Economic Impact Assessment for the China First Project EIS

Waratah Coal

FINAL REPORT

August, 2010

Economics, Planning & Development
Business Strategy & Finance
Community Research & Strategy
Design, Marketing & Advertising

Document Control

Job ID:	15112
Job Name:	Economic Impact Assessment for the China First Project EIS
Project Director:	Simon Smith
Project Manager:	Ashley Page
Company:	Waratah Coal
Job Contact:	Mark Imber
Document Name:	EIA China First Project Report FINAL REPORT.docx
Last Saved:	30/8/2010 1:43 PM

Version	Date	Reviewed PM	Approved PD
Draft Report v1.0	18th June 2010	AP	SS
Draft Report v2.0	26th July 2010	AP	SS
Report v3.0	28th July 2010	AP	SS
FINAL REPORT	30th August 2010	AP	SS

Glossary

Abbreviations

Abbreviation	Meaning
$2008 / 09	Monetary values given in 2008 / 09 Australian dollars
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ANZSCO	Australian and New Zealand Standard Classification of Occupations
ANZSIC	Australian and New Zealand Standard Industry Classifications
APSDA	Abbot Point State Development Area
AUD	Australian dollars
CGE	Computable General Equilibrium
CPI	Consumer Price Index
CSQ	Construction Skills Queensland
DEEDI	Queensland Government Department of Employment, Economic Development and Innovation
DEEWR	Australian Government Department of Education, Employment and Workplace Relations
DERM	Queensland Government Department of Environment and Resource Management
DET	Queensland Government Department of Employment and Training
DEWHA	Australian Government Department of the Environment, Water, Heritage and the Arts
DIDO	Drive in, drive out workers
DIP	Queensland Government Department of Infrastructure and Planning
EDR	Economic demonstrated resources
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPC	Exploration permit coal
FIFO	Fly in, fly out workers
FTE	Full time equivalent employment position
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GRP	Gross Regional Product
GSP	Gross State Product
ha	Hectare
kg	Kilogram
km	Kilometre
km^2	Square kilometres
LGA	Local Government Area
MISC	Mining Industry Skills Centre
Mtpa	Million tonnes per annum
OECD	Organisation for Economic Co-Operation and Development
OESR	Office of Economic and Statistical Research
PIFU	Planning Information and Forecasting Unit (DIP)
PJ	Petajoules
ROM	Run-of-Mine
SDPWO Act	*State Development and Public Works Organisation Act 1971* (Qld)
ToR	Terms of Reference
US$ or USD	United States dollars

Glossary of Terms

Term	Meaning
Abbot Point Catchment	Consists of the Whitsunday Regional Council and represents the local economy that is most likely to be directly impacted by development of port facilities for the export of coal as part of the China First Project.
Broader Service Area	Encompass the regional centres adjacent to the mine and export point sites from which workers and supplies will primarily be sourced, and is made up of the Isaac Regional Council, Mackay Regional Council and Rockhampton Regional Council.
Buffer	Area of vegetation providing protection from disturbance.
Building Price Index	An indicator of the variation in building costs over time including the costs of labour and building materials inputs.
Coal spot prices	The delivery price of coal being traded on a given day.
Computable General Equilibrium modelling	An economic modelling technique that estimates the net increase in demand generated by the project after taking into account resource constraints.
Consumer Price Index	The Consumer Price Index is an indicator that is constructed to measure changes over time in the general level of prices of consumer goods and services that households acquire, use or pay for consumption.
Direct economic impacts	Refers to impacts associated directly with an increase in expenditure within an economy.
Draw down on labour	Refers to a transfer of labour from one sector (sector a) of the economy to another (sector b) as a result of increased demand and wage improvements in sector b.
Economic demonstrated resources	Economic demonstrated resources (EDR) are resources with the highest levels of geological and economic certainty and include proved but probable (2P) commercial reserves.
EIS Study Area	The EIS Study Area (or the Study Area) refers to the region encompassing the Mine Catchment, Abbot Point Catchment and Broader Service Area and represents the region in which the project is located and expected to have the greatest direct impact.
Environmental impact statement (EIS)	The information document prepared by the proponent when undertaking an environmental impact assessment. It is prepared in accordance with terms of reference prepared or approved by government. EIS is the term used by the *Environment Protection and Biodiversity Conservation Act* 1999 and the *Environmental Protection Act* 1994, and it is defined in Part 4 of the *State Development and Public Works Organisation Act* 1971.
Exchange rate	Rate at which one currency may be converted into another.
Factor cost	The cost of all factors of production as paid by the producer (i.e., at basic prices), and does not include any taxes or subsidies on products.
Factor incomes	Comprises compensation of employees by, and operating surplus of, producers.
Factors of production	Represent the factors used during production activities that are not consumed during the process. Includes land, labour, capital and entrepreneurship
Flow-on / indirect economic impacts	Flow-on (or indirect) economic impacts refer to impacts throughout an economy induced by a direct increase in expenditure.
Full time equivalent employment position	Represents one employee working full time for a period of one year.
Good quality agricultural land	Land which is capable of sustainable use for agriculture, with a reasonable level of inputs, and without causing degradation of land or other natural resources. As defined in State Planning Policy 1 / 92: Development and the Conservation of Agricultural Land.
Gross Domestic / State / Regional Product	Represents the market value of all final goods and services produced within the Australian / State / regional economy during a given period of time.
Gross operating surplus	Represents the excess of gross output over the sum of intermediate consumption, compensation of employees and taxes less subsidies on production and imports.
Gross value added	Measurement of the contribution to the economy of each individual producer, industry or sector based on the net activity at each stage of production. Gross value added only measures the additional value added at each stage of production, and as such is considered a true measure of economic activity.
Indicators	Anything that is used to measure the condition of something of interest. Indicators are often used as variables in the modelling of changes in complex environmental systems.
Industry output	Measurement of the contribution to the economy of each producer, industry or sector based on the gross sales throughout the whole economy. As a gross measurement, industry output includes the purchases of goods and services consumed in the production process, and as such "double counts" the contribution of these goods and services.
Labour force	The labour supply available for the production of economic goods and services in a given period. Labour force is the most widely used measure of the economically active population.
Local Government Area	A geographical area under the responsibility of an incorporated local government Council

Term	Meaning
Mine Catchment	Consists of the Barcaldine and Central Highlands Regional Councils, and represents the local economies that are most likely to be directly impacted by mining activities undertaken during the China First Project.
Offsetting	Anything that balances, counteracts, or compensates for something else; providing compensation. For example carbon offsetting is the process of reducing greenhouse gas emissions by purchasing credits from others through emissions reductions projects, or carbon trading schemes.
Rail corridor	The 'corridor' of land in which the China First Project's rail line will intersect.
Real wage impact	Measurement of the change in wages and salaries as a result of a project over and above impacts on inflation.
Run-of-Mine	Coal as it comes from the mine prior to screening or any other treatment.
Saleable coal	Coal that has been screened and treated and is suitable for sale.
Skills shortage	An economic condition in which there are insufficient qualified candidates (employees) to fill available positions.
Skills transfer	Refers to the transference of skills from one employee to another.
Social impact assessment	A methodology to review the social effects of infrastructure projects and other developments.
Stakeholder	A person or organisation with an interest or stake in a project.
Steady state operations	Refers to a state in which operational activity does not change substantially over time.
Trade exposed	An industry or commodity that is exposed to international competition and prices.
Value chain / supply chain	Refers to the chain of interlinked value-adding processes and activities that convert inputs into outputs.

Executive Summary

Background of the Project

China First Pty Ltd has acquired the right to mine 1.4 billion tonnes of raw coal from tenements EPC 1040 and EPC 1079. It will see the development and construction of four 9 million tonnes per annum (Mtpa) underground long-wall coal mines, two 10 Mtpa open cut pits, two coal preparation plants each with a raw washing capacity of 28 Mtpa, as well as a world class railway facility, port and associated supporting infrastructure.

The annual Run-of-Mine (ROM) coal production will be 56 Mtpa to produce 40 Mtpa of saleable export product coal. At this scale of operation, the capital expense of constructing the required rail and port infrastructure is economically viable over the life of the project.

Processed coal will be transported by a new 447 km railway system from the Galilee Basin to the existing Port of Abbot Point. The railway component includes a state of the art, heavy haul, standard gauge railway to support 25,000 tonne train units. The final railway easement is expected to be approximately 60-80 m wide and will be confirmed at detailed design.

The Port of Abbot Point is undergoing an extensive expansion program to facilitate coal export to the growing world market. The China First Project will be integrated within the planned expansion strategies to further consolidate the operability of the Port of Abbot Point as a state of the art export facility. Waratah Coal proposes to develop a new coal terminal, estimated to cost approximately $2 billion and have capacity of 40 Mtpa, including a new stockyard and unloading facilities within the Abbot Point State Development Area (APSDA).

The auxiliary facilities for the project include the provision of new power supply infrastructure, water supply and wastewater treatment facilities, fire fighting and first aid infrastructure, machinery maintenance centre, accommodation and an airport. The construction period for the project is estimated to last 36 months.

On 28 November 2008, the China First Project was declared to be a 'significant project for which an Environmental Impact Statement (EIS) is required' under section 26 of *State Development and Public Works Organisation Act 1971* (SDPWO Act) by the Coordinator-General.

On 20 March 2009 the Australian Government Minister for the Environment, Heritage and the Arts determined that the project constitutes a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as it has potential for significant impact on matters of national environmental significance (MNES).

Following consultation between the Queensland Government Department of Infrastructure and Planning and the Commonwealth Department of the Environment, Water, Heritage and the Arts, it was agreed that the environmental impact assessments under the SDPWO Act and EPBC Act be conducted in parallel, based on one terms of reference and one EIS study and report that would satisfy the requirements of both jurisdictions.

Purpose of this Report

This report is developed as a background technical document for use in preparing the EIS. The report quantifies the expected beneficial and adverse economic impacts of the China First Project on the local, regional, State and national economies, as appropriate.

The report also recommends mitigation and enhancement strategies as well as monitoring regimes to ensure regional economic values are enhanced or, at least, maintained if the China First Project proceeds.

Methodology Overview

The following methodology was applied in assessing the economic impacts of the China First Project:

- A review of the existing economic environment of the regional and Queensland economies expected to be directly impacted by the China First Project, based on available data and information sources;
- Modelling of the economic impacts of the China First Project using Computable General Equilibrium (CGE) modelling techniques. CGE modelling estimates the net increase in demand generated by the project after taking into account resource constraints. An example would be the necessity to pay higher wages to attract workers from other businesses or regions in a tight labour market. By taking into account resource constraints CGE modelling is considered to provide a more realistic assessment of the impacts of a project of the scope and scale of the China First Project on the regional and State economies given the currently constrained labour market in the region and more broadly throughout Queensland;
- An assessment of the economic impacts of the China First Project against the specific Terms of Reference for the EIS, using results of the CGE modelling, input from the literature review and existing environment, findings from stakeholder consultation and the skills and experience of AEC*group*; and
- Development of strategies to avoid, reduce or mitigate the identified negative economic impacts and enhance the positive impacts of the China First Project, including strategies for local participation.

Project Overview and Description

Construction of the mine, railway and port facilities (coal stockyard and transfer infrastructure) is estimated to take approximately three years to complete, indicatively requiring approximately $8.8 billion in capital investment. Direct employment for construction activities is estimated to average approximately:

- 2,500 employees for construction of the mine over a three year period;
- 1,000 employees for construction of the rail infrastructure over a three year period; and
- 2,500 employees for construction of the port facilities over an 18 month period.

First coal exports are targeted for July 2013, with full export capacity of 40 Mtpa expected to be reached in 2015 / 16, generating an estimated $4.6 billion in export revenues per annum[1]. Direct employment during operation is estimated to be approximately:

- 1,500 employees for operation of the mine;
- 60 employees for operation / maintenance of the rail infrastructure; and
- 150 employees for operation of the port facilities.

In addition to the mine, rail line and port facilities, a range of utilities infrastructure will be developed by third parties to support the China First Project, including a new 275 kV transmission line from the Lilyvale substation to the mine (to be owned by Powerlink), fibre optic telecommunications infrastructure and, potentially, a new water pipeline from Moranbah to the Galilee Basin (currently being investigated by SunWater).

Waratah Coal also propose to invest in developing local road infrastructure as well as developing a new airstrip, or upgrading the Alpha airstrip, for the transportation of fly-in, fly-out (FIFO) workers to the mine site.

Existing Economic Environment

EIS Study Area

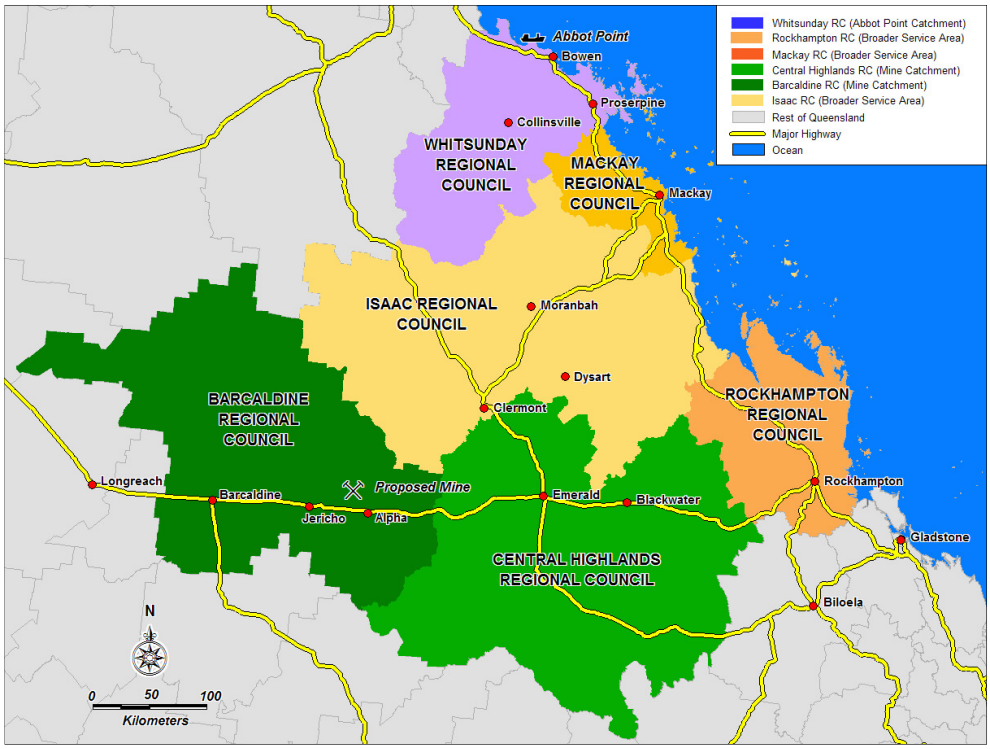
Three catchments have been used to establish and analyse the existing economic environment of the project and surrounding regions, the Mine Catchment, Abbot Point

[1] Export revenues are based on Waratah Coal's assumed coal price of approximately US$92 per tonne on average over the life of the mine, which is in line with coal spot prices in early 2010 (Australian Bureau of Agricultural and Resource Economics, 2010), and an exchange rate of approximately 0.8AUD / USD on average.

Catchment and Broader Service Area. Combined, these three catchments represent the Study Area for examining the regional economic impacts of the China First Project (refer to Figure ES.1).

The Mine Catchment consists of the Barcaldine and Central Highlands Regional Councils, while the Abbot Point Catchment consists of the Whitsunday Regional Council. The Broader Service Area catchment has been developed to encompass the regional centres adjacent to the mine and export point sites from which workers and supplies will be sourced, and is made up of the Isaac Regional Council, Mackay Regional Council and Rockhampton Regional Council.

Figure ES.1. Map of the China First Project Study Area and Catchments



Source: Australian Bureau of Statistics (2003).

A brief summary of the main economic characteristics of each catchment is presented below.

Economic Characteristics of the Catchment Areas

The Mine, Abbot Point and Broader Service Area catchments for this project each have very different economic structures. Population growth across the three catchments has historically been close to that of Queensland, but is expected to either match or exceed Queensland's growth rate over the next twenty years.

The mining sector is a major influence across the three catchments, but is particularly dominant in the mine catchment, where it provided almost two thirds of Gross Regional Product (GRP) in 2008 / 09.

Unemployment in the mine catchment is almost a third the level of Abbot Point and half that of the Broader Service Area – illustrating the strength of the mining sector throughout the region and its strong performance since the global economic downturn following the collapse of major US financial institutions in 2008.

All three catchments have higher proportions of technicians and machinery operators than the State, but have fewer clerical workers.

Key economic values of the China First Project's Study Area include:

- **High reliance on the mining and resources sector**: The significance of the mining industry to the Mine Catchment area is highlighted by one in five workers being employed in the sector. Projects such as the China First Project will act to maintain the industry's prominence and provide long-term employment opportunities for the region's existing mining workforce;
- **Trade exposure**: Because of the dependence on coal and coal seam gas in the region, fluctuations in global resource markets can potentially have grave impacts on the region, with little support from other industries to soften a downturn in the resources sector;
- **High proportion of FIFO / DIDO workers in regional centres**: Mining operations in the Mine Catchment area utilise a high proportion of FIFO / DIDO workers from other regions, particularly major centres such as Emerald, Mackay and Rockhampton, affecting the Mine Catchment area's ability to retain workers, incomes and associated population and household-based services (e.g., retail, community and recreational services). Population growth over the next twenty years in the Mine Catchment is expected to exceed the Queensland figure, but the region is not expected to witness the increases of some of the newer mining areas in Queensland as a high proportion of labour is expected to continue to be sourced from major population centres in FIFO / DIDO arrangements;
- **Internationally recognised tourism product**: In the Abbot Point Catchment, the juxtaposition of tourism in the internationally recognised Whitsundays and industrial exports from Bowen will require careful management, as both these have distinct needs and requirements. Satisfying the desires of both interests requires the careful management of the region's natural and human resources; and
- **Competition for labour**: The Broader Service Area economy is more diverse than that of the Mine Catchment and Abbot Point Catchment, but still has a highly dominant mining sector. Throughout the region, the higher wages paid by the mining sector has drawn labour from other sectors, particularly agriculture, which the Broader Service Area has historically been heavily involved with.

Additional detail on the existing economic base of the catchment areas is provided below.

Mine Catchment

Table ES.1 shows that the Mine Catchment's Gross Regional Product (GRP) was estimated at $5 billion in 2008 / 09, and experienced growth of 4.1% from the previous year, around half that of Queensland (8.6%). Almost two thirds of GRP (63.4%) in the region is produced by the mining sector and the sector accounts for a quarter of employment. The region has a participation rate far higher than the other catchments (81.8%), with an unemployment rate of 2.8% almost 3% lower than the other catchments. Despite the high level of employment in the mining sector, wages for mining workers living in the

Mine Catchment are lower than the other catchments as are average wages across all industries.

The property market in the Mine catchment showed strong growth across the house, land and unit markets over the year to December 2009.

Table ES.1. Summary Economic Indicators for the Mine Catchment

Indicator	Value
Population	
2009	33,779
2031	50,307
Avg Ann Growth 2009 to 2031	1.8%
Gross State Regional Product	
2008 / 09 ($M)	$4,996.4
2005 / 06 ($M)	$4,407.1
% Avg Annual Growth 2005 / 06 to 2008 / 09	4.1%
Labour Market	
Employed Persons (Dec 2009)	19,738
Unemployment Rate (Dec 2009)	2.8%
Change 2008 to 2009 [(a)]	0.8ppt

Note: ppt = percentage point change.
Source: Australian Bureau of Statistics (2010a), Queensland Treasury (2010), Queensland Treasury (2008), AEC*group*.

Abbot Point Catchment

The Abbot Point Catchment's economy is heavily dependent on the mining sector, with mining contributing 22.3% of the region's $2.3 billion GRP. The construction sector is the biggest employer in the Abbot Point Catchment, with over 9% of the region's workers involved in construction. Transport, postal and warehousing is also a major industry, contributing over 11% of GRP. Average wages for mining workers in the region are higher than the Queensland average, however across all sectors average wages for workers in the region are on average less than Queensland.

House prices rose by almost 4% in the year to December 2009 in the Abbot Point Catchment, however, land and unit prices dropped by 6.1% and 4.3% respectively over the same period. Key economic indicators are summarised in Table ES.2.

Table ES.2. Summary Economic Indicators for the Abbot Point Catchment

Indicator	Value
Population	
2009	34,195
2031	48,041
Avg Ann Growth 2009 to 2031	1.6%
Gross State Regional Product	
2008 / 09 ($M)	$2,287.3
2005 / 06 ($M)	$1,879.2
% Avg Annual Growth 2005 / 06 to 2008 / 09	6.8%
Labour Market	
Employed Persons (Dec 2009)	17,670
Unemployment Rate (Dec 2009)	6.8%
Change 2008 to 2009 [(a)]	1.9ppt

Note: ppt = percentage point change.
Source: Australian Bureau of Statistics (2010a), Queensland Treasury (2010), Queensland Treasury (2008), AEC*group*.

Broader Service Area

Mining makes up 34.6% of the region's estimated $18 billion GRP, with the transport, postal and warehousing sector the next largest contributor at 8.5% ($1.5 billion). While employment in these two sectors is proportionally higher than Queensland's figures for

these sectors, the employment proportions across other industries is close to State figures generally. Average wages for workers in the mining, construction and manufacturing industries are higher than the Queensland average – indicating strong demand for workers in these industries throughout the region.

The property market in the Broader Service Area is variable with house prices recording a marginal decrease (-0.8%) over the year to December 2009, vacant land prices increasing strongly (6.6%) and unit prices recording a marginal increase of 0.8% over the same period. Key economic indicators are summarised in Table ES.3.

Table ES.3. Summary Economic Indicators for the Broader Service Area

Indicator	Value
Population	
2009	252,265
2031	360,829
Avg Ann Growth 2009 to 2031	1.6%
Gross State Regional Product	
2008 / 09 ($M)	$18,222.7
2005 / 06 ($M)	$15,068.2
% Avg Annual Growth 2005 / 06 to 2008 / 09	6.5%
Labour Market	
Employed Persons (Dec 2009)	164,604
Unemployment Rate (Dec 2009)	4.7%
Change 2008 to 2009 [(a)]	1.1ppt

Note: ppt = percentage point change.
Source: Australian Bureau of Statistics (2010a), Queensland Treasury (2010), Queensland Treasury (2008), AEC*group*.

Economic Impact Assessment

Key Findings

Analysis and modelling prepared in this report identifies the China First Project will generate significant positive economic, employment and income impacts at the regional and State levels. Key impacts of the China First Project include:

- An increase in export revenues of $4.6 billion per annum through the export of 40 Mtpa of high quality thermal coal, representing an increase in Australian thermal coal export revenues of approximately 25.7% and an increase in total Australian exports of 2.0% from 2008 / 09 levels. The increase in export revenues may provide support for the strength of the Australian dollar;
- An increase in industry output in Queensland of $231.9 million per annum on average during the three year construction period, including an increase in output of $614.5 million per annum on average in the Study Area reflecting a draw of resources from elsewhere in Queensland;
- A $5.2 billion per annum on average boost to industry output in the Queensland economy over the first five years of operation, increasing to an average of $5.7 billion per annum on average thereafter to 2036 / 37. The majority of this increase in output will be captured by the Mine Catchment;
- Support and development for local business and industry, through securing local contracts for the supply of goods and services for the project where possible and through other flow-on activities and increased household consumption. Key industries supported by the China First Project include mining, transport and storage, construction and property and business services. A large proportion of goods and services are also anticipated to be sourced from elsewhere in the State, in particular from southeast Queensland;
- Increased competition for inputs such as land, labour and capital will result in resources moving to regions and industries that generate the greatest returns. As a result, output from the manufacturing and agricultural industries is estimated to

decrease, largely due to increased competition for skilled labour. Agriculture in the Study Area will also be adversely impacted by:

  - The acquisition of up to 55,000 hectares of land primarily used for grazing within the Mine Catchment for construction and operation of the mine; and
  - Disruption of property management practices for those properties intersected by the rail corridor, including potential impacts on land accessibility for land holders and livestock with restricted crossing between land parcels, additional costs for mustering, weed control and general property management (e.g., additional fuel usage, fencing, etc.), and the potential for 'land locking' of some land parcels (i.e., isolating or stranding some areas of land and thereby decreasing their commercial attractiveness and utilisation);

- An increase in employment in Queensland of 2,975 Full Time Equivalent (FTE) employees per annum on average during the three year construction period, including a draw of labour to the Study Area from elsewhere in Queensland and Australia. During the first five years of operation (2013 / 14 to 2017 / 18) the China First Project is estimated to support an additional 4,464 FTE employment positions per annum on average in Queensland, and approximately 3,954 FTE employment positions per annum on average thereafter;
- Capacity building and skills development in the local labour force through apprenticeships, traineeships and skills training, as well as ongoing skills transfer between imported and local labour and the permanent migration of some skilled labour;
- A decrease in unemployment and the unemployment rate as a result of jobs created by the China First Project, in particular in the project's Study Area;
- An increase in household incomes of:
  - Approximately $156.2 million per annum on average in the Study Area between 2010 / 11 and 2012 / 13, and approximately $164.0 million per annum on average between 2013 / 14 and 2036 / 37; and
  - Approximately $452.7 million per annum on average between 2010 / 11 in Queensland and 2012 / 13 and $776.1 million per annum on average between 2013 / 14 and 2036 / 37;
- Upward pressure on labour prices due to the increase in demand for skilled labour, particularly in industries experiencing skills shortages, further increasing household incomes. This increase is expected to be over and above any increases in the cost of living, representing an increase in real wages;
- A likely increase in residential property prices as a result of additional demand generated by contractors and flow-on employees migrating to the region. This is anticipated to be felt primarily in the major regional centres of Emerald, Bowen, Mackay, Proserpine and Rockhampton, as well as the local townships of Alpha, Jericho, Barcaldine and Clermont;
- An increase in:
  - Queensland Government revenues of approximately $364.9 million, primarily in the form of approximately $343 million per annum in royalty payments; and
  - Australian Government revenues of approximately $709.8 million, primarily through avenues such as company tax (approximately $302.9 million), personal income tax (approximately $237.8 million) and goods and services tax (approximately $158.3 million).

  These increased government revenues will provide opportunities for government to fund additional infrastructure and enhanced service provision at a range of levels;
- Development of rail and port infrastructure, as well as local road infrastructure, an airstrip and utilities infrastructure to support the project (e.g., power, water and telecommunications). This will provide benefits to the entire Study Area by providing a link between the abundant resources in the Galilee Basin and export infrastructure, assisting in commercialising these resources. This infrastructure will also improve

regional business capacity and competitiveness, and will provide positive legacy benefits for the region.

Additional detail of the economic impacts of the China First Project is provided in the sub-sections below.

Impacts on Industry

Impacts of the China First Project on industry output within the Study Area and Queensland across three stages – the initial three-year construction period, the first five years of operation and steady-state operations from 2018 / 19 to 2036 / 37 – are outlined in Table ES.4. The table indicates:

- The Queensland economy is estimated to receive a benefit of an additional $231.9 million per annum on average in industry output above what would be achieved without the project during the three year construction period between 2010 / 11 and 2012 / 13;
- Within the China First Project's Study Area, construction activity is estimated to result in an increase above the base (without project) scenario in industry output between 2010 / 11 and 2012 / 13 of:
  - Approximately $205.4 million per annum on average in the Mine Catchment;
  - Approximately $235.4 million per annum on average in the Abbot Point Catchment; and
  - Approximately $173.7 million per annum on average in the Broader Service Area;
- The extraction and export of 40 Mtpa of coal is estimated to provide a $5.2 billion per annum on average boost to industry output in the Queensland economy over the first five years of operation, increasing to an average of $5.7 billion per annum on average thereafter to 2036 / 37;
- The vast majority of industry output benefits in Queensland during operation will be generated by extraction of coal resources in the Mine Catchment, with this regional economy estimated to record an increase in industry output of approximately $5.0 billion per annum on average above the baseline (without project) scenario during the first five years of operation, and approximately $5.2 billion thereafter; and
- The Abbot Point Catchment is estimated to record an increase in industry output above what would be achieved without the China First Project of approximately $279.6 million during the first five years of operation, and $274.5 million thereafter. In the Broader Service Area, the provision of support services for the project is estimated to result in an additional $599.6 million in industry output per annum on average, increasing to $603.0 million in the longer term.

Table ES.4. Average Annual Impact on Total Industry Output Within the Study Area and in Queensland, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Industry Output		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Output (%)			
Mine Catchment	2.1%	43.4%	30.7%
Abbot Point Catchment	5.1%	5.3%	3.6%
Broader Service Area	0.5%	1.5%	1.1%
Queensland	0.0%	0.8%	0.7%
Change in Industry Output ($M)			
Mine Catchment	$205.4	$4,955.0	$5,161.8
Abbot Point Catchment	$235.4	$279.6	$274.5
Broader Service Area	$173.7	$599.6	$603.0
Queensland	$231.9	$5,221.5	$5,728.3

Source: Prime Research (unpublished).

In terms of impacts by industry, the China First Project is estimated to have the following impacts on industry output in Queensland (refer to Table ES.5):

- An increase in activity within the construction sector during the initial three year construction period, averaging approximately $568.6 million above what the sector would otherwise produce if the China First Project does not proceed;
- Business, finance and insurance services, trade and ownership of dwelling are also anticipated to record an increase in activity during the three years of construction, driven by a combination of increased demand for these services to supply the project as well as through additional household incomes and spending in the State;
- During operation (2013 / 14 to 2036 / 37), an increase in Queensland's mining sector output (above what would be achieved without the project) of approximately $4.5 billion per annum on average during the first five years of operation and approximately $4.8 billion per annum on average thereafter;
- An increase in demand for a range of goods and services in Queensland, both in terms of support sectors supplying mining operations (e.g., transport and storage, business, finance and insurance services) as well as a range of services to support the workforce and Queensland population, primarily as a result of flow-on industry activity, additional household incomes and expenditure, and Queensland Government revenues;
- A reallocation of some constrained resources, in particular labour, resulting in a potential overall "draw-down" on some sectors (e.g., agriculture, public administration, defence, health and education, recreation and other services), particularly during the early stages of the project, during which the Queensland economy is adjusting to changes in its economic structure; and
- A considerable decline in manufacturing industry output during operation. It is expected that the mining-related manufacturing sub-sector will benefit from the China First Project through demand for and provision of goods and services to support the project once operational. However, offsetting this it is anticipated the manufacturing sector will be one of the hardest hit sectors in terms of the reallocation and draw of labour to the China First Project given the relatively similar skills sets employed. Further, the export of $4.6 billion per annum of coal will place upward pressure on Australia's exchange rate, and may impact on the global competitiveness of manufacturing goods produced in Australia (although this impact, if any, is likely to be small). As a result, overall manufacturing output is estimated to decline in Queensland relative to what would be achieved if the project does not proceed.

Table ES.5. Average Annual Impact on Industry Output in Queensland, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Industry Output ($M)		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Agriculture	-$42.0	-$38.0	-$15.2
Mining	-$247.2	$4,506.8	$4,807.1
Manufacturing	-$209.3	-$1,249.4	-$1,050.8
Electricity and water	-$38.1	-$19.9	$23.7
Construction	$568.6	$92.5	-$82.7
Trade	$82.8	$331.2	$348.4
Transport and storage	-$64.0	$837.7	$890.6
Business, finance and insurance services	$176.1	$176.6	$155.4
Public administration, defence, health and education	-$7.7	$233.3	$231.1
Recreation and other services	-$3.6	$47.3	$58.1
Ownership of dwellings	$16.2	$303.4	$362.7
Total Change in Industry Output ($M)	**$231.9**	**$5,221.5**	**$5,728.3**

Source: Prime Research (unpublished).

Within the Study Area, the China First Project is assessed to have the following additional key impacts on industry and local business:

- An increase in construction industry activity during the three year construction phase in all three catchments – the Mine Catchment, Abbot Point Catchment and Broader Service Area – above what would be achieved without the China First Project;

- An increase in mining activity in the Mine Catchment of approximately $4.8 billion per annum on average above the baseline over the first five years of operation, and approximately $5.1 billion per annum on average between 2018 / 19 and 2036 / 37;
- During operation, the transport and storage sector in the Abbot Point Catchment is estimated to record an increase of approximately $265 million to $280 million per annum on average between 2013 / 14 and 2036 / 37, primarily though coal export activities at Abbot Point;
- The development of a local value chain and mining industry support network in each of the three catchment areas, in particular in the regional hubs of Emerald, Barcaldine and Mackay, as well as a range of services to support the workforce and people migrating to the region. This will benefit not only the China First Project but also potential future mining sector projects in the region;
- Potential for the new rail infrastructure to assist in easing bottlenecks in the existing rail and port infrastructure network;
- As with Queensland, some sectors are expected to record a decline in activity as a result of a reallocation of constrained resources (e.g., agriculture, public administration, defence, health and education, recreation and other services), particularly during the early stages of the project;
- Agriculture in the Study Area will also be adversely impacted by:
    - The acquisition of up to 55,000 hectares of land primarily used for grazing within the Mine Catchment for construction and operation of the mine; and
    - Disruption of property management practices for those properties intersected by the rail corridor, including potential impacts on land accessibility for land holders and livestock with restricted crossing between land parcels, additional costs for mustering, weed control and general property management (e.g., additional fuel usage, fencing, etc.), and the potential for 'land locking' of some land parcels (i.e., isolating or stranding some areas of land and thereby decreasing their commercial attractiveness and utilisation).

