Arrow Bowen Pipeline

ECONOMIC ASSESSMENT

- Rev 0
- 11 November 2011

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Glossary of Terms

ANZSIC – Australia and New Zealand Standard Industrial Code

Consumption Induced Effects – effects resulting from the recycling of cash flows in the economy, or households (consumers) spending their wages.

Consumption Induced Employment – employment created by consumption induced effects

Direct Effects – the initial impact from a direct injection of capital from the project into the domestic economy

Direct Employment – employment created by the project directly

Employment Impacts – the direct, indirect, and induced multiplier effects on employment.

Final Goods and Services – finished goods and or services sold to a user or consumer.

First Round Effect – effects resulting from all industries of the economy to support the direct input requirement i.e. to support the direct effect

Flow-on Effects – induced impacts which result from the direct effects. Flow-on effects include production induced and consumption induced effects.

Full-Time Equivalent (FTE) Jobs – total full-time and weighted hourly part-time jobs.

Income Impacts – multiplied effects on personal income and wages paid to workers resulting from direct and flow-on effects.

Industrial Support Effect – effects resulting from industries required to support the suppliers or the initial impacted industry i.e. industrial support effects are incurred from suppliers of first-round effected industries.

Inflows – imports of goods or materials into a regional or national economy.

Intermediate Goods and Services – goods or services used in the production of another good or services.

Multipliers – a measurement of how many times a single dollar is recycled, or multiplied, after being spent in the economy.

Outflows – exports of goods or materials from a regional or national economy.

Production Induced Effects – effects resulting from supporting industries and economic linkages related to direct effects. Production induced effects include the first-round effect and industrial support effect.

Production Induced Employment – employment created or supported by production induced effects.

Project Area – area defined by the Mackay and Fitzroy regions, specifically comprising the Regional Councils of Whitsunday, Isaac, Rockhampton, and Gladstone.

Output Impacts – The total economic impact identified by use of Input-Output multipliers including the direct effect, and flow-on effects.

Executive summary

The Arrow Bowen Pipeline project (the project) involves the construction of a 580 km long pipeline from Red Hill, approximately 90 km north of Moranbah in central Queensland to a proposed gas gathering station approximately 22 km southwest of Gladstone. The pipeline will convey coal seam gas (CSG) from the Bowen Basin for subsequent export as liquefied natural gas (LNG).

The project is aligned with local government policies and aspirations, supporting and strengthening the Australian economy including the Local Industry Policy, the Rockhampton Regional Council Corporate Plan, the Gladstone Region Economic Development Strategy, the Whitsunday Regional Council Corporate Plan, the Isaac Regional Council Corporate Plan, and the Mackay, Isaac and Whitsunday Regional Plan.

Economic impacts associated with the project have been assessed for all stages of the project including construction, operation, and decommissioning. Overall, the project is estimated to contribute significant economic gains to the project area, Queensland, and the domestic economy. During construction, the project is expected to contribute an estimated total output impact of $2.9 billion, as well as supporting an estimated annual average of 2,952 Full Time Equivalent (FTE) jobs during construction, 28 FTE jobs during operation, and contributing $627 million in household income over the life of the project.

Specifically, the project is expected to provide a number of economic benefits to the project area as well as Queensland and Australia including:

- Contribution to output;
- Contribution to household income;
- Contribution to employment; and
- An indirect contribution to energy self sufficiency and security of supply, and the continued prosperity of the Australian economy.

While some economic risks have been identified in the project area, they are generally low and cumulative impacts associated with significant projects in the project area are negligible.

Table 0-1 Project Employment Benefits*

Employment Impacts	Construction**	Operation	Total
Project Area	1041	7	1048
Total Queensland	1846	19	1865
Total Australia	**2952**	**28**	**2980**

Source: SKM
*Includes Direct, Indirect and Induced employment
**Average annual FTE employment during construction, 2016 through 2017

Table 0-2 Project Employment Benefits*

Income Impacts	Direct	Production Induced	Consumption Induced	Total
Project Area	$34.6	$48.3	$45.8	$128.8
Total Queensland	$79.3	$110.6	$105.0	$294.8
Total Australia	**$148.2**	**$245.8**	**$233.2**	**$627.2**

Source: SKM

Table 0-3 Project Output Benefits ('000,000)

Output Impacts	Direct	Production Induced	Consumption Induced	Total
Project Area	$173.9	$203.0	$225.9	$602.9
Total Queensland	$400.7	$465.3	$461.6	$1,327.6
Total Australia	**$890.6**	**$1,034.0**	**$973.0**	**$2,897.5**

Source: SKM

1. Introduction

Sinclair Knight Merz (SKM) has been commissioned by Arrow Bowen Pipeline Pty Ltd (Arrow) (the proponent), a subsidiary of Arrow Energy Pty Ltd, to undertake an Economic Assessment for the Arrow Bowen Pipeline Project (the project). The project involves the construction of a buried pipeline from Red Hill, approximately 90 km north of Moranbah in central Queensland to a proposed gas gathering station approximately 22 km southwest of Gladstone. The pipeline is 580 km in length and includes a mainline (AB) which is approximately 477 km long and three laterals (Dysart, Saraji & Elphinstone). The three laterals consist of: the Elphinstone Lateral (EL) approximately 52 km in length; the Saraji Lateral (SL) approximately 25.8 km in length; and the Dysart Lateral (DL) approximately 25.7 km in length. The pipeline will convey CSG from Arrow Energy's gas fields in the Bowen Basin for eventual export as LNG from the proposed Arrow LNG Plant on Curtis Island with construction commencing in 2016 and the first gas being supplied 2017/2018.

The purpose of the Economic Impact Assessment (EIA) is to provide information on the potential economic impacts of the project at regional, state and national levels as a specialist input to the Environmental Impact Statement (EIS). It also indicates strategies for capitalising on economic benefits while at the same time mitigating any possible negative impacts by:

- Defining the project and impacted areas;
- Providing a description of the local and regional economies;
- Reviewing project background and regional developments;
- Estimating the direct and flow-on economic effects of the project;
- Describing the impact on future local and regional economic development;
- Presenting measures to enhance or mitigate impacts to local and regional populations.

2. Regional economic profile

The project has the potential to impact the economies of a wide and diverse geographic region (including the project area, Queensland and Australia) and have a long-term, ongoing impact on the regional economy it traverses. Given the nature of pipeline operations however, any impact is largely constrained to the construction phase of the project.

2.1. Project Area

The potentially impacted areas are the local and regional economies directly affected by the project throughout its lifecycle along the proposed pipeline route. As is shown in **Figure 2-1**, the proposed route runs through the Mackay and Fitzroy regions, defined as the "project area", as governed by the

- Whitsunday Regional Council (Mackay),
- Isaac Regional Council (Mackay),
- Rockhampton Regional Council (Fitzroy), and
- Gladstone Regional Council (Fitzroy).

The potential economic impacts will be partially distributed through these areas, but will also have an effect on the greater Queensland and National economies. An economic baseline provides the context for estimated impacts, describing initial employment and industrial structure and the populations that will be directly affected by the project and influence the overall impact on Queensland and Australia.

ARROW BOWEN PIPELINE PRELIMINARY ROUTE (REV D)

