

19



# Economic impact assessment

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# 19 Economic impact assessment

## 19.1 Chapter purpose

The purpose of this chapter is to assess the actual and potential economic impacts from the Project. In doing so, it assesses the existing and future demand for Port capacity, the economic role of the Port in the region and risks resulting from not undertaking the Gatcombe and Golding Cutting Channel Duplication Project. The economic assessment undertaken in this chapter defines and evaluates the current situation against the expected developed Port to identify any positive or negative impacts on the region during the construction and operational phases of the Project.

## 19.2 Methodology

This economic impact assessment estimates the impacts of the Project in terms of employment and economic activity. The Project construction program is mostly related to dredging activities, which has low resource requirements, where most of the dredging capabilities are acquired offshore. The assessment only takes into account the local investment impact of \$250 million of total Project cost of \$760 million to assess the economic impact on the local economy, where the analysis focusses on income generated (from wages and salaries), employment and economic growth measures. Economic growth at the State level, Gross State Product (GSP) for Queensland, has direct and indirect economic benefits.

In these situations, economic impact assessment can provide another useful perspective; to understand the final impacts on jobs and economic activity in the region due to indirect impacts. These are sometimes known as 'transmitted impacts', because they are not a direct result of changes to resource use, but are changes that are transmitted through the economy.

The tasks undertaken to complete the economic assessment include:

- Identification of the economic study area, including confirmation of the associated economic profile
- Review of the Port and its role in the economic stability, sustainability and development of Gladstone and the region
- Review of current legislation, policy and guidelines relevant to economic development within the region
- Assessment of potential economic impacts of the Project to relevant industry and community using an input-output model, to derive the economic multipliers and assess the direct and indirect impacts on employment, income generation and economic growth.

## 19.3 Legislative and policy context

The Project is consistent with the objectives of numerous government strategies. These include:

- National Ports Strategy 2011
- Gladstone Region Economic Development Strategy 2015
- GSDA Development Scheme 2015
- Priority port master planning, including the Ports Act and the Master plan for the priority Port of Gladstone 2018
- GPC Strategic Plan.



Summaries of these strategy documents and their alignment with the Project are provided in Section 19.6.1.

## 19.4 Description of economic context

This section provides an overview of the existing economic profile of the Gladstone LGA and various regional trends and projected growth outcomes, which provide a baseline scenario for assessment of potential impacts of the Project on the regional economy.

### 19.4.1 Overview

The Gladstone LGA, shown in Figure 19.1, has a population of 62,814 with a strong and dynamic economy (QGSO 2018a). It is strategically located in proximity to significant natural resources across Central Queensland and a natural deep water port, the largest multi commodity port in Queensland.

The Gladstone region, in particular Gladstone city and adjacent Port of Gladstone, has from the 1800s been associated with large scale industry commencing with Parsons Point Meat Works, and then followed by the QAL refinery, Cement Australia, Orica Australia, Boyne Smelters Limited and Rio Tinto Alcan Yarwun. Since 2010, the Gladstone region's economy has undergone significant changes derived from the WICT and the Curtis Island LNG projects, as well as the Yarwun alumina refinery upgrade.

Gladstone's competitive advantages include two of the world's largest alumina refineries, the Curtis Island LNG complex and other large scale industry sited locally with strong existing supply chains and considerable infrastructure, consequently supporting growth with numerous employment opportunities and a highly skilled workforce.

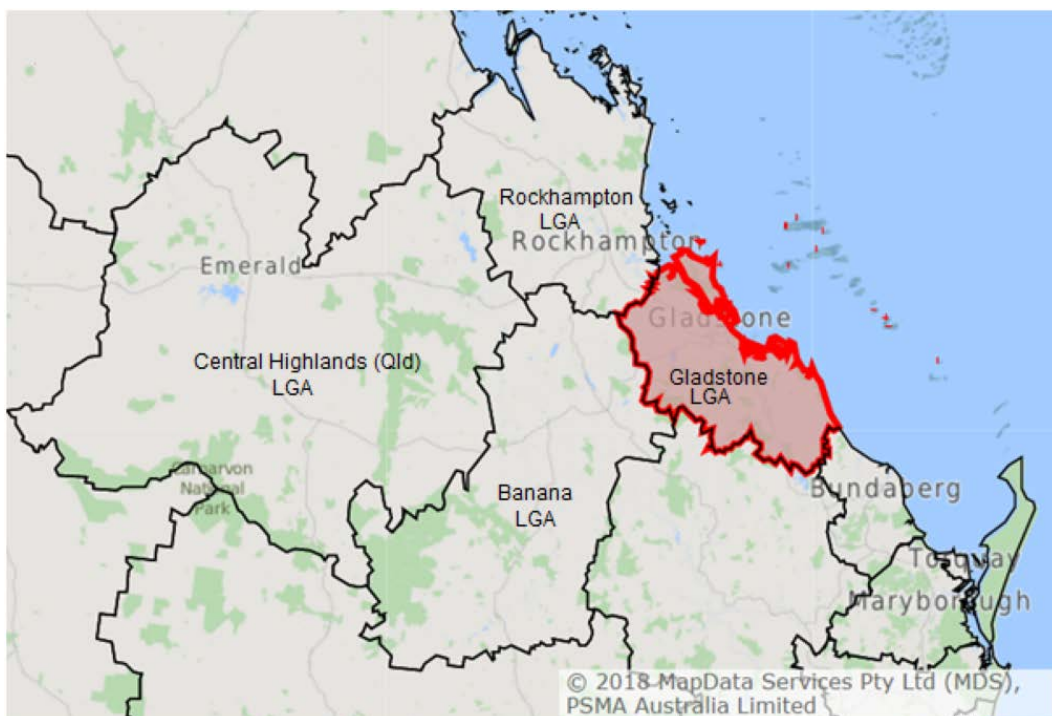


Figure 19.1 Local governments of the Central Queensland region

Source: MDS (2018)

## 19.4.2 Economic profile

Gross regional product (GRP) is the measure of wealth generated by businesses, organisations and individuals, and is a broad indicator of the growth or decline of the regional (local) economy.

Gladstone's GRP in the year ending 30 June 2018 is estimated at \$4.77 billion (economy.id 2018).

This represents 1.4% of Queensland's gross state product (GSP) (ABS 2018b). Figure 19.2 shows the Gladstone GRP trend since 2001.

Table 19.1 presents a comparison of the annual Gladstone GRP against that of Central Queensland and Queensland, respectively over six years. The trend shown indicates an increase in Gladstone's relative contribution to the economy post 2014. Finalisation of three LNG projects and the WICT contributed to the significant increase (15.5%) noted from 2016 to 2017. The economy is predominantly driven by imports and exports, which depend on fluctuations of global economic factors such as global demand, exchange rates and commodity prices.

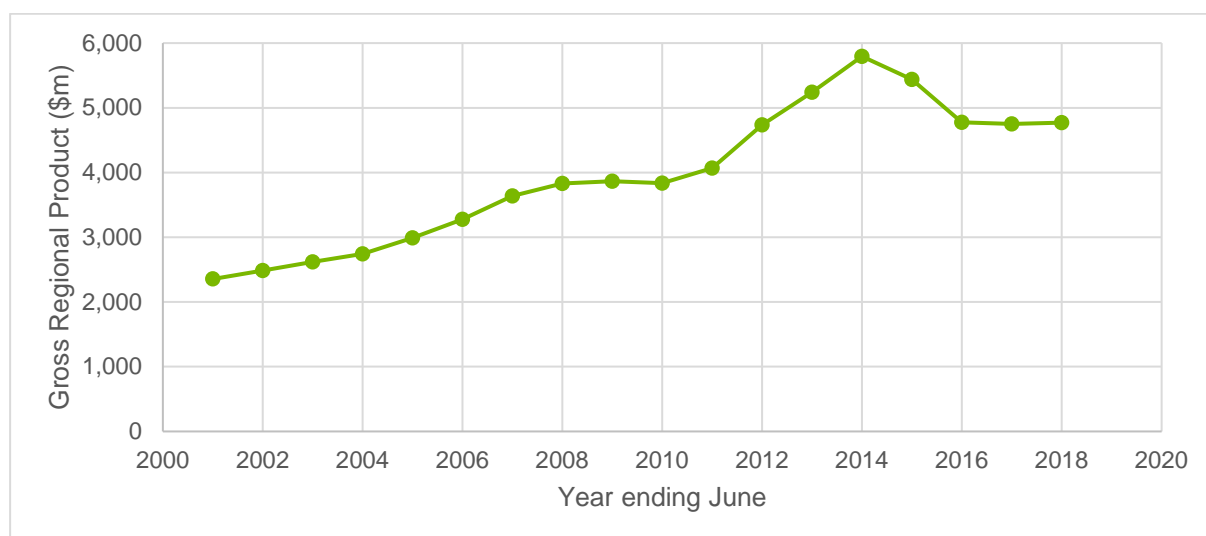
**Table 19.1** Gross regional product

Year ending June	Gladstone		Queensland	
	GRP (\$m)	% change from previous year	GSP (\$m)	% change from previous year
2018	4,773	+0.5	339,504	+3.4
2017	4,751	-0.5	328,449	+2.0
2016	4,777	-12.2	322,002	+2.5
2015	5,439	-6.1	314,121	+1.0
2014	5,795	+10.5	310,904	+2.2
2013	5,243	+10.7	304,308	+2.8
2012	4,738	+16.5	296,106	+5.5
2011	4,068	+6.1	280,606	+0.7
2010	3,835	-0.8	278,720	+1.4
2009	3,864	+0.8	274,822	+1.4
2008	3,832	+5.4	271,048	+4.6

**Table note:**

Data based on real June 2016 dollars for all years (inflation adjusted)

