel. The existing base tidal data for Gladstone (Auckland Point) is summarised in Table 2. Gladstone Harbour experiences large tidal ranges up to 4.83m. The large range generates strong tidal currents up to 1.5m/s in the main channels and up to 0.35m/s in the shallower extents of the estuary⁴.

Targinie Channel presents a similar issue for Panamax vessels transiting to Fisherman's Landing. The channel depth of 10.6m LWD constrains vessel movement with drafts of 13.0m being common on the import of Bauxite to the Rio Tinto Alumina Refinery. There is sufficient capacity for the operation of the channel; however, increased trade in deep draft Panamax vessels will impact capacity of the upper reaches of the harbour.

Table 2 Gladstone tidal planes⁵

Tidal Planes	Gladstone (Auckland Point)	
	m LAT	m AHD
Highest Astronomical Tide (HAT)	4.83	2.56
Mean High Water Springs (MHWS)	3.96	1.69
Mean High Water Neaps (MHWN)	3.11	0.84

⁴ GHD 2009c, Gladstone Ports Corporation: Report for Western Basin Dredging and Disposal Project – Coastal Processes Assessment, < <http://eisd.docs.dsdip.qld.gov.au/Port%20of%20Gladstone%20Western%20Basin%20Dredging/EIS/appendix-m-coastal-processes-assessment.pdf>>.

⁵ Department of Transport and Main Roads, Maritime Safety Queensland, Queensland Tide Tables Standard Port Tide Times 2015, Gladstone Port

Tidal Planes	Gladstone (Auckland Point)	
Mean Level (ML)	2.34	0.07
Australian Height Datum (AHD)	2.268	0.0
Mean Low Water Neaps (MLWN)	1.57	-0.7
Mean Low Water Springs (MLWS)	0.72	-1.6
Lowest Astronomical Tide (LAT)	0.0	-2.268
Port Datum (PD)	0.0	-2.268

Tidal currents are also a significant factor in determining berth alignments. The most ideal scenario is to align the berth face with the current. In the circumstance where the current pushes away from the berth face, the mooring loads are increased with an increased risk of a vessel moving off. In the circumstance where the current is pushing into the berth face, there is an additional berthing load imposed due to the additional velocity onto the wharf.

6.1.2.2 Seabed properties and profile

The existence of hard material (rock) will control the potential for channel development. The cost of removal of the rock is an order of magnitude of cost higher than conventional material with increased environmental harm from blasting. Sands and gravels are less of an issue for both dredging and reclamation. Soft clays and silts in reclamation or other onshore disposal areas present issues in relation to the retention time for water discharge and settlement to bring into use for other beneficial uses.

Observations of the seabed will indicate natural channels and gutters and may indicate areas of self-cleaning with respect to siltation. Steep batter slopes may be indicative of stiffer materials and represent areas of lower risk for maintenance.

6.1.2.3 Relationship of deep water to the shoreline

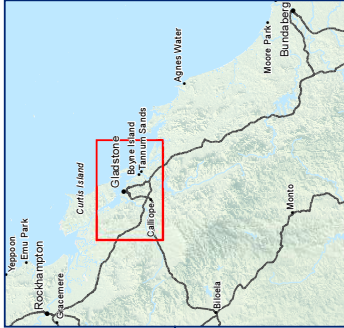
The relationship of deep water to the shoreline is a determining factor for the development of new berths. The shallow embayments between WICT and Fisherman's Landing are not conducive to the development of wharves.

The length of conveyors can be achieved to allow bulk materials to be handled; however, the cost of construction and maintenance, together with risks around spills over environmentally sensitive areas, present potential long-term issues. Dredging may be undertaken to get closer to the shoreline; however, the creation of basins in shallow areas present issues with the need for ongoing maintenance dredging.

Figure 6
Shipping channels and anchorages

Legend

- Cities
- Urban centres
- Local centres
- ⚓ Anchorages
- Railway
- Highways
- Secondary Roads
- Property boundaries
- Port limits
- ⋯ Proposed Gladstone port master planned area boundary
- ⋯ Great Barrier Reef Marine Park
- ⋯ Great Barrier Reef Coast Marine Park
- ⋯ Existing and proposed Shipping Channels
- ⋯ East Banks Sea Disposal Site



10 November 2015



Coordinate System: GCS GDA 1984
Datum: GDA 1984
Units: Degree

6.1.3 Boyne wharves

The Boyne wharf is located at the southern end of Gladstone Port Corporation's land holdings (refer to Figure 8). The wharf is primarily dedicated to the aluminium industry and services the Boyne Smelter Limited (BSL). The facilities are accessed via a private road and are well separated from existing sensitive land uses in South Gladstone.

Ships that arrive to load aluminium products or discharge liquid pitch and can berth bow-in or bow-out, depending on the state of the tide. Principal cargoes include aluminium ingots, petroleum coke, general cargo and liquid pitch. Berth depth is 15.0 metres (LAT).

This facility has good deep water access and throughput to the wharf is expected to increase. Access to the wharf is restricted as it must be gained via agreements from the private road owners.

6.1.4 South Trees wharves

The two South Trees wharves are dedicated to the aluminium industry, primarily serving Queensland Alumina. Berth depth is 12.8 metres (LAT).

The principal cargoes at South Trees East are alumina, caustic soda and fuel oil and the principal cargo handled at South Trees West is bauxite.

The bunker barge berthing facility is located adjacent to the South Trees berths and is dedicated to the barge operation.

6.1.5 Barney Point Terminal (part of Port Central)

The Barney Point terminal currently includes a wharf for the export of coal and other bulk commodities and is accessible by road and rail. The future development of this facility will see coal being relocated following the commencement of operations at the Wiggins Island Coal Terminal. Future use of the Barney Point Terminal will need to address potential dust impacts on the surrounding land uses and will change the visual aesthetics of the area from stockpiling of raw exposed materials to increased break bulk, petroleum, raw materials and containerised cargo. Berth depth is 15.0 metres (LAT). GPC will continue handling bulk products, including open stockpile, where issues of dust controls and other environmental issues can be addressed appropriately.

6.1.6 Auckland Point wharves (part of Port Central)

There are four wharves at Auckland Point accessible by road and rail. The Auckland Point wharves are the original port area established in the 1890s and are adjacent to the Gladstone central business district.

Auckland Point Wharf 1 is a multi-user/multi-product facility for export of dry bulk products. It is used by ships that arrive in ballast to load mostly magnesite, calcite or occasional break bulk. It is noted that bulk loading infrastructure at Wharf 1 has reached the end of its effective life and bulk loading operations will cease in 2016. Bulk loading requiring new infrastructure will not be precluded from future development at this berth.