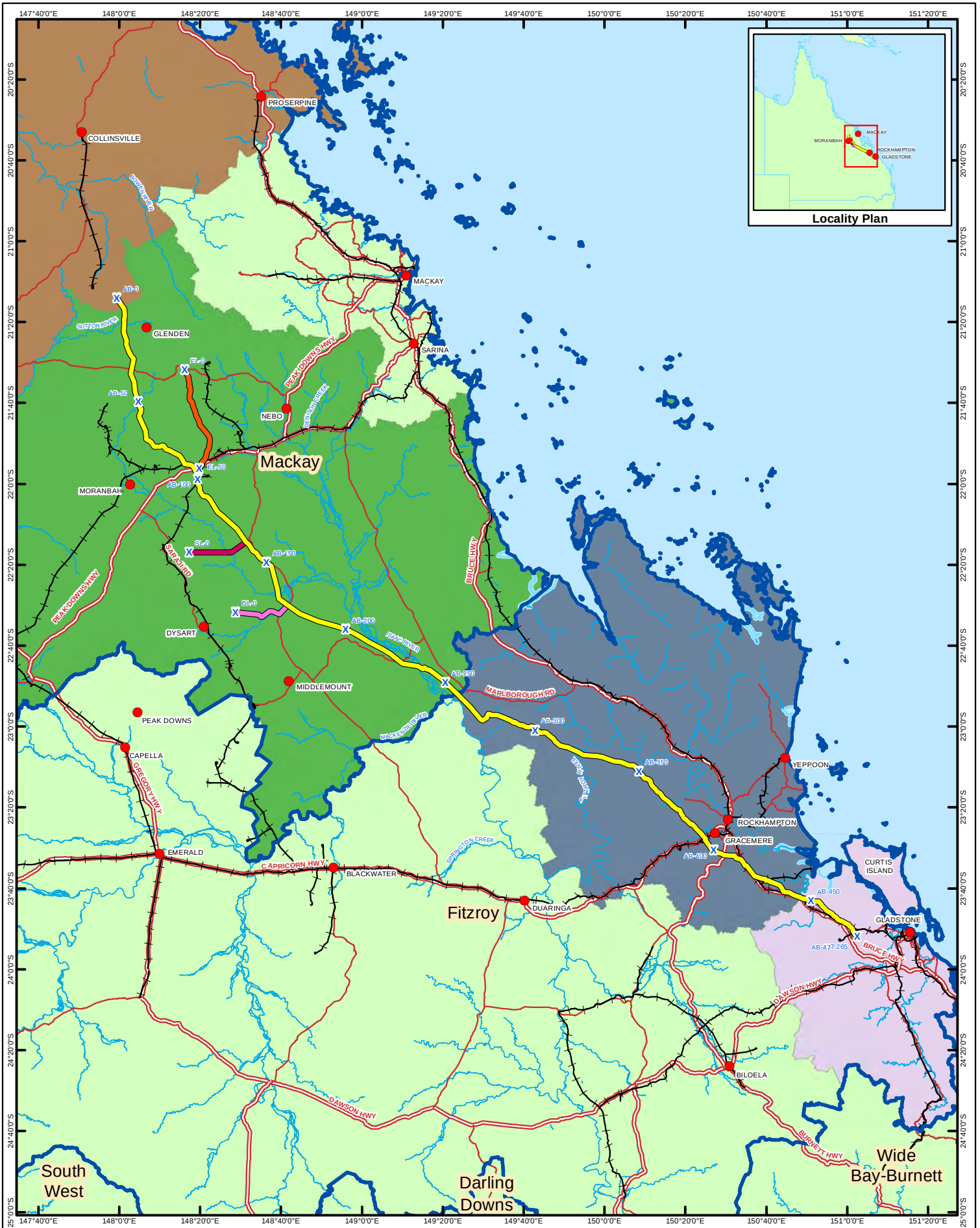


Figure 2 - 1: Project area

Legend

- Localities
- Kilometre Points
- AB Mainline Rev D
- Dysart Lateral Rev D
- Elphinstone Lateral Rev D
- Saraji Lateral Rev D
- Railways
- Highways
- Major Roads
- Major Watercourses
- Queensland Regions

LGA 2011

- GLADSTONE REGIONAL
- ISAAC REGIONAL
- ROCKHAMPTON REGIONAL
- WHITSUNDAY REGIONAL

Data Sources:
StreetPro: Localities, Roads, Railways
DERM: Major Watercourses, LGA
ABS Geography Section: Queensland Regions
Data Supplied by Arrow Energy:
ABP Mainline RevD,
ABP Lateral RevD
Kilometre Points

N

arrow energy go further

0 25 50
Kilometres

Scale: 1:2,250,000 @ A4
Coordinate System: GCS GDA 1994

Document: I:\ENVR\Projects\EN02962\Spatial\ArcGIS\V3\Figure_2_1_Project_Area_A4.mxd Date: 27/10/2011

NOT FOR CONSTRUCTION

2.2. Regional infrastructure and development

The project area currently includes 48 major infrastructure projects which have been designated as 'significant' by the Coordinator General (Department of Employment, Economic Development and Innovation, 2011). The infrastructure developments in the project area are expected to provide a significant contribution to regional and national output, income and employment (**Appendix A**). These developments will support the Gladstone and Mackay Ports and complement the overall economic vitality of the project area. It is therefore expected that the project will indirectly support ongoing port operations through cumulative benefits of line pipe imports for the project and LNG exports from the proposed Arrow LNG Plant on Curtis Island.

2.2.1. Port of Gladstone

As an important contributor to the regional economy, the Port of Gladstone is Queensland's largest commodity port and is home to the world's fourth largest coal export terminal (GPC, 2011).

The Port of Gladstone, which includes the Gladstone Marina and surrounding parklands as well as the Port Alma Shipping Terminal, is managed and operated by the Gladstone Port Corporation (GPC) and owned by the Queensland Government. It handles over 30 product types which are exported to more than 30 countries, and currently directly employs over 700 people. Major products types handled in the port include coal, alumina, aluminium and cement. The Port of Gladstone handles over 50 million tonnes of exported coal per annum. Approximately 61, 800 tonnes of line pipe will arrive at Port Alma.

2.2.2. Port of Mackay

The Port of Mackay is Queensland's fourth busiest multi-commodity port in terms of cargo throughput (Mackay Ports). Owned by the Queensland Government, the Port of Mackay is operated by the North Queensland Bulk Ports Corporation Limited. It comprises four berths, catering for the export of sugar and sugar products, molasses and grain and the import of petroleum, handling a total of 175 ships in 2010-11. The project intends to land approximately 131,000 tonnes of imported line pipe at the Port of Mackay.

2.3. Gross Regional Product

The Gross Regional Product (GRP) is the description of regional economic output and represents the total market value of goods and services produced within a region after subtracting costs of production – it is the regional equivalent of Gross Domestic Product (GDP) nationally and the Gross State Product (GSP) at State level.

The value of GSP for Queensland and the GRP for the project area between 2000-01 and 2005-06 is presented in **Table 2-1**. According to the Office of Economic and Statistical Research (OESR), Queensland recorded an average annual growth of 4.8 per cent over this period in real terms with Mackay and Fitzroy experiencing 5.5 percent and 3.2 percent growth respectively thereby contribute approximately 8.5 and 7.0 percent to the total GSP of Queensland respectively.

Table 2-1 Real Gross State and Regional Product ($m)

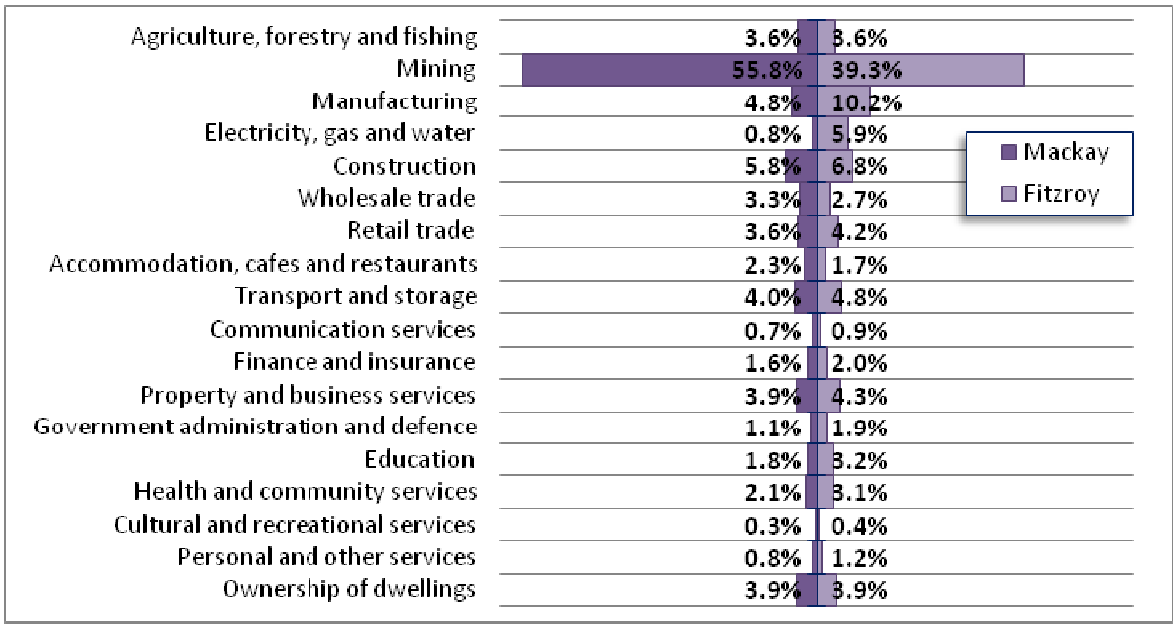
Region	2000–01 ($m)	2005–06 ($m)	Average annual growth
Fitzroy	12,041	14,126	3.2%
Mackay	10,468	13,698	5.5%
Queensland	**145,629**	**183,983**	**4.8%**
Rest of Australia	**674,929**	**783,471**	**3.0%**

Source: OESR, Experimental Estimates of Gross Regional Product

2.3.1. Industrial contribution

The industrial composition of GRP by Australian and New Zealand Standard Industrial Classification (ANZSIC) for the project area is presented in **Figure 2-2** and shows that the economies are heavily focused on mining (55.8 and 39.3 percent), while the cultural and recreational services (0.3 and 0.4 percent) are the smallest part of the economies of the project area. The mining industry has also become the largest part of the Queensland economy, comprising 10.6 percent of the economy during the same time period.

Growth in GRP over time again reflects the importance of the mining sector in the project area, with a 2.7 percent and 1.5 percent growth in the Mackay and Fitzroy region respectively. The construction industry has also experienced comparatively large growth. However, as shown in **Table 2-2**, the growth of other industries has been below one percent and in the Fitzroy region, agriculture and utilities have actually declined.



- **Figure 2-2 Industrial Composition of GRP, 2005-2006**

Source: OESR, Experimental Estimates of Gross Regional Product

- **Table 2-2 Contribution to Real GRP Growth, 2000-01 to 2005-06**

Industry	Mackay (%)	Fitzroy (%)	Queensland (%)
Agriculture, forestry and fishing	0.2	–0.3	0.0
Mining	**2.7**	**1.5**	**0.3**
Manufacturing	0.3	0.5	0.4
Electricity, gas and water	0.0	–0.3	0.0
Construction	**0.7**	**0.6**	**0.6**
Wholesale trade	0.2	0.0	0.2
Retail trade	0.2	0.2	0.4
Accommodation, cafes and restaurants	0.1	0.0	0.1
Transport and storage	0.2	0.2	0.3
Communication services	0.0	0.0	0.1
Finance and insurance	0.1	0.1	0.4
Property and business services	0.3	0.3	0.6
Government administration and defence	0.0	0.0	0.1
Education	0.0	0.0	0.1
Health and community services	0.1	0.1	0.3
Cultural and recreational services	0.0	0.0	0.1
Personal and other services	0.0	0.0	0.1
Ownership of dwellings	0.2	0.1	0.4

Source: OESR, Experimental Estimates of Gross Regional Product

2.4. Employment

The employment by industry for the project area shows that, while mining may be the driving total economic output, jobs are much more spread across industries as illustrated in **Figure 2-3.** The majority of mining employment is located in the Isaac Regional Council while the Rockhampton Regional Council has the larger overall employment and employment mix, signifying its importance as a regional economic centre.