**Source:** ABS (2018b), economy.id (2018)



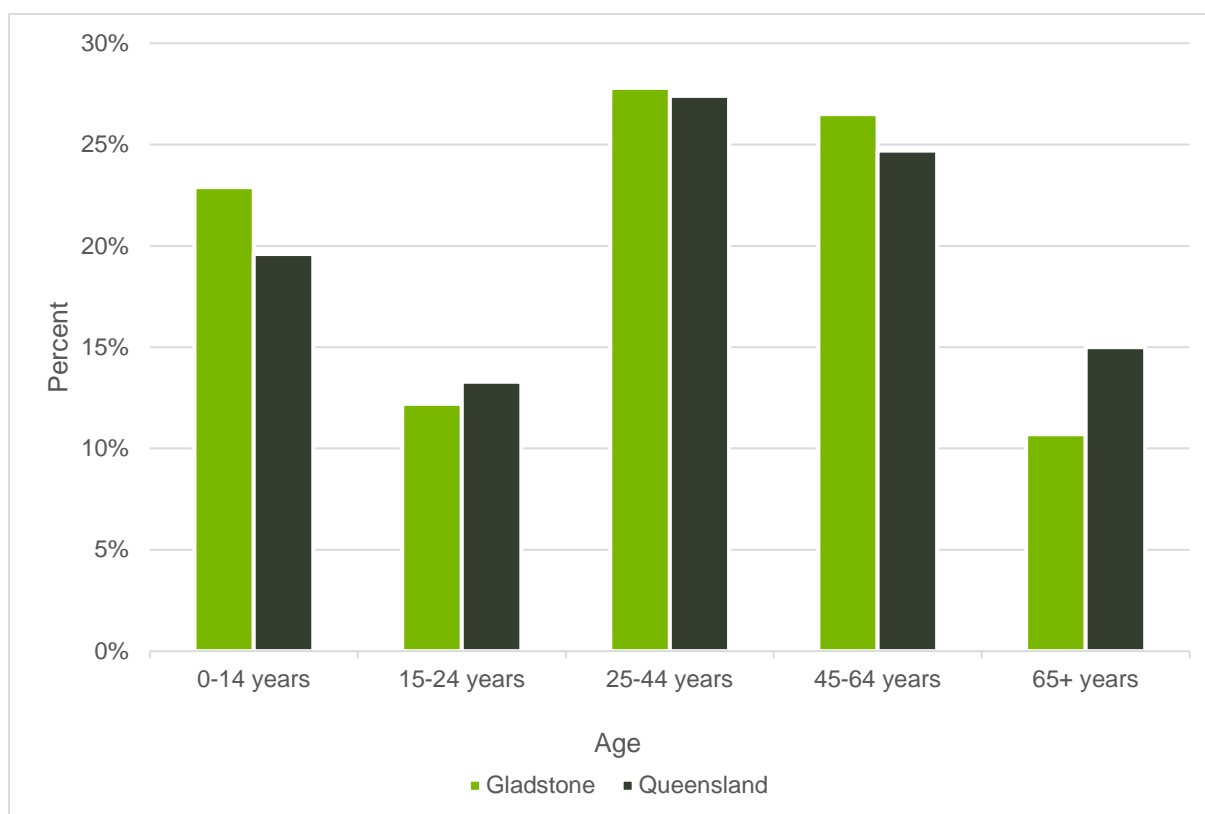
**Figure 19.2** Gladstone Gross Regional Product trend

**Source:** economy.id (2018)

### 19.4.3 Population structure

The Estimated Resident Population (ERP) in the Gladstone LGA, as at 30 June 2017, was 62,814 persons (QGSO 2018a) with a population density of 0.06 persons per hectare, compared to a population density of 0.03 and 1.52 persons per hectare in Queensland and Greater Brisbane, respectively (economy.id 2018). The ERP in Gladstone represents 1.3% of Queensland's population (QGSO 2018a). The average annual growth rate of the Gladstone LGA is 1.6% over the past 10 years, compared with Queensland's average annual growth rate of 1.8% (QGSO 2018a).

Figure 19.3 compares the population of Gladstone and Queensland by age as at 30 June 2017. The variations in Gladstone's age distribution was in line with the trends generally observed in Queensland. The total proportion of persons in the age group 65 and above in Gladstone was smaller than in the State, however Gladstone and Queensland had an almost equal proportion of potential working age persons (15 to 64 years). The median age in the Gladstone LGA was 35.8 years and 37.1 years for Queensland (QGSO 2018a). Overall, Gladstone LGA has a slightly younger population than the Queensland average. Gladstone also has a larger proportion of males (32,509) to females (30,779) than Queensland (ABS 2018a).



**Figure 19.3 Population by age as at 30 June 2017**

**Source:** QGSO (2018a)

Population projections estimate that the population for Gladstone will increase from 63,288 persons in 2016 to 75,327 persons in 2041 (QGSO 2018a). This corresponds to an average annual growth rate of 0.7% compared to an average annual growth rate of 1.6% for Queensland as shown in Table 19.2.

**Table 19.2 Population projections (medium series)**

Year ending June	Gladstone		Queensland	
	Population projection	% change from previous year	Population projection	% change from previous year
2016	63,288	-	4,848,877	-
2021	63,938	+0.2	5,261,567	+1.6
2026	66,800	+0.9	5,722,780	+1.7
2031	70,273	+1.0	6,206,566	+1.6
2036	72,935	+0.7	6,686,604	+1.5
2041	75,327	+0.6	7,161,661	+1.4
<b>Average annual growth</b>	<b>0.7</b>		<b>1.6</b>	

**Table note:**

2018 edition of population projections are based on the ERP for 30 June 2016. ERP is based on the place of usual residence and factors in those that missed the Census.

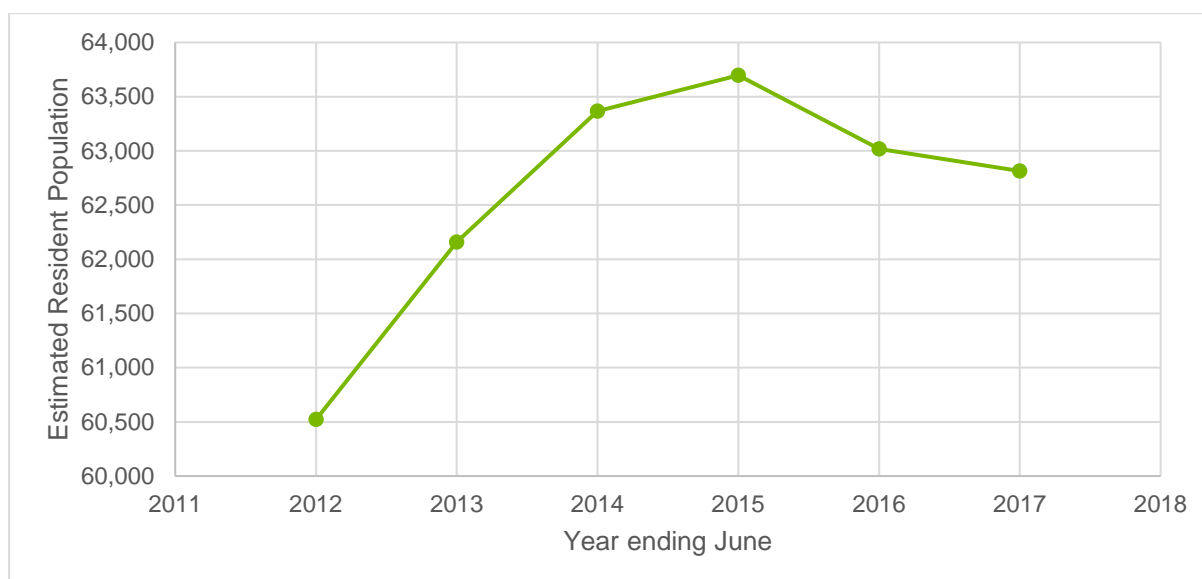
**Source:** QGSO (2018a)

However, the Gladstone LGA has experienced negative growth from 2015 to 2017, whilst Queensland continued a steady increase in population, as shown in Table 19.3. It is uncertain if the growth rate in the Gladstone LGA will meet the projections due to the recent declines, however the historic annual growth rate (1.6% over 10 years) is likely to provide a reasonable representation of future population change in the Gladstone LGA. Figure 19.4 shows the Gladstone population trend since 2012.

**Table 19.3 Population as at 30 June 2017**

Year ending June	Gladstone		Queensland	
	Estimated resident population	% change from previous year	Estimated resident population	% change from previous year
2017	62,814	-0.3	4,929,152	+1.7
2016	63,017	-1.1	4,845,152	+1.4
2015	63,697	+0.5	4,777,692	+1.2
2014	63,367	+1.9	4,719,653	+1.4
2013	62,158	+2.7	4,652,824	+1.8
2012	60,521	+1.8	4,568,687	+2.1

**Source:** QGSO (2018a)



**Figure 19.4 Gladstone population trend**

**Source:** QGSO (2018a)

### 19.4.4 Household profile

In June 2016, households comprising of one family were the most common household type in the Gladstone LGA (73.2%) followed by lone persons (22.6%). Separate homes represented 87.1% of household structures. The average household size in Gladstone was 2.6 persons with a total monthly income of \$6,872 compared to a total weekly income of \$6,074 in Queensland with the same average household size. The majority of families consisted of couples with children (45.5%) and a slight reduction in the percentage of couples without children (39.4%).

The Gladstone population that occupies privately owned dwellings with a mortgage is 38.1%, followed closely by rental properties (35.1%). Unoccupied private dwellings represented 19.2%, many of which would be available rental properties, providing relaxed access to accommodation (ABS 2018a). The average monthly household rent for the Gladstone region was \$1,083 and Queensland's significantly higher at \$1,430, however Gladstone's monthly mortgage payments exceeded the State's.

The percentage of the Gladstone dwelling stock which is non-private is 4.1%, providing transitory type accommodation for short term visits (GRC 2016). This includes 870 hotel/motel rooms, of which 530 were vacant and available, indicating that the market was not under demand pressure (QGSO 2016).

**Table 19.4 Household profile as at 30 June 2016**

		Gladstone	Queensland
Household type (%)	Lone person	22.6%	23.5%
	Group	3.1%	4.7%
	One family	73.2%	70%
	Multiple families	1.1%	1.8%
Average household size (persons)		2.6 persons	2.6 persons
Tenure type (%)	Owned outright	24.2%	28.5%
	Owned with mortgage	38.1%	33.7%
	Rented	35.1%	34.2%
	Other	0.5%	0.9%
Average monthly household mortgage payment		\$1,950	\$1,733
Average monthly household rental payment		\$1,083	\$1,430
Average monthly total household income		\$6,872	\$6,075



		Gladstone	Queensland
Dwelling structure (%)	Separate house	87.1%	76.6%
	Semi-detached, row or terrace house, townhouse	4.6%	10.6%
	Flat or apartment	6.3%	11.3%
	Other	1.6%	1.0%

Source: ABS (2018a), QGSO (2018a)

### 19.4.5 Employment

The labour force history below has been derived from Census data (ABS 2017, QGSO 2018a) and is presented in Table 19.5 and Table 19.6.

The proportion of full time employment in the Gladstone LGA from 2011 to 2016 has decreased by 12.32%, and part time employment has increased by 15.32%. A similar trend is displayed in Queensland as part time employment for the period has risen by 12.54%, whilst full time employment increased marginally by 1.97%.

**Table 19.5 Employment type**

Year ending June	Gladstone			Queensland		
	Full time	Part time	Other	Full time	Part time	Other
2016	17,743	7,776	1,564	1,333,193	691,751	111,509
2011	20,236	6,743	2,011	1,307,430	614,637	132,173
2006	16,353	6,029	1,661	1,186,559	534,343	91,471

Source: ABS (2017)

The unemployment rate in Gladstone as at 30 June 2018 was 7.9% compared to the Queensland unemployment rate of 6.0%. From 2006 to 2018, the unemployment rate in the Gladstone LGA had increased by an annual average of 33.7% (0.83 percentage points), however much of this was due to the spike in unemployment in 2016 as a result of a number of major projects concluding their construction phase. Since 2016, the unemployment rate for Gladstone LGA has decreased from 11.1% to 7.9%.