Auckland Point Wharf 2 is used by ships that arrive in ballast to load mostly grain cargoes.

Auckland Point Wharf 3 is a multi-user wharf where the principal cargoes handled are refined oil products (such as diesels, jet fuels, petrol, liquid petroleum gas) and caustic soda. Other cargoes include containers, break bulk, general cargo and heavy lifts.

Auckland Point Wharf 4 is a multi-user berth used by ships to load/discharge general cargo, heavy lifts, containers, break bulk, gypsum, magnetite and scrap metal. Wharf 4 is located directly in front of the Gladstone Container Terminal which is operated as a multi-user facility that has been designed to handle all forms of containerised, break bulk and general cargoes.

An additional three wharves can be added in the future between Auckland Point Wharf 4 and Barney Point to provide for Panamax vessels. These wharves could be land backed and able to provide for clean cargo such as containerised cargo, petroleum and break bulk.

P&O Cruises has added Gladstone to its cruising itinerary and ships will berth at Auckland Point.

Due to relative low utilisation, these berths are occasionally used as lay berths for inspection and maintenance.

6.1.7 RG Tanna Coal Terminal

RG Tanna Coal Terminal at Clinton includes four wharves (Clinton Wharf 1, 2, 3 and 4) and three ship loading facilities. The terminal is accessible by road and rail. All product is received by rail.

The terminal provides for ships ranging in size from 25,000 to 220,000 dead weight tonnage arriving in ballast, ready to load coal and swing in the area at the western end of Clinton Channels to berth bow-out at all RG Tanna coal berths. Ships berths have a depth of 18.8 metres (LAT).

Future expansion of the RG Tanna Coal Terminal could accommodate a fourth ship loader and provision of a fifth berth at the western end of the existing berths.

6.1.8 Wiggins Island Coal Terminal

The Wiggins Island Coal Terminal (WICT) began operations in 2015. The terminal will service the increasing demand for the export of coal from the Surat and Bowen Basins. The facility will ultimately provide four berths to handle coal and two berths for other bulk cargo. Berths will be designed to accommodate Capesize vessels.

The site is accessed via Mt Larcom Road. The terminal will be built in stages in response to demand and once fully commissioned, it will provide for up to 84 mtpa in export coal capacity, effectively doubling existing coal export capacity at the Port of Gladstone.

The terminal is connected to the North Coast rail line, with rail unloading facilities connected to the Golding Point stockyard via a 5.6km long overland conveyor.

Stage 1 of WICT is operational and provides capacity for the export of up to 27 million tonnes of coal per annum.

6.1.9 Fisherman's Landing

With the reclamation undertaken in the Western Basin expansion, Fisherman's Landing is planned to accommodate a total of 11 berths. The facility connects directly to the adjoining

Gladstone State Development Area (GSDA) with access corridors for road, rail, conveyor and pipelines. The proximity of berths to land provides opportunity for bulk and break bulk operations. A large land area will be available for stockpiling and materials handling.

Fisherman's Landing Wharf 1 is used by ships that arrive loaded to discharge bauxite. Loaded tankers will berth occasionally to discharge caustic soda.

Fisherman's Landing Wharf 2 is used by ships that arrive in ballast ready to load alumina and berth bow-out. Loaded tankers will berth occasionally to discharge caustic soda.

Fisherman's Landing Wharf 4 handles bulk cement clinker, cement and fly ash. It is used by ships that arrive in ballast to load cement clinker, and will berth stemming the tide.

Fisherman's Landing Wharf 5 is a multi-user facility that handles bulk liquids. It is used by chemicals tankers that arrive in loaded condition to discharge liquid ammonia, caustic soda and sulphuric acid.

6.1.10 Curtis Island-LNG Precinct

Three berths have been completed for the LNG export industry. There is capacity to expand the number of berths for LNG to seven subject to industry growth.

The growing export of LNG is a result of expanding coal seam gas production in the Surat Basin in southern Queensland. A 380 kilometre long underground gas pipeline has been constructed and runs from near Miles connecting to the GSDA and adjoining Port of Gladstone. The coal seam gas will be liquefied (LNG) at a plant on Curtis Island and then transferred by pipeline to ships for export. The LNG facilities on Curtis Island currently fall within the GSDA and are therefore subject to the GSDA Development Scheme.

6.1.11 Curtis Island-Hamilton Point (proposed)

Gladstone Ports Corporation owns land at Hamilton Point and has identified the area as having potential for the development of port facilities to accommodate multiple Capesize vessels. Land backed berths will provide flexibility for development and major cargo anticipated includes break bulk and containers. Development of port facilities at Hamilton Point will require a road and rail bridge to connect to the mainland.

6.1.12 Small craft marine infrastructure

The Port of Gladstone includes a marine industry precinct, including the marina (land and water based facilities) and public boat ramps. The precinct provides opportunities for public access to the water and harbour in appropriate locations where it does not conflict or create safety concerns with general maritime and core port activities.