The distribution of employment in the project area indicates a high degree of concentration of mining related employment. This reflects the fact that mining is the dominant employer in the Isaac Regional Council and accounts for 40 percent of the workforce with 49 coal mines, 25 mineral mines and 20 medium to large quarries (Isaac Regional Council, 2010).

Employment in the Rockhampton Regional Council is more distributed, representing the higher population concentrations and total service offerings, with retail trade comprising approximately 12 per cent. Manufacturing is the largest employing industry in the Gladstone Regional Council at nearly 20 per cent of total employment.

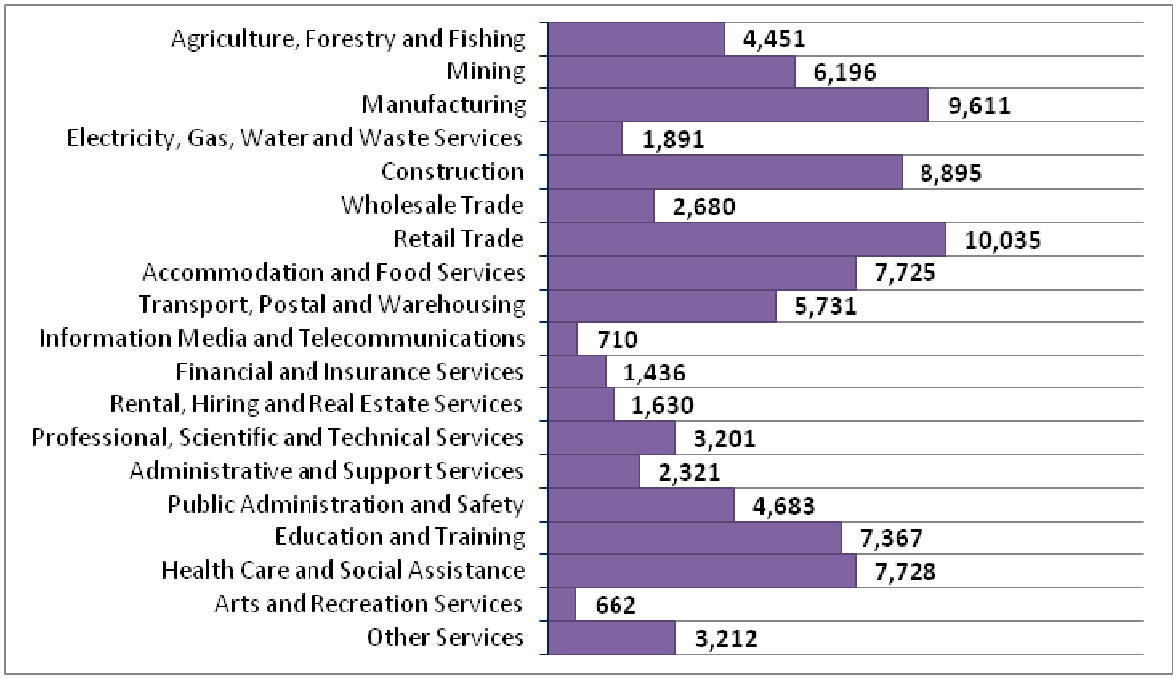


Figure 2-3 Project Area Employment by Industry, 2006

Source: ABS 2006 Census of Population and Housing

2.5. Occupation

The labour force occupations are presented in **Table 2-3** below. The workforce statistics show a high concentration of skilled labour, with technicians and trade workers making up a large proportion of employment in the project area along with machinery operations and drivers and labourers – especially in the Isaac Regional Council where industry in mining intensive.

Table 2-3 Occupations, Project Area

Occupation	Whitsunday	Isaac	Rockhampton	Gladstone
Managers	14.5%	12.9%	10.5%	9.9%
Professionals	10.1%	9.9%	15.1%	12.3%
Technicians & trades workers	16.7%	20.1%	17.1%	21.9%
Community & personal service workers	9.0%	4.6%	9.6%	7.0%
Clerical & administrative workers	10.4%	8.3%	14.4%	11.8%
Sales workers	9.5%	5.2%	10.0%	8.4%
Machinery operators & drivers	9.8%	24.9%	8.3%	13.1%
Labourers	18.1%	12.3%	13.3%	13.6%

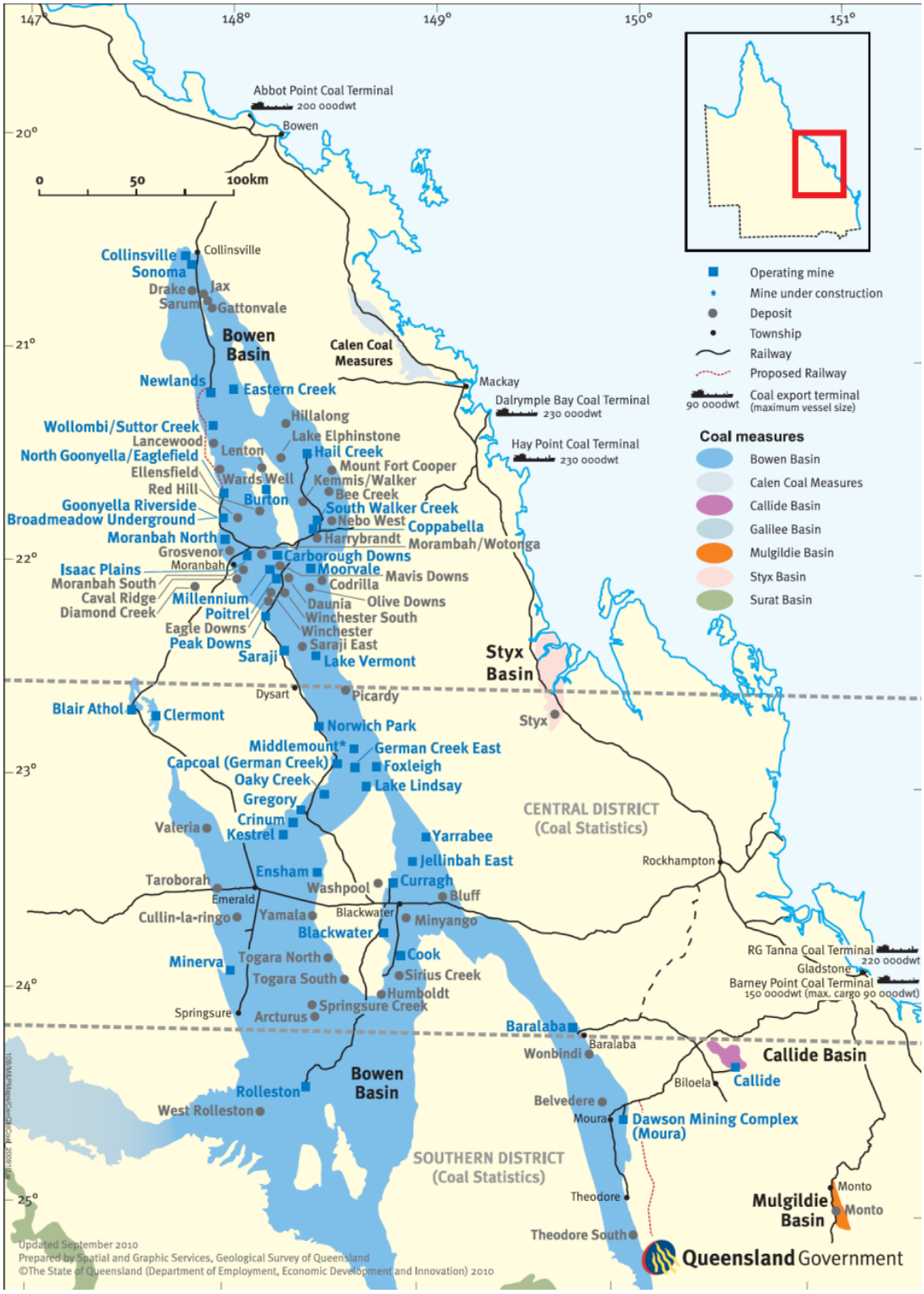
Source: ABS 2006 Census of Population and Housing

2.6. Industry significance

2.6.1. Mining

Queensland is the largest exporter of seaborne coal in the world, and has approximately 30 billion tonnes of identified resources of black coal. The project area supplies much of Queensland's high-grade coking coal and export –traded thermal coal, as well as hosting other significant resource reserves. Specifically, the project area provides over half of all coal produced and three quarters of the value of coal exports (Regional Economic Development Corporation, 2011). The extensive coal reserves within the project area provide the basis for a rapidly emerging CSG industry.