**Table 19.6 Labour force and unemployment**

Year ending June	Gladstone			Queensland		
	Labour force	Unemployed	Unemployment rate	Labour force	Unemployed	Unemployment rate
2018	33,078	2,599	7.9% ▼	2,624,897	158,352	6.0% ▼
2016	30,441	3,368	11.1% ▲	2,312,114	175,665	7.6% ▲
2011	30,365	1,375	4.5% ▼	2,184,403	132,172	6.1% ▲
2006	25,418	1,378	5.4%	1,932,353	91,470	4.7%

Source: ABS (2017), QGSO (2018a)

Table 19.7 shows employment by occupation as a percentage of the workforce in Gladstone LGA in comparison with Queensland. These occupations align with the GRC's Economic Development Strategy and their key industries for the future; namely alumina, cement and chemical production; resources and energy; engineering and advanced manufacturing; and, retail and professional services (GRC 2015). Further detail on employment by industry is provided in Section 18.5.4.

The most common occupation in the Gladstone LGA were technicians and trades workers at 21.4% of the workforce, compared to the most common in Queensland being professionals at 19.8% of workforce. Other common occupations in Gladstone include professionals (13.6%), labourers (12.9%), and machinery operators and drivers (12.4%). Most of these occupations also had the greatest degree of specialisation in Gladstone, with machinery operators and drivers having the highest. Whilst this data was derived from the 2016 census, there is a high likelihood that this distribution of labour is representative of current occupations.

**Table 19.7 Employment by occupation as at 30 June 2016**

Occupation	Gladstone (%)	Queensland (%)	Specialisation ratio*
Managers	9.5	12.1	0.79
Professionals	13.6	19.8	0.69
Technicians and trades workers	21.4	14.3	1.50
Community and personal service workers	9.2	11.3	0.81
Clerical and administrative workers	10.8	13.6	0.79
Sales workers	8.5	9.7	0.87
Machinery operators and drivers	12.4	6.9	1.80
Labourers	12.9	10.5	1.23

**Table note:**

\* The specialisation ratio measures the extent to which the proportion belonging to a particular occupation for Gladstone, engage in the activities designated as primary to that occupation.

**Source:** QGSO (2018a)

## 19.4.6 Key industries

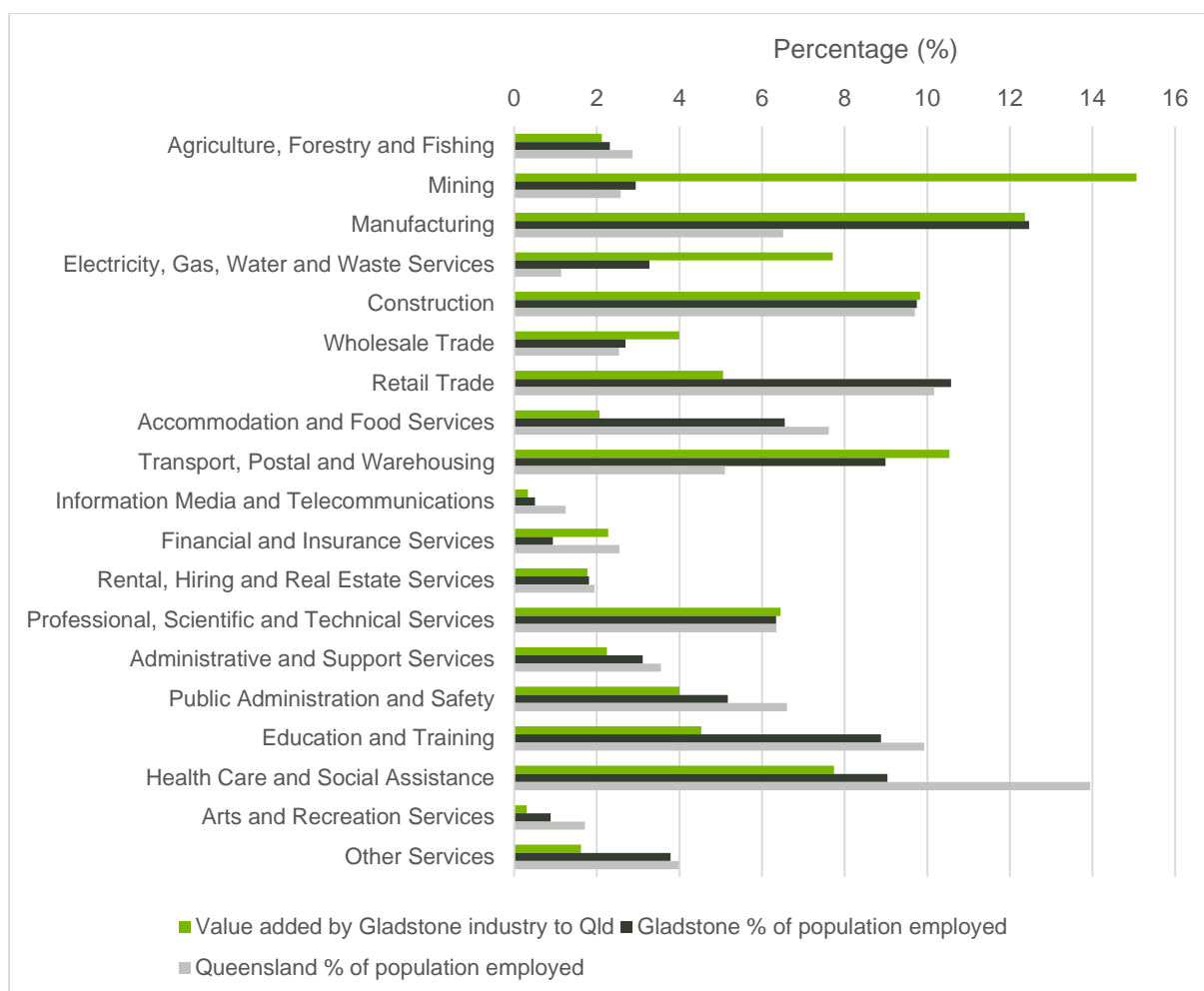
The Gladstone LGA has experienced solid industrial growth and strong economic development throughout the 20<sup>th</sup> Century, which has accelerated in the past decade. The Gladstone LGA's existing supply chains for major industry and highly skilled workforce complement the region's industry drivers as shown in Figure 19.5.

The largest industry employers in the Gladstone LGA were:

- Manufacturing (12.5%)
- Retail trade (11.6%)
- Construction (9.7%).

This contrasts with Queensland, where the largest employers were in the health care and social assistance industry, employing 13.9% of the workforce.

The value-added data shown in Figure 19.5 represents the economic value added by each local Gladstone industry. The greatest contributor was the mining industry, representing 15.1% of Gladstone's estimated total value-added (economy.id 2018). Other major contributors were the manufacturing industry (12.1%), which correlates with the industry being the largest employer in the Gladstone, and the transport, postal and warehousing industry (10.5%). The construction industry closely followed at 9.8%.



**Figure 19.5 Industry profile by employment and value-added as at 30 June 2017**

**Source:** economy.id (2018)

## 19.4.7 Fisheries

### 19.4.7.1 Commercial fisheries

Commercial fishing plays a role in the Gladstone and Queensland economy, and due to the potential marine impacts from the Project an overview of this activity is provided below.

The Port Curtis and the associated intertidal areas and upstream rivers and creeks are an important resource for Queensland's commercial fisheries. Both inshore and offshore fisheries operate out of Port Curtis with commercial fishing activities in the area consisting of crabbing, trawling, net fishing, line fishing and tourist charters. Further detail regarding commercial fishing is provided in Chapter 9 (nature conservation), Section 19.4.7.1 and Appendix I1 (Section 9). Provided below is an overview of the main commercial fishing activities in the economic study area which has been corroborated through one on one meetings with commercial fishers.

- **Trawling:** There are two licenced Queensland trawl fisheries that operate in the Port Curtis region, including the East Coast Otter Trawl Fishery and the River and Inshore Beam Trawl Fishery (NPRSR 2014). Trawlers are restricted from operating in specific areas of Port Curtis, such as the Inner Harbour and Western Basin zones.
- **Crabbing:** Commercial operators set crab pots in estuaries or near-shore areas such as in the Calliope River, adjacent to Fisherman's Landing, The Narrows, Graham's Creek and South Trees Inlet (NPRSR 2014; GPC 2012a; Wesche et al. 2013). Most Mud crabs are caught between December and June. Consultation with commercial operators indicates that the number of licences vary in the area.

- Fish netting: The waters upstream of Farmer's Island in the Calliope River are closed to commercial net fishing and restrictions are placed on commercial net fisheries operating in Port Curtis as part of the Rodds Bay DPA.

### 19.4.7.2 Commercial catch data

Commercial fisheries in Queensland are monitored through a compulsory logbook program administered by the Department of Agriculture and Fisheries (DAF). For reporting purposes, the Australian coastline is divided by a grid system. The Project impact areas are located within the 'S30' Commercial Fishery 30 nautical miles squared reporting grid (Grid S30).

Analysis of QFish datasets in Grid S30 for the 2009 to 2018 (financial years) period shown in Table 19.8 indicates that highly variable yields among years occurred. This was due to a combination of matters, including varying fishing boats in operation, less fishing days and post flood impacts. Further information about commercial fishing is provided in Section 18.5.4.1.

**Table 19.8 Commercial yield for all commercial fishing activities in the fishing activity area (S30)**

Year ending June	S30 commercial fish yield (t)	% of Queensland yield	S30 commercial fishing licences	% of Queensland licences	S30 commercial fishing days	% of Queensland fishing days
2018	257.5091	1.38%	64	4.60%	4,894	3.31%
2017	274.10034	1.38%	82	5.82%	4,697	3.10%
2016	303.63538	1.61%	78	5.53%	5,264	3.38%
2015	404.46232	2.09%	72	5.05%	5,087	3.39%
2014	444.4323	2.20%	56	3.88%	4,399	2.82%
2013	281.20963	1.27%	67	4.50%	3,807	2.48%
2012	276.90113	1.32%	74	4.85%	3,017	1.88%
2011	554.41838	2.38%	90	5.71%	5,174	3.20%
2010	421.2483	1.61%	88	5.37%	4,145	2.35%
2009	550.95934	2.12%	69	4.05%	3,589	2.06%
<b>Annual average</b>	<b>377 tonne</b>	<b>2% contribution</b>	<b>74 licences</b>	<b>5% contribution</b>	<b>4,407 days</b>	<b>3% contribution</b>

Source: DAF (2018)

### 19.4.7.3 Recreational fisheries

Port Curtis supports a popular recreational fishing industry, which is a key component of the region's tourism industry.