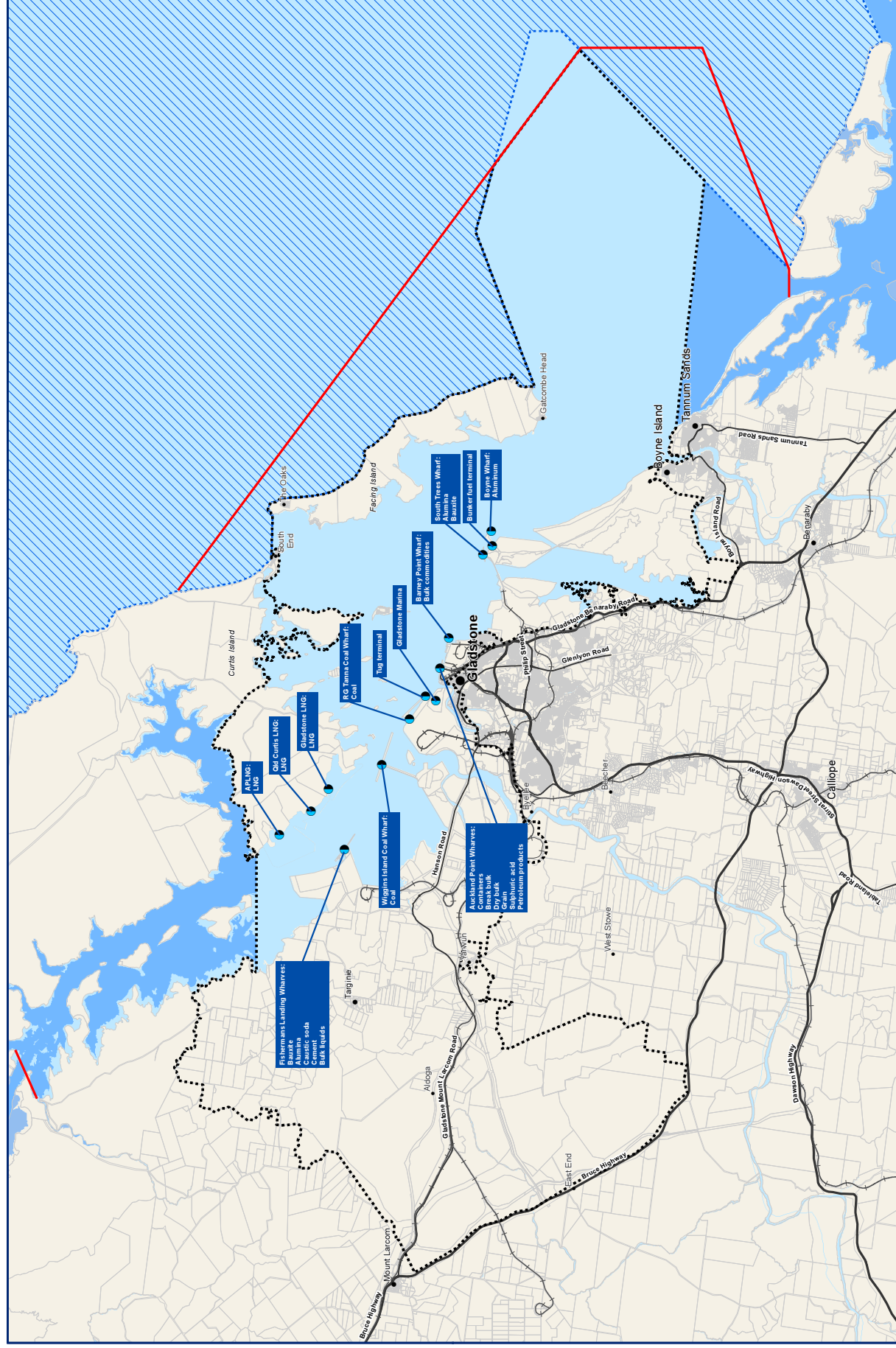
The Gladstone Marina and Auckland Creek are home to many of the port's recreational and commercial vessels. At the height of construction for the three LNG plants, there were approximately 450 Queensland registered commercial vessels operating in the Port of Gladstone with many more ships registered elsewhere also working in the area.

The GPC has recently completed construction on a new tug boat base behind the RG Tanna Coal Terminal to service the increased shipping in the port resulting from the development of the three LNG plants and the Wiggins Island Coal Terminal. The efficient deployment of tugs is critical to the operation of the port and this new facility will accommodate 12 vessels.

The port is also home to a growing recreational fleet. There are over 7,300 Queensland registered recreational vessels in the Gladstone area. The Gladstone Marina is a hub for recreational activities. Boat ramps are provided at locations across the harbour. Recreational vessels generally operate throughout all the waterways of the proposed Gladstone port master planned area.

Figure 8

Wharf centres



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6.2 Supply chain and supporting infrastructure

The efficient operation of the port relies on various elements of supporting infrastructure and transportation corridors to enable supply chains. There are a number of key pieces of linear infrastructure that service existing industry and/or transport materials to the Port of Gladstone. Key considerations in supporting the optimisation and efficient use of Gladstone's port and supply chain infrastructure include:

- **Corridor routes:** The need to ensure that the corridors between industrial development and port facilities are suited to the materials handling options is an important consideration. These links are critical to the efficient transportation and handling of materials.
- **Accessibility to wharves:** The facilitation of direct truck access is an important consideration in the efficient loading/unloading of goods at port wharves. It is necessary that a truck can manoeuvre to gain maximum efficiency where it is required to attend at the vessel's side (i.e. for containers, logs and general cargo). The optimal facility for such an operation is a land-backed wharf where maximum manoeuvrability of the vehicle is achieved. The majority of existing wharves at the port have been designed to accommodate bulk loading operations. This generally entails a narrow wharf which limits the turning circle and a single approach roadside which restricts the frequency of vehicle movement.
- **Berth utilisation:** A berth is impacted by the inter-vessel time; for a vessel with a short at-berth time an occupancy rate of 60 per cent may be the capacity. For a long at-berth time occupancy may be as high as 90 per cent. The future optimisation of Gladstone's available berths to vessel types will minimise the total service time of a vessel (waiting time for berths and the handling of vessels at their allocated berths).
- **Product compatibility:** While a particular facility may be capable of handling a range of bulk products, issues associated with contamination need to be resolved. In some instances, there is potential to undertake belt/system cleaning between products to address quality assurance standards; while in others, products will not be able to be handled using the same infrastructure. As an example, products such as coal and woodchips could not be handled using the same system due to the rigorous quality assurance requirements regarding carbon contamination.

6.2.1 Road infrastructure

Road infrastructure is critical to the port to provide a direct link with the major highway network. The road network within the proposed Gladstone port master planned area is shown on Figure 9. The principal elements of the road network servicing port areas comprise:

- Bruce Highway
- Calliope River Road
- Gladstone Benaraby Road
- Gladstone Port Access Road
- Hanson Road
- Dawson Highway
- Landing Road
- Gladstone Mount Larcom Road.

Gladstone Port Central is directly connected to the surrounding region by the Port Access Road which bypasses the Gladstone central business district. The Port Access Road provides a direct link to the Dawson Highway and Gladstone-Mt Larcom Roads which connect to the Bruce Highway to the south and north of the port respectively.

The Port Access Road currently connects with Glenlyon Road. The planned western extension to the Port Access Road has the potential to improve transport efficiency and road safety within Gladstone by alleviating the impact of large vehicles and hazardous good movements on local and general commuter traffic.

The Office of the Coordinator-General is currently preparing a road infrastructure study for the GSDA. The timing of development in the GSDA needs to be carefully managed so that the number of development fronts and associated demand for access roads is both reasonable and affordable.

The expected staging of road infrastructure up until 2031 in the GSDA is provided within Table 3.