A map of Central Queensland's coal projects (including those within the Bowen Basin) is provided in **Figure 2-4**. This region includes the Isaac Regional Council and the Whitsunday Regional Council, as well as the Mackay Regional Council. In 2007, the contribution to GRP from the mining sector in the project area was estimated at approximately 61 per cent, compared to 37 per cent in 2005 (AECgroup, 2007). The unprecedented growth was attributed to an increase in global demand, but was considered unsustainable, with growth in the mining sector expected to ease within two to five years from 2007 (ABARE, 2007 cited in AECgroup 2007). However, the Regional Economic Development Corporation (2011) has since forecast that with global demand for commodities still high, the outlook for future growth in exploration, mining and mineral processing in the central region is positive, resulting in increased economic prospects for the project area and Queensland.



- **Figure 2-4 Central Queensland coal**

Source: Department of Employment, Economic Development and Innovation (2010)

2.6.2. Construction

The construction industry is another key generator of economic output within the project area. The industry is estimated to have contributed 5.1 per cent to GRP in 2001 and 5.8 per cent in 2006 in the Mackay region. This contribution represents an estimated output of $294 million in 2001 and $794 million in 2006. In the Fitzroy region, the construction industry is estimated to have contributed approximately $419 million and $961 million to GRP 2001 and 2006 respectively.

The construction industry is also a relatively significant contributor to employment in the project area. A summary of the construction industry's contribution to employment in the project area is provided in **Table 2-4**, showing that the construction industry contributes between the range of 6.4 per cent and 12.6 per cent to total employment in each of the regional councils comprising the project area.

Table 2-4 Construction industry - employment

Local Government Area/Region	Number of employed persons	Contribution to Total
Whitsunday Regional Council	1,461	10.1%
Isaac Regional Council	649	6.4%
Rockhampton Regional Council	3,778	8.6%
Gladstone Regional Council	3,007	12.6%
Queensland	164,936	9.0%
Australia	709,840	7.8%

Source: ABS 2006 Census of Population and Housing

2.6.3. Manufacturing

The manufacturing industry is the dominant industry in the Gladstone Regional Council and in 2005-06 manufacturing contributed approximately $504 million to output, making it the largest contributor to GRP in the Gladstone Regional Council. Large scale projects such as metal processing refineries account for much of the region's value of manufacturing sector output. Queensland Alumina Ltd, one of the world's largest Alumina refineries, is located in the Gladstone Regional Council.

The Mackay-Whitsunday-Isaac region also has an extensive manufacturing (and mining services) industry, with manufacturing in the region predominantly made up of heavy fabrication and mining-related maintenance. Manufacturing businesses in the region provide engineering services including machinery repair and maintenance and fabricated metal product manufacturing for the mining and agribusiness sectors (Mackay Whitsunday Regional Economic Development Corporation, 2011).

2.6.4. Coal Seam Gas and Liquefied Natural Gas

CSG is an important energy resource in Queensland and production meets a significant proportion of gas demand, with an increasing regional, national and global demand for cleaner, carbon-efficient energy.

Between the early 1990s and 2009-10, the number of local gas wells drilled annually increased from 10 to over 600. Exploration and development activity in the region has remained strong despite recent economic downturn. Production of gas is expected to supply an increasing proportion of Queensland and other eastern state markets, servicing consumer and industry energy requirements; demonstrating the importance of the industry to the National economy.

Further to this, while Australia's supply of crude oil is limited, the country is well endowed with natural gas resources. In 2007, the Queensland Government's Smart Energy Policy required that 15 per cent of all electricity sold in Queensland was to be sourced from gas-fired generation by 2010. Gas produced in the Bowen and Surat Basins represents more than 70 per cent of Queensland's gas production and Arrow Energy currently supplies the fuel used to generate over 17 per cent of Queensland's electricity needs through gas.

In the past four years, there has been an increasing awareness of the potential to use Queensland's gas resources to produce LNG for export to service global demand for cleaner energy resources (Department of Employment, Economic Development and Innovation, 2011). As part of the Arrow LNG Project, the pipeline will operate solely for transmission of 35 per cent of gas requirements to the proposed plant in Gladstone for conversion and export as LNG. The EIS currently being prepared for the proposed Arrow LNG Plant will be submitted for approval by the Queensland and Commonwealth Government in late 2011. If approved, the plant is expected to produce up to 16 million tonnes per annum (mtpa) of LNG. The first gas from the project is expected to be supplied to the LNG plant in Gladstone in 2017/2018. The remaining 65 per cent of gas is expected to be sourced from the Surat Basin via the Arrow Surat Pipeline (ASP) (formerly the Surat Gladstone Pipeline).

Together, the project, the ASP, the development of the Bowen Basin and Surat Basin gas fields and the proposed Arrow LNG Plant will play an important role in meeting world demand for cleaner energy resources.

The estimated economic impacts associated with historic and proposed gas pipeline projects, which may be used as a comparison to the impact assessment conducted for the project in **Section 3** are summarised in **Table 2-5** below.

- **Table 2-5 Comparison of Gas Pipeline Projects**

Project	Proponent	Contribution to Employment	Contribution to Output	Contribution to Household Income
North Queensland Gas Pipeline	GHD	▪ Workforce of 84 FTEs for construction (direct) ▪ 40 – 81 FTEs from flow on impacts during construction	N/A	N/A
Queensland Hunter Gas Pipeline	Hunter Gas Pipeline Pty Ltd	▪ Workforce of 600 during construction (direct impact) ▪ Workforce of 25 initial operation (direct impact)	Direct Impact: $900 million	N/A
Arrow Surat Pipeline (formerly Surat-Gladstone Pipeline)	Arrow CSG (Australia) Pty Ltd (formerly Shell CSG (Australia) Pty Ltd)	▪ Workforce of 450 during construction (direct impact) ▪ Workforce of 15 during operation (direct impact) ▪ 6,200 FTEs including flow on impacts during construction ▪ 33 FTEs including flow on impacts per year of operation	▪ Direct Impact: $564 million ▪ Production Induced Impact: $453 million ▪ Consumption Induced Impact: $353 million	N/A
Gladstone LNG Project (impacts refer to the construction and operation of the CSG pipeline)	Santos Limited and Petroliam Nasional Berhad (PETRONAS)	▪ Workforce of 1,000 – 1,500 during construction (direct impact) ▪ Workforce of 8 per year for operation (direct impact)	N/A	N/A
QCLNG Project ▪ **Gas field expansion** ▪ **Network of Gas pipelines** ▪ **LNG plant and export facility**	Queensland Gas Company Ltd, a wholly owned subsidiary of the BG Group	▪ 18,889 FTE employee years in Queensland during construction: 2010-2013 (including flow on impacts) ▪ 40,749 FTE employee years in Queensland during operation (including flow)	▪ Approximately $2.4 billion in value-added activity during construction ▪ Approximately $29.5 billion in value-added activity	$2.65 billion between 2010 and 2021 including flow on impacts
Australia Pacific LNG Project	Australia Pacific LNG (50:50 joint venture between Origin Energy and ConocoPhillips)	▪ Workforce of 805 for construction (direct impact) ▪ Workforce of 20 during operation (direct impact) ▪ 9,900 FTEs (including flow on impacts during construction	▪ $1.4 billion in value added during construction (including flow on impacts) ▪ $1.3 billion per year in GDP during operation	N/A

3. Strategic alignment

The project's alignment with a number of key government objectives, strategies and policies for the industries potentially affected are identified and assessed in **Table 3-1**, including:

- The Local Industry Policy – A fair go for local industry (The Local Industry Policy) (Queensland Government, 2008);
- The Rockhampton Regional Council Corporate Plan 2009 – 2013;
- The Gladstone Region Economic Development Strategy;
- The Whitsunday Regional Council Corporate Plan 2009 -2013;
- The Isaac Regional Council Corporate Plan 2009-2014; and
- The Mackay, Isaac and Whitsunday Regional Plan, 2011 (Draft).

The Local Industry Policy has been developed in line with a 'Queensland first' philosophy, with the aim of creating employment and sustainable economic growth. Section 4 of the policy outlines a number of initiatives regarding local industry participation. Private sector employers are encouraged to apply the principles outlined in the policy on a voluntary basis. An analysis of this policy in **Table 3-1** finds that the mitigation strategies developed in response to economic risks ensure the project's alignment with The Local Industry Policy. Further, where applicable, the project is generally aligned with other relevant government policies outlined above. As with The Local Industry Policy, mitigation strategies for economic risks are designed to adhere to Government planning and development policy through the project area. Where policies do not relate to economic analysis or the project in general, a rating of not applicable (N/A) has been assigned.