Impacts on Employment

Employment Generation

Impacts of the China First Project on employment within the Study Area and Queensland are outlined in Table ES.6. In interpreting the employment estimates presented, it should be recognised that a large proportion of the China First Project's construction and mining workforces are anticipated to operate on a FIFO basis, with many of these workers having a permanent residence in major service centres such as Brisbane, Mackay, Rockhampton or Emerald. The table outlines:

- In consideration of an anticipated reallocation of labour resources between sectors, the China First Project is estimated to support, on average, an additional 2,975 Full Time Equivalent (FTE) employment positions per annum above what would otherwise be achieved in Queensland during construction (between 2010 / 11 and 2012 / 13);
- Within the Study Area, the increase in employment is anticipated to be strongest in the Mine Catchment (1,975 FTEs per annum on average) and Abbot Point Catchment (1,260 FTEs per annum on average) during the three years of construction. This is representative of the high level of construction employment directly generated by the China First Project in these catchments;
- During the first five years of operation (2013 / 14 to 2017 / 18) the China First Project is estimated to support an additional 4,464 FTE employment positions per annum on average in Queensland above the base (without project) scenario, and approximately 3,954 FTE employment positions per annum on average thereafter;
- Within the Study Area, the Mine Catchment is estimated to record the most significant impacts on employment during operation, with an estimated additional 1,928 FTE employment positions per annum on average during the first five years of operation and 1,252 FTE employment positions per annum on average thereafter;

- The Abbot Point Catchment, which is where the operational employment for the port facilities and rail line will be located, is estimated to record an additional 224 FTE employment positions per annum above what would be achieved without the China First Project between 2013 / 14 and 2017 / 18, and 124 FTE employment positions per annum on average thereafter; and
- Employment in the Broader Service Area is estimated to increase by approximately 669 FTE employment positions per annum on average above the base (without project) scenario during the first five years of operation, and approximately 451 FTE employment positions per annum on average thereafter.

Table ES.6. Average Annual Impact on Employment Within the Study Area and in Queensland, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Employment		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Employment (%)			
Mine Catchment	9.4%	8.5%	4.1%
Abbot Point Catchment	7.5%	1.2%	0.5%
Broader Service Area	0.6%	0.5%	0.3%
Queensland	0.1%	0.2%	0.1%
Change in Employment (FTEs)			
Mine Catchment	1,975	1,928	1,252
Abbot Point Catchment	1,260	224	124
Broader Service Area	723	669	451
Queensland	2,975	4,464	3,954

Note: Employment estimates presented in the table above are based on place of work, not place of usual residence.
Source: Prime Research (unpublished).

Impacts of the China First Project on Queensland's employment by industry are outlined in Table ES.7. The table shows that industries that are estimated to record an increase in demand and output (as identified in Table ES.5) are also expected to record an increase in employment to meet additional production requirements, while industries that are estimated to record a decline in output can be attributed at least partially to a draw of labour resources from these industries.

Of note, the China First Project will support a considerable number of employment positions in the trade sector and the public administration, defence, health and education sector in Queensland. This can be largely attributed to the considerable additional government revenues generated by the China First Project, supporting employment in government funded services, as well as additional household incomes and expenditure on goods and services.

Table ES.7. Average Annual Impact on Employment by Industry in Queensland, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Employment (FTEs)		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Agriculture	-126	-192	-120
Mining	-258	772	788
Manufacturing	-188	-2,215	-1,666
Electricity and water	-97	-70	20
Construction	2,564	575	-65
Trade	504	1,961	1,763
Transport and storage	-47	662	643
Business, finance and insurance services	617	718	607
Public administration, defence, health and education	5	1,964	1,698
Recreation and other services	3	254	255
Ownership of dwellings	0	35	32
Total Change in Employment (FTEs)	**2,975**	**4,464**	**3,954**

Note: Employment estimates presented in the table above are based on place of work, not place of usual residence.
Source: Prime Research (unpublished).

Within the Study Area, the China First Project is assessed to have the following additional key impacts on employment:

- During the construction phase, the increase in employment in the Mine Catchment and Abbot Point Catchment will be primarily driven by additional jobs in the construction industry (1,874 FTE employment positions per annum on average in the Mine Catchment and 1,040 FTE employment positions in the Abbot Point Catchment);
- In the Broader Service Area, the China First Project is estimated to support additional employment in not only the construction industry, but also key supply sectors to the construction industry such as manufacturing, trade and business, finance and insurance services;
- Once operational, the majority of additional employment positions supported in the Mine Catchment will be in the mining industry (1,102 FTE employment positions per annum on average between 2013 / 14 and 2017 / 18, and 1,098 FTE employment positions per annum on average thereafter), although an overlap in construction activity during the first year of operation will support construction employment during the initial operational period. Key support sectors such as manufacturing, trade, business, finance and insurance services and transport and storage are also estimated to benefit;
- The transport and storage sector will record the majority of additional employment generated by the China First Project in the Abbot Point Catchment during operation (142 FTE employment positions per annum on average between 2013 / 14 and 2017 / 18, and 131 FTE employment positions per annum on average thereafter);
- The Broader Service Area, as the service centre to the China First Project, is estimated to record a relatively diverse impact on employment as a result of the project, with most sectors in the region estimated to experience an increase in employment above what would otherwise be achieved without the China First Project;
- The draw of labour to the mining and transport and storage sectors during operation, as well as their key support sectors, is estimated to result in some other sectors recording a decline in employment compared to what would be achieved without the China First Project (e.g., agriculture in all three catchments, as well as manufacturing and mining in the Abbot Point Catchment and Broader Service Area); and
- Manufacturing employment in the Broader Service Area is also estimated to be adversely impacted by the China First Project's influence in terms of strengthening Australia's exchange rate and subsequent impacts on trade exposed industries.

Skills Requirements

Employment by occupation requirements during the three year construction period within the Study Area are presented in Table ES.8, and indicate that technicians and trades workers, labourers, and clerical and administrative workers will be in the highest demand over the period, in particular in the Mine Catchment and Abbot Point Catchment.

Table ES.8. Average Annual Impact on Employment by Occupation Grouping Within the Study Area, Deviation from the Baseline (Without Project) Scenario, 2010 / 11 – 2012 / 13

Occupation Group	Change in Employment		
	Mine Catchment	Abbot Point Catchment	Broader Service Area
2010 / 11 – 2012 / 13			
Managers	6.3%	3.3%	0.4%
Professionals	2.3%	3.7%	0.4%
Technicians and trades workers	21.7%	21.0%	1.3%
Community and personal service workers	0.8%	1.4%	0.1%
Clerical and administrative workers	8.4%	8.0%	0.7%
Sales workers	4.3%	3.8%	0.8%
Machinery operators and drivers	3.7%	6.6%	0.4%
Labourers	18.5%	7.3%	0.7%

Source: Prime Research (unpublished).

During operation, labour demand is estimated to remain high compared to the baseline scenario in the Mine Catchment, in particular during the first five years of operation (refer to Table ES.9). By comparison, no occupational groupings in the Abbot Point Catchment or Broader Service Area are estimated to record an increase in employment demand of more than 2.2% above what would otherwise occur without the China First Project throughout the operational period.

Table ES.9. Average Annual Impact on Employment by Occupation Grouping Within the Study Area, Deviation from the Baseline (Without Project) Scenario, 2013 / 14 – 2036 / 37

Occupation Group	Change in Employment		
	Mine Catchment	Abbot Point Catchment	Broader Service Area
2013 / 14 – 2017 / 18			
Managers	4.4%	0.6%	0.3%
Professionals	4.9%	0.8%	0.5%
Technicians and trades workers	13.9%	1.8%	0.7%
Community and personal service workers	1.0%	2.0%	0.4%
Clerical and administrative workers	6.1%	1.8%	0.8%
Sales workers	2.2%	0.9%	0.8%
Machinery operators and drivers	12.5%	2.2%	0.6%
Labourers	8.6%	0.7%	0.4%
2018 / 19 – 2036 / 37			
Managers	1.8%	0.3%	0.2%
Professionals	3.0%	0.4%	0.3%
Technicians and trades workers	5.1%	0.2%	0.2%
Community and personal service workers	0.6%	1.4%	0.2%
Clerical and administrative workers	2.6%	0.9%	0.4%
Sales workers	0.6%	0.4%	0.4%
Machinery operators and drivers	8.0%	1.2%	0.3%
Labourers	2.1%	0.2%	0.2%

Source: Prime Research (unpublished).

Key occupations that will be in highest demand during the construction and operation periods are outlined in Table ES.10.

Table ES.10. Key Occupations During Construction and Operation

Key Occupations During Construction	Key Occupations During Operation
• Construction managers • Engineering professionals • Building and engineering technicians • Fabrication engineering trade workers • Bricklayers, carpenters and joiners • Floor finishers and painting trades workers • Glaziers, plasterers and tilers • Plumbers • Electricians • Electronics and telecommunications workers • Wood trades workers • Accounting clerks and bookkeepers • Machine operators • Mobile plant operators • Construction and mining labourers	• Distribution and production managers • Engineering professionals • Natural and physical science professionals • Building and engineering technicians • Fabrication engineering trades workers • Mechanical engineering trades workers • Electricians • Contract, program and project administrators • Logistics clerks • Machine operators • Stationary plant operators • Mobile plant operators • Rail operators • Truck drivers • Construction and mining labourers

Skills Development and Attraction

Waratah Coal will seek to utilise local labour to the extent possible and practical during both construction and operation of the China First Project. However, during construction and operation Waratah Coal will utilise a primarily fly-in fly-out (FIFO) workforce, as it is anticipated that local labour will be insufficient to meet project requirements due to:

- Existing constraints in terms of labour availability in the project's Study Area and the nature of the China First Project, which will require some specialist skills for both the construction and operation of the project that are currently in short supply in the region; and
- Anticipated competition for labour resources from other major infrastructure, resource and industry projects expected to be developed throughout Central Queensland over the next five years.

In the longer term, the China First Project will present an attractive employment opportunity to the local labour force given the higher salaries on offer in the mining industry compared to other sectors of the economy. To assist local job seekers obtain the required skills, Waratah Coal will instigate policies and practices that will assist in developing the skills base of the region to support mining activities and improve local participation over time.

Additionally, while Waratah Coal will initially utilise a predominantly FIFO workforce, past experience in the Bowen Basin suggests the regional hubs of Emerald and Barcaldine, and potentially Clermont, will likely experience some permanent migration of mining contractors and support services workers using these centres as a base to provide services to the Galilee and Bowen Basins. Contractors and support service workers may also look to locate in Alpha if additional infrastructure and housing is developed to support an influx in population.

This will provide a positive long-term benefit to the regional economy in terms of a permanent increase in the skills base from not only those workers migrating to the region, but also through additional opportunities for ongoing skills transfer from people migrating to the region to existing residents.

Unemployment

The China First Project will provide job opportunities for people currently unemployed through the following avenues:

- Through the generation of job opportunities directly related to developing and operating the China First Project;
- Through flow-on job generation to support the project; or

- Through the creation of job openings to replace workers attracted to the China First Project from other sectors.

While not all of the positions generated by the China First Project will be filled by an unemployed person – a large proportion will also likely be filled by people re-entering the workforce or migrating to Queensland from elsewhere in Australia or overseas – it is anticipated that unemployment will decline as a result of jobs created by the China First Project.

Impacts on unemployment in Queensland are anticipated to be highest in the Mine Catchment and Abbot Point Catchment where construction and operational activity will primarily be centred, as well as in Southeast Queensland where many of the FIFO workers and a range of services are anticipated to locate.

Migration of Workers

A high proportion of construction and mining workers for the China First Project are expected to be engaged on FIFO arrangements, with permanent residences outside the Study Area. Table ES.11 presents employment estimates as outlined by CGE modelling results based on where those jobs will be located and the permanent residence of workers, to outline the anticipated level of local labour content compared to FIFO workers. The table shows that the vast majority of workers in the Mine Catchment are anticipated to be FIFO workers during both construction and operation. Similarly, during construction the Abbot Point Catchment is anticipated to source the majority of its workers from outside the region during construction, although during operation the FIFO component is expected to be less than the local labour component. By comparison the Broader Service Area is anticipated to have a much lower requirement for FIFO workers.

Table ES.11. Estimates of Employment Generation by Place of Work and Place of Usual Residence

Region	Place of Work	Place of Usual Residence	Net FIFO Component
2010 / 11 to 2012 / 13			
Mine Catchment	1,975	300	1,675
Abbot Point Catchment	1,260	302	959
Broader Service Area	723	538	184
Rest of Queensland	-983	1,836	-2,818
2013 / 14 to 2017 / 18			
Mine Catchment	1,928	386	1,543
Abbot Point Catchment	224	125	100
Broader Service Area	669	608	60
Rest of Queensland	1,643	3,346	-1,702
2018 / 19 to 2036 / 37			
Mine Catchment	1,252	287	964
Abbot Point Catchment	124	102	22
Broader Service Area	451	451	0
Rest of Queensland	2,128	3,114	-986

Source: Prime Research (unpublished).

Impacts to Factor Incomes

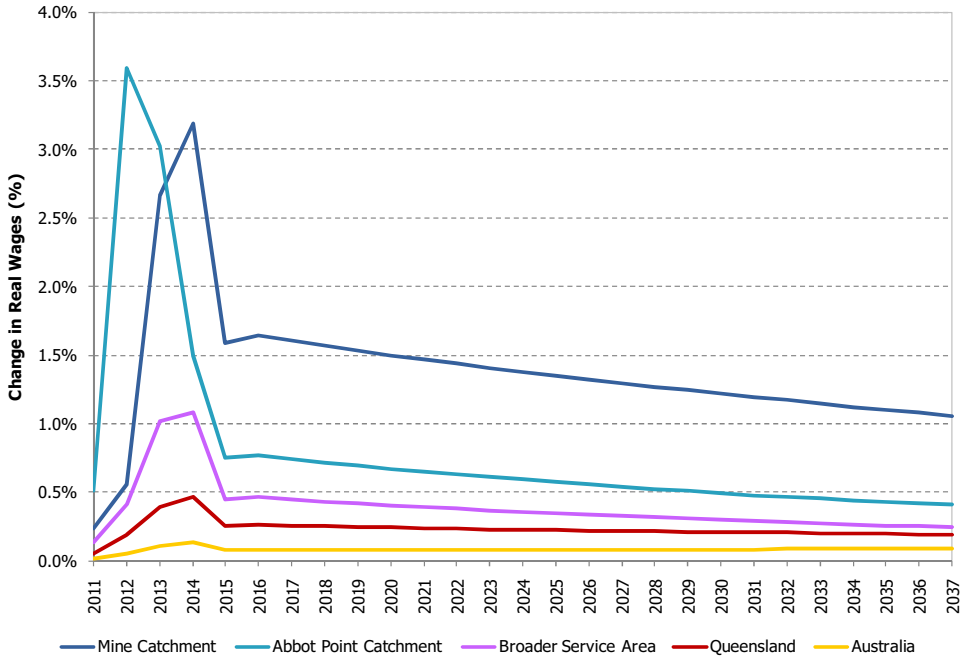
Compensation of Employees

Demand for labour by the China First Project will likely place upward pressure on wage rates throughout the regional, State and national economy as labour is attracted to the mining sector and other industries are forced to increase wages and salaries paid in order to retain and attract workers.

Modelling results presented in Figure ES.2 indicate that the China First Project could contribute to an increase in real wages of approximately 0.1% per annum on average in Australia and 0.2% per annum on average in Queensland between 2010 / 11 and

2036 / 37. Impacts on real wages are expected to be more acute in the Study Area, especially during the construction phase where labour demand is highest.

Figure ES.2. Annual Percent Change in Real Wages Resulting from the China First Project, 2010 / 11 to 2036 / 37



Source: Prime Research (unpublished).

This increase in the average real wage is over and above any increases in the cost of living, and therefore represents a real increase in household incomes in the Study Area, Queensland and Australia.

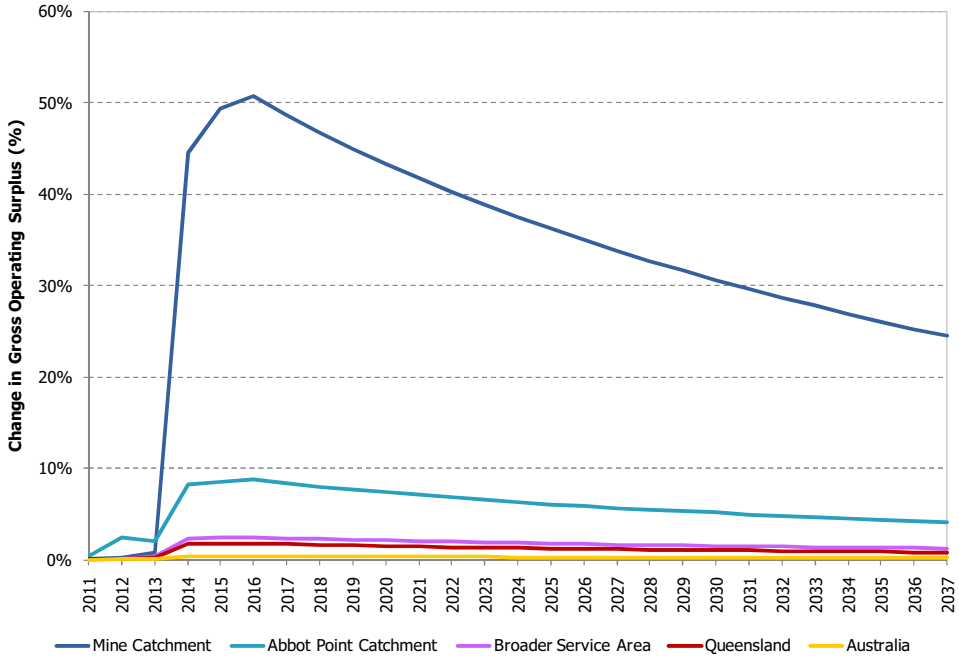
Gross Operating Surplus

The China First Project will:

- Generate additional confidence in Australian capital markets, encouraging increased capital injection into the Australian economy, in particular in the construction and mining industries and their value chain;
- Provide a potential benefit in relation to access and cost of finance for capital investment. The development of a 40 Mtpa coal mine with a stable contract in place for the supply of coal may lead to increased business confidence and improve access to (and reducing the cost of obtaining) finance throughout the region;
- Generate additional expenditure by industry and households which will benefit businesses through additional turnover and business profits; and
- Increase demand for industrial and commercial land, with an associated increase in values and rents for this land.

Modelling results presented in Figure ES.3 indicate that the China First Project could contribute to a considerable increase in gross operating surplus in the Mine Catchment and Abbot Point Catchment above what would be achieved without the project between 2010 / 11 and 2036 / 37, with milder increases in the Broader Service Area, Queensland and Australia.

Figure ES.3. Annual Percent Change in Gross Operating Surplus Resulting from the China First Project, 2010 / 11 to 2036 / 37



Source: Prime Research (unpublished).

Impacts on Property Values

The China First Project will impact on the local property market within the Study Area through additional demand for property as a result of both permanent and temporary migration of employees and their families to work on the China First Project, as well as through migration of people employed in jobs generated through flow-on activity.

The use of worker camps to accommodate the China First Project's predominantly fly-in fly-out (FIFO) workforce will ameliorate demand for accommodation in the local townships to some degree. Even so, the experience of the recent mining boom (2003 to 2008) in the Bowen Basin suggests the towns of Alpha and Jericho within the Mine Catchment, which are the closest townships to the mine site, are likely to experience an increase in property demand and prices as some contractors and executives during both construction and operation will likely seek alternative accommodation.

In the short to medium term this will place upward pressure on prices in both the rental market (through construction and mining workers seeking temporary accommodation outside the worker camp) and the property sales market (primarily through investors purchasing and developing property in the region to realise rental yields). In the long term, property sales prices may also be buoyed by some workers preferring to permanently migrate to the region.

Trends during the recent mining boom also suggest that regional hubs such as Emerald, Barcaldine and Mackay may also experience some increased demand for accommodation as a result of the China First Project. Since 2003, property prices in the major service and population centres of the Bowen Basin region have increased at a faster rate than in Brisbane as many mining and mining services-related workers have migrated to these centres in proximity to mining projects.

Impacts to Households

The China First Project will contribute to an increase in household incomes in the Study Area of approximately $156.2 million per annum on average between 2010 / 11 and

2012 / 13, and approximately $164.0 million per annum on average between 2013 / 14 and 2036 / 37. In Queensland, the China First Project will generate additional wages and salaries of approximately $452.7 million per annum on average between 2010 / 11 and 2012 / 13 and $776.1 million per annum on average between 2013 / 14 and 2036 / 37.

In addition to wages and salaries generated by the China First Project, households may benefit from increased wealth through:

- Opportunities for low income households and families to supplement their income through family members working either part time or full time at the mine;
- A reduction in unemployment in the Study Area and Queensland, providing people that were previously unemployed with higher incomes;
- Opportunities for wealth re-distribution to investors (i.e., shareholders) of the project and contribution to property owners through rental returns; and
- An increase in real wages throughout Australia, in particular in the Study Area, as an increase in demand for skilled labour places upward pressure on labour prices. The increase in real wages is over and above any increases in the cost of living, and therefore represents an increase in disposable incomes in the Study Area and Queensland.

However, not all project impacts on households will to be positive. Potential negative implications on households include:

- Wealth generated by the China First Project will be primarily distributed to those directly engaged in the project as a result of higher salaries paid in the mining industry and associated supply chain. With many of the China First Project employees living permanently outside the Study Area, this will result in a repatriation of wealth to towns and cities where these workers reside;
- Experiences during the most recent mining boom (2003 to 2008) suggest the disparity in salaries could contribute to a wealth divide between mining families and other residents. In combination with an expected increase in rental prices and property values in Alpha and Jericho, and potentially regional hubs such as Barcaldine, Emerald and Mackay, housing affordability could become an issue, in particular for those that are not employed by the China First Project or in other high earning occupations;
- Higher rental prices in the Study Area will likely attract investors to purchase and / or develop housing in the region to realise high rental yields. The rental market represents a wealth transfer from renters to property owners, and where these investors are external to the Study Area, this represents a transfer of wealth out of the region;
- Some areas and towns may be subject to increased traffic flows as a result of the China First Project, in particular the towns of Alpha and Jericho that are closest to the mine site, through a combination of:
    - Construction and mining related materials and equipment transportation. This will lead to increased road maintenance requirements;
    - New residents migrating to the region and / or mining employees seeking accommodation outside of the worker camps; and
    - The provision of some recreational, leisure, health and community services to the mine employees.

  The increase in traffic may result in increased travel times for residents where not appropriately planned for and strategies developed to mitigate these impacts.

Impacts on Export Revenues and Balance of Trade

The China First Project will result in an increase in export revenues of $4.6 billion per annum through the export of high quality thermal coal. This will represent an increase in Australian thermal coal export revenues of approximately 25.7% and an increase in total Australian exports of 2.0% from 2008 / 09 levels. The increase in export revenues may provide support for the strength of the Australian dollar. However, the impact of the China First Project on Australia's exchange rate, if any, is likely to be small.

Impacts on Government Revenues

Local Government Revenues

Local council revenues will increase as a result of people re-locating permanently or temporarily to the project's Study Area, through additional rates revenue associated with dwellings and workers camps that are constructed to meet additional demand and any appreciation in land value brought on by increased population. For renters, and those in workers camps, council fees and charges will be met by the landlords and employers.

However, off-setting additional revenues will be a requirement for additional funding for capital investments (e.g., local road and community infrastructure) as well as a likely increase in operating expenditure to meet the service provision and infrastructure demand and needs of an increased population.

Queensland Government Revenues

The China First Project will increase Queensland Government revenues directly through land tax, payroll tax, royalties and rents. Impacts of the China First Project on Queensland Government revenues are summarised in Table ES.12, and have been estimated based on prevailing tax rates (i.e., assumes tax policy does not change significantly over time). Queensland Government revenues have been estimated based on both direct and flow-on impacts of the China First Project.

In aggregate, Queensland Government revenues are indicatively estimated to be approximately $364.9 million per annum on average over the period 2010 / 11 to 2036 / 37, with royalties contributing an estimated 94.0% of total Government revenues.

Table ES.12. Average Annual Queensland Government Revenues from the China First Project (2010 / 11 to 2036 / 37)

Revenue Source	Estimated Revenue ($M)	Proportion of Revenue (%)
Land Tax	$0.8	0.2%
Payroll Tax	$18.4	5.0%
Royalties	$343.0	94.0%
Tenure Rents	$2.8	0.8%
Total Revenue	**$364.9**	**100.0%**

Source: Office of State Revenues Queensland (2010), Prime Research (unpublished), Queensland Department of Employment, Economic Development and Innovation (2010), Queensland Department of Mines and Energy (2010a), Queensland Department of Mines and Energy (2010b), AEC*group*

Australian Government Revenues

The China First Project will contribute to Australian Government revenues through company tax, fringe benefits tax, goods and services tax (GST), personal income tax and import duties. Australian Government revenues have been estimated based on both direct and flow-on impacts of the China First Project, with the exception of import duties that are estimated based on direct impacts only.

The impacts of the China First Project on Australian Government revenues are summarised in Table ES.13. The China First Project is indicatively estimated to generate an additional $709.8 million per annum on average in Australian Government revenues between 2010 / 11 and 2036 / 37.

Table ES.13. Average Annual Australian Government Revenues from the China First Project (2010 / 11 to 2036 / 37)

Revenue Source	Estimated Revenue ($M)	Proportion of Revenue (%)
Company Tax	$302.9	42.7%
Fringe Benefits Tax	$6.9	1.0%
GST	$158.3	22.3%
Personal Income Tax	$237.8	33.5%
Import Duties [(a)]	$4.0	0.6%
Total Revenue	**$709.8**	**100.0%**

Note: (a) Estimates of import duties over the period from 2010 / 11 to 2036 / 37 represent import duties on direct imports during construction only.
Source: Australian Customs and Border Protection Services (2010), Australian Taxation Office (2010), Prime Research (unpublished), AEC*group*

There is currently widespread debate relating to the proposed Australian Government's Mining Resources Rent Tax (MRRT). However, as this is not currently Government policy and is in the process of ongoing negotiation and planning, the structure of any tax effects remains unclear and is unable to be modelled with any accuracy. Should such a tax be introduced it would:

- Decrease resource company profits for those operations meeting MRRT criteria and thresholds;
- Increase tax revenues to the Australian Government through revenues generated by the MRRT; and
- Increase development hurdle rates and risk, with the implication of reducing the attractiveness of Australian resource deposits for development.

It is unclear at this stage the specific effect this proposed additional tax would have on the China First Project, and the associated broader flow-on effects.

Implications of the Project for Future Development

Beneficial Implications

The China First Project will involve the following key elements that could provide significant future benefits for the regional, State and national economies:

- The development of rail and port infrastructure that is critical to access and commercialise coal and other resource deposits with export potential in the Mine Catchment and the Galilee Basin;
- Investment by Waratah Coal in developing utilities (power, water and telecommunications) and transport (local roads and an airstrip) infrastructure to support the project;
- The development of a local mining sector value chain, providing a range of mining support services in the local region; and
- Development of the local skills base as a result of training programs, migration of skilled workers and ongoing skills transfer between workers.

Rail, port and other support infrastructure developed for the China First Project will be accessible by third parties, which will "open" the abundant high quality resources available in the Galilee Basin for future development, including coal and coal seam gas, by providing base support infrastructure and reducing hurdle rates for future resource development.

The development of open access rail infrastructure provides a platform for future expansion of the line to accommodate higher coal tonnages, thereby providing additional capacity for future development of coal and other resource operations in the Galilee Basin. This will be supported by enhanced skills and labour force capacity, assisting future resource projects through the local presence of skilled workers and supply chains.

Support infrastructure such as utilities and roads will also likely improve regional business capacity and competitiveness, providing greater opportunities for local business

growth and expansion. The China First Project also has the potential to improve business confidence in the region, which may ease lender's current concerns regarding development risk for residential developments. This would improve access to credit for developers to provide additional residential and commercial developments.

Potential Forgone Opportunities

While the China First Project is expected to deliver considerable beneficial impacts to the regional, State and national economies, there are some potential adverse implications of the project in terms of potential forgone opportunities, including:

- An erosion of the strong agriculture sector in the Study Area, in particular beef cattle in the Mine Catchment, through the acquisition of grazing land, disruption of agricultural management practices in land holdings along the rail corridor, and an expected draw of labour resources from the agricultural industry. However, agriculture is a stable rather than growth industry in the region and has limited potential for future expansion without intensification;
- Competition with other projects for labour (and other) resources, placing upward pressure on prices and increasing the difficulty for projects to source input materials and suitably skilled staff. This may result in some other projects being delayed or postponed;
- Support for the strength of the Australian dollar which may adversely impact the profitability and long term prospects of some sectors that are exposed to international competition, in particular manufacturing, some agricultural commodities and tourism-related sectors; and
- Attraction of employees from lower income paying industries, which could have deleterious impacts on local business and industry capacity to service the project and local population if not managed appropriately.

Cumulative Impacts

There are a considerable number of projects proposed and currently being investigated within the China First Project's Study Area, including a number of mining projects near the town of Alpha. Projects that have been considered in the cumulative impact assessment are:

- Abbot Point Expansion Project;
- Abbot Point Multi-Cargo Facility;
- Alpha Coal Project;
- BMA Bowen Basin Coal Project;
- Drake Coal Project;
- East Coast Alumina Refinery and Port;
- Galilee Basin Power Station;
- IsaLink High Voltage DC Transmission;
- Kevin's Corner Coal Project; and
- South Galilee Coal Project.

The concurrent undertaking of these projects has the potential to provide benefits that would otherwise not be achievable (refer to Table ES.14), as well as exacerbate some of the identified adverse impacts of the China First Project (refer to Table ES.15).

While the potential beneficial impacts should be encouraged and facilitated by appropriate planning measures where appropriate, it is the adverse cumulative impacts that are of key concern for future development of the Study Area, in particular those assessed to have a high risk rating. In order to ensure these potential cumulative impacts are appropriately managed it will be important for local Council and State Government to collaborate with project proponents and develop coordinated plans to account for the anticipated increased population, business and industry growth throughout the Study Area.

Table ES.14. Potential Beneficial Cumulative Impacts

Impact Description	Likelihood	Consequence	Impact Rating
Provision of common user infrastructure: Rail, port and other support infrastructure developed for the China First Project will be accessible by third parties, including other proposed coal mining projects in the region, while there are a number of port and utilities infrastructure projects proposed that will also provide important enabling infrastructure for industry development. Development of common user infrastructure will: • Reduce duplication of infrastructure development; • Assist in realising economies of scale in service provision; and • Support local business development.	**Almost Certain**	**Positive**	**Positive Effect**
Industry clustering and value chain development: Development of a number of coal mining projects in the Galilee Basin may provide the 'critical mass' required to develop a local mining support sector value chain. This has the potential to: • Develop a strong and efficient local supply network; • Assist local business realise economies of scale and scope; and • Provide enhanced synergies between businesses through clustering of similar industries.	**Likely**	**Positive**	**Positive Effect**
Increased business, consumer and investor confidence: Business, investor and consumer confidence is linked with investment and spending patterns. Development of a number of major projects would likely provide a boost in confidence for business, consumers and investors alike, supporting investment and consumption expenditure and, subsequently, economic growth.	**Likely**	**Positive**	**Positive Effect**
Economies of scale and scope for service provision: The combination of a number of projects being developed in the Study Area could provide a 'critical mass' in terms of delivery of a number of services provided by all levels of government as well as private industry.	**Possible**	**Positive**	**Positive Effect**

Table ES.15. Potential Adverse Cumulative Impacts

Impact Description	Likelihood	Consequence	Impact Rating
Crowding out of business due to competition for resources: The concurrent development of a number of major projects in the Study Area will result in additional demand and competition for labour and other inputs to supply these projects (e.g., land, capital, water, intermediate goods and services used in the production process). This will place upward pressure on input prices, and can result in "crowding out" of some businesses and industries due to: • A draw of labour from some sectors, in particular lower income paying sectors; • Reallocation of capital investment to those sectors providing higher returns; and • Reduced profit margins for business due to higher costs of production, eroding the viability of some businesses, particularly smaller businesses already operating on or near the margin.	**Almost Certain**	**Major**	**High**

Impact Description	Likelihood	Consequence	Impact Rating
Availability of affordable housing: The experience of the Bowen Basin during the latest mining boom indicates that the concurrent development of a number of projects in the Study Area would be expected to place significant additional upward pressure on housing prices. The increase in housing prices would: • Reduce the affordability of housing for lower income earning households; • Reduce disposable incomes of households that remain in the region, reducing consumer expenditure in the region, in particular for luxury items; and • Exacerbate difficulties of local business in retaining and attracting workers.	**Almost Certain**	**Major**	**High**
Infrastructure and service capacity constraints: The development of a number of projects concurrently could result in capacity constraints and bottlenecks in service delivery, in particular for transport infrastructure where the delivery of goods and services to support the projects will result in increased traffic loads on local roads.	**Possible**	**Minor**	**Medium**

Mitigation Measures and Monitoring Framework

The following section outlines mitigation strategies to assist in off-setting some of the potential adverse impacts of the China First Project on the local, regional and State economy, as appropriate, as well as enhance some of the potential economic benefits of the project.