Table 3 Anticipated roadworks required within the GSDA⁶

Infrastructure	Timeframe
Upgrade of Landing Road (OSOM Connection)	Short term priority
Complete duplication of Gladstone-Mt Larcom Road / Port Curtis Way between New Aldoga South Road and Blain Drive	<p>The timeframe is dependent on:</p> <ul style="list-style-type: none"> a) Rate of traffic growth; and b) Posted speed. <p>Note: Should the posted speed remain 100kph and growth remain as per recent years, the works need to be completed by 2026.</p> <p>Should posted speed be reduced for safety reasons, the duplication will be required up to five years earlier.</p>
Second Crossing of Calliope River	<p>The timeframe is dependent on:</p> <ul style="list-style-type: none"> a) Rate of traffic growth; and b) Posted speed.
New Aldoga South Road (construction has commenced)	Subject to GSDA development demand
Intersection of the Bruce Highway and Mt Larcom-Gladstone Road	Pre 2031

The Road Infrastructure Study provides an outline of how the road network for the GSDA should be developed into the future taking into account anticipated economic growth. The planning and approval of any additional access roads will need to consider the proposed interim road networks so as not to impede access to lots and to preserve the appropriate

⁶ PSA Consulting Australia 2014, Gladstone State Development Area: Road Infrastructure Study Final Draft Report, September 2014

hierarchy within the wider road network⁷. It is acknowledged that there are existing constraints on the capacity for heavy goods vehicles and road trains to access the proposed Gladstone port master planned area. It is therefore imperative that transport corridor requirements are carefully considered within the master planning process to ensure that future road network capacity requirements are adequately accommodated.

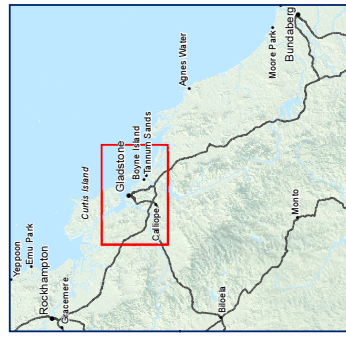
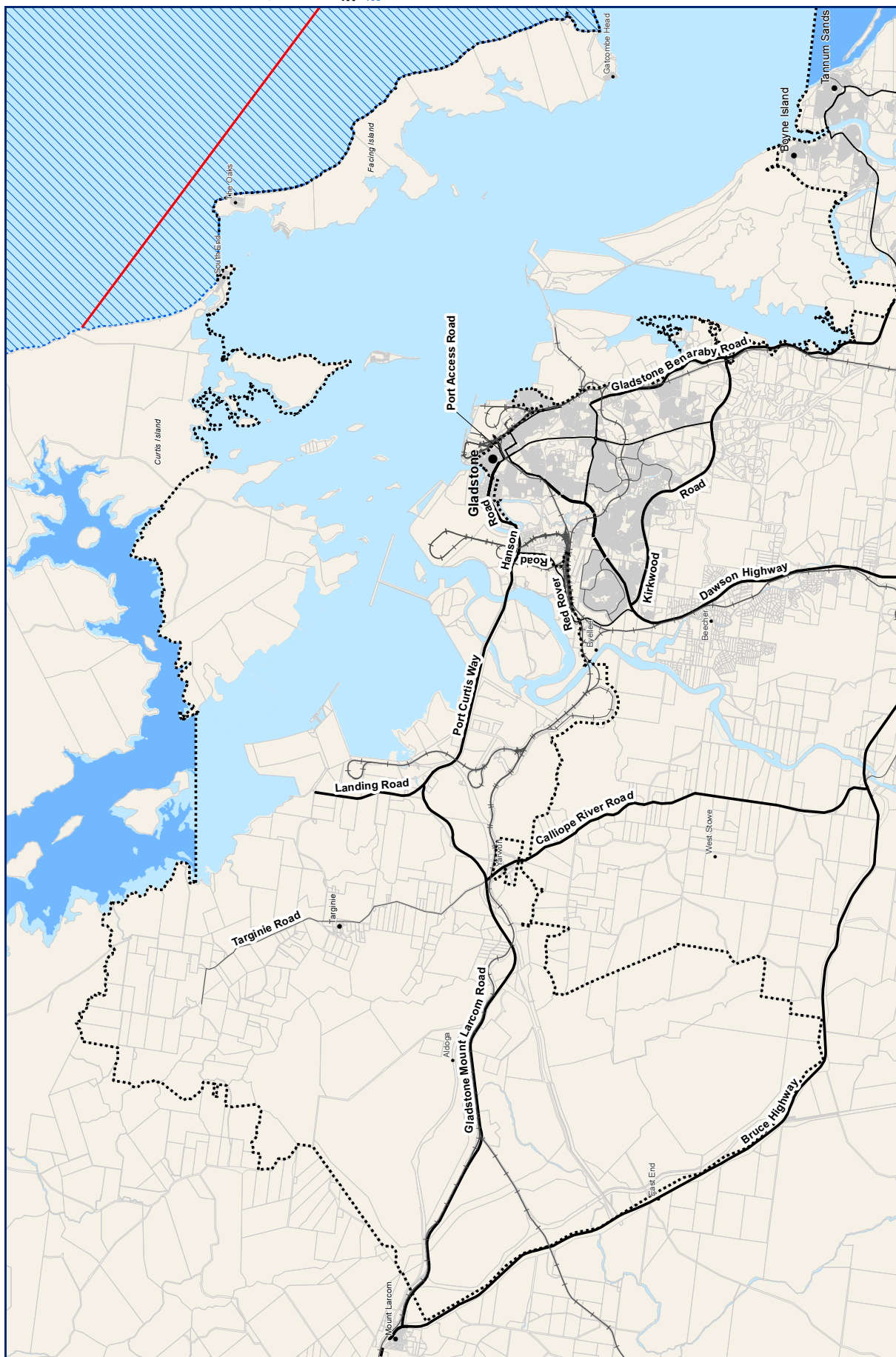
⁷ PSA Consulting Australia 2014, Gladstone State Development Area: Road Infrastructure Study Final Draft Report, September 2014

Figure 9

Road infrastructure

Legend

- Cities
- Urban centres
- Local centres
- Localities
- Railway
- Critical road infrastructure
- Secondary Roads
- Local Connector Roads
- Property boundaries
- Port limits
- Proposed Gladstone port master planned area boundary
- Great Barrier Reef Marine Park
- Great Barrier Reef Coast Marine Park



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0 0.5 1 2 3 4 5
Kilometres

Coordinate System: GCS GDA 1984
Datum: GDA 1984
Units: Degree

6.2.2 Rail infrastructure

The proposed Gladstone port master planned area is well serviced by an existing railway network as shown on Figure 10. It is recognised that the location of off road haulage and rail corridors is constrained by changes in grade and alignment. Efficiency in these material transfer systems come from high mass haulage and the corridors need to have minimal grades and smooth transitions in alignment to result in maximum efficiency of the logistics system.

North Coast Line

The North Coast Line is a 'shared service' railway and is the principal regional freight and passenger line within the Queensland Rail network, running the length of coastal Queensland between Nambour in the south and Cairns in the north. The North Coast Line provides Gladstone with a direct freight linkage to Brisbane. The system carries various freight products, including containerised and industrial freight, minerals, livestock and bulk commodities including sugar and grain. Containerised freight services operate between Brisbane and major centres in central and north Queensland. Long distance passenger and high speed tilt train services also operate on the line servicing central and north Queensland.