Fishing activities predominantly include line fishing, crabbing and prawning, and is mainly carried out by boat with a significant increase (36.1%) in boat registrations in the Gladstone LGA recorded over the period of 2006 to 2014 from 5,396 to 7,342 (Sawynok et al. 2014). Graham's Creek and The Narrows are popular locations for recreational fishing, crabbing and prawning (depending on season) (GPC 2012a). Land based recreational fishing occurs from almost every location around Port Curtis where there is public access to the shore, with likely more than 100 locations (Sawynok et al. 2014). Chapter 9 (nature conservation), Appendix I1 (Section 9) and Section 18.5.4.1 contain further background information on recreational fishing.



## 19.5 Description of the Port's role in the economy

This section considers the role of the Port in the economic stability, sustainability and development of Gladstone and the region providing additional economic context against which to assess the Project.

### 19.5.1 Significance of the Port of Gladstone

The Port of Gladstone is Queensland's largest multi-commodity port and is internationally recognised as a major bulk. The Port includes the RGTCT which is the fourth largest coal export terminal in the world (by throughput). More than 30 products are handled through the Port (refer Table 19.10), which are then exported to more than 30 countries.

The Port has national significance as one of the few naturally sheltered deep water ports on the east coast of Australia.

The Queensland Government's Governing for Growth – Economic Strategy and Action Plan sets out the government's direction and priorities to steer economic growth in Queensland. The strategy outlines the government's commitment to growing a four pillar economy involving agriculture, resources, construction and tourism. These pillars are the existing and future foundations of the Queensland economy and the mainstay of regional economies such as Gladstone (Queensland Government 2014).

National and state government policies, strategy and action plans demonstrate a clear expectation that the Port of Gladstone be further developed to allow an increase in throughput, in particular to accommodate the future expansion in coal, LNG exports and other industries.

The Port of Gladstone has a potential resource opportunity catchment that includes the following areas:

- Central and southern Bowen Basin (includes thermal and coking coal reserves (over 30 billion tonnes) (Mutton 2003)
- Surat Basin (includes strong and traditional agricultural production, thermal coal reserves (6 billion tonnes) and coal seam gas reserves (18,249 petajoules) (Queensland Government 2011)
- Wide Bay Burnett region, including the North Burnett Minerals Province opportunities (e.g. mineral production in particular coal resources in the Tiaro, Monto and north of Bundaberg areas). Other potential resources identified within this region include gold, silver, kaolin, limestone, ilmenite, apatite, scandium, feldspar, siltstone, silica sand, black granite and clay. Industry is also investigating coal seam gas in this region (Wide Bay Burnett Regional Organisation of Councils 2014).

### 19.5.2 Individual facilities reliant on the Port

The Port covers 4,448ha of land, 700ha of which is reclaimed land, and comprises eight main wharf centres (20 berths). The ownership and operator status of each wharf and the associated cargo type is summarised in Table 19.9.

**Table 19.9 Port of Gladstone wharves and cargoes (export and import)**

Wharf centre	Berths	Owned	Operated	Cargoes
RG Tanna Coal Terminal	4	GPC	GPC	Coal
Barney Point Terminal	1	GPC	GPC	Calcite and nickel ore
Auckland Point Terminal	4	GPC	GPC, GrainCorp and others	Passenger liner, grain, petroleum products, caustics soda, LP Gas, break bulk, sulphuric acid, gypsum magnetite, ammonium nitrate, scrap metal, containers and general cargo

Wharf centre	Berths	Owned	Operated	Cargoes
Fisherman's Landing	4	Rio Tinto Yarwun, GPC	Rio Tinto Yarwun and others	Bauxite, alumina, caustic soda, cement clinker, cement, fly ash, liquid ammonia and sulfuric acid
South Trees	2	QAL	QAL	Alumina, caustic soda, bunker fuel and bauxite
Boyne Wharf	1	GPC	Boyne Smelters Limited	Aluminium, liquid pitch and petroleum coke
Curtis Island LNG Precinct	3	Origin, ConocoPhillips, Sinopec, Royal Dutch Shell, Santos, Petronas, Total, Kogas	Operated by APLNG, Santos GLNG and QCLNG	LNG
Wiggins Island Coal Terminal (WICT)	1	WICET	WICET	Coal

Source: GPC (2018a); GPC (2017)

The major operational cargoes transported through the Port are summarised in Table 19.10.

**Table 19.10 Port of Gladstone major cargoes**

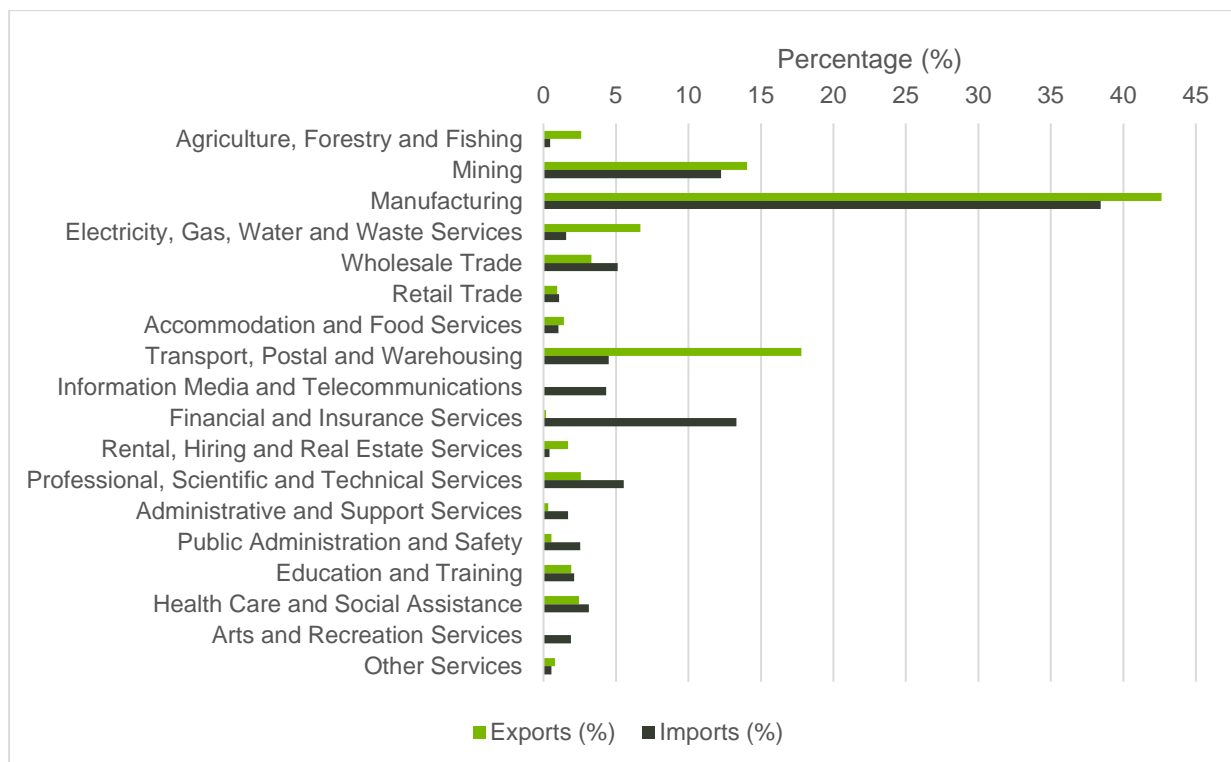
Imports		Exports	
Bauxite	Gypsum	Ammonium nitrate	General cargo
Break bulk	Liquid ammonia	Alumina	Grain
Bunker oil	Liquid pitch	Aluminium	Ilmenite
Caustic soda	Liquefied petroleum gas	Break bulk	Limestone
Containers	Magnetite	Calcite	LNG
Copper slag	Petroleum coke	Cement	Logs and woodchip
General cargo	Petroleum products	Cement clinker	Magnesia
		Coal	Magnesite
		Containers	Scrap metal
		Fly ash	

Source: GPC (2017)

### 19.5.3 Trade export and import

The Gladstone LGA generated \$4.22 billion from exports in financial year 2018, which equates to approximately 5.7% of Queensland's export revenue (QGSO 2018b). Almost half (42.6%) of these exports were contributed to by the manufacturing industry. Other major contributors to the Gladstone region's exports were the transport, postal and warehousing industry (17.8%) and the mining industry (14.0%). Primary metal and metal product manufacturing produced the majority of exports (29.7%), which comprised of companies such as the Queensland Alumina Ltd, Rio Tinto Alcan Yarwun and Boyne Smelters Ltd. The Gladstone LGA received \$4.83 billion of imports contributing to 10.6% of all imports into Queensland (QGSO 2018b).

Figure 19.6 illustrates the Gladstone LGA's imports and exports for the year ending 30 June 2018 and the associated industries.



**Figure 19.6 Proportion imports and exports by industry sector as at 30 June 2018**

**Source:** economy.id (2018)

An overview of the housing and land markets in Gladstone is provided in Section 18.5.2 and recent data regarding the Gladstone economy and industry is provided in Section 18.5.4.

## 19.5.4 Resources

The Queensland resources sector contributed \$3 billion in financial year 2017-2018. This is approximately 65% of Gladstone's total GRP whilst also contributing to 54% of Gladstone's total employment (QRC 2018). \$1.1 billion was spent on local businesses and community contributions and \$4.3 billion in royalties to the Queensland Government (QRC 2018).

The Port of Gladstone is located in an advantageous site with a potential resource opportunity catchment that includes the following areas:

- Central and Southern Bowen Basin
- Surat Basin
- Wide Bay Burnett region, including the North Burnett Minerals Province opportunities.

While future resource export from the Wide Bay Burnett region might be anticipated via the Port of Bundaberg due to proximity, the Bundaberg Port would require significant capital dredging to allow deep draft vessels to utilise the port. Therefore large scale export resource opportunities from this region will very likely utilise the Port of Gladstone.

While the timing, scale and volume of Queensland's resource growth in the short term is likely to be modest, the national and State government policies, strategies and action plans are being implemented to maximise Queensland's resource industry growth in the future.

### 19.5.4.1 Coal

Coal is Australia's and Queensland's largest energy export, contributing to 59% of all energy exports from Australia in the year ending 30 June 2018, excluding coke and semi-coked coal of lignite or peat, as per the latest publication by the Department of Industry, Innovation and Science (DIIS 2018). The ratio of coking coal to thermal coal for the Port of Gladstone is approximately 80:20.