Mitigation Strategy 1: Address Skills Shortages
Issue
There is insufficient supply of skilled workers available in the local region.
Objective
Develop the local and regional skills base through a combination of training programs, apprenticeships and traineeships.
Recommended Mitigation / Enhancement Strategies
Construction: • Encourage contractors engaged during construction of the China First Project to utilise Australian Government skills and training programs where possible, including the Australian Apprenticeship Program. • Provide information and develop awareness of Australian Government incentives and programs to all contractors engaged, and direct contractors to relevant agencies. • Engage and collaborate with Construction Skills Queensland to identify potential strategies for increasing the capacity of local job seekers to develop appropriate skills. **Operation:** • Identify and communicate the China First Project's skills requirements to Mining Industry Skills Centre (MISC) and the Department of Education and Training (DET) to identify areas of skills gaps and assist in workforce planning. • Collaborate with MISC and DET regarding extending the findings of research programs being undertaken by MISC to market the industry as a career of choice to not only persons currently in the labour force but also youth entering the labour force in the near future. • Collaborate with MISC and relevant Registered Training Organisations (RTOs) to develop customised training programs, including those undertaken as part of MISC's 'Work Readiness Program', that are suited to the needs of the China First Project and extend these training programs to the Mine Catchment and Broader Service Area through relevant RTOs. • Engage with MISC regarding accessing funding for training programs provided by RTOs through the 'Resources Industry Training Fund' (RITF). • Encourage contractors engaged on the China First Project to utilise Australian Government skills and training programs where possible, including the Australian Apprenticeship Program. • Provide information and develop awareness of Australian Government incentives and programs to all contractors engaged, and direct contractors to relevant agencies. • Collaborate with MISC to track skills requirements and gaps on an ongoing basis, as part of MISC's 'Heartbeat Project'. This will assist in ongoing industry-wide strategies and planning for addressing skills shortages.
Responsibility
Waratah Coal in collaboration with MISC, CSQ, DET and other relevant agencies.

Mitigation Strategy 2: Minimise Draw Down on Labour from Other Sectors
Issue
The China First Project is estimated to result in a draw / reallocation of labour from some sectors of the economy, in particular lower income paying sectors.
Objective
Minimise the adverse impacts of a draw down on labour from other sectors, and provide flexible arrangements for workers to encourage participation in both the mining and other sectors. This was identified as a key issue for lower income paying industries, in particular agriculture and local government.
Recommended Mitigation / Enhancement Strategies
• Waratah Coal engage with local business and residents to investigate options for providing flexible working arrangements that would allow locals to participate in not only the China First Project, but also maintain jobs in other industries. This may include, where practical, rostered shifts (e.g., 7 days on, 7 days off) or part-time employment opportunities in the China First Project that would enable local workers to also work part time in sectors such as agriculture and local government. • Waratah Coal assist local business to secure supply contracts and encourage new businesses to locate to the region (examined in more detail in Mitigation Strategy 3). • State Government, local Council and industry organisations collaborate to identify opportunities and strategies for encouraging local young adults employed on the China First Project and other mining projects to undertake skills training in other sectors. • MISC, DET, local government and other industry development organisations collaborate to identify and develop strategies to encourage locals to re-enter the labour force, including older workers and partners of mining employees. • State Government and local Council explore opportunities for attracting housing and service development in the region in order to encourage workers to migrate to the region across a range of industries.
Responsibility
In order to appropriately mitigate the likely draw of labour to the China First Project, collaborative planning between State Government, local Council, local industry, industry organisations, and mining proponents is required.

Mitigation Strategy 3: Develop the Local Supply Chain
Issue
There are gaps in the local supply network, negatively impacting on local business' capacity to support the needs of the China First Project through local supply of goods and services.
Objective
Assist and provide incentives for local business to secure supply contracts for the China First Project.
Recommended Mitigation / Enhancement Strategies

• In collaboration with local Council, economic development organisations, the Industry Capability Network (ICN) and State Government:
  ○ Identify the goods and services that are expected to be required by the China First Project and inform local business of service provision opportunities and requirements of business to secure contracts;
  ○ Develop and implement a Local Content Strategy establishing or participating in programs to assist qualified local and regional businesses tender for provision of goods and services to support the China First Project;
  ○ Examine options for establishing a local cooperative service or network to connect local business and supply chains and enable smaller, local businesses to collaborate in meeting service supply requirements of the China First Project; and
  ○ For goods and services that are not able to be sourced within the China First Project Study Area, develop strategies to encourage suppliers to locate to the region. Strategy development should be led by local Council, with Waratah Coal and other proponents to inform Council of business opportunities and allow Council to appropriately plan for likely industrial / commercial land requirements.

Responsibility
Waratah Coal in collaboration with the Industry Capability Network, DEEDI, local Council and local business.

Mitigation Strategy 4: Minimise Disruption of Agricultural Practices
Issue
The China First Project will result in the disruption of agricultural practices through the acquisition of agricultural land for development and operation of the mine, as well as the rail line intersecting properties. The China First Project will require access to land that is currently utilised for agricultural purposes, including up to 55,000 hectares across six land parcels for the mine site that is primarily used for grazing. Existing grazing activities on three of these properties will cease, however, land holders will negotiate compensation for the loss of this land with Waratah Coal. Agricultural activities on the other three will not be precluded by mining activities. Of key concern is ensuring adverse impacts of the project on other agricultural activities through noise, dust, stranding of assets and / or disruption of management practices are minimised.
Objective
Minimise adverse impacts to agricultural activities in the Study Area from the acquisition of agricultural land and disruption of management practices along the rail corridor.
Recommended Mitigation / Enhancement Strategies
• Waratah Coal include a buffer area between mining activities and adjacent land holdings. It is recommended that engineering design include an appropriate buffer area that will ensure adjacent land holdings are not excessively or inappropriately impacted by mining operations. • Waratah Coal engage with landholders along the rail corridor to identify potential disruptions to existing management practices for each property likely to be impacted, including potential changes to land configuration and likely costs, and potential for land stranding or isolation. • In order to minimise the disruption to agricultural practices, design of the rail line should ensure key adverse impacts on land access and ongoing management practices are avoided and / or mitigated (e.g., through provision of alternative access points). • Where land holdings are intersected by the rail line, Waratah Coal should negotiate with land holders' for reasonable compensation to provide required changes to alter paddock configuration, including alternative water access, fencing modifications and any additional stockyards required.
Responsibility
Waratah Coal.

Mitigation Strategy 5: Minimise Adverse Implications of Higher Property Prices
Issue
There is insufficient supply of local housing to meet anticipated increases in demand by mining contractors, executives and flow-on employees and their families migrating to the region, resulting in an increase in property and rental prices. This results in a subsequent issue in terms of insufficient supply of affordable housing in the region. Examination of recent movements in rental prices in the Bowen Basin show that even where worker camps are utilised, property prices will likely increase at a faster rate than would otherwise be achieved.
Objective
The role of mitigation strategies is to ensure that property price growth is not acute, and that the adverse impacts of an increase in property prices on local residents is minimised, in particular issues of housing affordability.
Recommended Mitigation / Enhancement Strategies
• Encourage use of worker camps by all FIFO project related employees to ensure demand for housing in the local property market is minimised. • Support the development of local infrastructure (examined in further detail in Mitigation Strategy 6). • State Government and local Council collaborate to develop and implement affordable housing schemes in affected regions to provide affordable accommodation for low income and displaced households. • State Government and MISC provide funding to undertake an assessment of recent mining projects in the Bowen Basin to identify the uptake of worker camp accommodation by mining employees and contractors, the proportion of mining employees and contractors seeking accommodation outside of these worker camps, and the effects they have had on local property markets and service demand. The findings of this study should be made available to local Council to assist land planning and the development of strategies to expand infrastructure and service provision in nearby towns such as Alpha, Jericho, Emerald and Barcaldine.
Responsibility
Waratah Coal, State Government, MISC and local Council.

Mitigation Strategy 6: Develop Supporting Infrastructure
Issue
Additional social and economic infrastructure is required to support the China First Project, flow-on business and industry growth, and employees and households migrating to the region.
Objective
Provide sufficient social and economic infrastructure to meet the increased demand generated directly and indirectly by the China First Project.
Recommended Mitigation / Enhancement Strategies
• Waratah Coal identify and communicate anticipated resident and non-resident population growth and associated infrastructure requirements and impacts as early as possible to relevant government authorities (impacts on population and associated infrastructure is examined in the Social Impact Assessment undertaken as part of this EIS). • Relevant government authorities investigate and develop anticipated cost estimates to provide social and economic infrastructure required to meet demand generated indirectly by the China First Project, and identify appropriate cost recovery strategies for developing this infrastructure. In order for Council to appropriately fund the development of required social and economic infrastructure, sources for initial funding will likely need to be negotiated between local Council and State Government, and potentially project proponents. • Waratah Coal and relevant government authorities negotiate appropriate contributions for social and economic infrastructure developments required as a direct result of activities of the China First Project.
Responsibility
State Government and local Council, with contribution from Waratah Coal.

Mitigation Strategy 7: Minimise Adverse Impacts of Increased Traffic
Issue
The China First Project will result in additional traffic movements due to transport of goods, services and potentially employees to support the China First Project, particularly during the construction period, potentially increasing travel times in the local area and increasing damage to roads and maintenance requirements.
Objective
Minimise impacts of additional traffic movements on local residents' travel times and other coal operators.
Recommended Mitigation / Enhancement Strategies
A range of strategies for mitigating the adverse impacts of increased traffic are presented in the Transport section of the EIS. Please refer to this section for more detail. In addition to these strategies, the following mitigation strategies are recommended to minimise impacts on travel times: • Develop strategies to ensure project related traffic movements (in particular for goods and services) are primarily undertaken during non-peak traffic periods on local roads. • Engage with other mining proponents and export facility operators to ensure coal movements are appropriately managed to not create or exacerbate bottlenecks in the rail and port network.
Responsibility
Waratah Coal, local Council and the Department of Transport and Main Roads.

Mitigation Strategy 8: Consideration of Cumulative Impacts
Issue
Cumulative impacts of the China First Project with other projects potentially being developed could significantly exacerbate the above issues.
Objective
Minimise the impact of multiple projects competing for constrained resources.
Recommended Mitigation / Enhancement Strategies
• State Government and proponents of major projects being developed in the region to collaborate and identify key project timings and requirements to allow adequate and appropriate planning for and mitigation of cumulative project impacts and minimise overlap between peak activity. Project sequencing requires cooperation between proponents as well as relevant government authorities to coordinate activities and source from the same labour pool rather than creating intense competition for labour. • Where major projects are located in close proximity, proponents and government authorities to collaborate to develop regional accommodation plans.
Responsibility
Mitigating the cumulative impacts of multiple projects being developed at once requires significant coordination of activities and cooperation between project proponents. To ensure adverse impacts of multiple projects are minimised, relevant government authorities will be required to take a lead role in the coordination process.

Table of Contents

List of Tables

List of Figures

1. Introduction

1.1 Background of the Project

China First Pty Ltd has acquired the right to mine 1.4 billion tonnes of raw coal from tenements EPC 1040 and EPC 1079. It will see the development and construction of four 9 million tonnes per annum (Mtpa) underground long-wall coal mines, two 10 Mtpa open cut pits, two coal preparation plants each with a raw washing capacity of 28 Mtpa, as well as a world class railway facility, port and associated supporting infrastructure.

The annual Run-of-Mine (ROM) coal production will be 56 Mtpa to produce 40 Mtpa of saleable export product coal. At this scale of operation, the capital expense of constructing the required rail and port infrastructure is economically viable over the life of the project.

Processed coal will be transported by a new 447 km railway system from the Galilee Basin to the existing Port of Abbot Point. The railway component includes a state of the art, heavy haul, standard gauge railway to support 25,000 tonne train units. The final railway easement is expected to be approximately 60-80 m wide and will be confirmed at detailed design.

The Port of Abbot Point is undergoing an extensive expansion program to facilitate coal export to the growing world market. The China First Project will be integrated within the planned expansion strategies to further consolidate the operability of the Port of Abbot Point as a state of the art export facility. Waratah Coal proposes to develop a new coal terminal, estimated to cost approximately $2 billion and have capacity of 40 Mtpa, including a new stockyard and unloading facilities within the Abbot Point State Development Area (APSDA).

The auxiliary facilities for the project include the provision of new power supply infrastructure, water supply and wastewater treatment facilities, fire fighting and first aid infrastructure, machinery maintenance centre, accommodation and an airport. The construction period for the project is estimated to last 36 months.

1.2 Legislative Context

On 28 November 2008, the China First Project was declared to be a 'significant project for which an Environmental Impact Statement (EIS) is required' under section 26 of *State Development and Public Works Organisation Act 1971* (SDPWO Act) by the Coordinator-General. This declaration initiated the statutory environmental impact assessment procedure of Part 4 of SDPWO Act which will be administered by the Department of Infrastructure and Planning on behalf of the Coordinator-General.

On 20 March 2009 the Australian Government Minister for the Environment, Heritage and the Arts determined that the project constitutes a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as it has potential for significant impact on matters of national environmental significance (MNES). The controlling provisions were determined as:

- Sections 12 and 15A (world heritage properties);
- Sections 15B and 15C (national heritage places);
- Sections 18 and 18A (listed threatened species and communities);
- Sections 20 and 20A (listed migratory species); and
- Sections 23 and 24A (Commonwealth marine areas).

The Minister for the Environment, Heritage and the Arts has further determined that environmental assessment of MNES is to be undertaken in accordance with Part 8 of the EPBC Act to be administered by the Commonwealth Department of the Environment, Water, Heritage and the Arts.

Following consultation between the Queensland Government Department of Infrastructure and Planning and the Commonwealth Department of the Environment, Water, Heritage and the Arts, it was agreed that the environmental impact assessments

under the SDPWO Act and EPBC Act be conducted in parallel, based on one terms of reference and one EIS study and report that would satisfy the requirements of both jurisdictions. Relevant Commonwealth, Queensland Government and local government authorities have been invited to participate in the EIS process as advisory agencies.

1.3 Purpose of this Report

This report is developed as a background technical document for use in preparing the EIS. The report quantifies the expected beneficial and adverse economic impacts of the China First Project on the local, regional, State and national economies, as appropriate.

The report also recommends mitigation and enhancement strategies as well as monitoring regimes to ensure regional economic values are enhanced or, at least, maintained if the China First Project proceeds.

2. Methodology

2.1 Terms of Reference

Terms of Reference (ToR) for the China First Project have been developed by the Coordinator-General (2009). Section 5 (Impacts on the state and local economies and management of impacts) of the ToR broadly requires:

- Description of the local and regional economies that may be affected by the project;
- Analysis of the potential economic impacts of the project at the regional, state and national level, as appropriate to the scale of the project, including impacts on small regional communities. This should include:
    - Assessment of direct economic impacts, including property values, industry output, employment and factor incomes;
    - Assessment of forgone industry output resulting from the project, forgone opportunities and impacts to households, and indirect impacts likely to flow to other industries;
    - An outline of strategies for local participation in the project, in terms of local supply of goods and services as well as local employment strategies, as well as strategies to respond to government policy (where relevant);
    - Assessment of the impact of the project on current and future management processes for adjacent properties during construction and / or operation; and
    - Developing and proposing mitigation and enhancement strategies and monitoring regimes to minimise disruption or alleviate costs resulting from the project.

The detailed assessment criteria, as described in the draft Terms of Reference, and the sections of this report that address specific criterion are summarised in Table 2.1.

Table 2.1. EIS Terms of Reference – Economic Impact Assessment

Terms of Reference	Section(s)
Description of the local and regional economies that may be affected by the project	4
Direct economic impacts on property values	5.4
Direct economic impacts on industry output	5.1
Direct economic impacts on employment	5.2
Direct economic impacts on factor incomes	5.3
Assessment of any forgone industry output from the project	5.1
Assessment of any forgone opportunities and impacts to households (e.g. recreation, increased travel times, etc.)	5.5
Assessment the indirect impacts likely to flow to other industries and economies from the development of the project. This should also consider the implications of the project for future development	5.6, 5.7, 5.8
Outline of strategies for local participation	5.2.3, 7
Identify and estimate the cost all potential changes to industry practices likely to occur during construction and operation of the project	5.1
Identify and estimate the cost of all potential impacts on households (e.g. travel time, noise, etc.) likely to occur during construction and operation of the project	5.5
Describe the measures to be taken to minimise disruption or alleviate cost impacts of the project	7
Potential for existing government policies and support programmes in mitigating impacts	7
Identification of the current and future management processes for adjacent properties which are likely to be impacted by the project during construction and / or operation, including: • The impact of the project on existing agricultural land uses and management practices; and • The range of measures required to mitigate real and potential disruptions to rural practices and management of properties	5.1.2, 5.8, 7

2.2 Method of Assessment

2.2.1 Existing Economic Environment

The existing economic environment section describes the existing economic profile of the EIS Study Area, and provides a baseline for assessment of the significance of potential impacts of the proposed development. This section has been developed based on data and information sourced from:

- The Australian Bureau of Statistics, Queensland Treasury, Office of Economic and Statistical Research, Department of Infrastructure and Planning, Real Estate Institute of Queensland, Residential Tenancies Authority and other public sector agencies;
- Consultations with local businesses and peak industry bodies;
- Private sector data providers and company websites; and
- AEC*group* propriety economic models.

Economic data collected during this stage is used to develop economic models, and forms the 'base scenario' against which the China First Project's impacts are assessed.

2.2.2 Economic Impact Modelling

Economic impacts of the China First Project have been modelled using a Computable General Equilibrium (CGE) modelling technique. CGE modelling estimates the net increase in demand generated by the project after taking into account resource constraints. An example would be the necessity to pay higher wages to attract workers from other businesses or regions in a tight labour market. By taking into account resource constraints CGE modelling is considered to provide a more realistic assessment of the impacts of a project of the scope and scale of the China First Project on the regional and State economies given the currently constrained labour market in the region and more broadly throughout Queensland. A detailed description of CGE modelling is provided in **Appendix A**.

A labour mobility constraint has been applied within the CGE modelling, with labour mobility assumed to be motivated by real wage differentials. Labour mobility assumptions include both inter-industry labour movement within regions as well as inter-regional and interstate labour movement. Labour is assumed to not be sufficiently mobile to remove these real wage differentials (i.e., in order to attract labour, real wages will increase).

2.2.3 Economic Impact Assessment

This section uses information from the previous sections to analyse, assess and discuss the economic impacts of the China First Project in relation to the ToR items outlined in Table 2.1.

The economic impact assessment includes input and information from:

- Consultation with business, industry and key industry organisations to identify potential economic impacts;
- Interpretation of modelling output in the context of the regional and state economies, and analysis of other, non-quantified changes to the economic environment; and
- Evaluation of the significance of impacts in relation to economic resources.

2.2.4 Development of Mitigation and Enhancement Strategies

This section identifies strategies to avoid, reduce or mitigate the negative economic impacts and enhance and facilitate the capture of the positive impacts identified in previous sections. This includes the development of strategies for local participation in the project. Key elements of strategies will include:

- Defining and describing the objectives of the task / strategy;
- Identifying practical methods to protect and / or enhance economic values; and
- Identifying practical monitoring measures.

3. Project Overview and Description

3.1 Project Overview

The proponent, Waratah Coal, intends to establish a new coal mine, railway, coal stockyards and supporting infrastructure to export high volatile, low sulphur, steaming coal to international markets (the China First Project). A brief overview of the project components is provided in the following sections.

3.1.1 The Mine

Waratah Coal's EPCs cover a total area of 15,250 km^2. The proposed mine is situated near "Kiora" approximately 13 km west and 35 km north of the township of Alpha. To date, Waratah Coal has identified a reserve of 1.1 billion tonnes of coal within its EPC 1040 and 1079 tenements. Coal quality tests confirm that these coal reserves average less than 0.5 % sulphur and possess an average calorific value of 25 MJ / kg.

The mine site (including buffer area) is estimated to cover an area of approximately 550 km^2 and will involve both open cut and underground coal production. Run-of-Mine (ROM) coal production from the open cut activities is estimated at approximately 20 million tonnes per annum (Mtpa) from the first year of production in 2012 / 13. Underground production activities are expected to produce approximately 36 Mtpa once in full production in 2015 / 16, with production ramping up between 2012 / 13 and 2015 / 16.

Water requirements of the mine will be derived from mine dewatering, augmented by supply from a new pipeline from Moranbah to the Galilee Basin (proposed by SunWater) and / or floodwater harvesting from the Belyando River catchment.

Following coal processing and washing, the China First Project is expected to produce approximately 40 Mtpa of export quality coal once at full production capacity.

3.1.2 Railway

It is proposed to develop 447 km of state-of-the-art, heavy haul, standard gauge, rail infrastructure from the Galilee Basin to the existing Port of Abbot Point for the transport of 40 Mtpa of washed coal from Waratah's mining operations to coal export facilities at Abbot Point. The rail infrastructure will support 25,000 tonne train units. The final railway easement is expected to be approximately 60-80 m wide and will be confirmed at detailed design.

3.1.3 Coal Terminal

It is proposed that new coal stockyards and coal transfer infrastructure will be established within the Abbot Point State Development Area (APSDA). The coal transfer infrastructure will link in with the Government developed common use infrastructure from the APSDA to the new Multi Purpose Cargo Wharf.

Initially the stockyards and transfer infrastructure will be built with a capacity of 40 Mtpa of coal. The infrastructure will integrate with either the APSDA and Port of Abbot Point common use infrastructure currently being considered by the Queensland Government or a jetty berth design similar to what is currently in use at Abbot Point.

3.2 Project Costs, Revenues and Timings

The China First Project will result in considerable investment in, and revenue generation from, developing the above infrastructure to extract high value coal resources for sale to export markets.

Construction of the mine, railway and coal stockyard and transfer infrastructure is estimated to take approximately three years to complete, indicatively requiring approximately $8.8 billion in capital investment. Direct employment for construction activities is estimated to average approximately:

- 2,500 employees for construction of the mine over a three year period;

- 1,000 employees for construction of the rail infrastructure over a three year period; and
- 2,500 employees for construction of the port facilities over an 18 month period.

First coal exports are targeted for July 2013, with full export capacity of 40 Mtpa expected to be reached in 2015 / 16, generating an estimated $4.6 billion in export revenues per annum[2]. Direct employment during operation is estimated to be approximately:

- 1,500 employees for operation of the mine;
- 60 employees for operation / maintenance of the rail infrastructure; and
- 150 employees for operation of the port facilities.

In addition to the above direct employees, a range of goods and services will be procured locally, providing contracting opportunities for local businesses and generating additional employment.

In addition to the mine, rail line and port facilities, a range of utilities infrastructure will be developed by third parties to support the China First Project, including a new 275 kV transmission line from the Lilyvale substation to the mine (to be owned by Powerlink), fibre optic telecommunications infrastructure and, potentially, a new water pipeline from Moranbah to the Galilee Basin (currently being investigated by SunWater).

Waratah Coal also propose to invest in developing local road infrastructure as well as developing a new airstrip (or upgrading the Alpha airstrip) for the transportation of fly-in, fly-out (FIFO) workers to the mine site.

[2] Export revenues are based on Waratah Coal's assumed coal price of approximately US$92 per tonne on average over the life of the mine, which is in line with coal spot prices in early 2010 (Australian Bureau of Agricultural and Resource Economics, 2010), and an exchange rate of approximately 0.8AUD / USD on average.

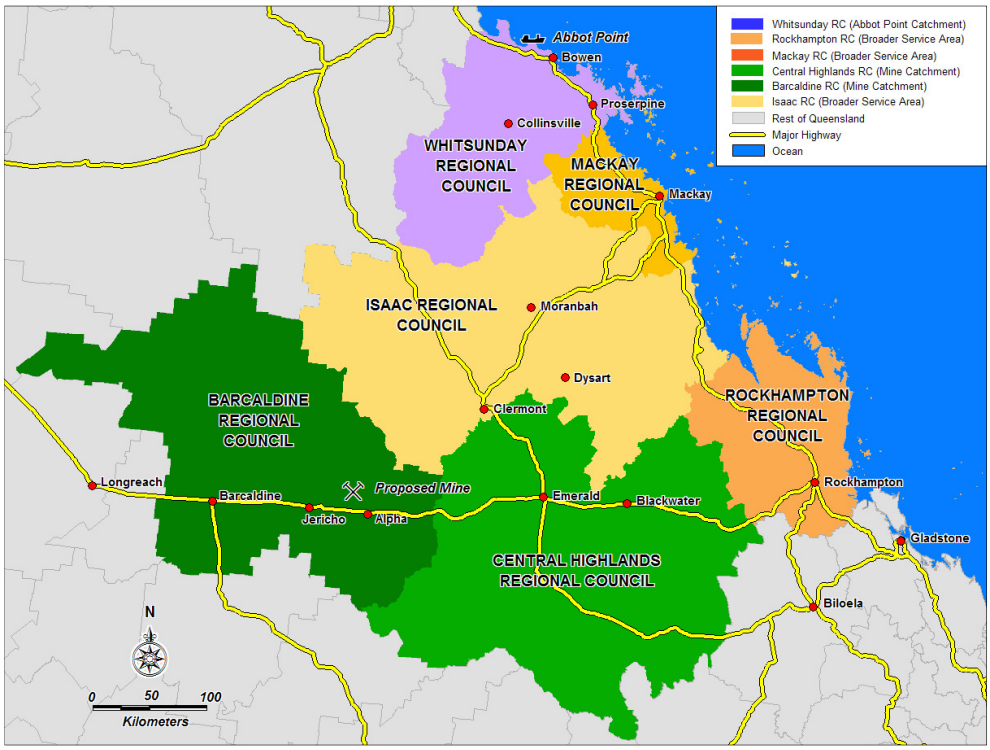
4. Existing Economic Environment

4.1 EIS Study Area

Three catchments have been used to establish and analyse the existing economic environment of the project and surrounding regions, the Mine Catchment, Abbot Point Catchment and Broader Service Area. Combined, these three catchments represent the Study Area for examining the regional economic impacts of the China First Project (refer to Figure 4.1).

The Mine Catchment consists of the Barcaldine and Central Highlands Regional Councils, while the Abbot Point Catchment consists of the Whitsunday Regional Council. The Broader Service Area catchment has been developed to encompass the regional centres adjacent to the mine and export point sites from which workers and supplies will be sourced, and is made up of the Isaac Regional Council, Mackay Regional Council and Rockhampton Regional Council.

Figure 4.1. Map of the China First Project Study Area and Catchments



Source: Australian Bureau of Statistics (2003).

A brief summary of the main economic characteristics of each catchment is presented in section 4.1.1.

4.1.1 Summary Overview of the Catchment Areas

The Mine, Abbot Point and Broader Service Area catchments for this project each have very different economic structures. Population growth across the three catchments has historically been close to that of Queensland, but is expected to either match or exceed Queensland's growth rate over the next twenty years.

The mining sector is a major influence across the three catchments, but is particularly dominant in the mine catchment, where it provided almost two thirds of Gross Regional Product (GRP) in 2008 / 09.

Unemployment in the mine catchment is almost a third the level of Abbot Point and half that of the Broader Service Area – illustrating the strength of the mining sector throughout the region and its strong performance since the global economic downturn in 2008.

All three catchments have higher proportions of technicians and machinery operators than the State, but have fewer clerical workers.

4.1.1.1 Mine Catchment

Barcaldine Local Government Area

Barcaldine Local Government Area (LGA) recorded a population of 3,376 residents in 2009, representing a decline in population of approximately 0.4% per annum on average since 2004. Without the China First Project, Barcaldine LGA's population is projected to grow marginally through to 2031, to 3,435 residents.

The main industry in the region is agriculture, in particular beef cattle, contributing 22.0% of the local economies GRP and 34.8% of employment. Other key industries include transport, postal and warehousing, and public administration and safety.

Central Highlands Local Government Area

There were an estimated 30,403 residents in the Central Highlands LGA in 2009, representing growth of 2.5% per annum on average since 2004. The Central Highlands LGA population is projected to grow by 2.0% per annum on average through to 2031, to 46,872 residents.

Central Highlands LGA's economy is highly reliant on the mining industry, contributing 65.8% of local GRP and 26.5% of employment. Agriculture is also a significant employer in the region, accounting for 11.2% of total employment.

4.1.1.2 Abbot Point Catchment

Whitsunday Local Government Area

Whitsunday LGA was the second fastest growing LGA within the Study Area between 2004 and 2009, recording population growth of 2.8% per annum on average to 34,195 residents in 2009. Whitsunday LGA's population is projected to grow at a rate of 1.6% per annum on average through to 2031, to 48,041 residents.

Mining is a key contributor to the local economy, with the northern tip of the Bowen Basin situated in the western parts of Whitsunday LGA, providing 22.3% of GRP. Transport, postal and warehousing is the second largest contributor to GRP (11.4%), driven by a combination of coal exports from the Abbot Point Coal Terminal and a sizable tourism industry centred on the internationally recognised Whitsunday Islands catered to by a charter boat fleet and the Hamilton and Proserpine airports. In line with its standing as a major tourism destination, accommodation and food services and retail trade are key employers in the Whitsunday LGA.

4.1.1.3 Broader Service Area

Isaac Local Government Area

Isaac LGA's population has grown at a rate of 2.6% per annum on average since 2004, to 22,417 residents in 2009. Isaac LGA's population is projected to grow by 2.0% per annum on average through to 2031, to 34,580 residents.

Isaac LGA encompasses a large proportion of mining operations in the Bowen Basin. As a result, the local economy is dominated by the mining industry, with this industry accounting for 82.8% of GRP and 49.2% of employment.

Mackay Local Government Area

Mackay LGA is the most prominent and fastest growing population centre within the Study Area, recording population growth of 3.3% per annum between 2004 and 2009, to 116,123 residents. Mackay LGA is projected to continue to grow rapidly through to 2031, averaging growth of 1.8% per annum to 172,993 residents.

As the major service centre to the Bowen Basin, Mackay LGA has a relatively diverse economy compared to most other regions in the Study Area. Mining is the main contributor to GRP (13.5%), while key mining support service sectors such as transport, postal and warehousing (11.5%) and manufacturing (8.3%), are also major contributors to the local economy. Mackay LGA also has a sizable construction industry, contributing 9.8% of GRP and 8.9% of employment.

Rockhampton Local Government Area

Rockhampton LGA is the second largest population centre in the Study Area, recording a population of 114,105 residents in 2009. This represented growth of 2.0% per annum between 2004 and 2009. Rockhampton LGA's population is projected to grow at 1.3% per annum to 2031, to 153,256 residents.

Rockhampton LGA is an industrial hub, with significant goods based sectors such as transport, postal and warehousing and manufacturing, with these industries contributing 12.6% and 8.6%, respectively to GRP and 12.9% and 9.0% to employment, respectively.