Moura and Blackwater systems

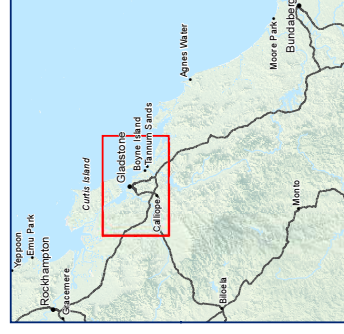
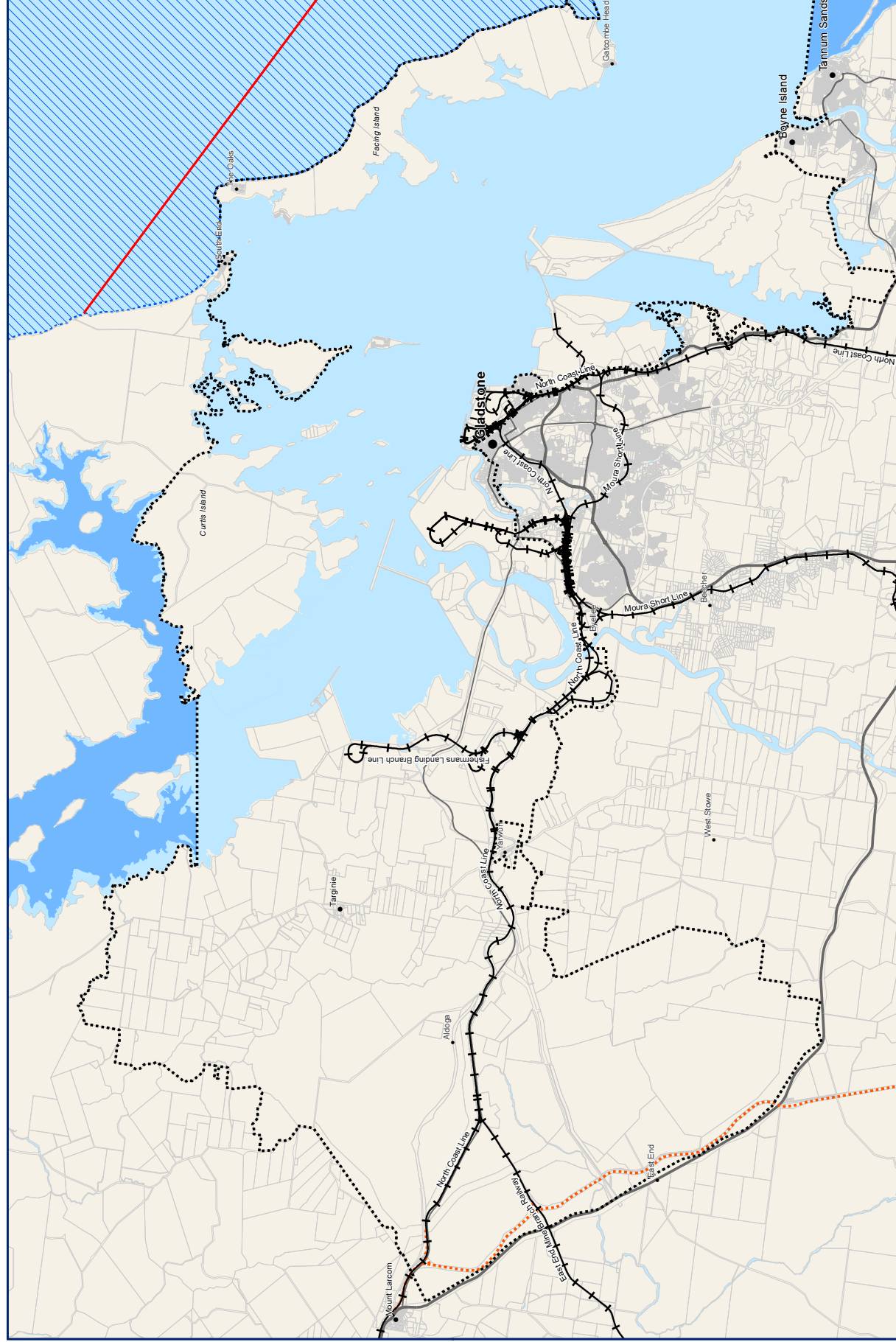
The Moura system and Blackwater system form part of the Central Queensland Coal Network. The Moura system is narrow gauge 1,067 mm (3 ft 6 in) and is used by diesel electric locomotives, while the Blackwater system is narrow gauge 1,067 mm (3 ft 6 in) and electrified, used by both electric and diesel locomotives.

Together, these systems transport coal to the Gladstone Power Station (NRG), Rio Tinto, Queensland Alumina Limited (QAL), Cement Australia and the RG Tanna, Barney Point and Wiggins Island coal terminals at the Port of Gladstone.

The Moura system includes the rail infrastructure comprising the rail corridor from the port of Gladstone (including domestic coal terminals in the vicinity of Gladstone) to Moura mine and the loading facility for Baralaba mine in the vicinity of Moura mine, and all branch lines directly connecting coal mine loading facilities to that corridor but excluding the corridor to Blackwater (and beyond).

The Blackwater system means the rail infrastructure comprising the rail corridor from the port of Gladstone (including domestic coal terminals in the vicinity of Gladstone) to Gregory, Minerva and Rolleston mines, and all branch lines directly connecting coal mine loading facilities to those corridors, with the exception of the corridor to Oaky Creek (and beyond) and the corridor to the Moura mine (and beyond).

Figure 10
Rail infrastructure



10 November 2015



Kilometres
Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

6.2.3 Pipelines and conveyors

A range of pipelines and conveyors are required to facilitate land and marine functions of the port. Above ground conveyors are used to transport materials such as coal, bauxite and alumina between land-based operations within and adjoining the port (within the GSDA). Pipelines are required to provide a direct link between land-based storage and shipping berths to allow for import and export of bulk liquids and gases through the Port of Gladstone.

There is a wide range of underground pipelines required to transport liquids and gases. Such pipelines may be located in land and/or marine environments. Services such as domestic gas and water supply are provided via pipelines from locations outside the port. These pipes vary in size and are generally located within road reserves or dedicated infrastructure corridors.

Various existing and future pipelines provide direct linkages between natural resource areas and the Port of Gladstone. The GSDA includes a Materials Transportation and Services Corridor (MTSC) that provides for the colocation of pipelines and other compatible linear infrastructure.