The Port of Gladstone contributed 33% of all coal exports from Queensland in financial year 2016-2017 (QG 2017h; GPC 2018b). It is sited within a catchment area containing two major coal basins serviced by rail, as well as two minor coal basins, with a total of 41 mines in 2017 and a further 14 projects either under construction or in advance stages of development with mining leases approved or in application (DNRM 2017).

In the year ending 30 June 2018, Japan was the largest importer from the Port of Gladstone, receiving over 21.3Mt of coal (GPC 2018b). India was the second largest importer of coal from the Port of Gladstone, receiving over 16.0Mt in the same year. China and Republic of Korea are also significant importers of coal cargo. Table 19.11 summarises the Port of Gladstone's annual coal exports compared with total throughput over the last eight years.

**Table 19.11 Port of Gladstone coal export and total throughput**

Throughput	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Coal exports (Mt)	53.2	59.8 ▲	57.3 ▼	69.6 ▲	68.6 ▼	72.2 ▲	68.9 ▼	67.2 ▼
Total throughput (Mt)	76.4	83.8 ▲	85.3 ▲	97.7 ▲	99.29 ▲	115.9 ▲	120.3 ▲	119.4 ▼

**Source:** GPC internal database records

Increased focus on renewable energy means that coal could become a less favourable energy source and consequential reductions in export. However, coal continues to be the chosen fuel supply option for a number of import countries due to its competitive cost. China and India's demand for coal is predicted to increase with additional coal-fired capacity between 2014 and 2035, whilst Japan and South Korea will remain large consumers of coal (DSD 2016b). As such, the Port of Gladstone will continue its role as a major coal exporter over this horizon.

#### 19.5.4.2 Liquefied natural gas

LNG has been identified as a fuel substitute to coal and the Gladstone LGA has the necessary infrastructure and supply chain to extract, process, store and transport this resource. The Port's LNG facilities on Curtis Island include QCLNG, GLNG and APLNG. These LNG facilities have significant long term supply agreements with power generators, gas distributors and national oil companies in Japan, Korea, Malaysia and China (DSD 2016b).

The QCLNG facility includes two trains, with capacity for 8.5Mtpa in total, and can accommodate an expansion to a production capacity of up to 12Mtpa. The peak operational workforce for the LNG facility is expected to be 200 personnel in Gladstone. Approximately 120 vessels are loaded each year (two to three each week). Exports at the QCLNG facility totalled 7.56Mt during the 2017-2018 financial year (GPC 2018a). It was estimated the QCLNG Project would contribute approximately \$29.5 billion in value-added activity in Queensland during operations (with an annual average of \$3.7 billion) and \$12.8 billion in value-added activity in the Fitzroy region (Gladstone, Rockhampton and Banana LGAs) (QGC 2009).

The GLNG facility includes three trains with a capacity of 7.8Mtpa and potential to produce up to 10Mtpa. The peak operational workforce for the LNG facility will be 250 personnel. In the 2017-2018 financial year, 86 vessels were loaded by GLNG and exports totalled 5.24Mt (GPC 2018a).

The APLNG facility includes two trains processing up to 9Mtpa, with potential to expand to four trains processing up to 18Mtpa. There will be 325 personnel employed during operation of the LNG facility. In the 2017-2018 financial year, 124 ships were loaded by APLNG and exports totalled 8.52Mt (GPC 2018a). The APLNG facility is anticipated to contribute on average approximately \$2 billion to the Queensland Gross State Product each year (APLNG 2010).



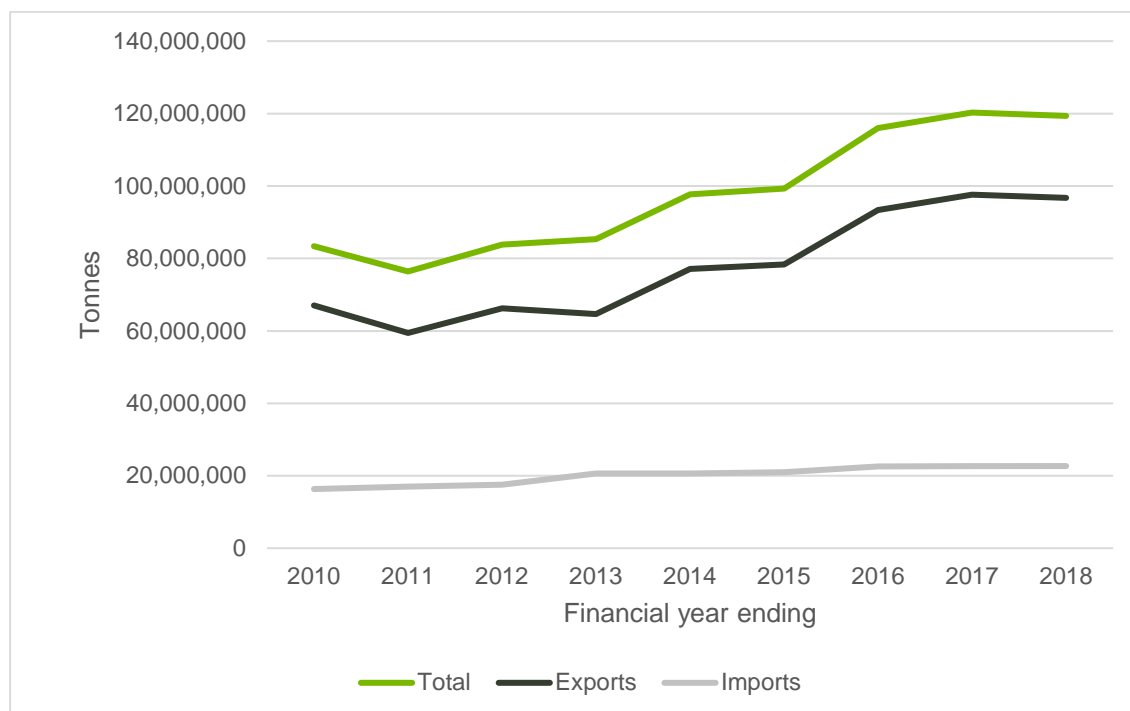
There has been extensive investment in the LNG facilities on Curtis Island and it is expected that LNG exports will represent a major commodity for the region. Financial year 2017-2018 saw an increase toward full capacity of 20.3Mt of gas exports (GPC 2018a). The contributions from the LNG projects are likely to extend out to the year 2050. In 2020-2021, it is estimated that the industry has capacity to export over 33Mt LNG through the Port of Gladstone (Commonwealth of Australia 2013). Whilst final output will be influenced by market factors, this export volume is estimated to be valued at over \$13.6 billion (undiscounted) (Commonwealth of Australia 2013).

### 19.5.5 Port throughput

The Port of Gladstone is one of the busiest ports in Australia, important to the local, State and national economies. The Port of Gladstone handles numerous products (refer Table 19.10), which are shipped to more than 30 countries.

In the year ending 30 June 2017, the Port of Gladstone achieved a record annual throughput of 120Mt, surpassing throughput at the Port of Hay Point, making the Port of Gladstone Queensland's largest port by volume and the RG Tanna Coal Terminal the world's fourth largest coal export terminal (by throughput) in the world (GPC 2017a). Throughput eased slightly (-0.7%) in financial year 2018 which was largely due to a reduction in coal exports.

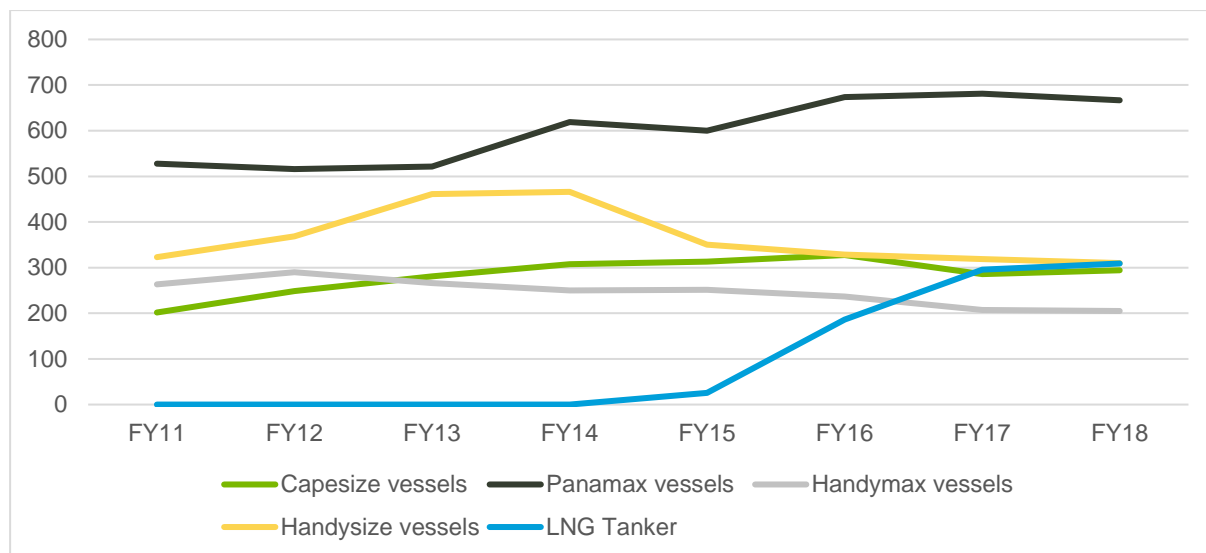
Figure 19.7 indicates the annual throughput of the Port from 2010 to 2018 in tonnes. There is a tonnage increase of 3.7% from 2016 figures (GPC 2018b). The Port of Gladstone exported 97Mt of cargo in 2018, an average increase of 5.6% per annum from 2010. A total of 22.7Mt of cargo was imported through the Port in 2018, which is an average increase of 4.9% per annum from 2010. Exports from the Port increased rapidly from 2015 to 2017 (24.61%) due to LNG facilities increasing operation to full existing train capacity, contributing 19.4Mt of gas exports in 2017 and 20.3Mt in 2018, well above their predicted throughput (15.8Mt) (GPC 2018b).



**Figure 19.7 Port of Gladstone annual throughput trend (tonnes)**

**Source:** GPC (2018b)

The vessels accessing the Port of Gladstone range in size from small fishing vessels to 220,000 dwt Capesize vessels. The number of vessels trading in the Port in financial year ending 2018 was 1,785, which has increased by an average of 5.09% per annum since 2011 (GPC 2018). Figure 19.8 shows the annual commercial vessel numbers, by vessel size, that have accessed the Port of Gladstone from financial years 2011 to 2018. There has generally been a consistent increase in larger vessel numbers (e.g. Capesize, Panamax) over this period, much of which corresponds to the increases in coal exports from the Port.



**Figure 19.8 Port of Gladstone annual throughput trend (vessels)**

**Source:** GPC (2018a)

Predictions of future low growth and moderate/high growth of total throughput for the Port are provided in Table 19.12 and Table 19.12, respectively. These estimates include a Port throughput tonnage base of 120Mt annually, which is defined as the average Port throughput that will be consistently achieved in future financial years from the existing operational industries, and potential expansions and new industries within the region.