4.1.1.4 Summary of Key Economic Values

Key values of the economic environment of the Study Area include:

- **High reliance on the mining and resources sector**: The significance of the mining industry to the Mine Catchment area is highlighted by one in five workers being employed in the sector. Mining is also a key industry in the Abbot Point Catchment, which incorporates the northern tip of the Bowen Basin, as well as in the Broader Service Area which incorporates the central portion of the Bowen Basin as well as key mining related support services in Mackay. Projects such as the China First Project will act to maintain the industry's prominence and provide long-term employment opportunities for the region's existing mining workforce;
- **Considerable coal exports**: The Abbot Point Coal Terminal, which is located within the APSDA and has undergone numerous upgrades in recent years to expand capacity to 50 Mtpa, is one of the key coal export terminals in the Mackay-Whitsunday region, along with Dalrymple Bay and Hay Point. Additional export capacity to 80 Mtpa and 110 Mtpa is currently being investigated for the Port of Abbot Point;
- **Trade exposure**: Because of the dependence on coal and coal seam gas in the region, fluctuations in global resource markets can potentially have grave impacts on the region, with little support from other industries to soften a downturn in the resources sector;
- **High proportion of FIFO / DIDO workers in regional centres**: Many mining operations in the Bowen Basin utilise a high proportion of FIFO / DIDO workers from other regions, particularly major centres such as Emerald, Mackay and Rockhampton. The China First Project will look to incorporate a similar workforce dynamic, which will affect the Mine Catchment area's ability to retain workers, incomes and associated population and household-based services (e.g., retail, community and recreational services). Population growth over the next twenty years in the Mine Catchment is

expected to exceed the Queensland figure, but the region is not expected to witness the increases of some of the newer mining areas in Queensland as a high proportion of labour is expected to continue to be sourced from major population centres in FIFO / DIDO arrangements;

- **Internationally recognised tourism product**: The Whitsundays are an internationally recognised tourism destination, attracting over 200,000 international visitors per year and approximately 400,000 to 500,000 domestic visitors (Tourism Queensland, 2010). In the Abbot Point Catchment, the juxtaposition of tourism in the Whitsundays and industrial exports from Bowen will require careful management, as both these have distinct needs and requirements. Satisfying the desires of both interests requires the careful management of the region's natural and human resources; and
- **Competition for labour**: Recent activity throughout the Central Queensland region highlights that demand for mining commodities and higher wages paid by the mining sector has drawn labour from other sectors, particularly agriculture, with which the region has historically been heavily involved.

4.2 Description of the Economy

4.2.1 Population Size and Growth

Historic and projected population figures for the Study Area and Queensland are presented in Table 4.1. Over the past five years the Mine Catchment has recorded average annual growth of 2.2% per annum, reaching 33,779 in 2009. This was below the Queensland average annual population growth of 2.6% over the five year period. Growth in the Abbot Point Catchment was in line with the Queensland average of 2.6% over the 2004 to 2009 period, while the Broader Service Area's population expanded at a faster rate of 2.8% per annum on average.

In contrast to recent years, between 2009 and 2031 the Mine Catchment is predicted to grow at a higher average annual rate of 1.8%, compared to the Queensland figure of 1.6%. The Abbot Point Catchment's growth is predicted to be in line with the State growth of 1.6% over this time, a drop of more than one percentage point per annum on average from that achieved between 2004 and 2009. The Broader Service Area's population is also projected to expand by 1.6% per annum on average.

An extra 16,528 people are expected to reside in the Mine Catchment by 2031, with an additional 13,846 people expected to reside in the Abbot Point Catchment. The Broader Service Area population is expected to grow by 108,184 residents by 2031, with a growth rate in line with the Queensland figure.

Table 4.1. Historical and Projected Population, 2004 to 2031

Catchment	2004	2009	2031	% Av. Ann. Growth 2004-09	% Av. Ann. Growth 2009-31
Mine Catchment	30,304	33,779	50,307	2.2%	1.8%
Abbot Point Catchment	29,781	34,195	48,041	2.8%	1.6%
Broader Service Area	222,091	252,645	360,829	2.6%	1.6%
Study Area	**282,176**	**320,619**	**459,177**	**2.6%**	**1.6%**
Queensland	**3,900,910**	**4,425,103**	**6,273,885**	**2.6%**	**1.6%**

Sources: Australian Bureau of Statistics (2010a), Queensland Treasury (2008).

4.2.2 Gross Regional Product

4.2.2.1 Size of the Economy

Gross Regional Product (GRP)[3] for the Mine Catchment was estimated at $5.0 billion for 2008 / 09, which represented 2% of Queensland's Gross State Product (GSP). Over the four years to 2008 / 09, the catchment's GRP grew at an average annual rate of 4.1%. The Abbot Point Catchment's GRP in 2008 / 09 was estimated at $2.3 billion, or 0.9% of Queensland's GSP and growing at an average annual rate of 6.8% over the four years to 2008 / 09. The Broader Service Area generated an estimated $18.2 billion in 2008 / 09, representing over 7.5% of GSP and growing at 6.5% per annum on average for the four years to 2008 / 09.

Each of the catchment areas showed lower average annual growth rates in GRP compared to Queensland, which recorded an average annual rate of 8.6% (refer to Table 4.2).

Table 4.2. Gross State / Regional Product at Factor Cost, 2008 / 09

Gross State / Regional Product	Mine Catchment	Abbot Point Catchment	Broader Service Area	Study Area	Queensland
2008 / 09 ($M)	$4,966.4	$2,287.3	$18,222.7	$25,476.4	$243,903.0
2005 / 06 ($M)	$4,407.1	$1,879.2	$15,068.2	$21,354.4	$190,518.0
Av. Ann. % Growth (2005 / 06 – 2008 / 09)	4.1%	6.8%	6.5%	6.1%	8.6%

Source: AEC*group*

4.2.2.2 Structure of the Economy

Mining is by far the largest contributor to the Mine Catchment's economy, representing 63.4% of GRP in 2008 / 09 (refer to Table 4.3). Mining is also a major contributor for the Broader Service Area, with over a third of GRP produced from the mining sector. Mining and transport are the major sectors for the Abbot Point Catchment, making up over a one third of GRP, driven by coal extraction, exports and tourism activities.

[3] GRP and GSP estimates presented in this chapter are at factor cost, which is a measure of GRP / GSP based on the cost of all factors of production as paid by the producer (i.e., at basic prices), and does not include any taxes or subsidies on products.

Table 4.3. Percent Industry Contribution to GRP, 2008 / 09

Industry	Mine Catchment	Abbot Point Catchment	Broader Service Area	Study Area	Queensland
Agriculture, forestry and fishing	3.3%	4.8%	1.6%	2.2%	2.0%
Mining	63.4%	22.3%	34.6%	39.1%	9.5%
Manufacturing	1.6%	4.5%	5.7%	4.8%	7.8%
Electricity, gas, water and waste services	0.5%	1.1%	2.0%	1.6%	1.9%
Construction	5.8%	9.5%	6.9%	7.0%	7.6%
Wholesale trade	1.3%	2.4%	3.1%	2.7%	4.5%
Retail trade	2.1%	5.4%	4.5%	4.1%	5.4%
Accommodation and food services	1.1%	6.6%	2.2%	2.4%	2.9%
Transport, postal and warehousing	4.5%	11.4%	8.5%	8.0%	6.7%
Information media and telecommunications	0.3%	0.7%	0.9%	0.8%	2.2%
Financial and insurance services	0.6%	1.3%	1.6%	1.4%	6.4%
Rental, hiring and real estate services	0.9%	3.0%	2.0%	1.9%	3.2%
Professional, scientific and technical services	0.9%	2.0%	2.1%	1.9%	4.6%
Administrative and support services	0.5%	1.5%	0.9%	0.8%	2.0%
Public administration and safety	1.7%	2.1%	2.8%	2.5%	5.2%
Education and training	1.2%	1.7%	2.5%	2.2%	3.7%
Health care and social assistance	0.9%	2.3%	3.0%	2.5%	5.7%
Arts and recreation services	0.1%	0.5%	0.3%	0.3%	0.6%
Other services	1.2%	2.0%	2.4%	2.1%	2.1%
Ownership of Dwellings	3.9%	7.2%	6.1%	5.8%	7.7%
Total Gross Value Added	***95.8%***	***92.4%***	***93.6%***	***93.9%***	***91.6%***
Taxes less Subsidies	4.3%	7.6%	6.5%	6.1%	8.4%
Gross State / Regional Product	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Gross State / Regional Product ($M)	**$4,966.4**	**$2,287.3**	**$18,222.7**	**$25,476.4**	**$243,903.0**

Note: Gross Value Added (GVA) is equal to Gross State / Regional Product (GSP / GRP) minus taxes plus subsidies.
Source: AEC*group*

4.2.3 Key Regional Markets

4.2.3.1 Labour Market and Employment Characteristics

Labour Force and Employment

Key labour market characteristics for the Study Area and Queensland are presented in Table 4.4. The Mine Catchment had an unemployment rate of 2.8% in the December Quarter 2009, which was just over half as high as the Queensland figure (5.4%). The unemployment rate increased by 0.8 percentage points from the same period a year ago, driven by the effects of the global economic downturn. However, this was below the increase in the Queensland rate over the year (1.7 percentage points), reflecting the resilience of the regional economy.

In contrast to the Mine Catchment, the unemployment rate in the Abbot Point Catchment (6.8%) was higher than the Queensland figure of 5.4% in the December Quarter 2009. The Broader Service Area recorded an unemployment rate in line with the State figure of 5.4%. The unemployment rate in the Abbot Point Catchment increased faster in 2009 than the Queensland average, while the Broader Service Area recorded a smaller increase in the unemployment rate than Queensland.

The participation rate in the Mine Catchment is significantly higher than the other catchments and Queensland overall, likely as a result of residents living in the region in search of work, which may affect the ability of the local population to provide labour for the project.

Table 4.4. Labour Force and Employment, December Quarter 2009

Catchment	Labour Force	Participation Rate	Unemployed Persons	Unemployment Rate	Change 2008-09 [(a)]
Mine Catchment	20,286	81.8%	548	2.8%	0.8%
Abbot Point Catchment	18,888	68.9%	1,218	6.8%	1.9%
Broader Service Area	134,246	69.5%	7,050	5.4%	1.1%
Study Area	**173,420**	**70.7%**	**8,816**	**4.7%**	**1.1%**
Queensland	**2,354,400**	**68.7%**	**127,400**	**5.4%**	**1.7%**

Notes: (a) The % figures presented in this column are percentage point change figures.
Sources: Office of Economic and Statistical Research (2010).

Employment by Industry

Employment by industry data for the catchments highlights the differences in composition of the economies (refer to Table 4.5). The mining sector dominates employment for the Mine Catchment, providing approximately one quarter of jobs in the region. In the Abbot Point Catchment and the Broader Service Area mining still plays a much larger role than for the rest of Queensland, although is not as prominent as in the Mine Catchment. Agriculture is also a major employer for the Mine Catchment, employing almost five times the Queensland proportion of the workforce.

Accommodation is the largest employer in the Abbot Point Catchment, reflective of the region's stature as a tourism destination and the significant number of tourist resorts in the Whitsundays. Retail and agriculture are also key employers in the region, combining to employ almost a quarter of the workforce in the Abbot Point Catchment, compared to around 15% of workers in the Broader Service Area and Queensland.

The Broader Service Area's economy has a large proportion of workers employed in mining, with many residents working as Fly-In, Fly-Out (FIFO) or Drive-In, Drive-Out (DIDO) employees working in the Bowen Basin. The Broader Service Area has the highest proportion of manufacturing workers of the three catchments that make up the Study Area, reflecting Mackay's strong mining-related manufacturing base and industrial activity in Rockhampton.

Table 4.5. Employment by Industry, 2006

Industry	Mine Catchment	Abbot Point Catchment	Broader Service Area	Study Area	Queensland
Agriculture, forestry and fishing	13.4%	11.4%	4.5%	6.5%	3.5%
Mining	24.0%	4.7%	8.5%	10.2%	1.7%
Manufacturing	3.5%	6.3%	8.9%	7.9%	10.1%
Electricity, gas, water and waste services	0.6%	0.9%	1.7%	1.5%	1.1%
Construction	9.9%	9.1%	7.8%	8.2%	9.0%
Wholesale trade	2.6%	2.6%	4.1%	3.7%	4.1%
Retail trade	8.3%	12.2%	11.9%	11.5%	12.0%
Accommodation and food services	5.9%	16.9%	7.3%	8.1%	7.1%
Transport, postal and warehousing	4.6%	6.8%	5.8%	5.7%	5.1%
Information media and telecommunications	0.4%	0.6%	0.9%	0.8%	1.5%
Financial and insurance services	1.1%	1.4%	2.0%	1.8%	3.0%
Rental, hiring and real estate services	1.3%	2.3%	1.8%	1.8%	2.2%
Professional, scientific and technical services	2.6%	3.2%	3.9%	3.7%	5.9%
Administrative and support services	1.8%	3.1%	2.1%	2.1%	3.1%
Public administration and safety	5.1%	3.5%	5.4%	5.2%	6.9%
Education and training	6.0%	5.1%	8.5%	7.8%	7.9%
Health care and social assistance	4.4%	6.3%	9.7%	8.6%	10.6%
Arts and recreation services	0.4%	0.9%	0.7%	0.7%	1.4%
Other services	3.9%	3.1%	4.5%	4.3%	3.9%
Total (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Total Number	**16,698**	**13,554**	**92,012**	**122,264**	**1,737,619**

Sources: Australian Bureau of Statistics (2007).

Employment by Occupation

The Mine Catchment has a high proportion of managers and machinery operators and drivers when compared to the other regions and Queensland, representative of the region's strength in agriculture and mining (refer to Table 4.6). The Mine Catchment has a lower proportion of professionals, community and personal service workers, and sales workers compared to Queensland, highlighting the region's relatively low level of business and community related services and the reliance of the region on accessing these services from the Broader Service Area.

The Abbot Point Catchment has a higher proportion of labourers and machinery operators and drivers compared to Queensland, primarily reflecting the skill sets required at the region's export loading facilities, sugar cane and horticulture operations, and a range of services supporting the tourism market. The Abbot Point Catchment also has a higher proportion of managers, which is typical of an economy with a high reliance on agriculture with owner manager operations. By comparison, Queensland has a considerably higher proportion of professionals, which is consistent with the Abbot Point Catchment's blue collar industry structure.

The Broader Service Area has a considerably higher proportion of technicians and trades workers and machinery operators and drivers than Queensland, reflective of the region's highly developed mining and heavy industry manufacturing sectors. The Broader Service Area also has a higher proportion of professionals when compared to the other catchments, however, the catchment has a lower proportion of professionals compared to Queensland.

Table 4.6. Employment by Occupation, 2006

Occupation	Mine Catchment	Abbot Point Catchment	Broader Service Area	Study Area	Queensland
Managers	17.5%	14.8%	11.3%	14.5%	12.6%
Professionals	9.9%	10.3%	13.5%	11.2%	17.5%
Technicians and trades workers	18.5%	17.0%	19.2%	18.2%	15.6%
Community and personal service workers	5.4%	9.2%	8.0%	7.6%	9.3%
Clerical and administrative workers	10.6%	10.6%	13.4%	11.5%	15.0%
Sales workers	6.4%	9.7%	9.4%	8.5%	10.5%
Machinery operators and drivers	18.7%	10.0%	12.2%	13.6%	7.4%
Labourers	13.0%	18.4%	12.9%	14.8%	12.1%

Sources: Australian Bureau of Statistics (2007).

Average Income by Industry

While the mining industry dominates employment in the Mine Catchment, mining workers that live in the area are paid less than those that live in the Abbot Point Catchment, the Broader Service Area and Queensland as a whole (refer to Table 4.7). By comparison, employees in the agriculture, forestry and fishing industry earn considerably more on average in the Mine Catchment than in Queensland. Similarly, employees in the agriculture, forestry and fishing industry, as well as accommodation and food services industry, earn more on average in the Abbot Point Catchment than in Queensland, although the other sectors' employees earn on average less than the Queensland.

Within the Broader Service Area, employees in key sectors of mining, transport, postal and warehousing and manufacturing earn more on average per week than employees in these industries elsewhere in Queensland. By comparison, employees in business and consumer related services typically are paid less per week than their counterparts elsewhere in Australia.

Table 4.7. Average Weekly Individual Income by Industry, 2006

Industry	Mine Catchment	Abbot Point Catchment	Broader Service Area	Study Area	Queensland
Agriculture, forestry and fishing	$775	$669	$662	$666	$622
Mining	$1,320	$1,732	$1,837	$1,431	$1,722
Manufacturing	$757	$664	$861	$744	$832
Electricity, gas, water and waste services	$729	$1,128	$1,126	$985	$1,241
Construction	$925	$935	$1,019	$928	$938
Wholesale trade	$983	$728	$1,044	$866	$844
Retail trade	$513	$485	$463	$486	$527
Accommodation and food services	$426	$538	$436	$466	$463
Transport, postal and warehousing	$758	$866	$907	$837	$886
Information media and telecommunications	$478	$758	$519	$583	$943
Financial and insurance services	$814	$677	$679	$681	$1,065
Rental, hiring and real estate services	$866	$854	$973	$846	$939
Professional, scientific and technical services	$827	$861	$930	$823	$1,105
Administrative and support services	$579	$635	$578	$587	$672
Public administration and safety	$789	$815	$812	$803	$968
Education and training	$724	$761	$743	$751	$829
Health care and social assistance	$680	$662	$665	$652	$793
Arts and recreation services	$477	$620	$413	$510	$632
Other services	$677	$611	$719	$653	$640
Total	**$742**	**$789**	**$810**	**$752**	**$877**

Sources: Australian Bureau of Statistics (2007).

4.2.3.2 Housing and Land Market

Property Sales and Prices

Data on property sales prices in the Study Area is summarised in Table 4.8. Median house prices in the Mine Catchment area jumped by almost 10% between December 2008 and December 2009. The Abbot Point Catchment saw a comparatively modest increase of 3.9% over the same period, while prices in the Broader Service Area declined marginally. Unit / townhouse sales in the Mine Catchment grew by over 5% over the year to December 2009, in contracts to the Abbot Point Catchment, which decreased at a similar rate. While unit / townhouse prices in the Service Area remained relatively static. Vacant land prices in the Mine Catchment grew by 10% to December 2009, with the Broader Service Area also seeing growth of over 6.5%. Vacant land prices in the Abbot Point Catchment decreased by over 6% in this time.

Table 4.8. House and Land Prices, December Quarter 2009

Catchment	House		Vacant Land		Unit / Townhouse	
	Value ($)	Annual % Change	Value ($)	Annual % Change	Value ($)	Annual % Change
Mine Catchment	$325,096	9.6%	$125,000	10.0%	$317,500	5.5%
Abbot Point Catchment	$422,500	3.9%	$150,000	-6.1%	$365,000	-4.3%
Broader Service Area	$370,437	-0.8%	$157,400	6.6%	$262,273	0.8%
Study Area	**$372,677**	**4.2%**	**$144.133**	**3.5%**	**$314,924**	**0.7%**

Note: Queensland medians are not commonly reported by REIQ. Figures were unavailable for some areas of the catchments due to the small number of sales.
Source: Real Estate Institute of Queensland (2010).

Data from the Real Estate Institute of Queensland (2010) indicates that over the five years to December 2009, house prices in Barcaldine LGA have increased by approximately 286.1%. In the Central Highlands LGA, house prices and unit / townhouse prices have increased by 100.3% and 103.8%, respectively, over the past five years, while the price of urban vacant land has increased by 175.0%.

In the Abbot Point Catchment, house prices in Whitsunday LGA have increased by approximately 110.5%. This contrasts with the more subdued growth for unit / townhouse prices and vacant urban land of 20.5% and 31.9%, respectively, over the past five years.

In the Broader Service Area, house prices in Isaac LGA have increased by approximately 166.7%. Some towns have recorded an increase of above 300% over this period, including Clermont (328.0%) and Dysart (341.6%). Vacant urban land prices have also increased significantly in Isaac LGA, by 281.0% over the past five years. Property prices in the Mackay LGA and Rockhampton LGA have also increased considerably over the past five years. In the Mackay LGA, house prices, unit / townhouse prices and vacant urban land prices have increased by 71.9%, 78.8% and 66.3%, respectively, while in Rockhampton LGA these types of property have increased in price by 107.9%, 89.7% and 52.6%, respectively.

By comparison, over the past five years in the Brisbane Statistical Division:

- House prices have increased by 38.2%;
- Unit / townhouse prices have increased by 42.5%; and
- Vacant urban land prices have increased by 38.7%.

Residential Approvals

The Mine Catchment area saw an increase in residential approvals over the year to December 2009, with the increased number of approvals matched with a rise in value (refer to Table 4.9). This strong result has largely been driven by speculative investors seeking to develop residential property in the Mine Catchment in expectation of rental returns should some of the proposed mining developments for the region proceed.

Residential approvals decreased by over 18% in the Broader Service Area over the same period, with approvals in Queensland down by almost a quarter, as the global economic downturn stalled a number of residential developments across Queensland and Australia. The Abbot Point Catchment recorded a drop in approvals of over 12%, but the value of approvals increased by almost 40%, indicating larger scale constructions in the region.

Table 4.9. New Residential Building Approvals, YE December 2008 to YE 2009

Catchment	No. of New Approvals			Value of New Approvals ($'M)		
	YE Dec 08	YE Dec 09	% Change	YE Dec 08	YE Dec 09	% Change
Mine Catchment	144	278	93.1%	$35.5	$68.0	91.5%
Abbot Point Catchment	287	252	-12.2%	$80.6	$112.1	39.1%
Broader Service Area	1,707	1,390	-18.6%	$465.5	$398.0	-14.5%
Study Area	**2,138**	**1,920**	**-10.2%**	**$581.6**	**$578.2**	**-0.6%**
Queensland	**36,651**	**28,261**	**-22.9%**	**$10,000.5**	**$6,985.2**	**-30.2%**

Source: Australian Bureau of Statistics (2010b).

Median Weekly Rents

Data on median weekly rents (refer to Table 4.10) shows that over the year to December 2009, weekly rents for three bedroom houses in the Abbot Point Catchment declined by almost 8%, despite an increase of new bonds over that time. Rents for units / townhouses in the Abbot Point Catchment increased marginally over the same period, while the number of new bonds grew by over 15%. This may indicate the supply of rental properties has increased in the region above growth in demand during the past year.

Median rent for houses in the Broader Service Area remained steady, while the number of new bonds fell. Rents for units and townhouses grew slightly, while the number of new bonds fell by over 6%.

Table 4.10. Residential Rental Market, YE December 2009

Catchment [(a)]	Median Weekly Rents		New Bonds	
	Value ($)	Annual % Change	Number	Annual % Change
Abbot Point Catchment				
House	$350	-7.8%	155	2.0%
Unit / Townhouse	$280	1.8%	165	15.4%
Broader Service Area				
House	$330	0.0%	478	-4.4%
Unit / Townhouse	$250	2.0%	710	-6.1%

Note: Data provided is for 3 bedroom houses and 2 bedroom units. (a) Data was not available for some catchment areas – the figures above should be treated as a guide only.
Source: Residential Tenancies Authority (2010).

Additional context for the property market within the Study Area is provided in section 5.4.

4.2.3.3 Construction Services and Building Inputs Market

Comparison of Queensland's construction price index with Australia (refer to Table 4.11) indicates that over the past six years construction prices in Queensland have generally increased at a faster rate across house, other residential building, non-residential building and roads and bridges construction prices, with roads and bridges experiencing the largest index point change over the period.

Table 4.11. Construction Price Index, December Q 2009

Catchment / Price Indicator	December 2009	Index Point Change 2008-09	Index Point Change 2003-2009
Queensland			
House	167.7	0.4	30.7
Other Residential	150.5	-18.2	20.7
Non – Residential	156.8	-16.8	26.3
Road and Bridge	169.7	-5.0	42.7
Australia			
House	156.3	4.0	26.5
Other Residential	149.7	-8.5	18.4
Non – Residential	153.0	-5.2	22.7
Road and Bridge	158.8	0.6	33.6

Source: Australian Bureau of Statistics (2010c).

Generally the construction materials market is highly global with many materials imported from interstate and overseas. Employment in construction in Queensland has generally been steadily growing over the past six years, however, at a regional level is highly variable and fluctuates depending on short-term contracts and investment occurring at a particular point in time. This is a reflection of the relatively mobile nature of construction workers.

On a regional level the Rawlinsons Building Price Index[4] indicates that the price of building inputs in Emerald is 20% higher than the cost for building inputs in Brisbane (Rawlinsons, 2010). Building inputs cost 10% more in Bowen than those in Brisbane, while Mackay and Rockhampton are 5% and 3% higher than Brisbane, respectively.

4.2.4 Key Infrastructure in the Local Region

Existing and proposed infrastructure for the project site and area includes the following:

- **Water**: Water in the region can be sourced from bores, mine dewatering, Lake Dalrymple or possible dams on the Belyando or Connors Rivers. Lake Dalrymple is

[4] A guide to percentage variation in building costs and includes costs labour and building materials inputs.

located 125 km south-west of Townsville, has a capacity of 1,186,000ML and is operated by SunWater;

- **Wastewater**: The mine site is not currently sewered, meaning wastewater produced from the mine operations will require wastewater infrastructure. Treatment facilities will need to be constructed on-site to cater for the mine's operation;
- **Transport**: The principal road in the region is the Capricorn Highway, which runs from Rockhampton West through Blackwater, Emerald, Alpha, Jericho and Barcaldine to Longreach. Existing rail transport in the region is not sufficient for transporting large quantities of coal to port, meaning rail infrastructure will be needed for the project;
- **Electricity / power**: The mine area is traversed by the existing Lilyvale - Clermont-Barcaldine 132 kV powerline owned by Ergon. Power may also be sourced from the proposed IsaLink HVDC line. This line involves the construction of 1,100 km of transmission line, part of which is proposed to cross the Galilee Basin; and
- **ICT**: Information and communications infrastructure in the region is limited to copper wiring.

4.2.5 Regional Resources and Competitive Advantages

Easily Accessible Coal

The Bowen Basin is one of Australia's principal black coal producing basins, with an estimated 24 gigatons of demonstrated and inferred reserves lying under a thin layer of younger sediments (Geoscience Australia *et al*., 2010). The Galilee Basin is one of Australia's largest relatively unexplored resource regions, and has attracted significant interest and exploration in recent years. In December 2008, the Galilee Basin was estimated to have around 6 gigatons of demonstrated and inferred thermal coal reserves (Geoscience Australia *et al*., 2010).

Emerging Coal-Seam Gas Industry

The Surat and Bowen Basins are the centre of Queensland's emerging coal-seam gas (CSG) industry, with proposed projects across Queensland potentially generating over 50 million tonnes per annum. In December 2008, Economic demonstrated resources (EDR) of CSG reached 15,714 petajoules (PJ) in Queensland, with the Surat Basin accounting for 61% or 10,273 PJ and the Bowen Basin accounting for approximately 34% or 5,441 PJ (Geoscience Australia *et al*., 2010). Considerable exploration is currently underway in both the Bowen and Galilee Basins.

Skilled and Available Workforce

The Broader Service Area's established manufacturing and construction industries have created a large pool of skilled workers for the development of infrastructure projects, with many workers basing themselves in Mackay and Rockhampton and operating as FIFO / DIDO workers on remote jobs. This gives the area a competitive advantage in sourcing labour.

Existing Port Infrastructure

The proximity of the Bowen Basin to port facilities at Abbot Point, Hay Point, Dalrymple Bay and Gladstone gives it a competitive advantage over more remote coal supplies in Queensland, cutting transport costs for coal. In comparison, the Galilee Basin still requires additional port and rail infrastructure in order to develop, however the Galilee Basin's geology is such that underground mining will be relatively cost-effective. High overseas demand for thermal coal also makes the Galilee Basin an attractive development proposition.

Well-Developed Tourism Infrastructure

The Abbot Point Catchment has significant tourist infrastructure, in particular in the Whitsunday Islands and Airlie Beach which attract over 600,000 tourists every year (Tourism Whitsundays, 2010).

4.2.6 Key Industries

4.2.6.1 Mine Catchment

Mining

Mining is the dominant industry in the Mine Catchment, contributing almost two thirds of GRP in 2008 / 09 ($3.2 billion / 63.4% of GRP) and nearly a quarter of total employment (24.0%). The dominance of mining in the area reflects the wealth of resources and mining activity in the broader region, in particular the Bowen Basin, as well as exploration activity in the Galilee Basin.

Mining in the Mine Catchment is currently centred in the Central Highlands LGA. Emerald is increasingly becoming recognised as a key service centre to the mining industry with a sizable, mobile contractor base. Despite this, average incomes for mine workers in the Mine Catchment ($1,320 per week) are below the Abbot Point Catchment, Broader Service Area and Queensland averages for mine workers.

Agriculture (Beef Cattle)

Despite an estimated contribution of only 3.3% of total GRP in 2008 / 09 ($162.4 million), the agriculture industry is a major employer in the Mine Catchment accounting for 13.4% of total employment in the region. Beef cattle is the prominent agricultural activity in the Mine Catchment, in particular in the Barcaldine LGA which encompasses vast tracts of grazing land. Broad-acre grain crops and irrigated cotton are also grown in the Central Highlands LGA.

4.2.6.2 Abbot Point Catchment

Mining

The Abbot Point Catchment incorporates the northern tip of the Bowen Basin and has a number of coal mines operating within its borders. Mining produced almost a quarter of the Abbot Point Catchment's GRP in 2008 / 09 ($510.7 million / 22.3% of GRP), and accounted for approximately 4.7% of total employment, indicating the importance of the industry to the region. Mine workers in the Abbot Point Catchment earned over $100 a week above the Queensland average.

Transport, Postal and Warehousing

The Abbot Point Coal Terminal is one of Australia's major coal exporting terminals, with a current capacity of 25 Mtpa and plans in place for expansion to double export capacity to 50 Mtpa, and feasibility studies for the further expansion of facilities to 80 and 110 Mtpa. The Whitsundays significant tourism industry further supports the transport, postal and warehousing sector.

In total, the Abbot Point Catchment's transport, postal and warehousing produced 11.4% of the region's GRP in 2008 / 09 ($261.8 million), and accounted for 6.8% of the region's total employment.

Construction

Construction is a major industry for the Abbot Point Catchment, producing an estimated 9.5% of GRP in 2008 / 09 ($217.8 million) and accounting for approximately 9.1% of total employment. This strength of this sector is driven by the mining industry and associated infrastructure development in the region (e.g., Abbot Point Coal Terminal expansion and rail infrastructure), as well as tourism related construction developments, in particular resort-style developments.

Agriculture

Agriculture is a key employer in the Abbot Point Catchment, accounting for 11.4% of total employment in the region. Sugar cane is the key commodity grown in the Proserpine area, while horticulture and grazing are key sub-sectors in the Bowen region.

4.2.6.3 Broader Service Area

Mining

Mining is a major producer in the Broader Service Area, in particular in Isaac LGA, which encompasses the majority of coal operations in the Bowen Basin. Mining produced approximately $6.3 billion of the Broader Service Area's GRP in 2008 / 09, accounting for over one third of total GRP. Of this, approximately $5.2 billion was produced in Isaac LGA.

The mining industry employs approximately 8.5% of workers in the Broader Service Area, with the average wage for mining workers the highest within the Study Area and above the Queensland average. The higher salaries paid in the Primary Catchment can be partially attributed to recent increases in demand for mining employees and resultant skills shortages in the region, which has placed upward pressure on wages and salaries in the region (Rolfe *et al*., 2007; Petkova *et al*., 2009).

Transport, Postal and Warehousing

The transport, postal and warehousing sector is a major contributor to the Broader Service Area's economy. The central geographic location of the Broader Service Area as well as the established port infrastructure gives the transport and warehousing sector competitive advantages over other regions.

The sector is estimated to have contributed 8.5% ($1.5 billion) to GRP in the Broader Service Area in 2008 / 09, and 5.8% of total employment. The average wage in the Broader Service Area for transport, postal and warehousing workers is higher than for transport workers in the other catchment areas and Queensland.

Manufacturing

The Broader Service Area has a sizable mining support sector, in particular mining-related manufacturing in Mackay. Rockhampton has a well developed industrial sector catering to food manufacturing and minerals processing, while there is some sugar cane milling and processing in Sarina. The manufacturing sector contributed an estimated $1.0 billion to GRP in 2008 / 09 (5.7% of GRP), and accounted for 8.9% of total employment.

Agriculture

Agriculture contributed an estimated $294.5 million to the Broader Service Area's GRP in 2008 / 09, and 4.5% of employment. Beef cattle grazing and sugar are the key agricultural activities in the Broader Service Area.

4.3 Description of Other Proposed Major Projects

The China First Project's Study Area has a significant number of projects currently proposed and / or being investigated for development over the next five years. Table 4.12 outlines the range of significant projects located wholly or partly within the China First Project's Study Area, as declared by the Queensland Government.

As can be seen from this list of projects, there is significant interest in developing coal resources in the Bowen and Galilee Basins, as well as additional rail and port infrastructure to transport coal to port facilities for export to overseas markets. There is also considerable interest in developing CSG to support the production of Liquefied Natural Gas (LNG).