- **Table 3-1 Key government policies**

Key Initiative	Alignment with the Project
The Local Industry Policy – A fair go for local industry	
▪ Recognise that involving local industry in projects and capital asset acquisitions provides economic benefits to all parties and is crucial to the long-term development of a strategic manufacturing and service industry capability that underpins a strong and diversified Queensland economy.	▪ Partially
▪ Ensure that Queensland and Australian suppliers are given a full, fair and reasonable opportunity to tender and participate in all stages of projects and acquisitions subject to this policy	▪ Yes
▪ Use Australian standards and codes in the formulation of specifications, tenders and the letting of contracts (except where it is unreasonable to do so)	▪ Yes
▪ Seek to maximise the level of goods and services, including design services, from local companies where they are competitive with respect to cost, quality and timeliness	▪ Yes
▪ Seek to incorporate this policy into contracts entered into with third parties for the supply of goods and services	▪ Yes
Rockhampton Regional Council Corporate Plan 2009-2013	
▪ An engaged, safe and inclusive community	▪ N/A
▪ A prosperous and self sustaining region ▪ Effective infrastructure management ▪ To be regarded as a financially strong council ▪ Increased investment in the region, through the attraction of new and diverse industry and the creation of long term employment opportunities	▪ Yes
▪ Protect and enhance the region's environmental values ▪ Regional development that encourages and supports sustainable growth whilst protecting the environment for future generations ▪ Active development and support of sustainability initiatives that both benefit the Region and contribute to a wider global response to protecting our environment	▪ Partially
▪ Honest, transparent and accountable corporate governance in line with corporate values	▪ N/A
Gladstone Region Economic Development Strategy	
▪ Formalise a Gladstone & Region Economic Partnership to Co-ordinate regional economic development activities	▪ N/A
▪ Continue to facilitate Large Scale Industrial Development Projects and Maximise Economic Potential of Gladstone's State Development Area and Port Assets	▪ Yes
▪ Establish formal working relationship with Fitzroy and Central West RDA Committee	▪ N/A
▪ Publicise findings of the Gladstone Region Economic Development Strategy	▪ N/A
▪ Convene an annual Gladstone Region Economic Development Summit	▪ N/A
▪ Develop and implement a Gladstone Region Business Leadership Program	▪ N/A
▪ Establish operational framework and secure resources to develop the Gladstone Region's strategic economic capacity building infrastructure priorities	▪ N/A
▪ Design, formalise and coordinate regional branding, promotional products, and a communications strategy	▪ N/A
▪ Maintain and disseminate key economic performance indicators for the Gladstone region	▪ N/A
▪ Grow the Gladstone region's export capacity and facilitate export market development for the region's small to medium sized enterprises	▪ Yes.
▪ Establish, resource, implement and monitor a region-wide Agricultural Industry development plan	▪ N/A
▪ Prepare a whole of Gladstone Region Diversification and Revitalisation Strategy	▪ N/A
▪ Prepare local community vision and development plans	▪ N/A

Key Initiative	Alignment with the Project
▪ Progress the recommendations of Gladstone Region Industrial Land Strategy for General/Service Industry	▪ N/A
▪ Establish operational framework and secure resources to respond to the region's significant workforce and labour market challenges	▪ N/A
▪ Facilitate local industry skill development and supply chain opportunities	▪ Yes
▪ SME Support, promotion and acknowledgement of its economic contribution	▪ Yes
▪ Foster industry sector business clusters and networks	▪ Yes
▪ Facilitate training and develop infrastructure to expand local construction workforce	▪ Partially
Whitsunday Regional Council Corporate Plan 2009-2013: Tourism and Economic Development Strategies	
▪ To foster and support Economic, Tourism, Social and Cultural Development within the region	▪ Yes
▪ To collaboratively pursue funding opportunities	▪ N/A
▪ To enhance opportunities for the creation of tourism within the region	▪ No
▪ To be a key player in economic growth within the region	▪ Yes
▪ To continually maintain and improve Council's tourism and community infrastructure to the highest standard, including Airlie Beach Lagoon, Bowen Foreshore, Shute Harbour Transit Facility, Whitsunday Coast Airport and Proserpine Tourist Park	▪ N/A
▪ Isaac Regional Council Corporate Plan 2009-2014 "Our Natural Environment"	
▪ Creating vibrant public spaces, town entrances and streetscapes	▪ N/A
▪ Developing community and stakeholder partnerships	▪ Partially
▪ Managing the risks associated with natural disasters and other events	▪ N/A
▪ Improving the knowledge of public health standards and sustainable practices such as – mitigating impacts of industry, waste management, recycling and climate change.	▪ Yes
Isaac Regional Council Corporate Plan 2009-2014 "Our Economy"	
▪ Encourage balance to support sustainable economic futures	▪ Yes
▪ Encouraging people to work, rest and play in the region	▪ Partially
▪ Planning and advocating to improve key partnerships with governments, industry and business	▪ Partially
▪ Planning sustainable affordable housing to support population retention and growth	▪ No
Mackay, Isaac and Whitsunday Regional Plan, 2011 (Draft)	
▪ **Sustainability and Climate Change** – the region grows and changes in a sustainable manner, generating prosperity maintaining and enhancing quality of life, minimising the use of resources, providing high levels of environmental protection, reducing greenhouse gas emissions and increasing resilience to natural hazards, including the projected effects of climate change	▪ Partially
▪ **Natural environment and regional landscapes** – the regions natural environment is protected and enhanced to conserve its biodiversity and sustain the region's landscape values. The natural environment is buffered from incompatible development to preserve the region's scenic amenity, watercourses, wetlands and air quality.	▪ N/A
▪ **Natural resources** – the region's natural resources and primary production lands are protected, rehabilitated and managed sustainably to ensure ongoing use, benefits and enjoyment for current and future generations.	▪ Partially
▪ **Economic Development** – a diverse resilient and sustainable economy that supports and builds on existing economic strengths, provides opportunities for the establishment of new business and industry and supports diversification, continued growth and prosperity across the region over the long term.	▪ Yes

4. Economic impact assessment

This section assesses the economic impacts of the project on a regional, state and national level. The regional impacts are defined as impacts on the project area. The basis of the economic assessment is an input-output (IO) model of the national economy in Australia. An IO model is a representation of the economy that shows the technological links between the various sectors in the economy. It shows both the sales and purchase of intermediate and final goods and services within an economy, demonstrating inflows in the form of raw materials and outflows in the form of exports. The model includes households, ensuring that it captures not only the economic activity of various industry sectors, but also the household expenditure within the economy which provides additional flow on effects in the form of supporting industries, services and jobs.

4.1. Methodology

The model uses 2006-2007 IO tables from the Australian Bureau of Statistics (ABS) to develop a set of multipliers which assess and measure the economic gain of the project. They represent the most current and readily available data at the time of this report and are valid for providing a picture of the impact of the project on the project area and Australian economy as a whole.

The derived multipliers estimate the total impact on all industries in the Australian economy from changes in the demand for output in any one industry. Multipliers have been calculated for the Australian economy to estimate the aggregate national effect of the project.

4.1.1. Queensland and project area distribution of impacts

The distribution of impacts to the economy of the project area depends on where inputs, such as materials and labour, are sourced for the project. Given Queensland's diverse resource supply including an economy rich in petroleum and coal product manufacturing developments, as well as other significant industrial development, it is likely that a significant proportion of economic benefits would accrue to the economy of the project area, especially through the supply of construction, manufacturing and petroleum inputs.

Consumption induced effects are generally dependent on where beneficiaries of output or income benefits reside on a permanent basis, or would be likely to consume a significant proportion of income. Hence, when output increases in the project area, consumption is also likely to increase in the local economies to some extent. However, given the remote location of the project, the continual movement of construction along the path of the pipeline, and the fact that almost all of the construction based labour is likely to come from outside of the local area (workers will likely be sourced on a Fly In-Fly Out (FIFO) basis), a significant proportion of consumption induced output is likely to leak out of the project area into other areas in the wider economy.

Based on the lack of certainty surrounding expenditure in the economy of the project area, and where flow-on impacts would accrue, SKM has made the assumptions presented in **Table 4-1** based on input from the client, analysis of the project area economy and studies undertaken for similar projects in the area. Approximately 15 to 20 percent of materials and labour is predicted to come from the project area with the rest coming from greater Queensland and Australia (excluding imported materials and expenditures abroad such as the line pipe).

Table 4-1 Distribution of Project Expenditure

Region	Construction	Operation
Project Area	20.0%	15.0%
Total Queensland	45.0%	45.0%
Total Australia	100.0%	100.0%

4.1.2. Economic linkages

The link between industry and economy, employment and income, as well as households and spending can be analysed by examination of IO multipliers created by SKM based on the ABS IO tables. Using the 2007 data, the multipliers capture the direct, indirect and induced effects of economic stimulus in terms of income, output, and employment. SKM calculated the following multipliers shown in **Appendix B**:

- Output multipliers – the amount of output required from all industries to produce output to satisfy the demand for an extra dollar of output from an industry – this also includes the induced effects by spending of extra wages and salaries earned by households.
- Income multipliers – the additional wages, salaries and supplements earned from working to produce the extra output required.
- Employment multipliers – measurement of the additional employment, in number of persons employed, supported through production of additional output in the economy.

4.1.3. Multiplier interpretation

The total economic impact identified by use of IO multipliers includes the direct effect of the initial increase in demand, and the flow-on effects. The flow-on effects include production induced impacts which result from the linkages between industries in an economy. For example, services required for transport of pipeline materials would also rely on fuel inputs from other industries. Flow-on effects also include consumption induced effects, effects result from the recycling of cash flows in the economy, or households (consumers) spending their wages. A new employee operating a transmission pipeline for example, may rent housing from a local owner or shop at the local grocery store and in doing so drive additional local employment and spending.

4.1.4. Assumptions and limitations

Using an IO analysis to model the effects of an industry or stimulus to an economy requires a number of assumptions that must be made clear in order to properly interpret the outputs. In general, an IO model assumes:

- Constant prices – the prices here are 2007 prices. While it is likely that prices have inflated since the initial IO tables were created and that additional demand may cause a shortage of commodities and labour, which would cause prices to increase, the IO model assumes that regardless of the stimulus, the impact on prices is negligible.
- Fixed technology – similar to the price assumption, assuming fixed technology means that the inputs and outputs from a particular industry remain the same and that consumption preferences do not change. While this adjustment clearly happens in the long run, changes in technology and spending preferences usually occur over a multi-year period and are considered negligible in the short term.
- Fixed import shares – this assumes that local resources have not been exhausted, or new local production has not been established, if oil were to now to be refined locally instead of being imported for example.
- Unlimited supplies of all resources, including labour and capital – output is not constrained and if the project needed more construction workers or concrete, it is readily available in the local market or readily available for import.
- A fixed relationship between income and private consumption – again consumptions patterns do not change, even with increasing income.