The estimated predicted future growth of throughput numbers have been based on:

- Government approved throughput capacity for existing wharf centres (e.g. environmental authorities under the EP Act)
- New projects and expansion projects that have been approved by Government (e.g. projects with an EIS approved and proponent funding commitment) and are expected to be operational within the relevant timeframes
- Predicted industrial and resource growth within the Gladstone LGA and resource catchment, including potential developments that may utilise the future Port wharves identified within GPC's Strategic Plan.

The key throughput assumptions used to predict the estimates of future low growth and moderate/high growth within the Port of Gladstone are summarised in Chapter 1 (introduction, Section 1.4).

**Table 19.12 Port of Gladstone estimated predicted future low growth in throughput and number of vessel movements**

	2018/19	2019/20	2025/26	2030/31
Port throughput base (Mt)	120	120	120	120
Port throughput predicted estimated growth (Mt)	8	12	16	16
<b>Total Port throughput (Mt)</b>	<b>128</b>	<b>132</b>	<b>136</b>	<b>136</b>
Coal exports (Mt)	74	76	78	76
<b>Breakdown of vessel size numbers (size ranges (dwt))</b>				
Capesize vessels (greater than 100,000)	301	308	317	309
Panamax vessels (60,000 to 99,999)	717	736	756	746
Handymax vessels (40,000 to 59,999)	218	224	230	227
LNG tanker (up to 120,000)	311	319	328	328
Handysize vessels (up to 39,999)	336	344	354	349
<b>Total vessel numbers</b>	<b>1,883</b>	<b>1,931</b>	<b>1,985</b>	<b>1,959</b>

Source: GPC internal database records

**Table 19.13 Port of Gladstone predicted estimated future moderate/high growth in throughput and number of vessel movements**

	2018/19	2019/20	2025/26	2030/31
Port throughput base (Mt)	120	120	120	120
Port throughput predicted estimated growth (Mt)	8	12	32	52
<b>Total Port throughput (Mt)</b>	<b>128</b>	<b>132</b>	<b>152</b>	<b>172</b>
Coal exports (Mt)	74	76	86	96
<b>Breakdown of vessel size numbers</b>				
Capesize vessels (greater than 100,000)	309	320	352	385
Panamax vessels (60,000 to 99,999)	717	736	756	780
Handymax vessels (40,000 to 59,999)	218	224	230	227
LNG tanker (up to 120,000)	311	319	328	328
Handysize vessels (up to 39,999)	336	344	354	349
<b>Total vessel numbers</b>	<b>1,891</b>	<b>1,943</b>	<b>2,020</b>	<b>2,069</b>

Source: GPC internal database records

## 19.5.6 Tourism and the Gladstone Marina

In addition to the export and import of various commodities, the Port of Gladstone is also home to a growing cruise ship industry as well as the Gladstone Marina and connecting parklands.

GPC, Gladstone Area Promotion and Development Limited, GRC and other relevant government agencies have been collaborating with P&O Cruises to launch their new Southern Great Barrier Reef Discovery Cruises at the Port of Gladstone (GPC 2013). This new cruise industry development began in 2016, promoting Gladstone as a tourism hub with the East Shores Precinct hosting markets in conjunction with cruise ships docking at Auckland Point Terminal.

The Gladstone Marina comprises 320 mooring berths catering to private, charter and service vessels. The following businesses operate within the Gladstone Marina:

- Heron Island Boat Transfer Terminal
- Compleat Angler Gladstone (also operates parking for Heron Island stays)
- Baileys Marine (operates refuelling services)

- Ship and Sale Chandlery
- Fodico Marine Group
- Curtis Ferry Services
- Volunteer Marine Rescue
- MIPEC Gladstone Slipway
- Gladstone Visitor Information Centre.

## 19.6 Assessment of economic impact

### 19.6.1 Project alignment with government strategy

#### 19.6.1.1 Port context

The Port of Gladstone is driven by two main functions, including the export of resources from the Central Queensland region and finished products, and the import of raw materials. These functions are driven by global and local economic factors.

The local economic factors of Gladstone include:

- A major coastal population centre
- An industrial city and economic powerhouse with a heavy port focus
- A major logistics hub for central and central western Queensland, including the Central Highlands and coal fields
- A regional service centre for the surrounding areas such as Calliope, Dawson and Callide valleys.

The Port is a major bulk-commodity port critical not only to Gladstone's economy but also Queensland's. It supports numerous associated industry sectors and its growth will enable the expansion of both Gladstone's and Queensland's trade and investment opportunities.

National and State government policies, strategy and action plans demonstrate a clear expectation that the Port of Gladstone be further developed to allow an increase in throughput, in particular to accommodate the future expansion in coal, LNG exports and other industries. Not proceeding with the Project will likely place limitations on these plans and strategies being successfully implemented.

#### 19.6.1.2 National Ports Strategy 2011

The National Ports Strategy was published in 2011 by Infrastructure Australia and endorsed by the Council of Australian Government. The purpose of this strategy 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' (Infrastructure Australia 2012).

The Project is consistent with the objectives of the National Ports Strategy to facilitate trade growth and improve the efficiency of port-related freight movement across infrastructure networks.



### **19.6.1.3 Priority port master planning (Sustainable Ports Development Act 2015 and Master plan for the priority Port of Gladstone 2018)**

The Queensland Government has recognised the Port of Gladstone as an important economic hub that contributes significantly to Gladstone LGA. In accordance with the Ports Act (refer Section 1.4.4.2), the Queensland Government has delivered a Master plan for the priority Port of Gladstone 2018. Through this master plan, the Government has demonstrated a commitment to support the ongoing sustainable development of the Port and the entire region.

The master planning area encompasses approximately 73,000ha in total; a 40,000ha land component and 33,000ha marine component. The strategic vision for this area relates to a longer term plan to 2050, allowing the Port of Gladstone and its associated industrial area to develop in a sustainable manner.

Objectives for the Port of Gladstone master planning that relate to the Project include:

- Facilitation of economic growth in the Gladstone LGA and Queensland
- Enabling consistent and sustainable growth of trade through the Port of Gladstone
- Efficient use and development of land and marine infrastructure
- Recognition and minimisation of impact from any development
- Maintenance of social wellbeing in the Gladstone LGA.

The Project is also consistent with the desired outcomes of these objectives. These outcomes include:

- Dredging undertaken where necessary to support the ongoing operation and growth of the Port
- Maintenance dredging undertaken in accordance with the dredge management plan and guidelines developed under the *Maintenance Dredging Strategy for Great Barrier Reef World Heritage Areas Ports*
- Beneficial reuse of material generated from capital dredging (including social, economic or environmental benefits).

### **19.6.1.4 Gladstone Ports Corporation Strategic Plan**

GPC has released the Strategic Plan to support their mission to responsibly manage, develop and operate Port facilities, and services for the sustainable economic growth and social prosperity of the region, Queensland and Australia (GPC 2012).

The Strategic Plan recognises the key wharf centres and existing infrastructure of the Port and has forecast an ultimate port shipping capacity of more than 300Mtpa (GPC 2012) with the potential to expand for an additional 27 wharves. Five of these are potential future wharves at WICT and three at the Curtis Island LNG Precinct.

The Strategic Plan also recognises the need to duplicate the Gatcombe and Golding Cutting Channels to facilitate projected increase in industrial trade demand and vessel movements whilst mitigating vessel safety. Depending on future factors, other Port shipping channels may also require duplication. The Project is consistent with these key outcomes.

In addition to the Strategic Plan, GPC's Statement of Corporate Intent outlines the strategies that will be implemented to support the Queensland Government's objective of growing a four pillar economy in Queensland through agriculture, tourism, resources and construction. The Port of Gladstone directly supports the resources sector and is a critical node in the supply chain that supports the national and State economy (DSDIP 2014).

### 19.6.1.5 Gladstone State Development Area

The GSDA Development Scheme (DSD 2015) is the current regulatory document for the GSDA which was declared in 1993, to facilitate future industry development with links to the marine infrastructure. The GSDA comprises 27,194ha for predominantly industrial development. The Port is essential to the economic viability of the Gladstone LGA, and has been a key driving force in the development and growth of the region's industry and site selection of the GSDA.

The development of the Western Basin area, including Fisherman's Landing, Hamilton Point and the WBE reclamation area, and the Project dredging, will play a significant role in allowing the GSDA to reach optimal potential (DSD 2015).

The GSDA Development Scheme states that the vision is:

- *To be the preferred location for the establishment of industrial development of regional, state and national significance and supporting infrastructure*
- *To be a location for supporting industries which facilitate industrial development of regional, state and national significance*
- *To have a coordinated approach and maximise the safe and efficient use of existing and future linear infrastructure to industries and the port*
- *To contribute to maintaining the outstanding universal value of the Great Barrier Reef World Heritage Area for development to occur in a logical sequence recognising the short and long term economic benefits to the region and state.*

The Project is consistent with the GSDA Development Scheme vision, and more specifically, the preferred development intent for the Port Related Industry Precinct and Curtis Island Industry Precinct. Both precincts state the requirement for:

- Medium and high impact industrial development and special industrial development
- Links to the port through the import and export of material and benefit from close proximity to port-related infrastructure and services.

The GSDA continues to attract major industry to the Gladstone LGA, especially the coal and LNG industries. The city of Gladstone comprises a strong retail and service sector, modern urbanised area, tourism and primary production, providing abundant choice for workers and opportunities for business.

### 19.6.1.6 Gladstone Region Economic Development Strategy 2015

The Gladstone Region Economic Development Strategy (GRC 2015) outlines GRC's intended framework to enable regional wide economic growth, building on the economic stimulus generated by the completion of the WICT and the LNG projects. The Strategy's confirmed objective is to facilitate sustainable, financially and environmentally responsible initiative that will advance future economic growth and continue the development of the region.