In addition to the projects currently undergoing an EIS process, there are a number of other projects that are currently under study or being investigated for the region, including a range of coal, energy and infrastructure related projects.

Where the significant interest in coal, CSG and LNG projects materialises into on-ground activity, demand for construction labour and resources is likely to increase considerably within the China First Project's Study Area, which may affect the ability of other projects to source appropriately skilled workers and will likely place upward pressure on labour prices.

An assessment of cumulative impacts should a number of significant projects be developed concurrently is provided in Chapter 6.

Table 4.12. Significant Projects in the Study Area, 2010

Project	Location	Capital Expenditure $billion	Construction Jobs	Commence Construction	Commence Operation
Abbot Point Expansion Project (Port Infrastructure)	Port of Abbot Point Coal Terminal	$0.68	950	In progress	2011
Abbot Point Multi-Cargo Facility (Port Infrastructure)	Abbot Point State Development Area	$1.8	300	Not specified	Not specified
Alpha Coal Project (Coal and Export Infrastructure)	Mine located 40 km northwest of Alpha, port facilities at Abbot Point and rail line linking the two	$7.5	2,500	2011	2013
Australia Pacific LNG Project (LNG)	LNG facility in Gladstone, with gas supplied from the Bowen and Surat Basins	$35.0	4,000	2011	2014
BMA Bowen Basin Coal Growth (Coal and Infrastructure)	Moranbah	$5.0	2,550	2010	2020
Codrilla Coal Mine Project (Coal)	45 km southwest of Nebo	$0.15	170	Not specified	Not specified
Connors River Dam and Pipelines (Infrastructure)	70 km south of Sarina	$0.82	570	Q2 2011	2014
Drake Coal Project (Coal)	17 km south of Collinsville	Not specified	400	2012	2013
Eagle Downs Coal Project (Coal)	20 km southeast of Moranbah	$1.0	Not specified	2011	2012
East Coast Alumina Refinery and Port (Refinery and Port Infrastructure)	Abbot Point State Development Area	$3.36	2,500	Not specified	Not specified
Ellensfield Underground Coal Project (Coal)	Halfway between Coppabella and Moranbah	$0.6	250 - 300	Mid 2011	2012
Ensham Central Coal Project (Coal)	40 km northeast of Emerald	$1.0	700	2010	2010
Galilee Basin Power Station (Power)	30 km northwest of Alpha	$1.25	1,000	2012	2017
Grosvenor Coal Project (Coal)	Moranbah	$1.0	Not specified	Not specified	Not specified
IsaLink High Voltage DC Transmission (Infrastructure)	Rockhampton to Cloncurry	$0.8	300	Not specified	Not specified
Kevin's Corner Coal Project (Coal)	55 km north of Alpha	$4.0	2,500	2011	2013
Millennium Expansion Project (Coal)	22 km east of Moranbah	Not specified	Not specified	2011	Not specified
New Saraji Underground Coal Project (Coal)	10 km northeast of Dysart	$1.0	Not specified	2010	2011
Shell Australia LNG Project (LNG)	LNG facility in Gladstone, with gas supplied from the Bowen and Surat Basins	Not specified	3,000	2012	2015
Shute Harbour Marina Development (Tourism and Marina Infrastructure)	Shute Harbour, Whitsundays	$0.24	200	2011	2013
South Galilee Coal Project (Coal)	Immediately southwest of Alpha	$1.5	2,000	2012	2015
Water for Bowen (Infrastructure)	Burdekin River to Bowen	$0.415	120	Q4 2010	Q4 2012
ZeroGen Project (Electricity)	Southern Bowen Basin	$4.3	2,000	2012	2015

Source: Queensland Department of Environment and Resource Management (2010), Queensland Department of Infrastructure and Planning (2010), Heavy Engineering Industry Reference Group (2010).

5. Economic Impact Assessment

The following assessment examines the economic impacts of the China First Project within the project's Study Area as well as in Queensland. The economic impact assessment addresses the economic components of the EIS Terms of Reference as outlined in Table 2.1. This chapter utilises economic modelling outcomes presented in **Appendix B** as well as consultation with key stakeholders (including local Council, economic development organisations, industry bodies and local business) to inform the assessment of economic impacts as appropriate.

5.1 Impacts on Industry

5.1.1 Impacts on Industry Output and Value Added Activity

The China First Project will result in considerable additional output and value added activity throughout the project's life, both directly through capital expenditure for the development of the mine and associated downstream infrastructure and from the extraction and export of 40 Mtpa of coal once operational, as well as through flow-on activities to support the project and service additional population.

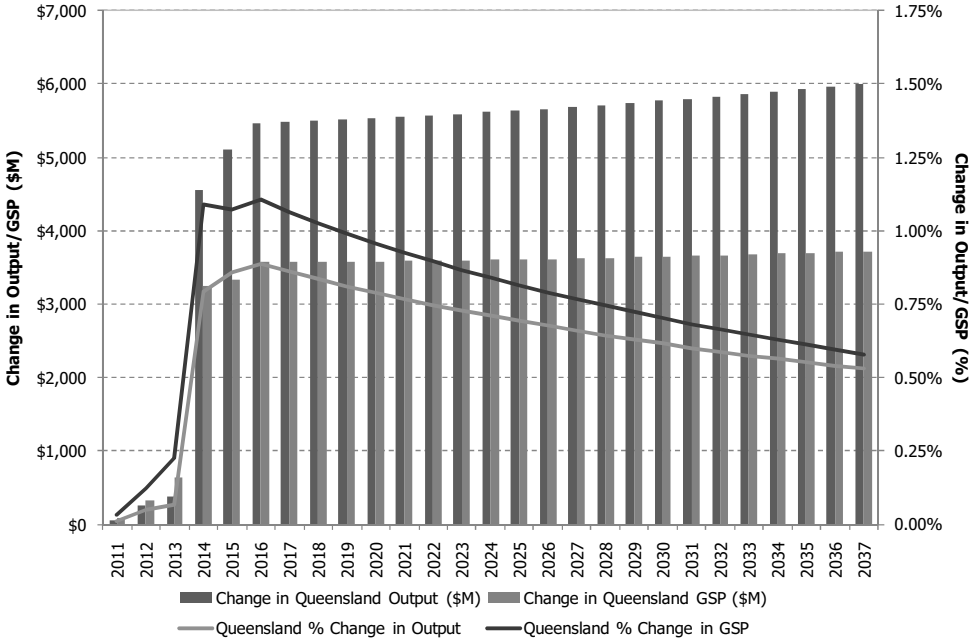
5.1.1.1 Impacts on Industry Output and Value Added Activity in Queensland

Figure 5.1 outlines the estimated impacts of the China First Project on total industry output and Gross State Product (GSP) within the Queensland economy between 2010 / 11 and 2036 / 37. As can be seen, during the 36 months of construction for the mine and associated downstream infrastructure the Queensland economy is estimated to record an increase in total industry output of approximately 0.04% on average above the baseline (without project) scenario, representing an average of approximately $231.9 million in additional output to the Queensland economy. GSP is estimated to increase by 0.1% over this period, with an estimated average increase in GSP of approximately $351.3 million over the three year period. GSP is estimated to increase by more than output during construction, reflecting a draw from lower value adding industries towards higher value adding industries.

During the first five years of operation, total industry output in the Queensland economy is estimated to be, on average, approximately 0.8% higher than would otherwise be realised if the China First Project does not proceed. This represents an increase in total industry output of approximately $5.2 billion per annum on average over the first five years of operation. Similarly, GSP is estimated to be approximately 1.1% higher over the first five years of operation than would be achieved without the China First Project, equivalent to an average increase in GSP of approximately $3.5 billion.

In dollar terms, once operational, the contribution to the Queensland economy attributable to the China First Project will remain relatively steady throughout the period to 2036 / 37 (approximately $5.5 billion to $6 billion in output and $3.6 billion to $3.7 billion in GSP). However, the percent change from the without project scenario for both total industry output and GSP are expected to trend towards the baseline over time, reflecting an expectation that the baseline economy will expand over the next 25 to 30 years regardless of whether the China First Project proceeds, and that over time some projects that would otherwise be displaced by the China First Project would be developed.

Figure 5.1. Impact on Queensland Total Industry Output and Gross State Product, Deviation from the Baseline (Without Project) Scenario



Source: Prime Research (unpublished).

Table 5.1 outlines the impacts of the China First Project on industry output by industry in Queensland across three timeframes – the initial three-year construction period, the first five years of operation and steady-state operations from 2018 / 19 to 2036 / 37.

During the initial three-year construction period, the construction sector is estimated to record the most significant increase in output above the base (without project) scenario of $568.6 million per annum on average, or 1.2%. Business, finance and insurance services ($176.1 million on average) and trade ($82.8 million on average) are also anticipated to record an increase in activity during the three years of construction, driven by a combination of increased demand for these services to supply the project as well as through additional household incomes and spending in the State.

Of note, ownership of dwellings is also estimated to record an increase in output above the base scenario during the construction phase ($16.2 million on average). Despite the project utilising a FIFO workforce and a worker camp to accommodate these workers, it is expected that some contractors and construction employees will seek accommodation outside of the worker camps, increasing demand for rental accommodation in the Study Area which will encourage investors to purchase and develop housing in the region. This is discussed in more detail in section 5.4.

During operation of the China First Project (2013 / 14 to 2036 / 37), revenue of approximately $4.6 billion per annum is estimated to translate to an overall increase in Queensland's mining sector output (above what would be achieved without the project) of approximately $4.5 billion per annum on average during the first five years of operation and approximately $4.8 billion per annum on average thereafter.

Associated with the increase in mining industry output will be an increase in demand for goods and services in Queensland, both in terms of support sectors supplying mining operations (e.g., transport and storage, business, finance and insurance services) as well as a range of services to support the workforce and Queensland population, primarily as a result of flow-on industry activity, additional household incomes and expenditure and Queensland Government revenues.

The significant increase in economic activity in the State will also result in a reallocation of some constrained resources, in particular labour, resulting in a potential overall "draw-

down" on some sectors (e.g., agriculture, public administration, defence, health and education, recreation and other services), particularly during the early stages of the project, during which the Queensland economy is adjusting to changes in its economic structure.

Of note, the manufacturing sector is estimated to record a considerable decline in overall industry output during operation. It is expected that the mining-related manufacturing sub-sector will benefit from the China First Project through demand for and provision of goods and services to support the project once operational. However, offsetting this it is anticipated the manufacturing sector will be one of the hardest hit sectors in terms of the reallocation and draw of labour to the China First Project given the relatively similar skills sets employed (refer to section 5.2.1.1). Further, the export of $4.6 billion of coal will likely place some upward pressure on Australia's exchange rate, which may impact on the global competitiveness of manufacturing goods produced in Australia (although this impact, if any, is likely to be small). As a result, overall manufacturing output is estimated to decline in Queensland relative to what would be achieved if the project does not proceed.

Table 5.1. Average Annual Impact on Industry Output in Queensland, Deviation from the Baseline (Without Project) Scenario

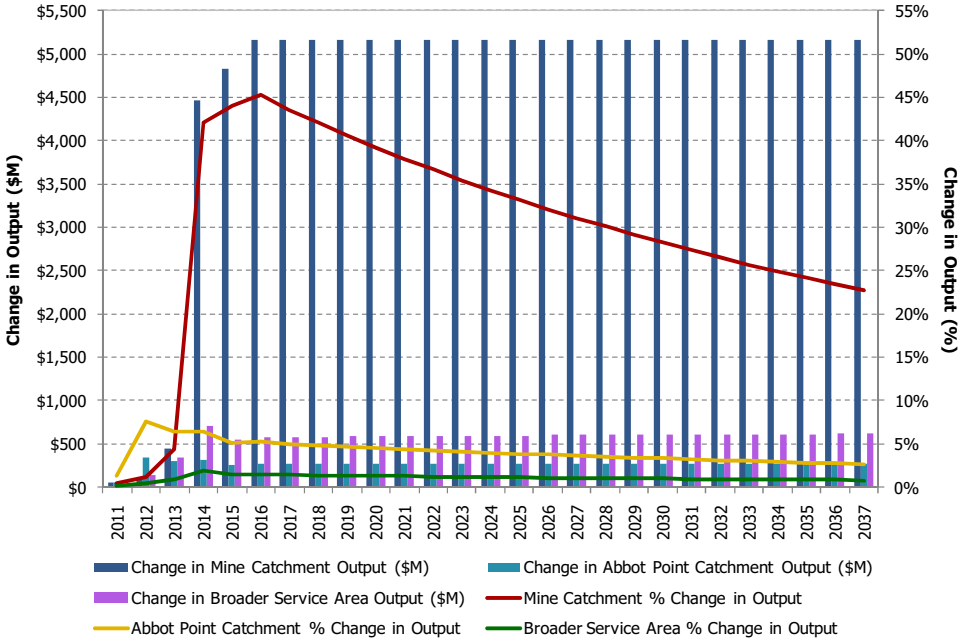
Industry	Change in Industry Output		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Output (%)			
Agriculture	-0.2%	-0.2%	-0.1%
Mining	-0.5%	8.0%	5.7%
Manufacturing	-0.2%	-1.0%	-0.7%
Electricity and water	-0.3%	-0.2%	0.1%
Construction	1.2%	0.2%	-0.1%
Trade	0.1%	0.4%	0.2%
Transport and storage	-0.2%	2.1%	1.6%
Business, finance and insurance services	0.2%	0.2%	0.1%
Public administration, defence, health and education	0.0%	0.3%	0.2%
Recreation and other services	0.0%	0.3%	0.3%
Ownership of dwellings	0.1%	0.9%	0.7%
Total Change in Industry Output (%)	**0.0%**	**0.8%**	**0.7%**
Change in Industry Output ($M)			
Agriculture	-$42.0	-$38.0	-$15.2
Mining	-$247.2	$4,506.8	$4,807.1
Manufacturing	-$209.3	-$1,249.4	-$1,050.8
Electricity and water	-$38.1	-$19.9	$23.7
Construction	$568.6	$92.5	-$82.7
Trade	$82.8	$331.2	$348.4
Transport and storage	-$64.0	$837.7	$890.6
Business, finance and insurance services	$176.1	$176.6	$155.4
Public administration, defence, health and education	-$7.7	$233.3	$231.1
Recreation and other services	-$3.6	$47.3	$58.1
Ownership of dwellings	$16.2	$303.4	$362.7
Total Change in Industry Output ($M)	**$231.9**	**$5,221.5**	**$5,728.3**

Source: Prime Research (unpublished).

5.1.1.2 Impacts on Industry Output Within the Project Study Area

Within the study area, Figure 5.2 shows that the Mine Catchment is expected to receive the greatest benefit in terms of additional industry output as a result of the China First Project, in particular during operation as the extraction of 40 Mtpa of high value coal resources boosts regional production in the region.

Figure 5.2. Impact on Industry Output in the China First Project Study Area, Deviation from the Baseline (Without Project) Scenario



Source: Prime Research (unpublished).

The sub-sections below examine the impacts of the China First Project on industry output within the project's Study Area in more detail.

Mine Catchment

Table 5.2 outlines the estimated impact of the China First Project on industry output within the Mine Catchment between 2010 / 11 and 2036 / 37. Key points of note include:

- The development of the mine is estimated to result in an increase in total industry output in the Mine Catchment of approximately 2.1% (on average) above baseline growth over the 36 months of construction. This represents, on average, approximately $205.4 million per annum in additional industry output in the Mine Catchment over this period;
- The increase in total industry output over the initial three year period is driven by a considerable increase in activity within the construction sector, averaging approximately 46.3% (or approximately $239.1 million) above what the sector would otherwise produce if the China First Project does not proceed;
- Construction activity is estimated to remain high during the first year of operation (2013 / 14) as mining activity and construction activity overlap;
- Once the mine is fully operational, construction activity is estimated to ease, yet remain approximately 2.5% above baseline industry expectations as the China First Project attracts supporting infrastructure and industry development, as well as residential development to accommodate people migrating to the region primarily as a result of flow-on industry development;
- During the first five years of operation, total industry output in the Mine Catchment is estimated to be, on average, approximately 43.4% higher than would otherwise be realised if the China First Project does not proceed. This represents an increase in total industry output of approximately $5.0 billion on average over the first five years of operation;
- The significant increase in industry output during operation is almost entirely driven by direct effects of additional output in the mining industry, which is estimated to be

approximately $4.8 billion (or 67.2%) higher, on average, than the baseline over the first five years of operation, and approximately $5.1 billion (or 47.0%) higher on average between 2018 / 19 and 2036 / 37;

- The increase in construction and mining industry output will support the development of other sectors in the value chain (e.g., manufacturing, transport and storage, business, finance and insurance services) as well as a range of services to support the workforce and people migrating to the region;
- The expansion and development of these industries will provide a local support network and value chain for mining in the Mine Catchment, in particular in the regional hubs of Emerald and to a lesser extent Barcaldine, which will benefit not only the China First Project but also potential future mining sector projects in the region. This is in line with current Council planning in these townships (R. Bauer, Executive Manager – Alpha Area, Barcaldine Regional Council, *pers. comm.*, 7 May 2010; A. Alyward, Manager Strategic Planning, Central Highlands Regional Council, *pers. comm.*, 4 May 2010); and
- Some sectors are expected to record a temporary decline in activity as a result of the considerable construction and mining activity in the region (e.g., agriculture, public administration, defence, health and education, recreation and other services), particularly during the early stages of the project, as a result of a reallocation of constrained resources.

Table 5.2. Average Annual Impact on Industry Output in the Mine Catchment, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Industry Output		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Output (%)			
Agriculture	-1.0%	-0.4%	0.0%
Mining	-1.4%	67.2%	47.0%
Manufacturing	11.1%	5.1%	2.3%
Electricity and water	-2.0%	1.6%	2.5%
Construction	46.3%	18.5%	2.5%
Trade	3.3%	2.1%	0.9%
Transport and storage	1.9%	4.1%	3.0%
Business, finance and insurance services	4.5%	2.7%	1.1%
Public administration, defence, health and education	-1.4%	-0.2%	0.3%
Recreation and other services	-3.4%	0.0%	1.3%
Ownership of dwellings	-1.6%	0.3%	0.6%
Total Change in Industry Output (%)	**2.1%**	**43.4%**	**30.7%**
Change in Industry Output ($M)			
Agriculture	-$9.1	-$3.7	-$0.4
Mining	-$86.6	$4,801.8	$5,095.0
Manufacturing	$25.7	$12.1	$6.5
Electricity and water	-$1.4	$1.3	$3.1
Construction	$239.1	$103.0	$23.3
Trade	$22.4	$15.9	$10.5
Transport and storage	$4.4	$10.1	$9.8
Business, finance and insurance services	$22.0	$14.0	$8.2
Public administration, defence, health and education	-$6.0	-$0.6	$1.9
Recreation and other services	-$1.5	$0.1	$1.1
Ownership of dwellings	-$3.7	$1.1	$3.0
Total Change in Industry Output ($M)	**$205.4**	**$4,955.0**	**$5,161.8**

Source: Prime Research (unpublished).

Abbot Point Catchment

Table 5.3 outlines the estimated impacts of the China First Project on industry output within the Abbot Point Catchment between 2010 / 11 and 2036 / 37. Key points of note include:

- The Abbot Point Catchment is estimated to record an average increase in industry output of approximately $235 million to $275 million above what would be achieved without the China First Project throughout the construction and operational phases of the project;
- Between 2010 / 11 and 2012 / 13, the construction industry is estimated to record an increase in industry output of approximately 94.7% (or $316.8 million) on average above the baseline (without project) scenario;
- Due to competition for constrained resources, most other sectors of the Abbot Point Catchment economy are estimated to record a reduction in industry output between 2010 / 11 and 2012 / 13 compared to what they would be expected to achieve if the China First Project does not proceed, with the notable exceptions of the business, finance and insurance services sector and the trade sector, which are estimated to receive an increase in output of approximately 11.1% (or $37.7 million) and 0.5% (or $4.5 million) on average, respectively, over the three year construction phase. The increase in industry output in these two sectors will be driven by supply of goods and services to the construction sector and its workforce during the construction phase;
- During operation, the transport and storage sector is estimated to record an increase of approximately $265 million to $280 million on average between 2013 / 14 and 2036 / 37, primarily though the stocking and export of coal at Abbot Point. This represents an increase above the baseline (without project) scenario of approximately 40.2% on average during the first five years of operation, and 32.3% on average thereafter; and
- As with the Mine Catchment, constraints on factors of production, in particular labour availability, are expected to result in a reallocation of economic activity from some sectors of the regional economy to supply the China First Project (e.g., agriculture, mining, manufacturing, recreation and other services).

Table 5.3. Average Annual Impact on Industry Output in the Abbot Point Catchment, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Industry Output		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Output (%)			
Agriculture	-2.5%	-0.5%	-0.1%
Mining	-4.4%	-0.9%	-0.5%
Manufacturing	-4.4%	-1.5%	-0.6%
Electricity and water	-6.2%	-0.3%	0.1%
Construction	94.7%	6.7%	-0.3%
Trade	0.5%	0.4%	0.3%
Transport and storage	-6.0%	40.2%	32.3%
Business, finance and insurance services	11.1%	1.0%	0.1%
Public administration, defence, health and education	-2.2%	0.0%	0.1%
Recreation and other services	-5.0%	-0.6%	-0.1%
Ownership of dwellings	-2.4%	0.9%	0.7%
Total Change in Industry Output (%)	**5.1%**	**5.3%**	**3.6%**

Industry	Change in Industry Output		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Output ($M)			
Agriculture	-$16.0	-$3.1	-$0.9
Mining	-$39.7	-$10.0	-$8.1
Manufacturing	-$14.4	-$5.5	-$2.8
Electricity and water	-$3.6	-$0.2	$0.1
Construction	$316.8	$24.1	-$2.0
Trade	$4.5	$3.9	$3.6
Transport and storage	-$35.5	$264.5	$279.9
Business, finance and insurance services	$37.7	$3.7	$0.7
Public administration, defence, health and education	-$6.2	$0.2	$0.7
Recreation and other services	-$3.0	-$0.4	-$0.2
Ownership of dwellings	-$5.3	$2.6	$3.5
Total Change in Industry Output ($M)	**$235.4**	**$279.6**	**$274.5**

Source: Prime Research (unpublished).

Broader Service Area

The estimated impacts of the China First Project on industry output within the Broader Service Area between 2010 / 11 and 2036 / 37 are outlined in Table 5.4. Key points of note include:

- Industry output is estimated to increase by approximately 0.5% (or $173.7 million) on average during the 36 months of construction, primarily through the supply of manufacturing goods (increase of 4.1% from the baseline scenario, or $163.1 million) and business services (1.6% or $47.8 million) to support construction of the project;
- Construction activity in the Broader Service Area is also estimated to increase during the three year construction period (approximately 1.7% on average, or $32.4 million). The Broader Service Area's construction sector will be supported by construction of the proposed rail line crossing though Isaac Regional Council, although it is anticipated that some construction employees that would otherwise be working in the region will be drawn to the Mine Catchment and Abbot Point Catchment for development of the mine and port facilities;
- Once operational, the Broader Service Area economy is estimated to record an increase in industry output of approximately $600 million between 2013 / 14 and 2036 / 37, representing an increase of 1.5% per annum on average during the first five years of operation and 1.1% per annum on average thereafter;
- Transport and storage is estimated to record the most significant increase in activity in the Broader Service Area of approximately 32.1% (or $544.1 million) on average during the first five years of operation and approximately 26.0% (or $570.1 million) on average thereafter. This increase will be driven by direct impacts through the transportation of coal from the mine to export facilities at Abbot Point, as well as through increased transportation of goods and services from and within the Broader Service Area to support mining and export activities;
- The industries of electricity, gas and water, trade and business, finance and insurance and ownership of dwellings are all estimated to benefit during operation of the China First Project, primarily as a result of providing support services to mining, transportation and export activities, as well as through increased incomes and consumption within the region; and
- Mackay provides a strong mining support services sector that has developed over many years to support mining activity in the Bowen Basin, in particular for engineering, heavy manufacturing and equipment needs. Development of the China First Project will provide these industries with an opportunity to expand to meet supply requirements of the project. However, as with the experience in Queensland overall, the Broader Service Area's manufacturing sector is estimated to record a slight decline in overall industry output during operation, primarily as a result of a

reallocation of skilled labour from some manufacturing sub-sectors to the China First Project.

Table 5.4. Average Annual Impact on Industry Output in the Broader Service Area, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Industry Output		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Output (%)			
Agriculture	-0.4%	-0.4%	-0.1%
Mining	-0.6%	-0.6%	-0.3%
Manufacturing	4.1%	-0.3%	-0.6%
Electricity and water	-0.4%	2.9%	2.2%
Construction	1.7%	0.9%	0.1%
Trade	0.6%	0.7%	0.4%
Transport and storage	-0.1%	32.1%	26.0%
Business, finance and insurance services	1.6%	1.8%	1.1%
Public administration, defence, health and education	-0.3%	-0.1%	0.0%
Recreation and other services	-0.8%	-0.5%	-0.2%
Ownership of dwellings	-0.2%	0.4%	0.3%
Total Change in Industry Output (%)	**0.5%**	**1.5%**	**1.1%**
Change in Industry Output ($M)			
Agriculture	-$11.4	-$12.5	-$4.6
Mining	-$59.1	-$68.3	-$64.8
Manufacturing	$163.1	-$14.3	-$27.9
Electricity and water	-$4.2	$37.0	$40.8
Construction	$32.4	$18.2	$2.1
Trade	$23.9	$32.7	$29.3
Transport and storage	-$1.3	$544.1	$570.1
Business, finance and insurance services	$47.8	$59.4	$50.7
Public administration, defence, health and education	-$10.1	-$1.7	$0.3
Recreation and other services	-$3.9	-$2.7	-$1.6
Ownership of dwellings	-$3.4	$7.7	$8.6
Total Change in Industry Output ($M)	**$173.7**	**$599.6**	**$603.0**

Source: Prime Research (unpublished).

5.1.2 Impacts on Local Businesses

5.1.2.1 Potential Beneficial Impacts on Local Business

The China First Project will generate widespread demand for goods and services, thereby presenting opportunities for local business to provide inputs and support the project, as well as to service the needs of the project's workforce. Section 5.1.1.2 outlines the impacts of the China First Project in terms of industry output within the Study Area, identifying that businesses in key industries supplying goods and services to the China First Project as well as permanent and temporary workers and their families locating in the region are likely to benefit as a result of additional industry and household consumption and expenditure (e.g., transport and storage, trade and business, finance and insurance services throughout the Study Area, as well as manufacturing in the Mine Catchment).

Additionally, the new rail infrastructure has the potential to assist in easing bottlenecks in the existing rail network by providing an additional standard gauge rail link between coal mines in the western Bowen Basin and export infrastructure. Bottlenecks in the rail network are recognised as a common issue by coal companies in the Bowen Basin, and negatively impact on Queensland's coal export capacity.

5.1.2.2 Potential Adverse Impacts on Local Business

While the China First Project is estimated to provide significant positive benefits in terms of additional business and industry output overall, some businesses will likely be adversely impacted by the project. Potential adverse impacts are examined below.

Adverse Impacts on Agriculture and Agricultural Management Practices

The China First Project could involve the acquisition of up to 55,000 hectares of land across six properties within the Mine Catchment for construction and operation of the mine. This land is primarily used for grazing, which will adversely impact the beef cattle industry that currently occupies the mine site via a reduction in productive land capacity. However, only three of the six properties will be directly impacted by above ground mining development and activity. The development of the underground mining operations on the other three properties will not preclude grazing activities on this land, providing some opportunity to continue agricultural activity on these properties.

The China First Project will also result in some disruption of property management practices for those properties intersected by the rail corridor, including potential impacts on land accessibility for land holders and livestock with restricted crossing between land parcels, additional costs for mustering, weed control and general property management (e.g., additional fuel usage, fencing, etc.), and the potential for 'land locking' of some land parcels (i.e., isolating or stranding some areas of land and thereby decreasing their commercial attractiveness and utilisation). This is discussed in more detail below.

Cattle properties are generally fenced according to how far cattle will walk in a day to drink water. Fenced areas larger than this typically result in under-utilisation of areas that are furthest from water points (except during the wet season).

The proposed railway will intersect some cattle properties between the Galilee Basin and Abbot Point, resulting in a change in paddock size and / or configuration. Where paddocks are divided by the railway, additional water points may be required to provide access to water either side of the railway, increasing management costs to farmers in terms of providing and maintaining watering facilities. Where the rail intersection results in paddocks being considerably smaller, re-fencing may be required to best arrange paddocks.

A railway may also warrant changes to fences so that cattle can move through the property and access cattle yards. In some cases it may be more practical to build new cattle yards so yards are located on either side of the railway.

Cropping properties intersected by the railway will also be adversely impacted. Cropping is a highly mechanised industry, with processes such as tilling, seeding, transplanting, weeding, spraying, watering, fertilising and harvesting all utilising tractors and machinery. In optimal conditions, farmers would typically configure tractor runs to minimise the number of runs and turns required in order to maximise efficiency, reduce time requirements and minimise damage to soil. Where the railway intersects properties this will likely decrease the efficiency of machinery operation, resulting in an increased number of passes required, time requirements and impacts on soil.

Impacts to each property will differ, but will invariably result in an impost on property managers and will likely increase costs of managing these properties. To fully understand impacts to each individual property, each property will need to be reviewed to understand how the property is currently managed (i.e., paddock utilisation, stock movements, bore placement and reliability, machinery passes, etc.) and any likely changes to management practices as a result of the railway. It will be important to understand the additional maintenance this will entail.

Impacts on property management are addressed in more detail in the Social Impact Assessment. Strategies for identifying and mitigating the impacts on agricultural management practices of individual properties are outlined in section 7.2.4.

Attraction and Retention of Staff

The China First Project is likely to attract employees from other local businesses and industries due to the high incomes on offer in the mining sector – the highest of any sector in Australia. Consultation with economic development bodies in the Study Area

identified that most low income paying industries encountered difficulties in attracting and retaining employees during the recent mining boom between 2003 and 2008 as mining companies could afford to pay considerably higher salaries (N. Pearce, CEO, Mackay Whitsunday REDC, *pers. comm.*, 15 April 2010; K. Porter, Chairperson, Mackay Chamber of Commerce, *pers. comm.*, 5 May 2010; S. Hobbs, General Manager, Central Highlands Development Corporation, *pers. comm.*, 5 May 2010).

Where local businesses are unable to attract and / or retain staff, this will impact on their capacity to sustain business productivity and limit potential for business growth.

Increased Business Costs and Reduced Profitability

The increase in competition for labour from the China First Project and capacity to pay higher wages will place pressure on local businesses to increase salaries and wages in order to retain and attract staff. The increase in labour costs will eat into business profitability, and will likely require businesses to either increase the prices of their goods and services or cut back on other expenses in order to recover costs. This may make some businesses operating on or near the margin unviable in the medium to long term, in particular those businesses that are price-takers and have little scope for increasing prices for their goods and services.

Impacts on International Market Competitiveness

The export of 40 Mtpa of coal generating an estimated $4.6 billion per annum in export revenues is expected to have an influence in terms of supporting Australia's exchange rate. While maintaining the strength of the Australian dollar can be viewed as a positive outcome, businesses that are exposed to international competition, either through high reliance on export markets or through competition with low cost imports, may be adversely influenced by the China First Project's positive effect on the exchange rate as a result of an erosion of their competitiveness in a global market.

However, it should be recognised the China First Project's influence on exchange rates is likely to be relatively small, with the $4.6 billion of exported LNG equating to approximately 2% of Australian exports in 2008 / 09 (refer to section 5.6). Key industries that typically compete in a global market and are influenced by movements in the exchange rate include manufacturing, some agricultural commodities and tourism-related sectors.

5.2 Impacts on Employment

5.2.1 Employment Generation

This section examines the impacts of China First Project in terms of employment generation, including both direct and flow-on job creation, as derived using CGE modelling. It should be noted that all employment estimates presented in this section are based on **place of work** rather than **place of usual residence**. A large proportion of both the construction and mining workforces are anticipated to operate on a FIFO basis, with many of these workers having a permanent residence in major service centres such as Brisbane, Mackay, Rockhampton or Emerald. As such, care should be taken in interpreting the employment estimates presented in terms of their implications for permanent versus temporary population change.

5.2.1.1 Employment Generation in Queensland

Construction of the China First Project will directly generate employment positions over a three year period for construction of the mine, rail infrastructure and coal transfer and export infrastructure. As outlined in Chapter 3, on average the three year construction phase is estimated to generate approximately:

- 2,500 employment positions per year for construction of the mine;
- 1,000 employment positions per year for construction of the rail infrastructure; and
- 2,500 employment positions over 18 months for construction of the port facilities (equating to an average of 1,250 over the three year construction period).