As a result of these assumptions, the results from IO modelling involve a certain degree of uncertainty. Therefore, it is important to note that economic impacts are not a specific forecast but provide a relative impact in relation to the economy as a whole. Additional key assumptions that relate to specific impacts of the project include:

- Expenditure which is known to be imported is removed from the inclusion of direct effects and a direct allocation of imports is used, allowing for the assessment of potential impacts on the domestic economy only.
- Use of national multipliers does not account for potential leakage of flow-on effects between regions. As such, there is potential that the regional impacts generated from the IO analysis could be overestimated. However, these impacts would be expected to be distributed to other regions, and therefore the total impact on the national economy would be the same.

4.2. Economic impacts

The economic impacts of the project are presented in terms of direct, production induced and consumption induced effects for both the project area, and Queensland and Australia as a whole. The production and consumption induced effects are estimated as multiplied direct effects, or expenditures, as provided by the proponent for construction and operations. These expenditures have then been grouped into their associated ANZSIC and applied to the IO model.

Construction is projected to commence in 2016 and run through to the end of 2017 with operations beginning in 2017/2018 and decommissioning in 2059 after a projected 40-year operational life. The allocation of construction expenditure is shown in **Table 4-2**. While the total expenditure on construction is estimated at $1,207 million, only $808 million is expected to be sourced from Australia, while the rest will be spent on importing line pipe. The proponent expects that operation of the pipeline will cost approximately $2 million per annum which has been allocated solely to the ANZSIC Water, Pipeline and Other Transport industry, with a separate decommissioning expenditure of $690,000 occurring in 2059.

Table 4-2 Expenditure – Construction ($m)

Industry Allocation	Expenditure ($m)
Heavy and Civil Engineering Construction	412.0
Specialised and other Machinery and Equipment Manufacturing	219.0
Wholesale Trade	76.0
Road Transport	11.4
Non-Residential Building Construction	19.0
Electricity Transmission, Distribution, On Selling and Electricity Market Operation	15.2
Water Supply, Sewerage and Drainage Services	15.2
Waste Collection, Treatment and Disposal Services	15.2
Iron and Steel Manufacturing	25.0
Total	**808**

Source: Arrow Energy, SKM

4.2.1. Impact summary

The following section presents the results of the IO modelling across all stages of the project lifecycle. Benefits have been summarised by the project area, the total for Queensland, and the total for Australia.

The employment benefits in **Table 4-3** have been grouped by construction and annual operations and include direct employment from construction and operation, production induced employment from supporting industries and consumption induced employment impacts from consumer

spending. Construction period employment effects represent annual average FTE over the 15 months of construction, with approximately 35 percent of direct, indirect and induced employment being generated in the project area and nearly 63 percent of the almost 3,000 of the potentially supported annual direct and flow-on construction period employment coming from Queensland. Operational employment impacts are the annual average jobs created during the projected 40-year operational life of the pipeline with approximately 67 percent of employment coming from across Queensland.

- **Table 4-3 Project Employment Benefits***

Employment Impacts	Construction**	Operations	Total
Project Area	1041	7	1048
Total Queensland	1846	19	1865
Total Australia	**2952**	**28**	**2980**

Source: SKM
*Includes Direct, Indirect and Induced employment
**Average annual FTE employment during construction, 2016 through 2017

Income and output benefits shown in **Table 4-4** and **Table 4-5** respectively include all the construction and operational effects over the 40-year life of the project. The project is estimated to generate a total of $627 million in personal income across the nearly 3,000 jobs in Australia, with $128 million distributed to employment in the project area. The project itself is estimated to directly provide almost $35 million in personal income over the project life.

In total, the project will directly inject close to $891 million into the Australian economy and create a total impact across Australia of close to $2.9 billion. One-fifth of the total output impact is expected to accrue to the project area and nearly half is expected to be generated throughout Queensland with a direct expenditure of $174 million in the project area over the project life.

The majority of project benefits occur throughout the construction stage of the project, reflecting the magnitude of the capital investment and direct injection in the economy.

- **Table 4-4 Project Income Benefits ('000,000)**

Income Impacts	Direct	Production Induced	Consumption Induced	Total
Project Area	$34.6	$48.3	$45.8	$128.8
Total Queensland	$79.3	$110.6	$105.0	$294.8
Total Australia	**$148.2**	**$245.8**	**$233.2**	**$627.2**

Source: SKM

- **Table 4-5 Project Output Benefits ('000,000)**

Output Impacts	Direct	Production Induced	Consumption Induced	Total
Project Area	$173.9	$203.0	$225.9	$602.9
Total Queensland	$400.7	$465.3	$461.6	$1,327.6
Total Australia	**$890.6**	**$1,034.0**	**$973.0**	**$2,897.5**

Source: SKM

4.2.2. Industrial linkages

The heavy and civil engineering construction (HCEC) industry accounts for the majority of direct construction-related project expenditure and **Table 4-6** shows the main industries that provide material and support services, or direct inputs, into HCEC with the largest support coming from additional construction services. Likewise, **Table 4-6** also shows the industries that provide direct input to the water, pipeline and other transport industry during the annual operations. The industries in this table represent the industries in which first round effects impacts for employment, income and output are generated.

- **Table 4-6 Direct Input Requirements – First round effect**

Heavy and Civil Engineering and Construction	Water, Pipeline and Other Transport Industry
Construction Services	Transport Support Services and Storage Industry
Professional, Scientific and Technical Services	Petroleum and coal product manufacturing
Building, Cleaning, Pest, Administrative and Other Services	Professional, Scientific and Technical Service
Structural Metal Product Manufacturing	Finance
Wholesale Trade	Wholesale trade.

Other key support industries required to support the increase in final demand through industrial support effects include:

- Basic Non-Ferrous Metal Manufacturing;
- Non-residential property Operators and Real Estate Services;
- Professional, Scientific and Technical Services;
- Wholesale Trade; and
- Auxiliary, Finance and Insurance Service.

These industries and those outlined in **Table 4-6** comprise the industries impacted through production-induced effects. Additionally, a number of industries are required to support the consumption induced effects generated from additional consumer spending which is distributed across a variety of industries in different proportions. As the name implies, they typically benefit consumption industries such as retail trade, accommodation and food services and arts/cultural and recreation services.

5. Additional effects

In addition to the quantitative effects, several additional economic gains and losses can be addressed from a qualitative perspective to address the potential affect on other significant projects in the project area and address broader economic opportunities from a number of perspectives. These effects include the impact on prices, consumption, property values and unemployment at a project area level as outlined in **Table 5-1**.

Table 5-1 Other effects

Impact	Project Area Level
Wages and salaries	Given the timing of construction and high likelihood of a FIFO workforce, the impact on wages and salaries in the project area is expected to be minimal at a project level.
Other prices	The timing of project construction is likely to contribute to stable demand as opposed to a significant shock to the economy and there is not expected to be significant upward pressure on other factor prices.
Consumption	At a regional level, the impact is not expected to be significant and will depend on where specific impacts occur and the extent to which income earned by workers during construction is consumed in localities along the pipeline. Given that the workers will be housed in temporary workers accommodation camps which are isolated from the local communities, this impact is expected to be minimal at a local level.
Property values	During construction (including commissioning), temporary worker accommodation camps will be provided, with workers expected to be employed on a FIFO basis. Direct employment required for operation of the project is not significant. Therefore increase in demand for housing in the project area is limited and is not expected to have an impact on property values.
Unemployment	At a regional level, the project is not expected to impact heavily on unemployment, although any effect would likely reduce unemployment.

The cumulative impact of the project in relation to other development in the project area is expected to be negligible due to the highly specialised nature of the construction workforce, the relatively small scale of construction labour required when compared to other projects, the short time frame of construction, and the relatively small impact of the project after construction.

5.1. Contribution to energy markets

Energy supply is critical to the functioning of modern industrialised economies; with secure, high quality energy and low cost energy supply being fundamental to economic vitality. Australia has historically been a net exporter of energy sources including oil, coal, natural gas and uranium, and in energy self sufficiency terms, Australia is strong when compared with net energy importing countries.

By transmitting gas for LNG production at a proposed plant in Gladstone, the project will further enhance Australian self-sufficiency, production and security of energy supply. LNG provides a

relatively lower carbon intensive energy source, and a means for diversification of energy sources to aid in satisfying long term energy supply for the Australian economy in line with depleting crude oil resources. As such, should Australia's energy supplies diminish in the near future; the project will have the opportunity to support the continued viability of energy supply in the Australian domestic market if required.

5.2. Government revenue

The project is expected to increase Federal Government revenue through all stages of the project through increased tax receipts from household and private sector income, as well as through other Government regulatory receipts. In economic terms, tax revenue represents a transfer of benefits from household or private sectors to the public sector, and does not reflect a change in economic condition relative to the aggregate benefits estimated from the economic impact assessment of the project. The distribution of tax income is difficult to determine, given that a significant level of expenditure and income would be taxed at a Federal level, and allocated through the national budget. However, the benefits to the Local Government Authorities and Queensland Government will likely be significant.