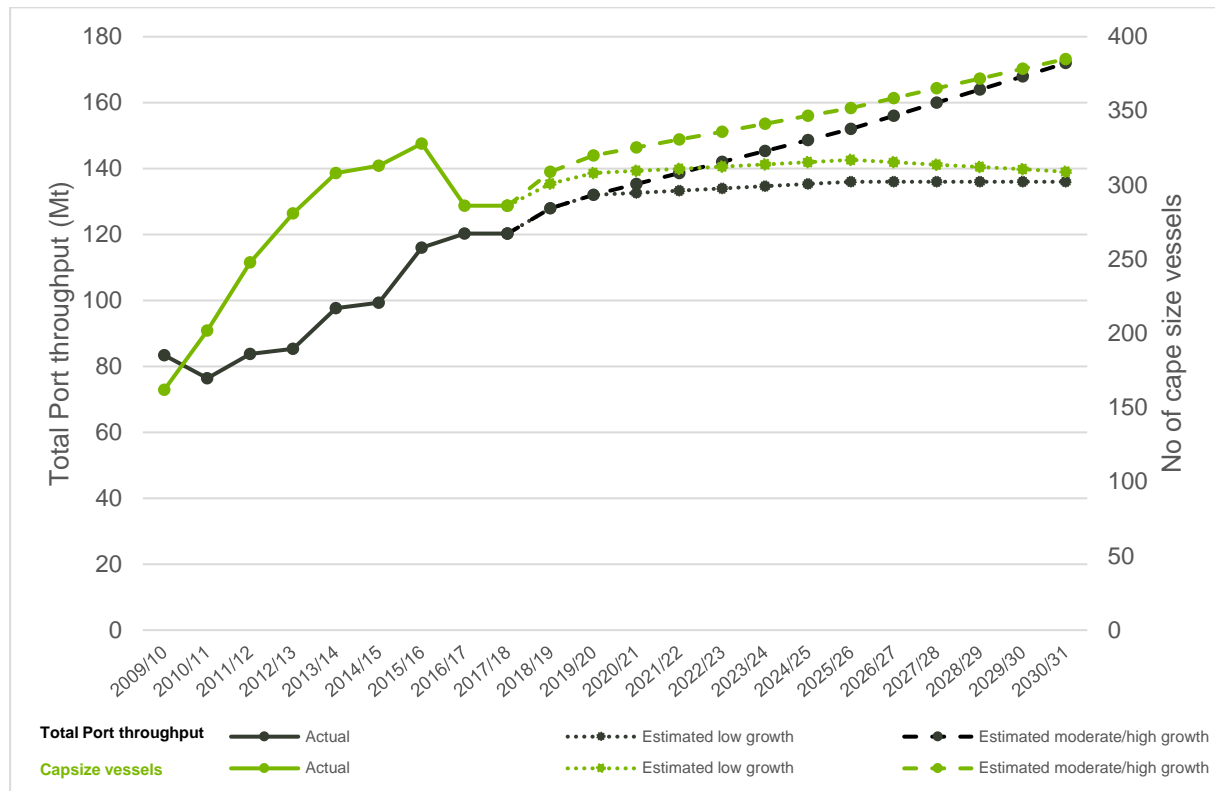
The GRC recognise the Port as an economic asset and competitive advantage to the Strategy's vision for economic development.

## 19.6.2 The need to accommodate additional port capacity

While there are no immediate increases in trade demands, the Project will allow the Gladstone LGA, specifically GPC, to ensure the Port is prepared when the future need arises. Based on the current and future predicted throughput and bulk carrier vessel movements, and current constraints of the Port (refer Section 1.4), the Project aims to improve the operational and economical efficiencies of the Port, and also improve the safety of Port vessel movements (refer Section 1.4).

Given the future projected coal and other products throughput discussed in Section 19.5.4, the number of bulk carrier vessels requiring access to the Port will also increase (refer Figure 19.9). There is also potential for future growth in container trade being pursued by GPC. In the last financial year (2017/18), there were 3,464 containers handled by the Port (GPC 2018a) and this is planned to increase in the future with better Port facilities and more regular shipping opportunities.

Figure 19.9 shows the actual and predicted estimated future low growth and moderate/high growth in total Port throughput and the number of Capesize vessels between financial years 2010-2011 and 2030-2031.



**Figure 19.9 Actual and predicted estimated future low and moderate/high growth in Port throughput and number of Capesize vessels**

Improving the tidal constraints for bulk carrier vessel movements within the Gatcombe and Golding Cutting Channels will also allow improved flexibility for vessel passing within the Port. There is the potential future need for the Port to accommodate deep drafted vessels importing cargo on high tides. The improved Port of Gladstone operational efficiencies will also enable substantial economic benefits for the region to be realised by enabling future resource and industry expansion within the industry and resource catchment for the Port.

The existing shipping channel constraints for the Port of Gladstone include:

- Single width channels
- Shallower bypass channels based on existing bathymetry for Gatcombe, Golding Cutting, Clinton, Boyne and Auckland Channels
- Gatcombe and Golding Cutting Channels provide safe passing for only light draft Handymax or smaller vessels. Tidal assistance for deep draft vessels is required for safe movement and passing of vessels within the Port.
- Port vessel capacity being limited by the vessel follow-on times creating delays between the time one ship passes a point in a shipping channel to the following ship passing the same point in the channel
- Limitations on inbound and outbound scheduled vessel movements.

These constraints currently have the potential to delay deeper draft vessels (e.g. Capesize) using the Port which results in inefficient vessel import and export port turn-around times. Over the next 5 to 10 years, as Port throughput and Capesize vessel numbers increase, the exiting shipping channel constraints will result in further deeper draft vessels delays and will limit the total number of vessel movements in and out of the Port each year, in turn placing limits on the Port's capacity.

Without the Project, the existing risk of vessel incidents will continue to have a direct impact on the safety of commercial vessel movements within the Port of Gladstone. Future predicted growth in Port vessel movements, including bulk carrier vessels, will further increase this vessel incident risk.

It is important for the Port of Gladstone to remain internationally competitive by being able to accommodate the medium and longer term changes in trade demand and global vessel sizes due to a need for better economies of scale through the use of larger vessels. In turn, import cargo that may have been previously diverted to other ports and transported to the Gladstone LGA by road or rail will be able to enter Gladstone directly, decreasing costs per container within Queensland.

It is also important to note the potential long lead times required for obtaining dredging environmental approvals, undertaking detailed design, procurement of contractors and implementing pre-dredging commitments and approval conditions. These long lead times result in a Project program requirement to receive EIS approval in late 2019 in order to maximise future opportunities within the Gladstone region.

As the Project will improve the operational efficiency of the Port, the benefits of the Project will flow to all the commodity export sectors reliant on the Port of Gladstone which are discussed in Section 19.5.

### **19.6.3 Project economic value to the local area and region**

#### **19.6.3.1 Background**

An input-output model has been used to assess the potential economic impact of the capital cost of the works in the Project through a multiplier effect. Input-output analysis requires the use of input-output tables and the input-output multipliers derived from them.

An input-output table provides a summary or 'snapshot' of the transactions occurring within an economy over a selected period. An input-output table is based on the fundamental notion that industries are inter-dependent, and these inter-dependencies are captured by the input-output table. In simple terms, an input-output table shows, for a given industry, which other industries it purchases from and to which other industries it sells. Input-output multipliers, derived from input-output tables, capture the extent of the inter-dependence between industries. Input-output multipliers are summary measures that can be used for estimating the impact on all industries in the economy from changes in demand for the output of any one industry. Input-output multipliers capture not only the direct effects of an industry expansion, but also the indirect or flow-on effects that arise due to industry interactions.

Input-output analysis is a flexible tool and can be used to produce a variety of economic impact measures. The analysis focusses on income generated (from wages and salaries), employment and economic growth measures. Economic growth is quantified at the State level, GSP for Queensland.

To undertake this analysis, input-output tables for Queensland were derived for the 2016-17 financial year and used to derive the multipliers used in the analysis. Total input-output multipliers capture:

- A direct or initial effect captures the direct effect of an increase in final demand for an industry's output
- A Type 1 multiplier captures both the direct effect and production induced effects. The latter refers to the industry's purchase of inputs from other businesses (referred to as first round production effects), and the further purchase of inputs by those other businesses (industrial flow-on effects).
- A Type 2 multiplier captures the direct and production induced effects of the Type 1 multiplier, and also captures consumption induced effects that flow from the expenditure of the income that is earned from the production of the additional sales of an industry.

### 19.6.3.2 Assumptions and multiplier selection

The analysis undertaken considered both the construction and maintenance cost of the Project, related to each component and stage. The total Project cost of \$760 million shown in Table 19.14 will be spent in a staged process, which includes:

- Establishment of the WBE reclamation area outer bund walls (southern and northern areas) and BUF, and initial dredging works for the barge access channel which together amount to \$110 million
- Stage 1 dredging, including landside operations and reclamation area works, local services and work boats, amounting to \$373 million. At the end of Stage 1 there will also be installation of navigational aids, at a cost of \$5 million. The total local component of works at this stage is \$85 million.
- Stage 2 dredging, including landside operations and reclamation area works, local services and work boats cost amount to \$272 million, of which the local component is \$55 million
- The total local investment cost is 33% of total Project cost at \$250 million, which has been used in the input-output model to assess the economic impact.

**Table 19.14 Total Project cost for the Project**

Project component	Total construction (\$ millions)	Local investment proportion (\$ millions)
Establishment of the WBE reclamation area outer bund walls (southern and northern areas) and BUF, and initial dredging works	110	110
Stage 1 dredging	378	85
Stage 2 dredging	272	55
<b>Total</b>	<b>760</b>	<b>250</b>

The final capital cost for the Project will be dependent on detailed design and outcome of the dredging operation and reclamation tendering process.

The costs associated with post-Project maintenance dredging and maintenance management activities of the WB and WBE reclamation areas will form part of the Port-wide annual maintenance dredging and Port land management requirements, respectively, and thus contribute no additional operational costs to the Project and have not been considered in the input-output analysis.

The Project construction phase and associated capital works spend of \$760 million over a five year period (i.e. WBE reclamation area and BUF establishment over 3 years, initial dredging works over 6.5 weeks, Stage 1 dredging over 33 weeks, and Stage 2 dredging over 25 weeks) will contribute to additional spending on goods and services within the local Gladstone area.

However, the economic benefit of the total Project cost to the local economy will only be a proportion of the total local investment, amounting to around \$250 million, as the dredging work is likely to be contracted to an overseas dredging operator, due to shortage of specialised domestic dredging equipment and operators. A significant proportion (67%) of the Project expenditure will therefore flow directly overseas, in the form of leasing payments to the dredging contractor and overseas workforce.

However, some of the expenditure will indirectly remain in the local region, such as accommodation and living expenses of the workforce while based in Gladstone. Some of the expenditure will also flow directly to local businesses, such as locally employed labour as described below. There will also be indirect impacts on businesses supporting local labour.

### 19.6.3.3 Results from the input-output model

Construction impacts have been derived from the multipliers from one of the three industries in the input-output tables, including:

- Heavy and civil engineering construction
- Transport support services and storage
- Professional, scientific and technical services.

Applying the economic multipliers for the above industries to the relevant capital expenditures provides estimates of the employment impacts generated by the Project. At the State level, the injection of capital expenditure of over \$250 million to the Queensland economy leads to total job growth of 733 direct jobs and 2,173 indirect jobs over the duration of the Project (refer Table 19.15). It is important to note that the model assumes that construction occurs in one year. However, the establishment of the WBE reclamation area will occur over three years, with capital expenditure of nearly \$115 million, generating a total (direct plus indirect) of 1,339 full-time equivalent jobs (FTE). To estimate the average number of FTE jobs associated with the Project it is necessary to divide the jobs figure by the number of years of the Project. Therefore, with a three year construction period, an average of 446 jobs are created per year. It is likely that some of these jobs could be occupied by the same person in each of the three years.