That is, the China First Project is estimated to generate a total of approximately 4,750 construction jobs per annum on average for the construction of the mine, rail-line and port facilities. However, it should be recognised that the construction sector is a highly dynamic industry characterised by relatively short term projects and contracts, and it is likely that a proportion of this generated employment will in fact provide a continuation of work for people currently employed in the construction industry, and in effect maintain activity that may otherwise be lost.

Modelling outcomes presented in Table 5.5 indicate that the China First Project is estimated to result in an additional 2,564 Full Time Equivalent (FTE) construction employment positions[5] per annum on average in Queensland during the three year construction phase that would otherwise not exist if the project does not proceed. This is considerably below the average annual 4,750 direct construction jobs generated by the project, and is reflective of the relatively tight labour market in Queensland and anticipated draw of construction labour from other projects (potentially resulting in some delays in other projects where they are unable to secure adequate resources).

Employment in construction in Queensland has generally been growing steadily over the past five years, however, at a regional level is highly variable and fluctuates depending on short-term contracts and investment occurring at a particular point in time. Given the relatively short-term nature of construction work and variable site locations, construction labour is typically highly mobile. As such, the construction phase of the China First Project will provide opportunities for not just the local construction workforce, but also construction workers elsewhere in the State and potentially throughout Australia.

The construction of the China First Project will also support employment in other sectors of the Queensland economy, in particular business, finance and insurance services (617 FTE employment positions above the baseline scenario) and trade (504 FTE employment positions above the baseline scenario). Constraints in labour availability is expected to result in a reallocation of labour between sectors, with some sectors estimated to record a "draw down" in employment compared to what would be anticipated without the project, in particular the mining, manufacturing, agriculture, electricity and water and transport and storage sectors.

Overall, the China First Project is estimated to result in an increase in employment in Queensland above what would be achieved without the project of approximately 2,975 FTE employment positions per annum on average over the three years of construction.

Table 5.5. Average Annual Impact on Queensland Employment by Industry, Deviation from the Baseline (Without Project) Scenario, 2010 / 11 to 2012 / 13

Industry	Change in Industry Employment 2010 / 11 – 2012 / 13	
	%	FTEs
Agriculture	-0.2%	-126
Mining	-0.6%	-258
Manufacturing	-0.1%	-188
Electricity and water	-0.5%	-97
Construction	1.1%	2,564
Trade	0.1%	504
Transport and storage	0.0%	-47
Business, finance and insurance services	0.2%	617
Public administration, defence, health and education	0.0%	5
Recreation and other services	0.0%	3
Ownership of dwellings	0.0%	0
Total Change in Industry Employment	**0.1%**	**2,975**

Note: Employment estimates presented in the table above are based on place of work, not place of usual residence.
Source: Prime Research (unpublished).

Once operational, the China First Project will generate employment positions for the operation of the mine, operation and maintenance of the rail infrastructure and operation

[5] One FTE employment position is equivalent to one employee working in full time work for a period of one year.

of the coal stockyards. Chapter 3 outlines that the operation phase will generate the following employment positions directly:

- 1,500 employment positions per year for operation of the mine;
- 60 employment positions per year for operation / maintenance of the rail infrastructure; and
- 150 employment positions per year for operation of the port facilities.

As is the case with mining output outlined in section 5.1.1.1, the overall increase in mining sector employment in Queensland is estimated to be less than the direct employment generation as a result of the potential draw of labour from other mines in the State and / or the potential that some other proposed mining projects in the State could be postponed if the China First Project proceeds (refer to Table 5.6). However, in contrast to output, the mining industry is not expected to be the main contributor to employment supported by the project, reflecting the industries considerably higher value per employee than any other sector. Overall employment in the mining industry in Queensland is estimated to increase by approximately 772 FTE employment positions per annum on average during the first five years of operation, and 788 FTE employment positions per annum on average thereafter.

Modelling outcomes, outlined in Table 5.6, suggest the Queensland public administration, defence, health and education sector is estimated to be a primary beneficiary of the China First Project, with an estimated increase in employment of approximately 1,964 FTE employment positions per annum on average above the baseline scenario during the first five years of operation, and 1,698 FTE employment positions per annum on average thereafter. These employment positions are expected to be supported by the significant additional Government revenues generated by the extraction and export of coal, as well as additional tax revenues through avenues such as payroll tax, company tax, personal income tax and goods and services tax (refer to section 5.6 for an overview of anticipated Government revenues generated by the China First Project). These additional Government revenues will provide additional funds to both State and Commonwealth Governments to provide a broad range of additional public, health and education services.

The trade sector is also estimated to record a considerable increase in employment above what would be expected to be achieved if the China First Project does not proceed. It is estimated that approximately 1,961 FTE employment positions per annum on average would be supported during the first five years of operation, and 1,763 FTE employment positions per annum on average thereafter, driven primarily by additional household incomes and expenditure on retail goods.

Transport and storage, business, finance and insurance services and recreation and other services are also estimated to record an increase in employment over and above what would be achieved without the China First Project, through a combination of additional demand for the supply of goods and services to support the China First Project and additional consumptive demand from the Queensland population.

Table 5.6. Average Annual Impact on Queensland Employment by Industry, Deviation from the Baseline (Without Project) Scenario, 2013 / 14 to 2036 / 37

Industry	Change in Industry Employment (%)		Change in Industry Employment (FTEs)	
	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Agriculture	-0.2%	-0.1%	-192	-120
Mining	1.7%	1.2%	772	788
Manufacturing	-0.8%	-0.6%	-2,215	-1,666
Electricity and water	-0.4%	0.1%	-70	20
Construction	0.2%	0.0%	575	-65
Trade	0.4%	0.2%	1,961	1,763
Transport and storage	0.5%	0.4%	662	643
Business, finance and insurance services	0.2%	0.1%	718	607
Public administration, defence, health and education	0.3%	0.2%	1,964	1,698
Recreation and other services	0.4%	0.3%	254	255
Ownership of dwellings	1.0%	0.7%	35	32
Total Change in Industry Employment	**0.2%**	**0.1%**	**4,464**	**3,954**

Note: Employment estimates presented in the table above are based on place of work, not place of usual residence.
Source: Prime Research (unpublished).

As highlighted in section 5.1.1.1, the manufacturing sector is expected to record a considerable reduction in activity and employment as a result of the China First Project, primarily as a result of a draw of labour from this sector to the China First Project. There is some compatibility in skills sets between the manufacturing, mining, construction and transport and storage sectors, and it is likely that some persons who would otherwise be employed in the manufacturing sector may transition to the higher paying mining, construction or transport and storage sectors if the China First Project proceeds.

The agriculture industry is also estimated to record a decline in employment compared to what would be achieved without the China First Project, primarily reflecting the likely draw of some agricultural workers to higher paying mining positions, as well as the take-up of some grazing land for development of the mine.

5.2.1.2 Employment Generation Within the Project Study Area

Modelling results outlined in Table 5.7 show that the China First Project is estimated to support, on average, approximately 3,958 FTE employment positions per annum in the Study Area above what would be achieved without the project during the three year construction phase. Almost half of these employment positions are estimated to be in the Mine Catchment (1,975 FTE employment positions per annum on average), 31.8% in the Abbot Point Catchment (1,260 FTE employment positions) and the remainder in the Broader Service Area (723 FTE employment positions).

The estimated 3,958 FTE employment positions supported in the Study Area are fewer than the 4,750 construction jobs directly generated by the project, reflective of the anticipated draw of labour from other sectors as well as other construction projects in a constrained labour market.

While some of the construction projects currently underway in the Mackay-Whitsunday region will either be completed or nearing completion by the time construction commences on the China First Project, there are a significant number of projects under consideration in Central Queensland (refer to section 4.3) that will compete with the China First Project for construction labour. As such, there will likely be limited potential for redeployment of existing crews in the region to build mining and related infrastructure for the China First Project, resulting in a relatively high requirement for labour sourced from outside the Study Area. This is examined in more detail in section 5.2.5.

Table 5.7. Average Annual Impact on Employment Within the Project Study Area, by Catchment, Deviation from the Baseline (Without Project) Scenario, 2010 / 11 to 2036 / 37

Industry	Change in Industry Employment		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Employment (FTEs)			
Mine Catchment	1,975	1,928	1,252
Abbot Point Catchment	1,260	224	124
Broader Service Area	723	669	451
Total Project Study Area (FTEs)	**3,958**	**2,821**	**1,827**
Proportion of Employment by Catchment (%)			
Mine Catchment	49.9%	68.3%	68.5%
Abbot Point Catchment	31.8%	8.0%	6.8%
Broader Service Area	18.3%	23.7%	24.7%
Total	**100.0%**	**100.0%**	**100.0%**

Note: Employment estimates presented in the table above are based on place of work, not place of usual residence.
Source: Prime Research (unpublished).

During the first five years of operation, the China First Project is estimated to support approximately 2,821 FTE additional employment positions per annum on average in the Study Area compared to the baseline scenario, with 68.3% in the Mine Catchment (1,928 FTE employment positions), 8.0% in the Abbot Point Catchment (224 FTE employment positions) and 23.7% in the Broader Service Area (669 FTE employment positions). Employment is expected to ease in the long term to 1,827 FTE employment positions above the baseline scenario, with similar splits between each employment centre.

The sub-sections below examine the impacts of the China First Project on employment within the project's Study Area in more detail.

Mine Catchment

Modelled employment impacts in the Mine Catchment are summarised in Table 5.8. Key points of note include:

- The China First Project is estimated to directly generate an average of approximately 2,833 construction jobs in the Mine Catchment each year during the three year construction phase (2,500 for the mine, and approximately one third of the 1,000 employees for construction of the rail line). Accounting for the draw of labour from other sectors and projects, employment in the construction sector is estimated to increase by approximately 75.2% compared to the baseline scenario during the three year construction phase, equating to an additional 1,874 FTE construction employment positions in the Mine Catchment;
- Some construction activity will overlap with operational activity of the project, supporting construction employment during the first year of mining operations, before easing to a long term average of 67 additional FTE employment positions in the construction industry above the baseline scenario;
- Mining employment is estimated to increase by 1,102 FTE employment positions above the baseline scenario on average during the first five years of operation, and 1,098 FTE employment positions thereafter. This is below the 1,500 direct mining jobs created by the project, which is attributable to a likely postponement of some other mining projects in the China First Project's Study Area if the project proceeds;
- Both construction and mining employment estimates include FIFO employees working in the Mine Catchment but residing permanently outside the region (e.g., Mackay, Rockhampton, Brisbane). Given the significant number of projects under consideration for the Central Queensland region, it is likely that a large proportion of the workforce will be sourced from outside the Study Area and employed on a FIFO basis;
- Flow-on impacts are estimated to result in an increase in employment in the Mine Catchment during construction and operation for the sectors of trade, business, finance and insurance services, manufacturing and transport and storage;

- Agriculture (including cropping, livestock and horticulture farming) is estimated to record a decline in employment compared to the baseline scenario across the construction and operation phases. Most farms in the Mine Catchment area, while family run, rely on hiring additional labour to assist manage and run the farms. Consultation indicates there are key concerns in the Mine Catchment, in particular in the Barcaldine Regional Council area, that farms in the region will struggle to attract and retain farm workers due to the higher salaries on offer in the mining industry (R. Bauer, Executive Manager – Alpha Area, Barcaldine Regional Council, *pers. comm.*, 7 May 2010); and
- Modelling outcomes suggest the deviation in agricultural employment from the baseline scenario is estimated to ease over time. This is a reflection of the difficulty the agriculture industry has encountered in retaining staff, in particular younger staff, which is anticipated to continue into the future regardless of whether the China First Project proceeds. This problem has been exacerbated over the past decade, largely due to the increase in low cost imports of a variety of agricultural commodities, limiting growth prospects, and the higher salaries of other industries such as mining. While this is an existing issue, given the region's reliance on the agriculture industry, in particular beef cattle, it will be important to develop strategies to minimise any potentially deleterious impact of the China First Project on employment retention in the agriculture industry.

Table 5.8. Average Annual Impact on Industry Employment in the Mine Catchment, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Industry Employment		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Employment (%)			
Agriculture	-1.2%	-0.4%	0.0%
Mining	-1.7%	19.5%	13.6%
Manufacturing	9.8%	3.6%	1.4%
Electricity and water	-2.6%	-0.4%	1.3%
Construction	75.2%	26.6%	1.8%
Trade	2.7%	1.3%	0.3%
Transport and storage	1.7%	2.9%	2.1%
Business, finance and insurance services	4.3%	2.1%	0.8%
Public administration, defence, health and education	-1.1%	-0.2%	0.2%
Recreation and other services	-2.9%	-0.3%	0.9%
Ownership of dwellings	0.0%	0.0%	0.0%
Total Change in Industry Employment (%)	**9.4%**	**8.5%**	**4.1%**
Change in Industry Employment (FTEs)			
Agriculture	-31	-12	-1
Mining	-87	1,102	1,098
Manufacturing	60	23	9
Electricity and water	-3	0	1
Construction	1,874	695	67
Trade	105	53	19
Transport and storage	17	30	25
Business, finance and insurance services	81	42	19
Public administration, defence, health and education	-35	-5	10
Recreation and other services	-6	-1	3
Ownership of dwellings	0	0	0
Total Change in Industry Employment (FTEs)	**1,975**	**1,928**	**1,252**

Note: Employment estimates presented in the table above are based on place of work, not place of usual residence.
Source: Prime Research (unpublished).

Abbot Point Catchment

Modelled employment impacts in the Abbot Point Catchment are summarised in Table 5.9. Key points of note include:

- Employment in the Abbot Point Catchment's construction sector is estimated to increase by approximately 55.6% or 1,040 FTE construction employment positions compared to the baseline scenario during the three year construction phase;
- The business, finance and insurance services, trade and transport and storage sectors are also estimated to record an increase in employment during the three year construction phase above the baseline scenario as a result of the China First Project; and
- Once operational, the China First Project will directly generate an estimated 210 transport and storage jobs in the Abbot Point Catchment, 150 for operation of the port facilities and 60 for operation of the rail. Accounting for a likely transfer of labour from other transport and storage businesses and projects, employment in the transport and storage sector is estimated to increase by approximately 142 FTE employment positions above the baseline scenario during the first five years of operation, and 131 FTE employment positions thereafter.

Table 5.9. Average Annual Impact on Industry Employment in the Abbot Point Catchment, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Industry Employment		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Employment (%)			
Agriculture	-2.6%	-0.5%	-0.2%
Mining	-4.8%	-1.1%	-0.5%
Manufacturing	-0.5%	-0.9%	-0.4%
Electricity and water	-3.4%	-0.1%	0.1%
Construction	55.6%	3.7%	-0.2%
Trade	2.3%	0.4%	0.1%
Transport and storage	3.0%	9.7%	7.6%
Business, finance and insurance services	11.8%	0.9%	0.1%
Public administration, defence, health and education	-1.1%	0.1%	0.1%
Recreation and other services	-1.7%	-0.7%	-0.4%
Ownership of dwellings	-0.8%	0.6%	0.5%
Total Change in Industry Employment (%)	**7.5%**	**1.2%**	**0.5%**
Change in Industry Employment (FTEs)			
Agriculture	-48	-10	-4
Mining	-41	-10	-8
Manufacturing	-4	-9	-4
Electricity and water	-3	0	0
Construction	1,040	74	-6
Trade	127	22	11
Transport and storage	41	142	131
Business, finance and insurance services	182	15	1
Public administration, defence, health and education	-27	2	4
Recreation and other services	-6	-3	-2
Ownership of dwellings	0	0	0
Total Change in Industry Employment (FTEs)	**1,260**	**224**	**124**

Note: Employment estimates presented in the table above are based on place of work, not place of usual residence.
Source: Prime Research (unpublished).

Broader Service Area

Modelled employment impacts in the Broader Service Area are summarised in Table 5.10. Key points of note include:

- Employment generation in the Broader Service Area is anticipated to be strongest during the three year construction phase, with construction of the rail line contributing directly to construction industry employment in the Broader Service Area and the region's strong manufacturing sector anticipated to benefit in terms of increased employment to produce goods and services to support the construction activities throughout the Study Area;
- The Broader Service Area's business, finance and insurance services and trade sectors are also estimated to record an increase in employment above the baseline scenario from development of the China First Project during the three year construction phase;
- During operation, the transport and storage, business, finance and insurance services, trade and electricity and water sectors are estimated to experience the most significant increase in employment, with these sectors providing support to both the China First Project in terms of goods and services, as well as to the anticipated increase in population and incomes;
- The mining and agriculture sectors are estimated to record the most significant loss in employment as a result of the China First Project. Some mining workers that would otherwise work within the Broader Service Area are likely to transition to the Mine Catchment, while employees of the agriculture sector are likely to be attracted to the China First Project due to the higher salaries paid; and
- Despite additional demand for mining-related manufacturing goods, manufacturing employment is also estimated to decline slightly over the long term compared to the baseline scenario, driven primarily by the China First Project's influence in terms of a draw of skilled labour from the manufacturing sector.

Table 5.10. Average Annual Impact on Industry Employment in the Broader Service Area, Deviation from the Baseline (Without Project) Scenario

Industry	Change in Industry Employment		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Employment (%)			
Agriculture	-0.4%	-0.4%	-0.2%
Mining	-0.7%	-0.8%	-0.5%
Manufacturing	4.2%	0.4%	-0.2%
Electricity and water	-0.5%	2.4%	1.9%
Construction	2.1%	1.0%	0.1%
Trade	0.4%	0.5%	0.3%
Transport and storage	-0.1%	3.8%	3.1%
Business, finance and insurance services	1.4%	1.5%	0.9%
Public administration, defence, health and education	-0.2%	0.0%	0.0%
Recreation and other services	-0.6%	-0.4%	-0.1%
Ownership of dwellings	-0.5%	-0.1%	0.0%
Total Change in Industry Employment (%)	**0.6%**	**0.5%**	**0.3%**

Industry	Change in Industry Employment		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Change in Industry Employment (FTEs)			
Agriculture	-24	-28	-15
Mining	-84	-103	-95
Manufacturing	416	38	-24
Electricity and water	-9	45	39
Construction	215	105	18
Trade	116	156	122
Transport and storage	-7	269	255
Business, finance and insurance services	168	195	144
Public administration, defence, health and education	-52	1	13
Recreation and other services	-15	-9	-4
Ownership of dwellings	0	0	0
Total Change in Industry Employment (FTEs)	**723**	**669**	**451**

Note: Employment estimates presented in the table above are based on place of work, not place of usual residence.
Source: Prime Research (unpublished).

5.2.2 Skills Requirements

During the three year construction period the Mine Catchment and Abbot Point Catchment are estimated to record an increase in demand for technicians and trade workers of more than 20% compared to the baseline scenario (refer to Table 5.11). Labourers will also experience a considerable increase in demand in the Mine Catchment (18.5%), although this is estimated to be milder in the Abbot Point Catchment (7.3%). Clerical and administrative workers in both the Mine Catchment and Abbot Point Catchment, managers in the Mine Catchment, and machinery operators and drivers in the Abbot Point Catchment are also estimated to experience an increase in demand of more than 5% above what would be expected to occur without the project during the three years of construction.

Key occupations that will be in highest demand during the construction period include:

- Construction managers;
- Engineering professionals;
- Building and engineering technicians;
- Fabrication engineering trade workers;
- Bricklayers, carpenters and joiners;
- Floor finishers and painting trades workers;
- Glaziers, plasterers and tilers;
- Plumbers;
- Electricians;
- Electronics and telecommunications workers;
- Wood trades workers;
- Accounting clerks and bookkeepers;
- Machine operators;
- Mobile plant operators; and
- Construction and mining labourers.

In the Broader Service Area, the larger labour pool and lower demand for labour during the construction period (refer to section 5.2.1.2) is estimated to result in relatively mild increases in demand across all occupation groups over the period.

Table 5.11. Average Annual Impact on Employment by Occupation Grouping Within the Study Area, Deviation from the Baseline (Without Project) Scenario, 2010 / 11 – 2012 / 13

Occupation Group	Change in Employment		
	Mine Catchment	Abbot Point Catchment	Broader Service Area
2010 / 11 – 2012 / 13			
Managers	6.3%	3.3%	0.4%
Professionals	2.3%	3.7%	0.4%
Technicians and trades workers	21.7%	21.0%	1.3%
Community and personal service workers	0.8%	1.4%	0.1%
Clerical and administrative workers	8.4%	8.0%	0.7%
Sales workers	4.3%	3.8%	0.8%
Machinery operators and drivers	3.7%	6.6%	0.4%
Labourers	18.5%	7.3%	0.7%

Source: Prime Research (unpublished).

During operation, labour demand is estimated to remain high compared to the baseline scenario in the Mine Catchment, in particular during the first five years of operation (refer to Table 5.12). Key occupation groupings will include:

- Technicians and trade workers (average of 13.9% above baseline between 2013 / 14 and 2017 / 18, easing to 5.1% in the long term); and
- Machinery operators and drivers (average of 12.5% above baseline between 2013 / 14 and 2017 / 18, easing to 8.0% in the long term).

Other occupation groupings, such as labourers, professionals and clerical and administrative workers will also experience a notable increase in demand over the operational period in the Mine Catchment.

By comparison, no occupational groupings in the Abbot Point Catchment or Broader Service Area are estimated to record an increase in employment demand of more than 2.2% above what would otherwise occur without the China First Project throughout the operational period.

Key occupations that will be in highest demand during the operation period include:

- Distribution and production managers;
- Engineering professionals;
- Natural and physical science professionals;
- Building and engineering technicians;
- Fabrication engineering trades workers;
- Mechanical engineering trades workers;
- Electricians;
- Contract, program and project administrators;
- Logistics clerks;
- Machine operators;
- Stationary plant operators;
- Mobile plant operators;
- Rail operators;
- Truck drivers; and
- Construction and mining labourers.

Table 5.12. Average Annual Impact on Employment by Occupation Grouping Within the Study Area, Deviation from the Baseline (Without Project) Scenario, 2013 / 14 – 2036 / 37

Occupation Group	Change in Employment		
	Mine Catchment	Abbot Point Catchment	Broader Service Area
2013 / 14 – 2017 / 18			
Managers	4.4%	0.6%	0.3%
Professionals	4.9%	0.8%	0.5%
Technicians and trades workers	13.9%	1.8%	0.7%
Community and personal service workers	1.0%	2.0%	0.4%
Clerical and administrative workers	6.1%	1.8%	0.8%
Sales workers	2.2%	0.9%	0.8%
Machinery operators and drivers	12.5%	2.2%	0.6%
Labourers	8.6%	0.7%	0.4%
2018 / 19 – 2036 / 37			
Managers	1.8%	0.3%	0.2%
Professionals	3.0%	0.4%	0.3%
Technicians and trades workers	5.1%	0.2%	0.2%
Community and personal service workers	0.6%	1.4%	0.2%
Clerical and administrative workers	2.6%	0.9%	0.4%
Sales workers	0.6%	0.4%	0.4%
Machinery operators and drivers	8.0%	1.2%	0.3%
Labourers	2.1%	0.2%	0.2%

Source: Prime Research (unpublished).

In combination with an expected increase in real wages (refer to section 5.3), the considerable demand for specific skills sets related to the construction and operation of the China First Project suggests the project will place pressure on skills availability within the Study Area, in particular in the Mine Catchment but also during construction in the Abbot Point Catchment, leading to a deepening of skills shortages in the region.

5.2.3 Skills Development and Attraction

Waratah Coal will seek to utilise local labour to the extent possible and practical during both construction and operation of the China First Project. However, given the following constraints it is likely that the availability of local labour for the project will be limited, particularly in the short term.

The construction industry is characterised by relatively short term projects and contracts (see section 5.2.1 for additional detail), and the development of the China First Project is likely to provide an opportunity for continuity of work for local construction workers. However, construction of the China First Project will require some specialised skill sets that may not be available in the region. As such, it is expected that some construction workers will be imported to the region as part of the China First Project.

Waratah Coal will encourage construction crews and contractors employed to develop the China First Project to engage and utilise apprenticeships, traineeships and skills training where appropriate, which will provide positive legacy benefits to the region in terms of developing the region's skills base for future construction projects.

During the first few years of operation Waratah Coal will utilise a primarily fly-in fly-out (FIFO) workforce, as it is anticipated that local labour will be insufficient to meet project requirements due to:

- Existing constraints in terms of labour availability in the project's Study Area and the nature of the China First Project, which will require some specialist skills for both the construction and operation of the project that are currently in short supply in the region; and
- Anticipated competition for labour resources from other major infrastructure, resource and industry projects expected to be developed throughout Central

Queensland over the next five years, in particular in nearby Gladstone (refer to section 4.3 for a list of proposed projects).

However, the China First Project will present an attractive employment opportunity to the local labour force given the higher salaries on offer in the mining industry compared to other sectors of the economy. It is anticipated that the China First Project will be particularly attractive to younger workers in the region, with consultation suggesting that some local workers will seek to attain relevant training and qualifications while working in other industries (A. Aylward, Manager Strategic Planning, Central Highlands Regional Council, *pers. comm.*, 4 May 2010).

To assist local job seekers obtain the required skills, Waratah Coal will instigate policies and practices that will assist in developing the skills base of the region to support mining activities and improve local participation over time.

While Waratah Coal will utilise a predominantly FIFO workforce, a range of goods and services will be procured locally. Past experience in the Bowen Basin suggests the nearby regional hubs of Emerald – which is home to a number of contractors that provide a range of services to the mining industry, including engineers, maintenance staff, and a variety of trades – Barcaldine and, potentially, Clermont will likely experience some permanent in-migration of mining contractors and support services workers as a result of the China First Project, with workers using these centres as a base to provide services to the Galilee and Bowen Basins (Rolfe *et al*., 2007; S. Hobbs, General Manager, Central Highlands Development Corporation, *pers. comm.*, 5 May 2010). Contractors and support service workers may also look to locate in Alpha if additional infrastructure and housing is developed to support an influx in population.

This will provide a positive long-term benefit to the regional economy in terms of a permanent increase in the skills base from not only those workers migrating to the region, but also through additional opportunities for ongoing skills transfer from people migrating to the region to existing residents.

5.2.4 Unemployment

While CGE modelling results do not provide a measure of changes in unemployment and the unemployment rate, the estimated change in employment can provide an indication of likely implications for unemployment across regions.

Queensland recorded an estimated 127,400 unemployed people in the December Quarter 2009, equating to an unemployment rate of 5.4% (refer to section 4.2.3.1). The China First Project will provide job opportunities for people currently unemployed through the following avenues:

- Through the generation of job opportunities directly related to developing and operating the China First Project;
- Through flow-on job generation to support the project; or
- Through the creation of job openings to replace workers attracted to the China First Project from other sectors.

While not all of the positions generated by the China First Project will be filled by an unemployed person – a large proportion will also likely be filled by people re-entering the workforce or migrating to Queensland from elsewhere in Australia or overseas – it is anticipated that unemployment will decline as a result of jobs created by the project.

Modelling outcomes suggest the China First Project will contribute to an increase in employment in Queensland of approximately 2,975 FTE employee positions per annum during construction. If half of these additional positions are filled by unemployed people, this would equate to a reduction in unemployed people in Queensland of approximately 1,488 people, and a reduction in the unemployment rate of approximately 0.1 percentage point from the December Quarter 2009.

The reduction in unemployment in Queensland is likely to be slightly higher during operation, with modelling results indicating the China First Project will provide approximately 4,464 FTE employment positions per annum on average above what would otherwise be achieved without the project during the first five years of operation, and approximately 3,954 FTE employment positions per annum on average thereafter.

Impacts on unemployment in Queensland are anticipated to be highest in the Mine Catchment and Abbot Point Catchment where construction and operational activity will primarily be centred, as well as in Southeast Queensland where many of the FIFO workers and a range of services are anticipated to locate.

5.2.5 Migration of Workers

A high proportion of construction and mining workers for the China First Project are expected to be engaged on FIFO arrangements, with permanent residences outside the Study Area. Estimates of employment generation presented in the previous sections have outlined the number of jobs anticipated to be created in the Study Area and Queensland. Table 5.13 presents the same employment generation figures based on the permanent residence of workers as estimated using CGE modelling, to outline the anticipated level of local labour content compared to FIFO workers[6].

The table shows that the vast majority of workers in the Mine Catchment are anticipated to be FIFO workers during both construction and operation. Similarly, the Abbot Point Catchment is anticipated to source the majority of its workers from outside the region during construction, although during operation the FIFO component is expected to be less than the local labour component. By comparison the Broader Service Area is anticipated to have a much lower requirement for FIFO workers.

Table 5.13. Estimates of Employment Generation by Place of Work and Place of Usual Residence

Region	Place of Work	Place of Usual Residence	Net FIFO Component
2010 / 11 to 2012 / 13			
Mine Catchment	1,975	300	1,675
Abbot Point Catchment	1,260	302	959
Broader Service Area	723	538	184
Rest of Queensland	-983	1,836	-2,818
2013 / 14 to 2017 / 18			
Mine Catchment	1,928	386	1,543
Abbot Point Catchment	224	125	100
Broader Service Area	669	608	60
Rest of Queensland	1,643	3,346	-1,702
2018 / 19 to 2036 / 37			
Mine Catchment	1,252	287	964
Abbot Point Catchment	124	102	22
Broader Service Area	451	451	0
Rest of Queensland	2,128	3,114	-986

Source: Prime Research (unpublished).

5.3 Impacts to Factor Incomes

The OECD defines factor incomes as comprising "compensation of employees by, and operating surplus of, producers" (OECD, 2001). The China First Project's anticipated impacts on factor incomes are examined in the sub-section below.

Compensation of Employees

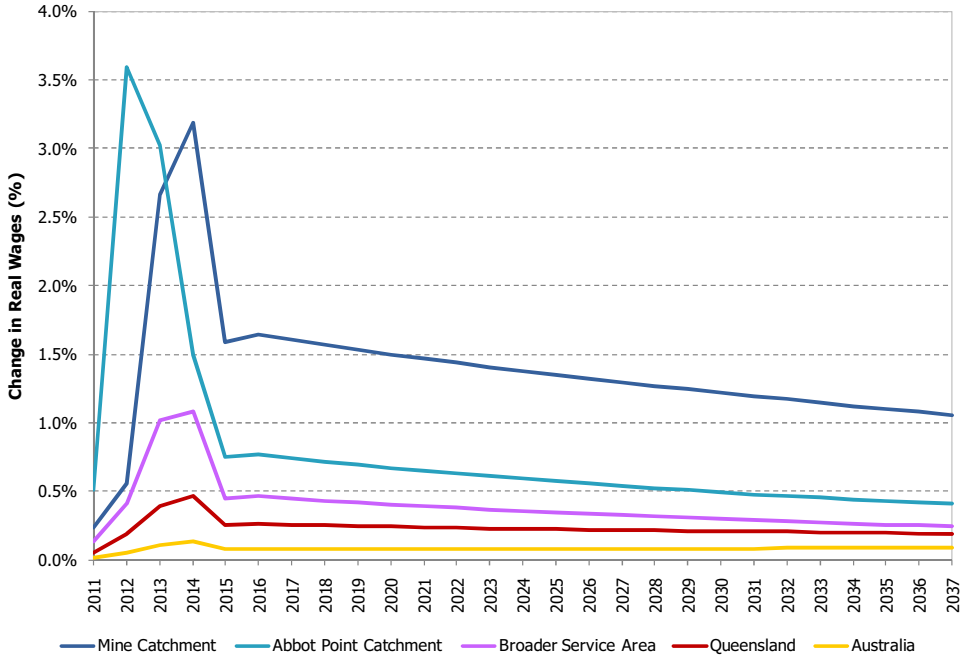
The China First Project will generate additional demand for labour in the Study Area. Given existing labour and skills shortages in the region, particularly in the mining sector, this is likely to place upward pressure on wage rates throughout the regional, State and national economy as labour is attracted to the mining sector and other industries are forced to increase wages and salaries paid in order to retain and attract workers.

[6] It should be recognised that employment estimates derived from CGE modelling are net estimates of worker flows, including all (direct and flow-on) inward and outward migration of workers from regions. The actual proportion of construction and operation labour sourced from outside the Study Area is likely to differ from that indicated by net estimates, and given the anticipated competition for labour from other projects may be higher.

Modelling results are presented in Figure 5.3 and indicate that the China First Project could contribute to an increase in real wages of approximately 0.1% per annum on average in Australia and 0.2% per annum on average in Queensland between 2010 / 11 and 2036 / 37. The increase in real wages is expected to be more acute in the Study Area, with an estimated increase of:

- 1.4% per annum on average in the Mine Catchment;
- 0.8% per annum on average in the Abbot Point Catchment; and
- 0.4% per annum on average in the Broader Service Area.