5.3. Balance of payments

During construction, the project will have a small affect on the Australian Balance of Payments (BOP) account and exchange rates through imports of materials. Therefore the project may decrease the BOP account in the short term.

The extent to which the project is financed through offshore capital markets may increase this effect. However, the size of the project in terms of capital outlay is small relative to GDP, and therefore the impacts on the BOP account during, and as a result of, construction are expected to be negligible.

5.4. Economic impacts of hazards

Based on the information provided to date, it is unlikely that there are adverse economic impacts of any potential hazards identified within the project area.

5.5. Potential for local investment

Once commissioned and operating, the project may be on-sold to, and operated by, a third party. As such, the potential for direct equity investment by local businesses or the community is low. However, indirect ownership of the project through superannuation funds is likely for the wider community.

6. Benefit enhancement and risk mitigation

The highlights presented in **Table 6-1**, show expected economic benefits from the project including proposals to improve these benefits.

Some potential economic risks have also been identified through an assessment of project area impacts, as well as likely distribution of output, employment and household income benefits which may affect the magnitude of the economic benefits. These risks are generally low. As it is likely that the engineering, procurement, construction and management (EPCM) of the pipeline will be outsourced, the strategies to manage such potential risks lie outside the project scope.

As previously mentioned, the cumulative impacts will be minimal due to:

- A highly specialised construction workforce;
- A relatively small scale of construction labour required compared to other projects;
- The timing of construction and commissioning relative to other development;
- The overall short construction window;
- The continual movement of construction along the path of the pipeline; and
- The relatively small impact of the project after construction.

Table 6-1 Economic benefits and mitigation measures

Economic benefit	Impact	Likelihood	Realisation Strategy
Increased output in the project area	▪ Local economic growth/ increased contribution to GRP	Moderate	Provided that the net benefit of the project is not undermined, locally sourced inputs (labour and materials) will be examined to enhance the economic benefit to project area.
Increased output in Queensland	▪ Regional economic growth/increased Gross State Product	Moderate	Provided that the net benefit of the project is not undermined, Queensland sourced inputs will be examined to enhance the economic benefit to Queensland.
Increased output in the National economy	▪ Economic growth/ increase in Gross Domestic Product	Moderate	Provided that the net benefit of the project is not undermined, locally sourced inputs will be examined to enhance the economic benefits to the domestic economy.
Increased employment in the project area	▪ Reduction in regional unemployment rate ▪ Reduction in required unemployment benefits paid by the government	Moderate – given labour required is highly specialised, it is difficult to determine where workers can be sourced	Provided that the net benefit of the project is not undermined, labour and materials will be examined from the project area. Labour will be sourced locally where possible despite expectation of a FIFO arrangement.
Increased employment in Queensland	▪ Reduction in regional unemployment rate ▪ Reduction in unemployment benefits paid by the Government	Moderate – given labour required is highly specialised, it is difficult to determine where workers can be sourced	Provided that the net benefit of the project is not undermined, inputs from the Queensland economy will be examined to enhance the net benefit to the Queensland economy.
Increased employment in Australia	▪ Reduction in unemployment rate ▪ Reduction in unemployment benefits paid by the Government	High – it is likely that a significant majority of the workforce would be sourced domestically and a significant amount of materials are expected to be sourced domestically.	Provided that the net benefit of the project is not undermined, locally sourced inputs will be examined to enhance the economic benefits to the domestic economy.
Increased household income in the project area	▪ Potential increase in consumption ▪ Potential increase in savings ▪ Potential increase in investment	Low – the extent of the benefit depends on where inputs are sourced, and where consumption occurs	Provided that the net benefit of the project is not undermined, locally sourced inputs (labour and materials) will be examined to enhance the economic benefit to project area. Labour will be sourced locally where available despite expectation of a FIFO arrangement.
Increased household income in Queensland	▪ Potential increase in consumption ▪ Potential increase in savings ▪ Potential increase in investment	Moderate – the extent of the benefit depends on where inputs are sourced, and where consumption occurs	Provided that the net benefit of the project is not undermined, Queensland sourced inputs (labour and materials) will be examined to enhance the economic benefit to Queensland.
Increased household income in Australia	▪ Potential increase in consumption ▪ Potential increase in savings	High	Provided that the net benefit of the project is not undermined, locally sourced inputs will be examined to enhance the economic benefits to the domestic

Economic benefit	Impact	Likelihood	Realisation Strategy
	▪ Potential increase in investment		economy.
Increased LNG production (Cumulative)	▪ Energy self sufficiency ▪ and security of supply	High	CSG transmission to a proposed LNG plant in Gladstone

▪ Table 6-2 Project area economic risks

Economic Risk/Uncertainty	Impact	Likelihood
Unemployment following construction	Increased unemployment rate across project area	Low – given the FIFO nature of employment, there is low risk of an increase in the unemployment rate of the project area.
Employment is transferred from other businesses	Reduced impact on employment opportunities	Low – Given that construction of the project is highly specialised, employment is unlikely to transfer from other industries and given the timing of the project is more likely to support reduced employment opportunities from winding down of other projects.
BOP changes	Exchange rate fluctuations	Low – The project will import materials required for pipeline construction however this impact is expected to be negligible when considering the size of the project relative to GDP.

7. Conclusion

Economic impacts associated with the project have been assessed for all stages including, construction, operation and decommissioning. Overall, the project is estimated to contribute significant economic gains to the project area and the domestic economy, especially during construction, by generating an estimated total output impact of $2.9 billion, as well as supporting an estimated annual average of 2,952 FTE jobs during construction, 28 FTE jobs during operation, and contributing $627 million in household income over the life of the project. The project is aligned with local government policies and aspirations, supporting and strengthening the Australian economy.

Specifically, the project is expected to provide a number of economic benefits to the project area as well as Queensland and Australia including:

- Contribution to output;
- Contribution to household income;
- Contribution to employment; and
- An indirect contribution to energy self sufficiency and security of supply; and
- The continued prosperity of the Australian economy.

While some economic risks have been identified in the project area, they are generally low and cumulative impacts associated with significant projects in the project area are negligible.

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Appendix A Significant projects

- **Table 7-1 Significant Project Area Development**

Abbot Point Coal Terminal Stage 3	Gladstone Nickel
Alpha Coal	Gladstone Steel Making Facility
Arrow LNG	Guthalungra Aquaculture
Australia Pacific LNG	Great Keppel Island Resort
Balaclava Island Coal Export Terminal	Hook Island Wilderness Resort Redevelopment
Belvedere Coal	IsaLink High Voltage Direct Current Transmission
BMA Bowen Basin Coal- Goonyella Riverside Mine	Jilalan Rail Yard
BMA Bowen Basin Coal - Airport	Lower Fitzroy River Infrastructure
Bow Energy CSG and Gladstone Gas Pipeline	Moranbah Ammonium Nitrate
Bowen Basin Coal - Caval Ridge	Moranbah and Nebo Power Stations
Bowen Basin Coal - Daunia Mine	Moura Link-Aldoga Rail
Boyne Smelters Upgrade	Nathan Dam and Pipelines
Byerwan Coal	Northern Missing Rail Link
Calliope River Substation	Stuart Oils Shale, Stage 2
Carmichael Coal Mine and Rail	Port of Gladstone Western Basin
Central Queensland Gas Pipeline	Queensland Curtis LNG
Clermont Coal	Shute Harbour Marina
Coke and Power Plant	South Galilee Coal
Dent Island Golf Course and Residential Resort	Surat Basin Rail
Fisherman's Landing Port Expansion	Surat to Gladstone Pipeline
Galilee Power Station	Sun LNG- Fisherman's Landing
Galilee Coal (Northern Export Facility)	Water for Bowen Water Transport System
Gladstone-Fitzroy Water Pipeline	Wiggins Island Coal Terminal
Gladstone Liquefied Natural Gas	Yarwun 2 Alumina Refinery Expansion