The Stanwell to Gladstone Infrastructure Corridor State Development Area (SGICSDA) provides for a range of pipeline infrastructure and connects with the GSDA MTSC through to the Port of Gladstone. The proposed Arrow Bowen Pipeline is an underground high-pressure steel pipeline to transport coal seam gas from the Bowen Basin to a gas hub 22km west of Gladstone.

The Callide Infrastructure Corridor State Development Area (CICSDA), located in Central Queensland, provides for up to four LNG pipelines that will traverse the GSDA and link directly to the Port of Gladstone. The 44km long CICSDA is intended to accommodate multiple underground pipelines. It is designed primarily for pipelines to transport coal seam gas from the Surat Basin to the LNG plants on Curtis Island.

The identification of potential future corridors is critical to address linkage constraints between industrial developments and port facilities. Conveyor routes are capable of handling limited changes in grade and elevation with these variables attracting additional operating costs. The horizontal alignment can accommodate changes through the use of transfer stations and sweeping curves of conveyors. Transfers attract additional capital investment and introduce additional elements for environmental controls.

Pipelines are generally less impacted by the terrain and can be circuitous in the route between the two sites. Transits over ridge lines and abrupt changes of horizontal alignment add to the cost of operations of the pipeline due to increased head issues.

6.2.4 Water, power and sewerage infrastructure

Water

The Gladstone Area Water Board (GAWB) supplies bulk raw and treated water to the Gladstone region. GAWB's reticulated water infrastructure services the Port of Gladstone including a pipeline connection to Curtis Island.

GAWB operates a water delivery system of raw (non-potable) water and of treated (potable) water. The water delivery system comprises a network of pipelines, pump stations, chlorination units and reservoirs for balancing storage.

Reticulated water supply is available at Port Central. There are some water pressure issues, but generally it is adequate to service current needs. Fuel farms and any other hazardous facility supplement the water supply in their own facilities to meet Australian Standards for firefighting.

A new water supply network upgrade has recently been installed to service current and future demands for the RG Tanna Coal Terminal and the Gladstone Marina.

Fisherman's Landing is currently supplied with raw water only from GAWB. Any future industry requirement for reticulated water services will need to be funded/provided by industry in response to demand.

Power

The Port of Gladstone is serviced through links into the surrounding high voltage Powerlink electricity network.

Gladstone Power Station is operated by NRG Gladstone Operating Services and is Queensland's largest coal-fired power station. The 1,680 megawatt power station accounts for approximately 13 per cent of Queensland's installed electricity generation capacity and plays a pivotal role in the supply of electricity in central Queensland. Gladstone Power Station receives its primary fuel supplies from coal mines in Central Queensland.

Sewerage

Gladstone Regional Council is responsible for collecting sewage and treating it to a suitable standard for discharge for serviced properties. Sewage is transported from properties through Council's sewerage network. The sewage is either pumped through the system or flows directly under gravity to one of two sewage treatment plants.

Reticulated sewerage is available at Port Central. Future services can be provided in response to any need for additional services identified by industry.

A sewerage network upgrade has recently been installed to service current and future demands for the RG Tanna Coal Terminal and Gladstone Marina.

There is an existing sewerage connection from Gladstone to Curtis Island to service the LNG plants and future development.

There are no sewerage services currently available at Fisherman's Landing.

6.3 Port related facilities and supporting industries

Beyond the activities conducted immediately adjacent to port infrastructure on strategic port land, there are a range of activities which have a direct relationship with the port and rely on the logistics functionality that the port provides in terms of the transportation, storage and handling of goods (refer to Figure 11). Table 4 and Table 5 outline these existing and proposed port related facilities within the proposed Gladstone port master planned area.

Table 4 Existing port related facilities

Location	Details
South Trees and Boyne Island	<ul style="list-style-type: none"> - Queensland Alumina Limited (QAL) – Alumina production - Boyne Smelter Limited (BSL) – Aluminium production
Gladstone Marina	<ul style="list-style-type: none"> - Various marine industries and coastal rescue services
Yarwun	<ul style="list-style-type: none"> - Rio Tinto Alumina Refinery – Alumina refining - Orica – Chemical Manufacturing - Northern Oil Refinery – Base oil recycling - Earth Commodities Quarry – Coarse Aggregate extraction - Yarwun Quarry - Coarse Aggregate extraction
	<ul style="list-style-type: none"> - Cement Australia – Cement production - Transpacific – Industrial solutions - Queensland Energy Resources Limited (QERL) – Oil Shale Mining
Curtis Island	<ul style="list-style-type: none"> - Gladstone Liquefied Natural Gas (GLNG) - Australia Pacific Liquefied Natural Gas (APLNG) - Queensland Curtis Liquefied Natural Gas (QCLNG)

Table 5 Proposed port related facilities

Location	Details
South Trees and Boyne Island	<ul style="list-style-type: none"> - Large special industry precincts (GRC Planning Scheme) located at South Trees and Boyne Island
Gladstone State Development Area	<ul style="list-style-type: none"> - High Impact Industry Precinct – This precinct is to accommodate high impact industrial development that is difficult to locate in conventional industrial estates such as; mineral and resource refining and processing, chemical and industrial material manufacturing, metal product manufacturing and processing, abattoir, rail dependant industries including rail marshalling yards, which require a very large land parcel and separation from sensitive receptors. - Waste Management Precinct – The purpose of this precinct is to accommodate waste management development such as residue storage facilities, waste disposal, recycling and waste incineration that require large land parcels that are isolated from sensitive receptors. - Medium – High Impact Industry Precinct – The purpose of this precinct is to accommodate medium and high impact industrial development such as boiler making or engineering works, storage of dangerous goods, food processing, manufacture of wood, metal, glass, plastic, plastic products and workshops that require large land parcels.