Figure 5.3. Annual Percent Change in Real Wages Resulting from the China First Project, 2010 / 11 to 2036 / 37



Source: Prime Research (unpublished).

This increase in the average real wage is over and above any increases in the cost of living, and therefore represents a real increase in household incomes in the Study Area, Queensland and Australia. Increases in real wages are most acute during the construction period where labour demand is highest.

Gross Operating Surplus

Gross operating surplus is defined by the Australian Bureau of Statistics (2009a) as the excess of gross output over the sum of intermediate consumption, compensation of employees, and taxes less subsidies on production and imports. As such, gross operating surplus includes returns on factors of production such as land, capital and entrepreneurship.

The China First Project will generate additional confidence in Australian capital markets, encouraging increased capital injection into the Australian economy, in particular in the construction and mining industries and their value chain. Conversely, other sectors not related to the construction and mining sector value chain may experience a decline in capital investment as this is drawn to the construction and mining value chain.

The China First Project may provide a benefit in relation to access and cost of finance for capital investment. Consultation with key stakeholders identified that since the Global Financial Crisis (and to some degree even before then) access to finance has constrained a number of developments. Anecdotal evidence suggests lenders have had reservations

regarding lending funds to developers (e.g., residential developments) in the region due to uncertainty in the Study Area's key industries of mining, tourism and agriculture. The development of a 40 Mtpa coal mine with a stable contract in place for the supply of coal may ease some lenders concerns and perceived risk, ultimately leading to increased business confidence and improving access to (and reducing the cost of obtaining) finance throughout the region.

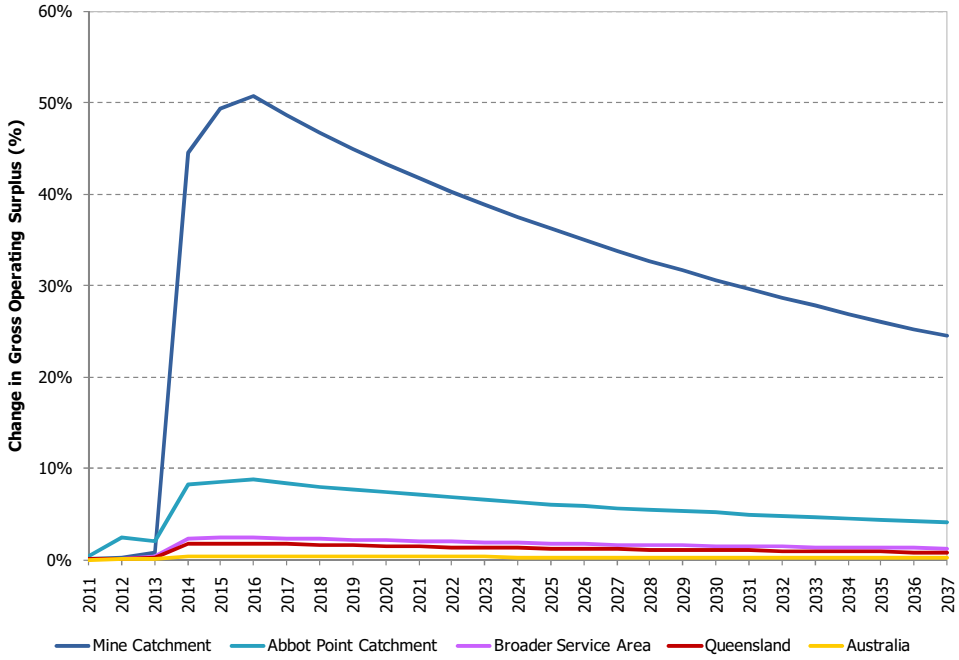
The demand for goods and services generated by the China First Project and its workforce (refer section 5.1) will generate additional expenditure by industry and households which will benefit businesses through additional turnover and business profits. This will also increase demand for industrial and commercial land, with an associated increase in values and rents for this land. Where this is not met by an equivalent increase in the supply of suitable industrial and commercial land, prices and rents for these types of land would be expected to increase considerably.

Consultation with economic development organisations and regional councils indicates that there is significant suitable land available for industrial and commercial development to support the China First Project's supply chain and the development of population support services, particularly in key regional hubs such as Emerald, Barcaldine and Mackay (R. Bauer, Executive Manager - Alpha Area, Barcaldine Regional Council, *pers. comm.*, 7 May 2010; A. Aylward, Manager Strategic Planning, Central Highlands Regional Council, *pers. comm.*, 4 May 2010; K. Porter, Chairperson, Mackay Chamber of Commerce, *pers. comm.*, 5 May 2010; N. Pearce, CEO, Mackay Whitsunday REDC, *pers. comm.*, 15 / 4 / 2010).

Modelling results are presented in Figure 5.4 and indicate that the China First Project could contribute to an increase in gross operating surplus above what would be achieved without the project between 2010 / 11 and 2036 / 37 of approximately:

- 32.5% per annum on average in the Mine Catchment, with a peak of 50.7% in 2015 / 16. The increase in gross operating surplus is particularly strong in the Mine Catchment given the considerably higher value of coal compared to existing agricultural production;
- 5.7% per annum on average in the Abbot Point Catchment, with a peak of 8.7% in 2015 / 16;
- 1.6% per annum on average in the Broader Service Area;
- 1.1% per annum on average in Queensland; and
- 0.3% per annum on average in Australia.

Figure 5.4. Annual Percent Change in Gross Operating Surplus Resulting from the China First Project, 2010 / 11 to 2036 / 37



Source: Prime Research (unpublished).

5.4 Impacts on Property Values

The high level of direct and flow-on employment generated by the China First Project and the associated population increase from workers and their families migrating to the region to fill local labour shortages is expected to place additional demand on both the rental and property sales markets. Where this additional demand is not met by an equivalent increase in supply, this will contribute to a reduction in vacancy rates and place upward pressure on property prices.

During construction, the majority of the workforce will be engaged in FIFO arrangements. Worker camps will be developed to accommodate construction crews for the mine and rail infrastructure, while construction crews for the coal stockyards and coal transfer infrastructure will primarily be accommodated using current camp facilities located near Abbot Point. However, it is likely that some workers, particularly in the Abbot Point area, will choose alternative accommodation arrangements, most likely renting property in proximity to the development site they are working on.

During operation, mine workers will continue to predominantly operate on a FIFO basis with accommodation at the worker camp. Operational employees for the rail line and port facilities, on the other hand, are expected to predominantly live permanently in the Bowen region, placing additional demand on the local property market.

In addition to the direct workforce, flow-on employment positions generated by the China First Project will result in the attraction and migration of people to the Study Area, as well as other regions in Queensland (in particular Southeast Queensland, refer section 5.2), further influencing the local and State property markets.

Other things being equal, an increase in demand for accommodation places upward pressure on housing and rental prices. Where demand outstrips supply, the increase in housing and rental prices can be sharp and place considerable additional burden on existing residents, particularly lower income households that already pay a high proportion of their income on living expenses. In the past this has contributed to existing residents in the Bowen Basin leaving the region, for example, as experienced in mining

'boom' towns such as Moranbah, where higher earning mine employees 'crowded out' local residents as a result of a higher capacity to pay for accommodation against a backdrop of limited housing supply (Rolfe *et al*., 2007; ABC Tropical Queensland, 2008; Landline, 2006).

A detailed description of anticipated property market impacts within the Study Area is provided in the sub-sections below.

Mine Catchment

The towns of Alpha and Jericho, the closest townships to the China First Project mine site, contained a combined 504 dwellings in total at the time of the 2006 Census of Population and Housing (Australian Bureau of Statistics, 2007). As the nearest townships to the mine site it is likely they will provide some attraction for mine construction and operational employees that do not wish to reside in the worker camp.

Consultation suggests there is limited available accommodation in these townships at present, with a relatively small rental market. However, sales activity has increased considerably in recent years, driven by external investors seeking to acquire property in the region to develop "executive style" rental accommodation, with the expectation that some construction crews, mine employees and mining executives will prefer to locate outside of the worker camps (E. Wood, Principal, Belyando Livestock and Property Pty Ltd, *pers. comm.*, 4 May 2010).

Interest in the region from investors has contributed to a significant increase in property values in Alpha and Jericho over the past four years, with recent valuations for a number of houses with land between four and six times their respective values from four years ago. Values for vacant land lots have increased even more significantly, in some instances as much as 10 to 20 times their values of four to five years ago (E. Wood, Principal, Belyando Livestock and Property Pty Ltd, *pers. comm.*, 4 May 2010; R. Bauer, Executive Manager – Alpha Area, Barcaldine Regional Council, *pers. comm.*, 7 May 2010).

Of note, rental prices in Alpha and Jericho have not increased as considerably as property and land values, with anecdotal evidence suggesting average rents have increased by between 1.5 to two times that of four years ago (E. Wood, Principal, Belyando Livestock and Property Pty Ltd, *pers. comm.*, 4 May 2010). This is indicative of a speculative market, with investors anticipating rental values and yields to increase considerably once proposed mining projects in the Galilee Basin commence, including the China First Project.

The level of interest and activity in the region suggests that additional supply of housing for rent could assist in accommodating the FIFO construction and operational workforces for the mine component of the China First Project. The development of a worker camp will also greatly assist in mitigating impacts on rental demand and prices generated by those employed directly by the mine.

Even so, experiences during the recent mining boom in the Bowen Basin (2003 to 2008) suggest rental prices and, subsequently, property values and sales prices, could increase significantly as a result of mining employees and contractors in the region, as well as demand from flow-on workers and associated population. As noted in Petkova *et al*. (2009), despite the increasing prevalence of worker camps in the Bowen Basin, rental prices in mining towns increased considerably between 2003 and 2008 as a result of some mining workers and contractors seeking accommodation outside of the worker camps. Table 5.14 highlights the effect that increased demand for rental accommodation in the Bowen Basin had on mining towns in the region during the latest mining boom, in comparison to Brisbane.

Table 5.14. Growth in Median Weekly Rents in Selected Bowen Basin Towns, June Quarter 2003 to June Quarter 2008

Town	Median Weekly Rent		
	2003	2008	% Change 2003 to 2008
Blackwater	$150	$395	163.3%
Bowen	$145	$300	106.9%
Clermont	$125	$290	132.0%
Collinsville	$125	$300	140.0%
Dysart	$140	$650	364.3%
Emerald	$220	$385	75.0%
Mackay	$190	$380	100.0%
Moranbah	$250	$650	160.0%
Rolleston	$160	$300	87.5%
Brisbane	*$230*	*$360*	*56.5%*

Source: Residential Tenancies Authority (unpublished).

As can be seen, rental prices in mining towns within the Bowen Basin have increased at a considerably faster rate than in Brisbane, driven by demand for accommodation from high earning mining workers in the region. It can be expected that the towns of Alpha and Jericho may experience similar growth in rental prices as a result of the China First Project.

In addition to impacts in the towns of Alpha and Jericho, consultation and past research in the region suggest that Emerald, the major population centre within the Mine Catchment and home to a sizeable base of contractors that provide a range of services to the mining industry, is likely to experience additional migration to the township and surrounding areas as contractors look to move to a regional hub in proximity to mining activity in the Bowen and Galilee basins (Rolfe *et al.*, 2007; S. Hobbs, General Manager, Central Highlands Development Corporation, *pers. comm.*, 5 May 2010). Barcaldine may experience similar population growth given its proximity to the Galilee Basin.

Migration of workers (and their families) to these townships will place additional pressures on existing housing supply, and if an equivalent increase in supply is not forthcoming could result in an increase in property values and rental prices significantly above normal growth patterns.

Abbot Point Catchment

Bowen has experienced considerable development activity in recent years, most notably the Northern Missing Link that will provide rail infrastructure linking the North Goonyella and Newlands rail lines to connect mines in the northern Bowen Basin and Central Queensland with the Abbot Point Coal Terminal, as well as development of the Abbot Point Coal Terminal itself to handle the increase in coal exports.

Over this period there have been large workforces in the Bowen region, and despite these projects providing worker camps, some workers have elected to rent accommodation in town. This resulted in very high demand for rental properties in the region during this period. At the peak of activity approximately two years ago, there were very few vacancies in Bowen, with anecdotal evidence suggesting this resulted in rents increasing by around 10% to 15% (Q. Muller, Principal, Century 21 Coral Coast Realty, *pers. comm.*, 5 May 2010).

Given recent history, while the use of existing worker camps at Abbot Point will assist in alleviating potential impacts on the local property market in Bowen during construction, there will likely be some construction workers that choose to find alternative accommodation, placing additional demand on local housing / rental supply and, subsequently, upward pressure on rental and property prices.

During operation, the coal stockyards and coal transfer facilities will employ approximately 150 employees, with most living locally, while approximately 60 people are anticipated to be employed for rail operations and live in the Bowen region. Some of this workforce will likely be filled by people migrating to the Bowen region, placing additional demand on the local property market.

In addition to those people directly employed by the China First Project, it is anticipated that some support services will expand and / or locate to the Bowen region, in particular to meet opportunities for rail and port maintenance, services and equipment. Other industries are also likely to benefit through additional consumer spending in the region, for example retail trade, accommodation establishments, restaurants and other food services. Growth in these industries may attract new residents to the region to fill job vacancies.

Consultation suggests there have been a number of residential developments that have been approved in Bowen that have not been able to obtain the required finance to develop (Q. Muller, Principal, Century 21 Coral Coast Realty, *pers. comm.*, 5 May 2010). This is an issue confronting the entire Mackay-Whitsunday region at present, with the legacy of the Global Financial Crisis and the region's reliance on the fortunes of the mining and tourism sectors generating some reservations for potential lenders (K. Porter, Chairperson, Mackay Chamber of Commerce, *pers. comm.*, 5 May 2010).

As a result, the supply of new residential property to the market has been hindered despite additional land being released and dwellings being approved that could otherwise assist in meeting additional demand for accommodation. The approval of major projects such as the China First Project will provide stable employment opportunities in the Bowen region, and may encourage lenders and assuage their concerns regarding development risk. This would provide access to credit for developers to provide additional residential developments to meet demand generated by the China First Project.

Overall, given the relatively small increase in employment in the Abbot Point Catchment during operation – 224 FTE employment positions per annum on average during first five years of operation, and 124 FTE employment positions thereafter (refer to section 5.2.1.2) – and residential projects ready to be developed, it is not expected the China First Project will result in a noticeable impact on property and rental prices during operation.

Broader Service Area

During construction, it is anticipated that the majority of the workforce will be engaged on FIFO arrangements, and accommodated in construction worker camps located near the mine site, along the rail line and near the Abbot Point SDA.

Given the use of worker camps it is not anticipated that there will be any noticeable impacts on property markets within the broader service area during construction, although there may be some potential for construction workers and their families to migrate to major centres in the broader service area such as Mackay, and then stay at worker camps during their rostered shifts. Where this occurs, some additional demand will be placed on these property markets.

During operation, the majority of property market impacts in the broader service area are expected to be generated by flow-on impacts of the China First Project, in particular as a result of additional demand in the mining services and support sector.

Mackay has a well developed mining services sector that supports mining activity in the Bowen Basin, in particular engineering, heavy manufacturing and mining related equipment. Development of the China First Project will provide these industries with an opportunity to expand to meet supply requirements of the project. Consultation suggests additional opportunities exist to support the mining industry, in particular in terms of hospitality services catering to the needs of employees accommodated in the worker camps, such as food services, laundry, cleaning and maintenance of worker camps, as well as other assets (K. Porter, Chairperson, Mackay Chamber of Commerce, *pers. comm.*, 5 May 2010).

Demand for household and consumer related services are also likely to increase as a result of the additional employment opportunities and incomes generated both directly and through the supply chain for the China First Project. The majority of these services will likely develop in the major service centres in the project's Study Area, Mackay in particular.

Modelling suggests that the China First Project could generate approximately 669 additional employment positions in the Broader Service Area during the first five years of operation, and 451 thereafter (see section 5.1.1.2 for more detail). It is expected that

some of the flow-on labour demand generated will be filled by existing local residents, providing jobs for some local unemployed people, people currently out of the labour force, as well as a reallocation of labour between business and industry. However, given the currently constrained labour market in the region, it is anticipated that some positions will need to be filled by people migrating to the Study Area, particularly in regional hubs and population centres where the majority of services are located such as Emerald (in the Mine Catchment) and Mackay (in the Broader Service Area).

Increased demand for property in these localities without increased supply of housing will place upward pressure on property and rental prices. Most of the additional 669 FTE employment positions in the Broader Service Area during the first five years of operation are expected to be located in the major service centre of Mackay. With over 40,000 dwellings in the Mackay Regional Council area in 2006 (Australian Bureau of Statistics, 2007) and in consideration that only a portion of employment positions will be filled by people migrating to the region, it is unlikely the operation phase of the China First Project will have a significant impact on property values and rental prices in the Broader Service Area.

5.5 Impacts to Households

The China First Project will contribute to a considerable increase in household incomes and wealth throughout the Study Area and Queensland, through a combination of:

- The generation of additional wages and salaries in the Study Area above the baseline (without project) scenario of approximately $156.2 million per annum on average during the construction phase (between 2010 / 11 and 2012 / 13), and approximately $164.0 million per annum on average during operation (between 2013 / 14 and 2036 / 37). This includes flow-on benefits, which will be broadly based across the economy as income is circulated between individuals and businesses;
- The generation of additional wages and salaries in Queensland of up to approximately $452.7 million per annum on average during construction and up to $776.1 million per annum on average during operation;
- Presentation of opportunities for low income households and families to supplement their income through family members working either part time or full time at the mine. This could represent a significant benefit to farm households in particular, where production and value of farm outputs (and therefore incomes) can vary considerably between years;
- The generation of employment opportunities will also present a benefit in terms of reducing unemployment in the Study Area and Queensland and providing people that were previously unemployed with higher incomes;
- Opportunities for wealth re-distribution to investors (i.e., shareholders) of the project and contribution to property owners through rental returns; and
- An increase in real wages throughout Australia resulting from the increase in demand for skilled labour, which is likely to place upward pressure on labour prices, particularly in industries experiencing skills shortages. The increase in real wages is expected to be most significant in the Study Area, in particular the Mine Catchment (refer to section 5.3 for more details). The increase in real wages is over and above any increases in the cost of living, and therefore represents an increase in disposable incomes in the Study Area and Queensland.

The increase in household incomes in the regional and State economies will increase household consumptive capacity through both new households forming in the region (e.g., through the attraction of workers and their families to the region / State) and an increase in existing household disposable incomes (e.g., through workers moving to higher paying positions or unemployed or underutilised persons entering gainful or more regular employment). This is expected to encourage further household consumption and expenditure in both the regional and State economies.

Nonetheless, not all project impacts on households will to be positive. For example, the wealth generated by the China First Project will be primarily distributed to those directly engaged in the project as a result of higher salaries paid in the mining industry and associated supply chain. As outlined in section 5.2.1, many of the employees will be FIFO

workers living permanently outside the Study Area, resulting in a repatriation of wealth to towns and cities where these workers reside rather than captured in local economy.

Further, the disparity in wealth distribution may contribute negative implications for households that are in the lower income thresholds. Consultation highlighted that during the most recent mining boom (2003 to 2008) a considerable wealth divide was opening between mining families and other residents (A. Aylward, Manager Strategic Planning, Central Highlands Regional Council, *pers. comm.*, 4 May 2010; S. Hobbs, General Manager, Central Highlands Development Corporation, *pers. comm.*, 5 May 2010). The higher salaries paid to mining employees enables them to afford the rapidly rising prices of property, while other families often require two incomes to afford to own a home in the area (S. Hobbs, General Manager, Central Highlands Development Corporation, *pers. comm.*, 5 May 2010). Housing supply shortages have contributed to this issue, driving up both rental prices and property values.

As a result, some residents within the Study Area were forced to leave the region leading up to and during the peak of the boom in 2007, as they could no longer afford the high cost of accommodation (S. Hobbs, General Manager, Central Highlands Development Corporation, *pers. comm.*, 5 May 2010). As outlined in section 5.4, it is likely that the China First Project will generate additional demand for housing in the Study Area, and in the currently constrained market this will contribute to maintaining the high and rising property prices in the Study Area, in particular in the Mine Catchment. As such, housing affordability will likely remain an ongoing issue, in particular for those that are not employed by the China First Project or in other high earning occupations.

Higher rental payments in the Study Area will likely attract investors to purchase and / or develop housing in the region to realise high rental yields. This has already begun to occur in towns such as Alpha and Jericho based largely on speculation and anticipation of projects in the Galilee Basin going ahead (E. Wood, Principal, Belyando Livestock and Property Pty Ltd, *pers. comm.*, 4 May 2010; R. Bauer, Executive Manager - Alpha Area, Barcaldine Regional Council, *pers. comm.*, 7 May 2010). Other towns in the Study Area, such as Emerald, Mackay and Bowen, have received considerable interest from investors in recent years as major infrastructure and resource projects have been developed (Q. Muller, Principal, Century 21 Coral Coast Realty, *pers. comm.*, 5 May 2010; K. Porter, Chairperson, Mackay Chamber of Commerce, *pers. comm.*, 5 May 2010). The rental market represents a wealth transfer from renters to property owners, and where these investors are external to the Study Area, this represents a transfer of wealth out of the region.

Consultation raised concerns that some areas and towns may be subject to increased traffic flows as a result of the China First Project (S. Hobbs, General Manager, Central Highlands Development Corporation, *pers. comm.*, 5 May 2010; E. Wood, Principal, Belyando Livestock and Property Pty Ltd, *pers. comm.*, 4 May 2010). In particular, the towns of Alpha and Jericho that are closest to the mine site are likely to experience increased traffic flows through a combination of:

- Construction and mining related materials and equipment transportation;
- New residents migrating to the region and / or mining employees seeking accommodation outside of the worker camps; and
- The provision of some recreational, leisure, health and community services to the mine employees.

Key service centres near the mine such as Emerald and Barcaldine may experience some increased traffic where needs of the workforce cannot be met within the worker camp or locally. Concern was also raised regarding an increase in traffic, in particular along the Capricorn Highway, as a result of equipment and material movements from Gladstone, Rockhampton and / or Mackay to the Galilee Basin, as well as labour flying into Emerald and then driving inland (S. Hobbs, General Manager, Central Highlands Development Corporation, *pers. comm.*, 5 May 2010). The increase in heavy vehicle movements will also lead to increased road degradation and maintenance requirements, which may impact on both road safety and travel times.

Bowen may also experience some increased traffic flows, primarily during construction of the coal stockyards and coal transfer infrastructure as a result of the transportation of materials and equipment as well as employees travelling to the site.

The increase in traffic in these centres may result in increased travel times for residents without strategies developed to mitigate these impacts. Proposed strategies for mitigating impacts of increased traffic on travel times are presented in the Transport Impact Assessment appended to the EIS.

5.6 Impacts on Export Revenues and Balance of Trade

The China First Project will target export of 40 Mtpa of coal from 2015 / 16 onwards, ramping up to full capacity from first coal exports in July 2013. Using Waratah Coal's assumed coal price for the China First Project of US$92 per tonne and an exchange rate of 0.8AUD / USD, this equates to annual export revenues of approximately $4.6 billion once full production capacity is reached in 2015 / 16.

Australian thermal coal exports were valued at $17.9 billion in 2008 / 09 (Australian Bureau of Agricultural and Resource Economics, 2010), with metallurgical coal exports valued at $36.8 billion (total coal export value of $54.7 billion in 2008 / 09). The China First Project will represent an increase in national thermal coal export values of approximately 25.7% from 2008 / 09 values, and 8.4% of total coal export values.

Total Queensland balance of trade was estimated to be $22.6 billion in 2008 / 09, consisting of exports valued at $56.6 billion in 2008 / 09, and imports valued at $34.0 billion (Australian Bureau of Statistics, 2010d). At an Australia-wide level, international exports were valued at $230.8 billion in 2008 / 09, while imports were valued at $219.5 billion. Once fully operational, the China First Coal Project will result in an increase in exports from Queensland and Australia of 8.3% and 2.0%, respectively, from 2008 / 09 levels, and with comparatively small levels of imports required during operation this will represent a considerable increase in the balance of trade, in the vicinity of 20% in Queensland and 40% in Australia against the 2008 / 09 level.

This increase in Australian exports will assist in maintaining the value of the Australian dollar, which may have some negative ramifications for "trade exposed" industries that operate on relatively tight margins and compete in a global market against low cost overseas producers (e.g., manufacturing and agriculture), potentially leading to industry rationalisation and innovation to maintain profitability. However, the impact of the China First Project on Australia's exchange rate, if any, is likely to be small.

5.7 Impacts on Government Revenues

Details of anticipated taxation revenues associated with the China First Project, relative to the base case, are summarised in Table 5.15, with the Queensland Government expected to receive approximately one third of additional revenue, primarily through royalty payments.

It should be noted that a portion of Australian Government revenues are likely to provide benefits to Queensland through the subsequent expenditure and redistribution of these revenues to provide services and infrastructure throughout Australia.

Table 5.15. Average Annual Additional Queensland and Australian Government Revenues from the China First Project (2010 / 11 to 2036 / 37)

Government	Estimated Revenue ($M)	Proportion of Total Government Revenue
Queensland	$364.9	34.1%
Australian	$705.8	65.9%
Total	**$1,070.8**	**100.0%**

Source: Prime Research (unpublished), AEC*group*

More detail regarding the source of revenue is discussed in the following sections.

5.7.1 Local Government Revenues

Local council revenues will increase as a result of people re-locating permanently or temporarily to the project's Study Area, through additional rates revenue associated with dwellings and workers camps that are constructed to meet additional demand and any

appreciation in land value brought on by increased population. For renters, and those in workers camps, council fees and charges will be met by the landlords and employers.

However, off-setting additional revenues will be a requirement for additional funding for capital investments (e.g., local road maintenance and development to accommodate increased traffic flows, additional community infrastructure requirements) as well as a likely increase in operating expenditure to meet the service provision and infrastructure demand and needs of an increased population.

5.7.2 Queensland Government Revenues

The China First Project will increase Queensland Government revenues directly through:

- Land tax;
- Payroll tax;
- Royalties; and
- Rents.

Impacts of the China First Project on Queensland Government revenues are summarised in Table 5.16, and have been estimated based on prevailing tax rates (i.e., assumes tax policy does not change significantly over time). Queensland Government revenues have been estimated based on both direct and flow-on impacts of the China First Project.

In aggregate, Queensland Government revenues are indicatively estimated to be approximately $364.9 million per annum on average over the period 2010 / 11 to 2036 / 37, with royalties contributing an estimated 94.0% of total Government revenues.

Table 5.16. Average Annual Queensland Government Revenues from the China First Project (2010 / 11 to 2036 / 37)

Revenue Source	Estimated Revenue ($M)	Proportion of Revenue (%)
Land Tax	$0.8	0.2%
Payroll Tax	$18.4	5.0%
Royalties	$343.0	94.0%
Tenure Rents	$2.8	0.8%
Total Revenue	**$364.9**	**100.0%**

Source: Queensland Office of State Revenues (2010), Prime Research (unpublished), Queensland Department of Employment, Economic Development and Innovation (2010), Queensland Department of Mines and Energy (2010a), Queensland Department of Mines and Energy (2010b), AEC*group*

Similar to impacts at the regional council level, increased Queensland Government revenue will be counteracted by the need to invest in additional infrastructure and services to support population growth and increased economic activity. For example, this is likely to include increased expenditure on developing and maintaining State roads, as well as public, education and health infrastructure and services.

Land Tax

The Mining Lease tenement for the China First Project is yet to be finalised, however, the mine site is estimated to require an area of approximately 55,000 hectares. The unimproved capital value of rural land can vary considerably based on the quality of the land for productive purposes. Prior to the recent interest in the region for mining activities, rural properties would typically sell for approximately $500 per hectare to $800 per hectare northwest of Alpha (E. Wood, Principal, Belyando Livestock and Property Pty Ltd, *pers. comm.*, 24 May 2010), with rural land sales assumed to approximate the unimproved capital value. However, recent mining activity has created considerable uncertainty in the rural land market, with values likely no longer tied as strongly to the land's value for agricultural purposes.

To ensure a conservative estimate, the average unimproved capital value of land is assumed to be approximately $650 per hectare, with rural land holdings in the region typically between 5,000 to 25,000 hectares. This equates to a land tax payment of approximately $650,000 to $750,000 per annum (Queensland Office of State Revenues, 2010).

Payroll Tax

The China First Project is estimated to generate approximately $452.7 million in additional wages and salaries per annum on average in Queensland between 2010 / 11 and 2012 / 13, above what would otherwise be achieved if the China First Project does not proceed, and $776.1 million per annum on average between 2013 / 14 and 2036 / 37. Payroll tax is paid at a rate of 4.75% for companies with a payroll in excess of $1 million (Queensland Office of State Revenues, 2010), not including any potential deductions, concessions or exemptions. Modelling outcomes (based on standard industry payroll tax contributions) suggest that the China First Project could contribute approximately $18.4 million per annum on average to Queensland Government revenues between 2010 / 11 and 2036 / 37 (Prime Research, unpublished).

Royalties

In accordance with the *Mineral Resources Act 1989*, owners of a resource must pay royalties to the Queensland Government for the right to extract the resource. Royalties on coal are payable on an *ad valorem* (value) basis. A two tier royalty schedule applies for extraction of coal resources (Queensland Department of Mines and Energy, 2010a), as follows:

- 7% of value up to A$100 per tonne; and
- 10% of the value thereafter.

Assuming an average coal price of US$92 per tonne and an exchange rate of 0.8AUD / USD, this equates to an average value of coal exports of A$115 per tonne. As this is above the threshold of A$100 per tonne, both tiers of the royalty schedule will be triggered, and equates to a royalty payment of $8.50 per tonne. On this basis, the China First Project is estimated to generate approximately $343.0 million in royalty payments per annum once at full production capacity.

The Queensland Government received approximately $3.1 billion in royalties from coal sales in 2008-09 (Queensland Department of Mines and Energy, 2010b). Royalties from the China First Project would deliver approximately an 11% increase in Queensland Government coal royalty revenues from 2008 / 09 levels.

Tenure Rents

Tenure rents will be payable for the Mining Lease tenement held for the China First Project. Mining Lease rents are charged at $50.55 per hectare (Queensland Department of Employment, Economic Development and Innovation, 2010), and with an estimated area of 55,000 hectares this equates to an annual payment of approximately $2.8 million.

Other Duties

The Queensland Government will also likely receive additional revenue through various other duties associated with increased consumption activity (e.g., property, motor vehicle, insurance duties). Although not quantified, it is reasonable to assume the China First Project will have a positive impact on consumption-induced tax revenues.

5.7.3 Australian Government Revenues

The China First Project will contribute to Australian Government revenues through:

- Company tax;
- Fringe benefits tax;
- Goods and services tax (GST);
- Personal income tax; and
- Import duties.

Australian Government revenues have been estimated based on both direct and flow-on impacts of the China First Project. The impacts of the China First Project on Australian Government revenues are summarised in Table 5.17. The China First Project is

indicatively estimated to generate an additional $709.8 million per annum on average in Australian Government revenues between 2010 / 11 and 2036 / 37.

Table 5.17. Average Annual Australian Government Revenues from the China First Project (2010 / 11 to 2036 / 37)

Revenue Source	Estimated Revenue ($M)	Proportion of Revenue (%)
Company Tax	$302.9	42.7%
Fringe Benefits Tax	$6.9	1.0%
GST	$158.3	22.3%
Personal Income Tax	$237.8	33.5%
Import Duties [(a)]	$4.0	0.6%
Total Revenue	**$709.8**	**100.0%**

Note: (a) Estimates of import duties over the period from 2010 / 11 to 2036 / 37 represent import duties on direct imports during construction only.
Source: Australian Customs and Border Protection Services (2010), Australian Taxation Office (2010), Prime Research (unpublished), AEC*group*

There is currently widespread debate relating to the proposed Australian Government's Mining Resources Rent Tax (MRRT). However, as this is not currently Government policy and is in the process of ongoing negotiation and planning, the structure of any tax effects remains unclear and is unable to be modelled with any accuracy. Should such a tax be introduced it would:

- Decrease resource company profits for those operations meeting MRRT criteria and thresholds;
- Increase tax revenues to the Australian Government through revenues generated by the MRRT; and
- Increase development hurdle rates and risk, with the implication of reducing the attractiveness of Australian resource deposits for development.

It is unclear at this stage the specific effect this proposed additional tax would have on the China First Project, and the associated broader flow-on effects.