Source: DEEDI, 2011

Appendix B Multipliers

	Output Multipliers			Income Multipliers			Employment Multipliers		
ANZSIC	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
0101	1.00	0.69	0.56	0.07	0.18	0.14	5.96	3.31	2.56
0102	1.00	0.64	0.56	0.09	0.16	0.14	3.89	2.91	2.59
0103	1.00	0.77	0.67	0.11	0.19	0.17	5.85	3.55	3.09
0201	1.00	0.43	0.75	0.21	0.13	0.19	2.59	2.08	3.46
0301	1.00	0.87	0.87	0.17	0.22	0.22	2.23	3.95	3.98
0401	1.00	0.44	0.57	0.13	0.13	0.14	2.43	2.15	2.61
0501	1.00	0.87	0.83	0.16	0.22	0.21	3.15	3.91	3.80
0601	1.00	0.61	0.63	0.11	0.17	0.16	1.05	2.43	2.88
0701	1.00	0.20	0.27	0.05	0.07	0.07	0.38	1.11	1.23
0801	1.00	0.48	0.42	0.05	0.14	0.10	0.71	2.02	1.92
0802	1.00	0.41	0.42	0.07	0.12	0.11	0.95	1.68	1.94
0901	1.00	0.97	0.95	0.18	0.25	0.24	2.81	4.24	4.39
1001	1.00	0.66	0.94	0.22	0.21	0.24	1.62	3.13	4.33
1101	1.00	1.21	0.82	0.14	0.23	0.21	2.31	6.59	3.78
1102	1.00	0.83	0.66	0.08	0.21	0.17	1.22	3.52	3.03
1103	1.00	1.15	0.74	0.09	0.24	0.19	1.32	5.71	3.41
1104	1.00	0.90	0.79	0.13	0.22	0.20	1.96	4.54	3.62
1105	1.00	0.96	0.61	0.07	0.21	0.15	1.48	4.05	2.80
1106	1.00	1.05	0.79	0.11	0.25	0.20	1.57	5.03	3.64
1107	1.00	0.91	1.09	0.28	0.22	0.27	7.59	4.05	5.02
1108	1.00	1.18	0.96	0.16	0.27	0.24	2.43	5.59	4.40
1109	1.00	1.06	0.87	0.14	0.26	0.22	1.51	4.87	4.01
1201	1.00	0.88	0.76	0.11	0.24	0.19	1.43	3.98	3.50
1202	1.00	0.87	0.63	0.06	0.23	0.16	0.83	4.15	2.92
1205	1.00	0.85	0.76	0.13	0.22	0.19	1.67	4.35	3.51
1301	1.00	0.63	0.95	0.28	0.15	0.24	1.40	3.29	4.38
1302	1.00	1.38	0.80	0.08	0.28	0.20	0.88	5.86	3.66
1303	1.00	0.72	0.85	0.20	0.19	0.21	4.82	3.61	3.90
1304	1.00	0.54	0.80	0.18	0.18	0.20	2.83	3.36	3.67
1305	1.00	0.55	0.96	0.25	0.19	0.24	9.66	3.49	4.43
1306	1.00	0.62	0.83	0.19	0.18	0.21	7.04	3.21	3.80
1401	1.00	0.92	0.90	0.17	0.24	0.23	3.24	3.89	4.13
1402	1.00	0.86	0.98	0.21	0.23	0.25	4.42	3.86	4.52

	Output Multipliers			Income Multipliers			Employment Multipliers		
ANZSIC	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
1501	1.00	0.86	0.82	0.16	0.22	0.21	5.44	3.44	3.79
1502	1.00	0.73	0.83	0.17	0.21	0.21	1.58	3.31	3.82
1601	1.00	0.53	0.94	0.26	0.17	0.24	5.36	2.69	4.31
1701	1.00	0.33	0.19	0.02	0.06	0.05	0.42	0.90	0.89
1801	1.00	0.68	0.71	0.10	0.22	0.18	2.13	3.29	3.24
1802	1.00	0.59	0.68	0.13	0.17	0.17	2.02	2.95	3.10
1803	1.00	0.87	0.75	0.12	0.22	0.19	0.55	3.35	3.46
1804	1.00	0.71	0.77	0.17	0.18	0.19	2.08	2.90	3.53
1901	1.00	0.70	0.83	0.19	0.19	0.21	2.73	2.77	3.83
1902	1.00	0.45	1.01	0.31	0.15	0.25	2.89	2.10	4.64
2001	1.00	0.59	0.83	0.22	0.16	0.21	3.61	2.47	3.79
2002	1.00	0.37	0.91	0.31	0.10	0.23	4.84	1.53	4.18
2003	1.00	1.09	0.83	0.11	0.27	0.21	0.96	4.13	3.83
2004	1.00	0.98	0.98	0.21	0.23	0.25	2.01	3.52	4.52
2005	1.00	0.76	0.92	0.23	0.19	0.23	3.54	2.89	4.22
2101	1.00	0.98	0.72	0.12	0.21	0.18	2.48	3.32	3.33
2102	1.00	0.86	0.39	0.04	0.13	0.10	0.72	1.91	1.79
2201	1.00	0.90	0.83	0.18	0.20	0.21	1.69	3.14	3.79
2202	1.00	0.90	0.89	0.19	0.22	0.22	1.82	3.47	4.10
2203	1.00	0.75	0.82	0.20	0.17	0.21	2.61	2.69	3.76
2204	1.00	0.71	0.94	0.25	0.17	0.23	6.11	2.82	4.30
2301	1.00	0.87	0.89	0.16	0.24	0.22	3.84	3.95	4.08
2302	1.00	0.53	0.80	0.21	0.15	0.20	1.16	2.37	3.66
2303	1.00	0.60	1.01	0.28	0.18	0.25	1.62	2.35	4.62
2304	1.00	0.48	0.72	0.20	0.13	0.18	1.03	1.90	3.32
2401	1.00	0.58	0.90	0.24	0.17	0.23	3.38	2.59	4.13
2403	1.00	0.82	0.78	0.17	0.19	0.20	2.86	2.88	3.57
2404	1.00	0.71	0.81	0.18	0.19	0.20	3.37	3.11	3.74
2405	1.00	0.69	0.87	0.21	0.18	0.22	3.69	2.95	4.00
2501	1.00	0.82	0.94	0.21	0.21	0.23	8.39	3.64	4.30
2502	1.00	0.73	0.89	0.22	0.19	0.22	4.30	3.10	4.09
2601	1.00	0.81	0.57	0.08	0.18	0.14	0.78	2.67	2.63
2605	1.00	0.70	0.79	0.18	0.18	0.20	1.96	2.81	3.64
2701	1.00	0.28	0.34	0.05	0.10	0.08	2.19	1.63	1.55
2801	1.00	0.60	0.75	0.16	0.18	0.19	2.55	2.82	3.45

	Output Multipliers			Income Multipliers			Employment Multipliers		
ANZSIC	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
2901	1.00	0.06	1.09	0.45	0.04	0.27	4.74	0.69	5.00
3001	1.00	1.13	0.82	0.06	0.31	0.21	1.98	5.41	3.78
3002	1.00	1.12	0.86	0.08	0.31	0.22	1.56	5.37	3.96
3101	1.00	1.11	0.98	0.14	0.30	0.25	0.99	5.32	4.51
3201	1.00	0.83	0.93	0.19	0.24	0.23	6.34	4.23	4.29
3301	1.00	0.69	0.99	0.25	0.20	0.25	3.19	3.11	4.57
3901	1.00	0.58	1.12	0.33	0.18	0.28	11.56	3.02	5.15
4401	1.00	0.62	0.97	0.25	0.19	0.24	8.29	3.12	4.48
4501	1.00	0.77	0.95	0.22	0.21	0.24	6.91	3.65	4.36
4601	1.00	0.56	0.82	0.21	0.16	0.21	4.90	2.73	3.77
4701	1.00	0.58	0.89	0.24	0.16	0.22	2.54	2.41	4.08
4801	1.00	0.66	0.68	0.13	0.18	0.17	2.75	2.66	3.14
4901	1.00	0.77	0.81	0.16	0.21	0.20	2.17	2.92	3.70
5101	1.00	0.51	0.93	0.27	0.16	0.23	7.09	2.58	4.29
5201	1.00	0.59	0.75	0.14	0.20	0.19	2.11	2.91	3.45
5401	1.00	0.48	0.78	0.18	0.17	0.20	2.85	2.72	3.59
5501	1.00	0.76	0.82	0.15	0.22	0.21	3.35	3.80	3.79
5601	1.00	0.72	0.78	0.15	0.21	0.19	2.36	3.58	3.57
5701	1.00	0.86	0.93	0.16	0.26	0.23	3.26	4.25	4.26
5801	1.00	0.64	0.71	0.13	0.20	0.18	2.46	3.19	3.26
6001	1.00	0.61	0.96	0.19	0.25	0.24	9.27	3.35	4.41
6201	1.00	0.30	0.80	0.18	0.18	0.20	2.23	1.25	3.69
6301	1.00	0.27	0.98	0.27	0.17	0.25	1.73	1.11	4.52
6401	1.00	0.29	1.40	0.47	0.17	0.35	1.70	1.34	6.45
6601	1.00	0.64	0.88	0.19	0.20	0.22	1.46	2.87	4.04
6701	1.00	0.21	0.20	0.00	0.09	0.05	0.00	1.14	0.91
6702	1.00	0.67	0.83	0.16	0.21	0.21	1.91	3.05	3.82
6901	1.00	0.74	1.13	0.27	0.25	0.28	3.82	3.69	5.19
7001	1.00	0.47	1.33	0.42	0.18	0.33	3.33	2.57	6.12
7201	1.00	0.61	1.29	0.39	0.20	0.32	4.44	3.01	5.93
7501	1.00	0.46	1.39	0.45	0.18	0.35	5.90	2.43	6.37
7601	1.00	0.53	0.88	0.24	0.16	0.22	4.68	2.60	4.05
7701	1.00	0.40	1.35	0.46	0.15	0.34	8.83	2.18	6.20
8001	1.00	0.19	1.50	0.59	0.09	0.38	9.07	1.40	6.88
8401	1.00	0.14	1.36	0.54	0.08	0.34	9.07	1.22	6.26

	Output Multipliers			Income Multipliers			Employment Multipliers		
ANZSIC	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced
8601	1.00	0.13	1.50	0.61	0.07	0.38	10.64	1.12	6.88
8901	1.00	0.55	0.93	0.23	0.19	0.23	6.70	3.01	4.30
9101	1.00	0.73	0.97	0.21	0.23	0.24	6.25	3.65	4.44
9201	1.00	0.75	0.96	0.21	0.22	0.24	3.03	3.63	4.40
9401	1.00	0.67	0.84	0.18	0.20	0.21	4.70	3.19	3.86
9402	1.00	0.66	0.93	0.22	0.20	0.23	4.25	3.06	4.28
9501	1.00	0.57	1.12	0.32	0.19	0.28	9.59	2.96	5.15
9502	1.00	0.33	1.29	0.46	0.13	0.32	6.19	1.94	5.93