Location	Details
	<ul style="list-style-type: none"> - Medium – High Impact and Port Related Industry Precinct - This precinct is to accommodate medium and high impact industrial development such as mineral and resource refining and processing, chemical and industrial material manufacturing, metal product manufacturing and processing, engineering works, storage of dangerous goods that require large land parcels, are difficult to locate in conventional industrial estates outside the Gladstone SDA and require separation from sensitive receptors. Uses in this location have links to the port through the import or export of material and benefit from close proximity to port related infrastructure and services. - Medium Impact Industry Precinct – In the long term this precinct is to accommodate medium impact industrial development such as food processing and manufacturing. In the short to medium term rural and agricultural uses may be supported where they do not compromise existing or future industrial development in the Gladstone SDA. Rural and agricultural uses may also act as buffer areas to sensitive receptors external to the Gladstone SDA. This precinct provides opportunities for environmental offsets. - Low – Medium Impact Industry Precinct – This precinct is to accommodate low to medium impact industrial development such as warehousing, repairing and servicing, engineering works, assembling metal products and manufacturing that supports and compliments industrial activities located within the GSDA. - Transport and Support Services Precinct – The purpose of this precinct is to accommodate low impact industrial development such as warehousing, exploration and mining support services, machinery and equipment servicing, construction services, transport depot, distribution centre, contractors depot and storage yard and compliment the industrial activities located within the Gladstone SDA. - Industry Investigation Precinct – The purpose of this precinct is to recognise and protect land for future industrial development, linear infrastructure and linear infrastructure corridors. - Curtis Island Industry Precinct – Uses in this location have links to the port through the import or export of material and benefit from close proximity to port related infrastructure and services. Development within this precinct must recognise the adjacent Curtis Island Environmental Management Precinct. - Transition Precinct – The purpose of this precinct is to accommodate low impact industrial development such as repairing and servicing, fitting and turning workshops, assembling wood or metal products that require a small to medium sized development parcel and compliment industrial activities located within the Gladstone SDA. - Materials Transportation and Services Corridor Precinct - This precinct is to provide an efficient and effective route for linear infrastructure to link infrastructure to industries within the Gladstone SDA and the Port of Gladstone. The precinct is to accommodate linear infrastructure such as gas transportation pipelines, potable and sea water pipelines, sewage pipelines and slurry pipelines, conveyors, rail lines, roads and haul roads.

In addition to facilities located on strategic port land or with a direct relationship to the Port, there are a number of other industrial areas. These may provide general services including support to port operations however they do not necessarily need to be co-located with port land and facilities.

In addition to the GSDA, two industrial precincts exist within the proposed Port of Gladstone master planned area, including:

- Barney Point Low Impact Industry Area
- Hanson Road Mixed Business and Low Impact Industry Area

Currently there is approximately 505.7 hectares of total industrial zoned land within the identified industrial precincts of the Gladstone Region. Of this, approximately 171.9 hectares is developed for industrial purposes and 13.7 hectares is developed for other purposes.

Of the remaining 320.1 hectares of vacant industrial zoned land, 95.3 hectares is serviced, or has the potential to be serviced with reticulated infrastructure through the priority infrastructure plan. The remaining 220.7 hectares is unserviced industrial zoned land.

Outside of the Gladstone State Development Area further industrial growth may occur as extensions to existing industrial precincts. These areas generally represent opportunities for the short to medium term provision of industrial land. Potential extension areas have been identified at:

- Hanson Road Precinct
- Barney Point Precinct
- Toolooa Precinct
- Calliope Precinct
- Boyne Tannum Precinct.

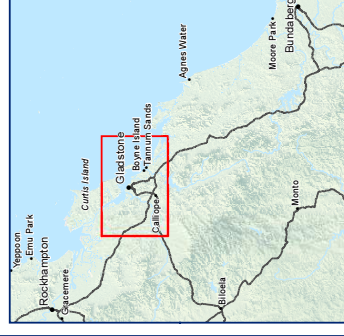
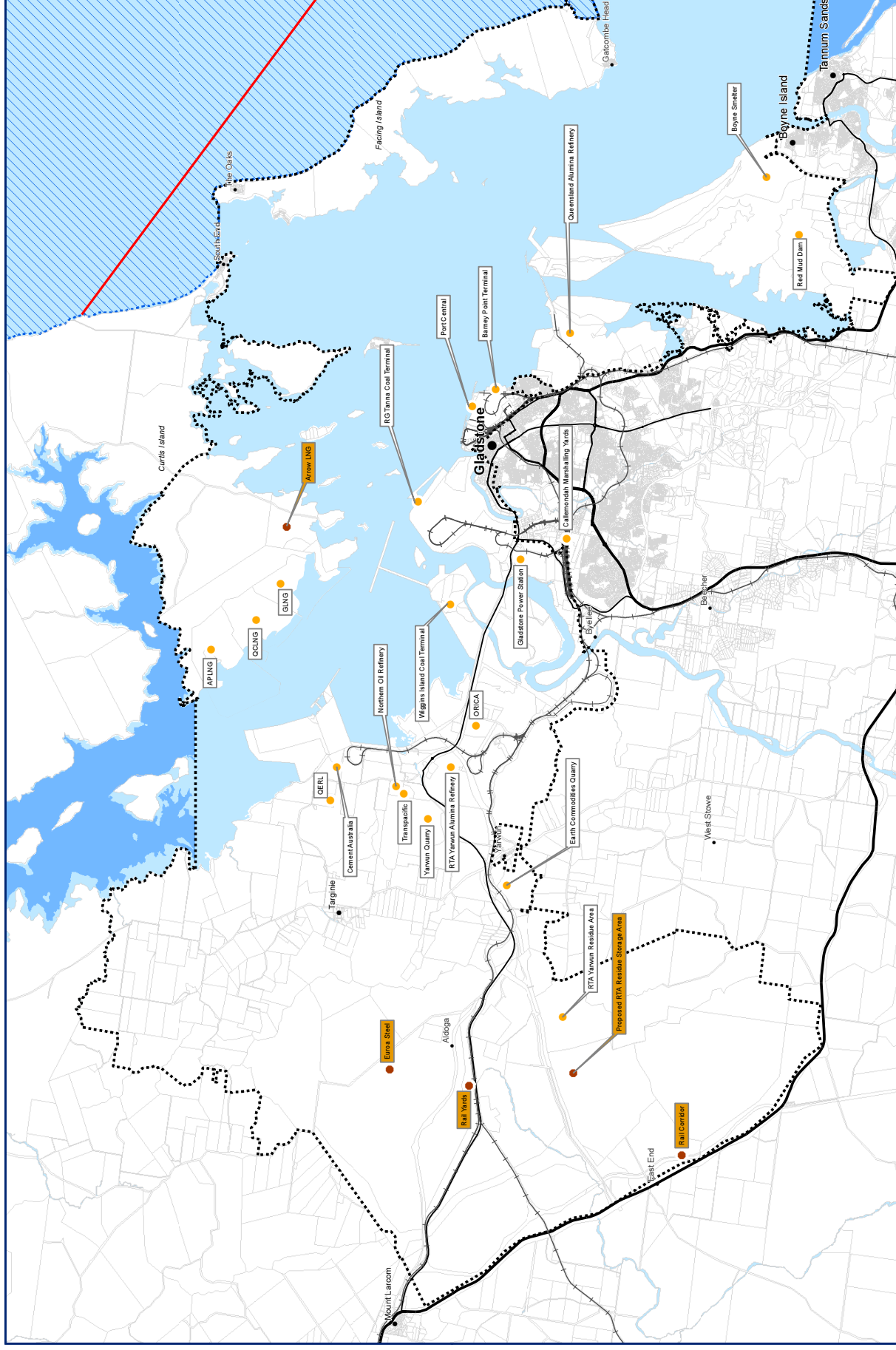
Possible extensions to industrial precincts outside of the State Development Area represent 94 hectares of new industrial land for the Gladstone Region which is broadly suitable for mixed use, low impact and limited medium impact industry.