**Table 19.15** Direct and indirect employment benefits

Description	Direct benefit (FTE)	Indirect benefit (FTE)	Total benefits (FTE)
Establishment of the WBE reclamation area outer bund walls (southern and northern areas) and BUF, and initial dredging works	337	1,002	1,339
Stage 1 dredging	219	648	867
Stage 2 dredging	177	524	701
<b>Total</b>	<b>733</b>	<b>2,174</b>	<b>2,907</b>

The Project will lead to total income generation of \$287 million (direct and indirect) for the Queensland economy. Table 19.16 provides the direct and indirect income benefits for each component and stage of the Project.

**Table 19.16** Direct and indirect income benefits

Description	Direct benefit (\$ million)	Indirect benefit (\$ millions)	Total benefits (\$ millions)
Establishment of the WBE reclamation area outer bund walls (southern and northern areas), BUF and initial dredging	49	83	132
Stage 1 dredging	32	54	85
Stage 2 dredging	26	44	69
<b>Total</b>	<b>107</b>	<b>181</b>	<b>286</b>

The Project will lead to total economic growth of more than \$502 million (direct and indirect) for the Queensland economy, as contribution of 0.15% to the GSP of Queensland and 10.5% to the GRP of Gladstone. Table 19.17 gives the direct and indirect economic growth benefits for each component and stage of the Project.



**Table 19.17** Direct and indirect economic growth

Description	Direct benefit (\$ million)	Indirect benefit (\$ millions)	Total benefits (\$ millions)
Establishment of the WBE reclamation area outer bund walls (southern and northern areas) and BUF and initial dredging works	73	158	231
Stage 1 dredging	48	102	150
Stage 2 dredging	39	83	121
<b>Total</b>	<b>160</b>	<b>343</b>	<b>502</b>

## 19.6.4 Other potential economic impacts

### 19.6.4.1 Education and training

Dredging work is a specialist skill set which for large capital dredging campaigns requires dredging equipment and the associated workforce to be sourced from overseas.

The establishment of the WBE reclamation area and BUF will consist of activities not dissimilar to general civil construction works with machine and plant operators required, while the post dredging phase will, in general, have a need for a workforce with earth moving, rehabilitation and environmental management skills. The workforce for these Project activities are most likely to be sourced from the Gladstone region.

GPC will work with the appointed dredging Project contractors to develop appropriate recruitment and training programs as relevant. This would include identifying roles through all phases of the Project that can be filled by local workers. Where possible recruitment and training programs will focus on attracting and training Aboriginal people, women, secondary school students, unemployed and underemployed people. Further details of the labour supply and procurement strategy are discussed in Section 18.7.3, including training to meet labour supply strategies and programs.

The installation of the navigation aids will require a mix of the skills sets, including pile driving, welders, marine engineers and electricians.

### 19.6.4.2 Housing and land markets

As confirmed in Section 2.3.1, the Project workforce is small and the likelihood that housing supply, demand or pricing issues will result from the Project has been assessed as low.

The dredging contractor is expected to be an international contractor so a portion of the workforce required for specialised dredging activities will be workers from outside the Gladstone LGA. However, due to the relatively short duration of dredging, relocation of the family members of the workers sourced outside of the Gladstone LGA is not expected.

Impact on the housing rental market within the region will be minimal. Any short term construction workforce demand requirements generated by the Project can be met by the commercial accommodation sector within Gladstone – as described at Section 19.4.4 the area has sufficient capacity to cater for any potential demand.

### 19.6.4.3 Commercial, recreational and Aboriginal fishing

As discussed in Section 9.11.2, both inshore and offshore fisheries operate out of Port Curtis with commercial fishing activities utilising the following areas located within/adjacent to the WBE reclamation area, including:

- Mangrove areas in The Narrows and estuarine inlets
- Seagrass meadows and intertidal wetlands in coastal areas.

From a recreational viewpoint, the most popular locations for recreational crabbing trips are the estuarine and inlet areas of Calliope River as well as Graham's Creek and The Narrows, followed by the Boyne River and South Trees Inlet (Gladstone Region 2018).

Analysis of intertidal and marine vegetation communities within the WBE reclamation area (refer Sections 9.4 and 9.6) indicates that seagrass meadows (i.e. important habitat for recreational and commercially harvested species) are present across both the northern and southern areas associated with the WBE reclamation area. Direct loss of mangrove and foreshore intertidal communities is not predicted to occur as part of the WBE reclamation area.

Whilst the direct loss of inshore habitat from the establishment of the WBE reclamation area has the potential to impact on fisheries values, due to the significant extent and availability of other Port Curtis seagrass meadows, mangrove communities and other inshore areas identified as having fisheries importance, this Project direct loss of inshore habitat is unlikely to result in any overall public dis-benefit or adverse cumulative impact on Port Curtis fisheries.

While the dredging activities have the potential to impact on the Port Curtis marine environment (e.g. increase in turbidity), these impacts will be temporary and will be managed in accordance with the Dredging EMP and Project EMP (refer Appendices Q1 and Q2, respectively). Any potential cumulative Project impact to commercial fishing has, therefore, been assessed as low due to the low ratio of fishers operating in the vicinity when compared to the overall availability of fishing areas and the found utilisation by fishers. The temporary nature of the impacts that arise from dredging are expected to be localised and the period limited to the areas being disturbed by dredging. The reclamation area has been determined considerate of this Project and future Port dredged material placement requirements formed by assessment of beneficial re-use and the mitigation of future disturbance to any other areas within the harbour precincts.

It is not expected that the dredging activities will impact the fisheries values of the broader area. Commercial fishing catch weights and GVP are, therefore, not expected to be significantly impacted by the Project activities. Project EIS consultation with fishery groups and individuals supports this conclusion; they consider that the fish stock is agile, being adaptive to new conditions and feeding habitats with populations remaining in Port Curtis, while shellfish will be impacted even less as they breed in deep water.

The movement of dredgers and other Project vessels within the Port will not have any detrimental impact on the ability to fish in the marine waters of the Port.

It is not expected that the Project activities will significantly impact recreational and Aboriginal fishing due to the scale and location of disturbance areas. Commercial activities such as charter fishing are not expected to be impacted by the Project activities. Port vessel operational excursions would continue as usual, navigating around the dredging vessels and navigational aid installation barges as required.

#### **19.6.4.4 Tourism**

Tourism based services (fishing charters and the Heron Islander) would operate as per normal from the Port area. Similarly, recreational boating (fishing or cruising), which is a noted contributor to the local tourism industry, will not be impacted by the Project with Port access and through navigation maintained. The operations of the marina and associated facilities will not be affected. No impact to the cruise ship services and their ability to berth at the Auckland Port Terminal are anticipated. The Project, therefore, is unlikely to affect tourism spend and revenue within the Gladstone LGA. GPC will work with its customers, tenants and tourism operators to ensure that accurate information about the Project is available to assist with tourist queries should they arise.

#### 19.6.4.5 Avoided cost of shipping delays

The Project will also result in economic benefit of any potential avoided delay costs in the future shipping movements in the Port, in particular Capesize vessels (import and export). As per the Maritime Union of Australia submission to the Senate Rural and Regional Affairs and Transport Legislation Committee (August 2015), delay risks at Australian ports reduce potential competitiveness.

It is vital for the Port of Gladstone, one of only four priority ports within Queensland, to have port capacity to cater for future vessel demand and minimise the risk of detention and delay to avoid the higher demurrage costs that ships are required to pay (due to their higher cost structure, given it is calculated on daily operating costs of ships). The higher demurrage costs, which could exceed \$30,000 per ship per day, has the potential to reduce the competitiveness of ships utilising the Port of Gladstone and the return on investment. The potential future shipping delays and higher costs associated with utilising the Port of Gladstone has the potential to be a disincentive for the ships to use the Port, leading to a loss of business and potential negative impact on the Gladstone and Queensland economy, with loss of employment, income and economic growth.

### 19.7 Mitigation measures

While Project economic mitigation measures are not required for the positive economic benefits, the following measures will be implemented to manage any unidentified temporary, localised impacts associated with the economic environment:

- Continue consultation with Port users – In the lead-up to, and during dredging activities, GPC will continue to consult with its customers to inform them of upcoming activities and discuss any Project impacts on their operations
- Continue consultation with commercial fishing groups – In the lead-up to, and during dredging activities, GPC will continue to consult with local commercial fishing groups so that any issues associated with the dredging program and its interaction with commercial fishing can be identified and addressed early
- Encourage local employment and supply opportunities – While GPC employees will be involved in the construction management of the Project, and potentially components of the establishment of the WBE reclamation area outer bund wall and BUF construction, other Project activities will not be GPC employed positions. GPC recognises it has a role to play in developing employment, training and supply opportunities for local people. As relevant, GPC will work with its contractors to develop local employment and training opportunities during construction, focusing on skills development for school leavers, women, Aboriginal people and unemployed/underemployed. During construction and maintenance, where relevant, GPC will also encourage the organisation and its contractors to develop strategies to assess capacity and cost-effectiveness of sourcing goods and services from the local, regional and wider State economy. The labour supply and procurement strategy is discussed in more detail in Section 18.7.3.

### 19.8 Summary

The Project is required to accommodate medium and longer-term future growth in industry and trade in the Gladstone region to ensure that the Port remains competitive in a global market with increasing vessel size. Channel dredging improves accessibility for vessels and increased shipping movements, and reduces the existing and potentially increasing vessel incident risk as Port throughput increases. The Project also increases the prospect of additional berths at the Port to accommodate the predicted estimated future growth in export and import, particularly the highly demanded commodities of coal and LNG.

Whilst the existing Port shipping channels have capacity available to meet the current throughput and vessel numbers, the nature of the Project requires early environmental approval to ensure that ongoing sustainable development of the Port and Gladstone region are achieved. This desired outcome is not only the intent of the Project, but numerous national, State and regional government policies, strategies and action plans.

Deciding not to proceed with the Project will restrict future trades and the economic growth contingencies of these Government strategies, and the economic growth of the Gladstone region and State which rely on the Port.

The potential economic impact on the Queensland economy is also substantial, where \$250 million investment will lead to generation of employment of 2,906, income generation of \$287 million and economic growth of more than \$502 million, a contribution of 0.15% to the GSP of Queensland and 10.5% to the GRP of Gladstone.

**Table 19.18      Summary of Project economic benefit**

Description	Total economic benefit
Employment benefits (FTE)	2,906
Income benefits (\$ millions)	\$287
Economic growth (\$ millions)	\$502