Figure 11

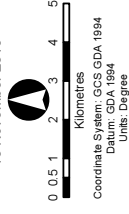
Port related activities

Legend

- Cities
- Urban centres
- Local centres
- Localities
- Existing port related activity
- Proposed port related activity
- Railway
- Highways
- Secondary Roads
- Property boundaries
- Port limits
- Proposed Gladstone port master planned area boundary
- Great Barrier Reef Marine Park
- Great Barrier Reef Coast Marine Park



10 November 2015



6.4 Urban areas

Existing residential land uses within Gladstone City are predominantly located throughout the suburbs of West Gladstone, South Gladstone, Sun Valley, Toolooa, Kin Kora, Telina, New Auckland, Clinton and the southern end of Barney Point. This is in addition to the outer urban areas of Calliope, Tannum Sands and Mount Larcom which to varying degrees have experienced residential growth. The majority of housing stock is comprised of detached houses however there are also precincts within Barney Point and West Gladstone which contain a mix of both detached houses and unit complexes. Further information on these residential communities is at Section 8—Social values.

Most new housing development in the Gladstone region up to 2031 will be undertaken on greenfield land.

Existing local planning instruments identify areas for residential development (greenfield and infill), throughout the city which may influence, or be impacted by, port operations and development. These include:

- Toolooa—Toolooa comprised 429 dwellings as at the 2011 Census. Approximately 188 hectares of greenfield land has been earmarked within the Toolooa Priority Development Area (PDA) to accommodate up to 1000 new residential dwellings with a mix of densities.
- East Shores—the East Shores precinct, currently administered by the Gladstone Ports Corporation contains land which provides a significant community benefit through the development of a world-class recreational hub. Key features of the precinct include an interactive water play park, barbeque areas, playground, fishing platform and extended jetty structure and a waterfront promenade and viewing platform with shade structures. The precinct has potential to undergo further urban regeneration which may include a range of residential, commercial, retail, cultural, recreational, tourism and educational uses.
- Barney Point—the suburb of Barney Point was comprised of 570 dwellings as at the 2011 Census date. The established residential area along Barney Street, immediately adjacent to the Barney Point Coal Terminal has been zoned as Medium Density Residential under the Gladstone Regional Council Planning Scheme 2015 which will allow for the future development of four to six storey residential complexes.
- Gladstone Central—the suburb of Gladstone Central was comprised of 855 dwellings as at the 2011 Census date. The area to the north-east of the CBD along Auckland Street is zoned as a Medium Density Residential under the Gladstone Regional Council Planning Scheme 2015 which will allow for development of four to six storey residential complexes.
- Mount Larcom—Mount Larcom is a small rural township 35km west of the Gladstone CBD. The suburb of Mount Larcom comprised 278 residents and 134 dwellings as at the 2011 Census within a low density/rural residential setting. Any encroachment of industrial land uses associated with the operation of the Port of Gladstone would need to be appropriately protected from residential development at Mount Larcom. There is also opportunity for this township to expand in the future, subject to suitable infrastructure and services upgrades.

There is increasing pressure being placed on some industrial and sensitive land use interfaces from encroaching residential development within the Gladstone Regional Council LGA. This is particularly evident at the periphery of Barney Point. Future instances of land

use incompatibility need to be avoided through the retention and reinforcement of buffers/separation precincts. This will ensure that residential amenity is appropriately protected and industrial operations are not compromised.

6.5 Environmental areas and separation precincts

Each of the land use planning instruments operating within the proposed Gladstone port master planned area include areas either set aside for environmental purposes or to ensure appropriate separation between incompatible developments (e.g. between residential and heavy industry).

6.5.1 Gladstone Regional Council Planning Scheme 2015

- Limited Development Zone and Major Industry Buffer at Gladstone Power Station, South Trees and Boyne Island. The function of each large special industry area is protected by Major Industry Buffer precincts which prevent inappropriate adjacent development of a sensitive nature.
- Conservation Zone towards the western fringe of Gladstone City provides for the protection, restoration and management of areas (such as National Parks) identified as supporting significant biological diversity and ecological integrity.
- Environmental Management Zone limits the scale of development in areas of environmental and visual amenity significance such as on the Gladstone harbour islands (e.g. Facing Island).

6.5.2 Gladstone Ports Corporation Land Use Plan 2012

- Parkland and Education Precinct at Gladstone Marina allows public access to the water and harbour and give recreational and community benefit.
- Buffer Precincts at RG Tanna Coal Terminal and Hanson Road separate potentially incompatible port land use activities or may be used as part of the port's impact mitigation measures to separate port activities from surrounding sensitive land uses; and preserve land for future port uses.
- Environment Precinct - designated to protect land because of identified significant ecological values (including cultural heritage) (e.g. Facing Island); and to separate potentially incompatible port land use activities or is used as part of the port's impact mitigation measures to separate port activities from surrounding sensitive land uses.

6.5.3 GSDA Development Scheme 2015

- Separation Precinct – The Separation Precinct provides an appropriate separation between industrial activities within the GSDA and sensitive receptors outside the GSDA. This precinct supports the development of rural and agricultural uses where they do not compromise existing or future industrial development in the GSDA.
- Curtis Island Environmental Management Precinct - This precinct is to recognise and protect environmental values, provide opportunities for rehabilitation and enhancement of existing values, recognise and protect wetlands, vegetation and fauna habitats closely related to the Great Barrier Reef Marine Park and the Great Barrier Reef World Heritage Area.

6.6 Conclusions

This section has provided an overview of the location and nature of land use activities within the proposed Gladstone port master planned area. Activities and supporting infrastructure critical to the function of the port need to be protected from incompatible development and the future capacity of supply chain and supporting infrastructure needs to be safeguarded through appropriate land use designations within the Master Plan.

Key activities and functions of the port identified through the land use review include:

- Shipping and marine infrastructure:
 - Shipping channels and anchorages (Figure 6)
 - Wharf centres (Figure 8)
- Supply chain and supporting infrastructure:
 - Road (Figure 9)
 - Rail (Figure 10)
- Pipelines and conveyors
- Water, power and sewerage infrastructure
- Port related activities (Figure 11)
- Urban areas
- Environmental areas and separation precincts.