Company Tax

Company tax is paid at a flat rate of 30% of profit before tax (Australian Taxation Office, 2010). Estimating the likely increase in company tax revenues is complex due to the varying profit margins and the broad range of depreciation, gearing and tax offsets across different business and industries. Modelling outcomes based on estimated profits and standard industry company tax contributions (including tax exemptions such as financing costs and depreciation) indicate the China First Project is estimated to contribute approximately $302.9 million per annum on average to Australian Government revenues through additional company taxes between 2010 / 11 and 2036 / 37 (Prime Research, unpublished).

Fringe Benefits Tax

The China First Project is likely to contribute to Australian Government revenues through additional Fringe Benefit Tax (FBT) payments on benefits provided by employers' outside of salaries and wages (e.g., work car, reimbursements, entertainment). The rules for calculating the taxable value of a fringe benefit vary according to the type of benefit (Australian Taxation Office, 2010), making estimation of FBT difficult. However, modelling outcomes based on standard averages of FBT relative to salaries and wages paid by industry suggest that the Australian Government could receive additional revenues through FBT of approximately $6.9 million per annum on average between 2010 / 11 and 2036 / 37 (Prime Research, unpublished).

Goods and Services Tax (GST)

Goods and services tax (GST) revenues are also expected to increase as a result of the China First Project as a result of increased demand for goods and services both directly through the project and from flow-on industry and household consumption. Modelling of GST impacts indicates that between 2010 / 11 and 2036 / 37 the Australian Government

is estimated to receive an additional $158.3 million per annum on average through GST as a result of the China First Project (Prime Research, unpublished).

Personal Income Tax

Assessing personal income tax impacts is complex due to possible exemptions, deductions, variable tax rates, and the varying range of salaries. Modelling of economic impacts indicates the China First Project is estimated to result in an increase in wages and salaries in Australia of approximately $1.2 billion per annum on average between 2010 / 11 and 2036 / 37.

An indicative estimate of personal income tax has been developed based on national averages of income tax compared to salaries and wages paid (Prime Research, unpublished). Modelling indicates the China First Project is estimated to generate approximately $237.8 million per annum on average in additional personal income tax revenues for the Australian Government between 2010 / 11 and 2036 / 37.

Import Duties

The China First Project will also contribute directly to an increase in imports and, thereby, import duties, primarily during construction of the project in terms of sourcing specialised components for project development. Based on standard industry averages, it is estimated the China First Project will import approximately $2.1 billion in materials for the development of the mine, rail and port infrastructure during the three year construction period (Prime Research, unpublished). Most construction related goods have an import tariff of approximately 5% not including any concessions (Australian Customs and Border Protection Services, 2010), equating to total import duties of approximately $107.4 million over the three year construction period.

During operation, import requirements are anticipated to be relatively small, with negligible import duties over this period. Overall, it is indicatively estimated that an average of approximately $4.0 million per annum in import duties will be received by the Australian Government as a direct result of activities undertaken for the China First Project over the outlook period from 2010 / 11 to 2036 / 37.

Flow-on activity will also result in an increase in imports and import duties, however, there is limited information available to quantify the level of imports this may entail.

5.8 Implications of the Project for Future Development

5.8.1 Beneficial Implications

In addition to the positive economic impacts of the China First Project outlined in the above sections, the China First Project has the potential to provide a number of indirect beneficial impacts that could influence future development activities within the Study Area, including:

- The China First Project involves the development of rail and port infrastructure that is critical to access and commercialise coal and other resource deposits with export potential in the Mine Catchment and the Galilee Basin. An alternative to developing the rail infrastructure could be to develop a dedicated haul road for the transport of coal to Abbot Point, however, in consideration of the efficiency gains and ongoing cost comparisons of rail versus road for transport of coal, as well as potential social issues such as operator safety, rail is likely to be the most desirable option for transport of coal to export facilities;
- Waratah Coal will invest in developing utilities infrastructure to support the project, for example electricity, water and telecommunications (in particular fibre-optic), which will provide benefits to the entire Study Area beyond the direct operations of the mine, by improving regional business capacity and competitiveness. Waratah Coal will also invest in improving the local road networks and will develop or upgrade an airstrip, further improving access to the region;
- Rail, port and other support infrastructure developed for the China First Project will be accessible by third parties, which will "open" the abundant high quality resources available in the Galilee Basin for future development, including coal and CSG, by

providing base support infrastructure and reducing hurdle rates for future resource development. This may allow some smaller operations to be commercially viable in the future;

- The development of open access rail infrastructure provides a platform for future expansion of the line to accommodate higher coal tonnages, thereby providing additional capacity for future development of coal and other resource operations in the Galilee Basin. With strong global demand and high export values for thermal coal and gas, the development of the Galilee Basin has the potential to significantly boost regional, State and national economic growth;
- The China First Project is expected to encourage the development of a local mining sector value chain (as outlined in section 5.1.1.2), with a range of support services anticipated to develop in the local region over time. In addition, the local skills base is expected to grow as a result of training programs, migration of skilled workers and ongoing skills transfer between workers (refer to section 5.2.2). This will provide positive legacy benefits in the region in relation to skills and labour force capacity building and assist future resource projects through the local presence of skilled workers and supply chains; and
- The generation of additional employment opportunities throughout the project's Study Area and anticipated migration of people to the Study Area to fill some of these positions (see section 5.4) has the potential to ease lender's current concerns regarding development risk for residential developments. This would improve access to credit for developers to provide additional residential and commercial developments.

5.8.2 Potential Forgone Opportunities

While the China First Project is expected to deliver considerable beneficial impacts to the regional, State and national economies, as well as a number of positive implications for future development, there are some potential adverse implications of the project in terms of potential forgone opportunities. These include:

- An erosion of the strong agriculture sector in the Study Area, in particular beef cattle in the Mine Catchment, through the acquisition of up to 55,000 hectares of land primarily used for grazing, disruption of agricultural management practices in land holdings along the rail corridor, and an expected draw of labour resources from the agricultural industry (see section 5.1.2 for more details). It should be recognised, however, that while the region's beef cattle industry is traditionally strong in the region, it is a stable rather than a growth industry and has limited potential for future expansion without intensification;
- The China First Project will place additional pressure on an already tight labour market in an industry (and region) that in recent years has been exposed to significant skills shortages. Given the tightness of the labour market, it is likely that the China First Project will compete with other projects for labour (and other) resources, placing upward pressure on prices and increasing the difficulty for projects to source input materials and suitably skilled staff. As such, resource constraints resulting from the development of the China First Project may result in some other projects being delayed or postponed;
- In addition to potential labour constraints, the China First Project has the potential to negatively influence other mining projects as a result of competition for contracts. While the China First Project will compete in an international market currently characterised by strong growth in demand outstripping supply, there is a possibility that other coal projects in Australia currently in operation or being investigated may be negatively influenced by the introduction of an additional 40 Mtpa of coal in the market in terms of securing contracts. However, given the buoyant current market for coal –forecasts from the Australian Bureau of Agricultural and Resource Economics (2010) suggest that demand for imported of coal in Asia is expected to increase by approximately 100 Mtpa over the next five years, driven primarily by demand in India and China – it is unlikely the China First Project will materially affect the development of other coal projects through impacts on coal supply contracts;
- The China First Project is expected to maintain the strength of the Australian dollar which may adversely impact the profitability and long term prospects of some sectors

that are exposed to international competition (refer to section 5.1.2 for more details). Key industries expected to be impacted by the exchange rate include manufacturing, some agricultural commodities and tourism-related sectors; and

- The high incomes on offer from the China First Project are likely to attract employees from lower income paying industries and this could have deleterious impacts on local business and industry capacity to service the project and local population if not managed appropriately (refer to section 5.1.2 for more details).

6. Cumulative Impact Assessment

6.1 Cumulative Impact Framework

There are a considerable number of projects proposed and currently being investigated within the China First Project's Study Area, including a number of mining projects near the town of Alpha. A list of the current significant projects in the Study Area is provided in section 4.3.

Given the limited information available regarding many of these proposed projects for the Study Area, and uncertainty regarding which projects may ultimately be developed, it is difficult to quantify with any certainty the cumulative impacts of multiple projects being developed and operating concurrently.

This section qualitatively examines the potential impacts in terms of capacity constraints of the China First Project on the local economies within the Study Area where other proposed projects for the regions also proceed. Cumulative impacts have been assessed using risk assessment framework described in **Appendix C**.

The projects considered in this cumulative impact assessment have been developed in negotiation with the Queensland Government, and includes the following projects:

- Abbot Point Expansion Project;
- Abbot Point Multi-Cargo Facility;
- Alpha Coal Project;
- BMA Bowen Basin Coal Growth;
- Drake Coal Project;
- East Coast Alumina Refinery and Port;
- Galilee Basin Power Station;
- IsaLink High Voltage DC Transmission;
- Kevin's Corner Coal Project; and
- South Galilee Coal Project.

Each of these projects either has or is in the process of undertaking assessments of their impacts on the local, regional, State and national economies. The various positive economic impacts of these projects will be examined in these studies separately and have not been assessed in this report.

Rather, this chapter focuses on the potential for the concurrent undertaking of these projects to exacerbate the identified adverse impacts of the China First Project, or for the combination of these projects to complement each other and provide benefits that would otherwise not be achieved.

6.2 Assessment of Potential Beneficial Cumulative Impacts

6.2.1 Provision of Common User Infrastructure

Rail, port and other support infrastructure developed for the China First Project will be accessible by third parties, and is essential to "open" the abundant high quality resources available in the Galilee Basin for future development. A number of other coal projects are planned for the Galilee Basin, including Hancock Coal's Alpha and Kevin's Corner projects, as well as the South Galilee Coal Project, have similar infrastructure requirements as the China First Project.

Developments such as the Abbot Point Multi-Cargo Facility, expansion of the Abbot Point Coal Terminal, the Galilee Basin Power Station and the IsaLink High Voltage DC Transmission Line will also provide important enabling infrastructure for industry development.

If these projects all proceed, it is **almost certain** that essential infrastructure developed to support the China First Project would be utilised and expanded to cater to the needs of a number of users. This would minimise the cost of developing this infrastructure, minimise disruption to adjacent land practices, and provide efficiency benefits in the delivery of infrastructure and their services through economies of scale. It is possible that development of these projects may also encourage additional investment in and improvement of other infrastructure in the region.

Access to reliable, high quality utilities (e.g., water, electricity, telecommunications) and transport infrastructure would also provide a long term benefit to local business and support business development. The outcome of providing common user infrastructure is assessed to be **positive**. The cumulative impact assessment for provision of common user infrastructure is summarised in Table 6.1.

Table 6.1. Assessed Beneficial Impact: Provision of Common User Infrastructure

	Consequence					
Likelihood	Severe	Major	Moderate	Minor	Negligible	Positive
Almost Certain						**Positive Effect**
Likely						
Possible						
Unlikely						
Rare						

6.2.2 Industry Clustering and Value Chain Development

It is anticipated that the China First Project will provide some opportunities for local businesses to supply goods and services to support the project and its workforce, and potentially attract some new businesses to the region. However, it is expected that most major support services to the mining sector will be sourced from the Broader Service Area (in particular Mackay) or from outside the Study Area.

It is **likely** the development of a number of coal mining projects in the Galilee Basin may provide the 'critical mass' required to develop a local mining support sector value chain that one project alone cannot provide. This has the potential to benefit the mining projects in terms of developing a strong and efficient local supply network, and has the potential to considerably benefit economic development in the local region. Local businesses may also be able to realise economies of scale and scope as a result of the greater demand multiple projects could provide, and clustering of similar industries has the potential to provide enhanced synergies between businesses.

On a broader scale, however, the development of a local value chain is likely to predominantly represent a transfer of activity from elsewhere in Queensland (as projects would otherwise be expected to source goods and services from elsewhere in Queensland) rather than a genuine increase in activity. Regardless, the development of a local value chain to support multiple projects is considered to be a **positive** outcome. The cumulative impact assessment for industry clustering and value chain development is summarised in Table 6.2.

Table 6.2. Assessed Beneficial Impact: Industry Clustering and Value Chain Development

	Consequence					
Likelihood	Severe	Major	Moderate	Minor	Negligible	Positive
Almost Certain						
Likely						**Positive Effect**
Possible						
Unlikely						
Rare						

6.2.3 Increased Business, Consumer and Investor Confidence

The investment in a significant number of major projects in the Study Area would provide a clear statement of intent for development in the region. Combined with the additional

household incomes, increase in demand for local goods and services, and demand for housing these projects would entail, development of a number of major projects would **likely** provide a boost in confidence for business, consumers and investors alike.

Business, investor and consumer confidence is linked with investment and spending patterns, with higher levels of confidence typically supporting higher levels of business investment and consumer expenditure, and vice versa. Consumption and investment are key elements of economic growth, and as such an improvement in business, investor and consumer confidence would be expected to support economic growth in the region, Queensland and Australia, and as such represents a **positive** outcome.

It is difficult to predict the exact nature of the combined projects' impact on business, consumer and investor confidence and the subsequent benefits to economic growth. Examination of the Queensland State Accounts shows that during the period between 2003 / 04 and 2007 / 08, which coincided with the recent mining boom in the Bowen Basin, growth in GSP average 5.2% per annum in real terms (Australian Bureau of Statistics, 2009b). By comparison, over the past 20 years (1989 / 90 to 2008 / 09) Queensland's GSP averaged growth of 4.5% per annum. This serves to highlight the potential impact a period of intense investment can have on economic growth.

The cumulative impact assessment for increased business, consumer and investor confidence is summarised in Table 6.3.

Table 6.3. Assessed Beneficial Impact: Increased Business, Consumer and Investor Confidence

	Consequence					
Likelihood	Severe	Major	Moderate	Minor	Negligible	Positive
Almost Certain						
Likely						Positive Effect
Possible						
Unlikely						
Rare						

6.2.4 Economies of Scale and Scope for Service Provision

It is **possible** the combination of a number of projects being developed in the Study Area could provide a 'critical mass' in terms of demand for a number of services provided by all levels of government as well as private industry, and thereby provide opportunities to improve the level of service provision and the coordination and efficiency of service delivery that may otherwise not be possible. Key services that may benefit as a result of increased demand include:

- Education and training;
- Health services;
- Child care services;
- Public and community services; and
- Recreation and leisure activities and services.

While improving service delivery may provide significant social benefits to some community groups, the economic implications are less tangible. Improving the efficiency of service delivery should provide some cost savings, and education and training is critical to developing a skilled workforce for the ongoing prosperity of the regional, State and national economies, and therefore can be considered a **positive** economic outcome. However, in consideration of existing plans and workforce development programs in the region, the cumulative benefit in terms of improved service provision is likely to be minor.

The cumulative impact assessment for economies of scale and scope for service provision is summarised in Table 6.4.

Table 6.4. Assessed Beneficial Impact: Economies of Scale and Scope for Service Provision

Likelihood	Consequence					
	Severe	Major	Moderate	Minor	Negligible	Positive
Almost Certain						
Likely						
Possible						Positive Effect
Unlikely						
Rare						

6.3 Assessment of Potential Adverse Cumulative Impacts

Potential adverse cumulative impacts are assessed below. While the potential beneficial impacts should be encouraged and facilitated by appropriate planning measures where appropriate, it is the adverse cumulative impacts that are of key concern for future development of the Study Area. In order to ensure these potential cumulative impacts are appropriately managed it will be important for local Council and State Government to collaborate with project proponents and develop coordinated plans to account for the anticipated increased population, business and industry growth throughout the Study Area.

6.3.1 Crowding Out of Business Due to Competition for Resources

Given the size and scale of the projects proposed, the concurrent development of a number of major projects in the Study Area is **almost certain** to result in additional demand and competition for labour and other inputs to supply these projects (e.g., land, capital, water, intermediate goods and services used in the production process).

Competition for constrained resources places upward pressure on input prices as projects and business compete to attract and retain increasingly constrained resources. While some of the resources required can be imported if not available locally (land is a notable exception), mobility constraints can place additional upward pressures on input prices, in particular labour supply. This can result in "crowding out" of some businesses and industries due to:

- A draw of labour from some sectors, in particular lower income paying sectors, as labour is attracted to these industries that offer higher wages and salaries;
- Reallocation of capital investment to those sectors providing higher returns; and
- Reduced profit margins for business due to higher costs of production (e.g., wages, rents), eroding the viability of some businesses, particularly smaller businesses already operating on or near the margin.

Crowding out of lower income paying sectors and smaller businesses can result in a significant deficit in the local services available to existing residents and those either temporarily or permanently migrating to the region for work.

The increased competition for and price of inputs can also increase hurdle rates for projects as well as reduce the capacity of local economies to develop a support base for major projects, increasing the reliance on imports.

While impacts of increased input prices would be felt most keenly in the Study Area, other regions in Queensland and Australia would also be impacted. For example, labour is relatively mobile between regions and industries (particularly in the medium to long term), and as such competition for labour in the Study Area would be expected to place upward pressure on labour prices throughout the regional, State and national labour pool.

Modelling results for the China First Project outlined in Chapter 5 indicates that crowding out will be an issue for some sectors even where other projects are not explicitly considered. Where the projects considered in this cumulative impact assessment all proceed, the impacts of crowding out will be greater. As such, without appropriate planning the increased competition for resources anticipated where the projects considered in this cumulative impact assessment all proceed is assessed to be of **major** consequence.

The cumulative impact assessment for crowding out of business due to competition for resources is summarised in Table 6.5.

Table 6.5. Assessed Adverse Impact: Crowding Out of Business Due to Competition for Resources

	Consequence					
Likelihood	**Severe**	**Major**	**Moderate**	**Minor**	**Negligible**	**Positive**
Almost Certain		**High (9)**				
Likely						
Possible						
Unlikely						
Rare						

6.3.2 Availability of Affordable Housing

The China First Project is expected to result in an increase in property prices in the Mine Catchment and, to a lesser extent, the Abbot Point Catchment. Where a number of major projects are developed concurrently, adverse impacts on property prices are expected to be exacerbated.

The experience of the Bowen Basin during the latest mining boom indicates that where a number of projects are developed concurrently demand for housing in the Study Area would increase considerably, and would **almost certainly** result in significant additional upward pressure on housing prices.

Complicating this issue, the demand for construction labour by major projects would compete with demand for residential construction workers, constraining the industry's capacity to deliver additional supply to market, particularly in the short to medium term.

The increase in housing prices would reduce the affordability of housing for lower income earning households, and the experience of the Bowen Basin suggests this would likely result in some households being forced to leave the region. Disposable incomes of households that remain in the region will also decline as a greater share of income is required for accommodation, reducing consumer expenditure in the region, in particular for luxury items. The outward migration of some residents from the region and high housing costs would also exacerbate difficulties of local business in retaining and attracting workers.

Counter-acting the adverse implications on housing affordability from increased activity in the region to some degree, the development of a number of projects concurrently has the potential to provide some benefits in terms of coordination of housing and accommodation planning. However, even with appropriate accommodation planning issues of housing affordability are likely to be of **major** consequence in the local economy if a significant number of major projects are developed at the same time.

The cumulative impact assessment for availability of affordable housing is summarised in Table 6.6.

Table 6.6. Assessed Adverse Impact: Availability of Affordable Housing

	Consequence					
Likelihood	**Severe**	**Major**	**Moderate**	**Minor**	**Negligible**	**Positive**
Almost Certain		**High (9)**				
Likely						
Possible						
Unlikely						
Rare						

6.3.3 Infrastructure and Service Capacity Constraints

As outlined in sections 6.2.1 and 6.2.4, the concurrent development of multiple major projects would result in an increase in demand for a variety of economic and social

infrastructure, including transport, power, water, sewerage and telecommunications, as well as government, community and recreational infrastructure and services.

While this has the potential to enhance infrastructure and service delivery, where additional demand is not met by an increase or improvement in the supply of services it is **possible** the development of a number of projects concurrently could result in capacity constraints and bottlenecks in service delivery, in particular for transport infrastructure where the delivery of goods and services to support the projects will result in increased traffic loads on local roads.

While the severity of these capacity constraints and bottlenecks would vary depending on the type of infrastructure or service affected and the degree, in consideration of the infrastructure planned as part of the projects considered in this cumulative impact assessment and the anticipated increase in government revenues, the consequence of any constraints in service delivery are expected to be relatively short term and **minor**.

The cumulative impact assessment for infrastructure and service capacity constraints is summarised in Table 6.7.

Table 6.7. Assessed Adverse Impact: Infrastructure and Service Capacity Constraints

	Consequence					
Likelihood	**Severe**	**Major**	**Moderate**	**Minor**	**Negligible**	**Positive**
Almost Certain						
Likely						
Possible				**Medium (5)**		
Unlikely						
Rare						

7. Mitigation / Enhancement Strategies

This section outlines the key issues that need to be addressed to mitigate adverse impacts of the China First Project and / or enhance positive impacts, and recommends strategies for addressing these issues.

7.1 Key Issues to be Addressed

From the assessment of economic impacts of the China First Project presented in Chapter 5, the following key issues have been identified as needing to be addressed in order to minimise or mitigate the adverse impacts of the project and / or realise and enhance the positive impacts of the project:

- *Address skills shortages*: There is insufficient supply of skilled workers available in the local region;
- *Minimise draw down on labour from other sectors*: The China First Project is estimated to result in a draw / reallocation of labour from some sectors of the economy, in particular lower income paying sectors;
- *Develop the local supply chain*: There are gaps in the local supply network, negatively impacting on local business' capacity to support the needs of the China First Project through local supply of goods and services;
- *Minimise disruption to agricultural practices*: The China First Project will result in the disruption of agricultural practices through the acquisition of productive agricultural land for development and operation of the mine, as well as the rail line intersecting properties;
- *Minimise adverse implications of higher property prices*: There is insufficient supply of local housing to meet anticipated increases in demand by mining contractors, executives and flow-on employees and their families migrating to the region, resulting in an increase in property and rental prices. This results in a subsequent issue in terms of insufficient supply of affordable housing in the region;
- *Develop supporting infrastructure*: Additional social and economic infrastructure is required to support the China First Project, flow-on business and industry growth, and employees and households migrating to the region;
- *Minimise adverse impacts of increased traffic*: The China First Project will result in additional traffic movements due to transport of goods, services and potentially employees to support the China First Project, potentially increasing travel times and road maintenance (particularly during the construction period) in the local area; and
- *Consideration of cumulative impacts*: Cumulative impacts of the China First Project with other projects potentially being developed could significantly exacerbate the above issues.

The following section outlines mitigation strategies to assist in off-setting some of the potential adverse impacts of the China First Project on the local, regional and State economy, as appropriate, as well as enhance some of the potential economic benefits of the project.

7.2 Mitigation Strategies

7.2.1 Address Skills Shortages

Issue:

The Study Area is already experiencing skills shortages for construction and mining positions, and the development and operation of the mine will exacerbate these shortages.

Objective:

Develop the local and regional skills base through a combination of training programs, apprenticeships and traineeships.

Recommended Mitigation / Enhancement Measures:

In terms of developing the skills base to support the China First Project, it should be recognised that there are currently a number of programs being undertaken by various State and national organisations and Government agencies to address this key issue. Programs of particular relevance to the China First Project include:

- **Construction Skills Queensland Industry Support Program**: This program, run by Construction Skills Queensland (CSQ), is designed to increase retention rates of apprentices and trainees by providing a different approach to servicing the needs of regions' building and construction industry employers, apprentices and trainees through an industry driven mentoring and support model.
- **Heartbeat Project**: The Heartbeat Project is run by the Mining Industry Skills Centre (MISC) with partial funding from the Australian Government Department of Education, Employment and Workplace Relations (DEEWR) and quantifies the skills shortage in specific roles by aggregating data across the industry and projects skills shortages into the future. Statistical information is then made available to participating resource sector organisations to assist them in their workforce planning.
- **Mining Industry Skills Strategy**: The Mining Industry Skills Strategy was developed by MISC and launched in late 2007. The Skills Strategy identifies the current skills shortages in the industry across Australia, and outlines six priority goals for workforce planning and development to address skills shortages in the industry. Research and development activities are ongoing towards achieving these six priority goals, with key projects including:
    - *Career Pathways*: MISC is working with the mining industry to present clear and defined career pathways for various job roles to attract workers to the industry and retain current workers;
    - *Bowen Basin Skills Formation Strategy*: The Bowen Basin Skills Formation Strategy, funded by the Queensland Department of Education and Training (DET), provides a range of strategies for attracting and retaining skilled workers to the mining industry; and
    - *Attraction and Retention Project*: This research project has examined attraction and retention strategies adopted by other industries throughout Australia to develop best practice strategies for the mining industry.
- **Work Readiness Program**: This program, run by MISC and funded by DEEWR, provides an entry level training program targeting school leavers, university graduates and other non-experienced personnel who are keen to enter the mining industry.

  The program is delivered through a combination of classroom-based training plus structured on-site activities. Content, length and delivery methodology is customisable in order to meet the specific training requirements of project sites and companies. Participants attend up to two weeks of classroom training followed by on-site training of between three and ten weeks.
- **Resources Industry Training Fund**: The Resources Industry Training Fund (RITF) assists organisations within the resources industry to fund the delivery of training and development programs to new and existing workers. MISC manages the RITF on behalf of DET. Eligible applicants are entitled to reimbursement of up to 50% of the cost of training programs delivered by Registered Training Organisations (RTOs).
- **Australian Government Skills and Training Programs**: The Australian Government offer a range of funding and incentives for employers and employees to engage in skills training and development, including:
    - Australian Apprenticeships Program;
    - Training Pathways Program;

- Productivity Places Program; and
- Workforce Innovation Program.

In addressing issues of skills shortages in the construction industry, the following strategies are recommended to mitigate and minimise impacts of the China First Project[7]:

- Encourage contractors engaged during construction of the China First Project to utilise Australian Government skills and training programs where possible, including the Australian Apprenticeship Program. It is recommended Waratah Coal provide information and develop awareness of Australian Government incentives and programs to all contractors engaged, and direct contractors to relevant agencies; and
- It is recommended Waratah Coal engage and collaborate with CSQ to identify potential strategies for increasing the capacity of local job seekers to develop appropriate skills.

To address issues of skills shortages in the mining industry, the following mitigation strategies are recommended:

- Identify and communicate the China First Project's skills requirements to MISC and DET to identify areas of skills gaps and assist in workforce planning;
- Collaborate with MISC and DET regarding extending the findings of the Career Pathways research and other attraction and retention research to market the industry as a career of choice to not only persons currently in the labour force but also youth entering the labour force in the near future;
- Collaborate with MISC and relevant RTOs to develop customised training programs, including those undertaken as part of the Work Readiness Program, that are suited to the needs of the China First Project and extend these training programs to the Mine Catchment and Broader Service Area through relevant RTOs. These programs should target under-utilised labour resources in the region (including people not currently in the labour force), workers in other industries wishing to enter the mining industry and, importantly, school leavers;
- Engage with MISC regarding accessing funding for training programs provided by RTOs through the 'Resources Industry Training Fund' (RITF);
- Encourage contractors engaged on the China First Project to utilise Australian Government skills and training programs where possible, including the Australian Apprenticeship Program. It is recommended Waratah Coal provide information and develop awareness of Australian Government incentives and programs to all contractors engaged, and direct contractors to relevant agencies; and
- It is recommended that Waratah Coal collaborate with MISC to track skills requirements and gaps on an ongoing basis, as part of the Heartbeat Project. This will assist in ongoing industry-wide strategies and planning for addressing skills shortages in the region.

Responsibility:

Waratah Coal in collaboration with MISC, CSQ, DET and other relevant agencies.

7.2.2 Minimise Draw Down on Labour from Other Sectors

Issue:

The China First Project is estimated to result in a draw / reallocation of labour from some sectors of the economy, in particular lower income paying sectors.

Objective:

Minimise the adverse impacts of a draw down on labour from other sectors, and provide flexible arrangements for workers to encourage participation in both the mining and other

[7] It should be recognised that the relatively short term nature of the construction phase of the China First Project limits to some degree the capacity for Waratah Coal to 'up-skill' the local construction labour force.

sectors. This was identified as a key issue for lower income paying industries, in particular agriculture and local government.

Recommended Mitigation / Enhancement Strategies:

To assist in minimising the impacts of a draw down on labour in other sectors, the following mitigation strategies are recommended:

- Waratah Coal engage with local business and residents to investigate options for providing flexible working arrangements that would allow locals to participate in not only the China First Project, but also maintain jobs in other industries. This may include, where practical, arrangements such as rostered shifts (e.g., 7 days on, 7 days off) or part-time employment opportunities in the China First Project that would enable local workers to also work part time in sectors such as agriculture and local government;
- Waratah Coal assist local business to secure supply contracts and encourage new businesses to locate to the region (this is examined in more detail in section 7.2.3);

It must be recognised, however, that the high salaries offered by the China First Project will result in some difficulties for other sectors to attract and retain workers. In order to appropriately mitigate the likely draw of labour to the China First Project, collaborative planning between State Government, local Council, local industry, industry organisations, and mining proponents is required. To this end, it is recommended that:

- State Government, local Council and industry organisations collaborate to identify and explore opportunities and strategies for encouraging local young adults employed on the China First Project and other mining projects to undertake skills training in other sectors. This will enable at risk industries to maintain a skills base in the region and provide greater flexibility in the workforce;
- MISC, DET, local government and other industry development organisations collaborate to identify and develop strategies to encourage locals to re-enter the labour force, including older workers and partners of mining employees. It is recommended this include a strategy aimed at providing flexible working arrangements and job-sharing in key industries susceptible to a draw down in labour; and
- State Government and local Council explore opportunities for attracting housing and service development in the region in order to encourage workers to migrate to the region across a range of industries.

Responsibility:

Collaborative partnership between State Government, local Council, local industry, industry organisations, and Waratah Coal.

7.2.3 Develop the Local Supply Chain

Issue:

There are gaps in the local supply network, negatively impacting on local business' capacity to support the needs of the China First Project through local supply of goods and services. This reduces the potential for the local economy to capture flow-on benefits of the project.

Objective:

Assist and provide incentives for local business to secure supply contracts for the China First Project.

Recommended Mitigation / Enhancement Strategies:

The following mitigation strategies are recommended to assist local business secure supply contracts and encourage new businesses to locate to the region:

- In collaboration with local Council, economic development organisations, the Industry Capability Network (ICN) and State Government:

- Identify the goods and services that are expected to be required by the China First Project and inform local business of service provision opportunities and requirements of business to secure contracts;
- Develop and implement a Local Content Strategy establishing or participating in programs to assist qualified local and regional businesses tender for provision of goods and services to support the China First Project;
- Examine options for establishing a local cooperative service or network to connect local business and supply chains and enable smaller, local businesses to collaborate in meeting service supply requirements of the China First Project; and
- For goods and services that are not able to be sourced within the China First Project Study Area, develop strategies to encourage suppliers to locate to the region. Strategy development should be led by local Council, with Waratah Coal and other proponents to inform Council of business opportunities and allow Council to appropriately plan for likely industrial / commercial land requirements.

Responsibility:

Waratah Coal in collaboration with the Industry Capability Network, DEEDI, local Council and local business.

7.2.4 Minimise Disruption of Agricultural Practices

Issue:

The China First Project will result in the disruption of agricultural practices through the acquisition of agricultural land for development and operation of the mine, as well as the rail line intersecting properties.

Objective:

Minimise adverse impacts to agricultural activities in the Study Area from the acquisition of agricultural land and disruption of management practices along the rail corridor.

Recommended Mitigation / Enhancement Strategies:

The China First Project will require access to land that is currently utilised for agricultural purposes, including approximately 55,000 hectares across six land holdings that is primarily used for grazing. Existing agriculture activities on three of these land parcels will cease for development of the mine site and above ground construction and mining activity, however, land holders will negotiate compensation for the loss of this land with Waratah Coal. The development of the underground mining operations on the other three properties will not preclude grazing activities on this land, and it is recommended that Waratah Coal negotiate with land holders to enable agricultural activities to continue on these properties.

Of key concern is ensuring adverse impacts of the project on other agricultural activities through noise, dust, stranding of assets and / or disruption of management practices are minimised. To this end, the following mitigation strategies are recommended:

- Waratah Coal will include a buffer area between mining activities and adjacent land holdings. It is recommended that engineering design include an appropriate buffer area that will ensure adjacent land holdings are not excessively or inappropriately impacted by mining operations; and
- Waratah Coal engage with landholders along the rail corridor to identify potential disruptions to existing management practices for each property likely to be impacted, including potential changes to land configuration and likely costs, and potential for land stranding or isolation;
- In order to minimise the disruption to agricultural practices, design of the rail line should ensure identified key adverse impacts on land access and ongoing management practices are avoided and / or mitigated (e.g., through provision of alternative access points); and

- Where land holdings are intersected by the rail line, Waratah Coal should negotiate with land holders' for reasonable compensation to provide required changes to alter paddock configuration, including alternative water access, fencing modifications and any additional stockyards required.

Responsibility:

Waratah Coal.

7.2.5 Minimise Adverse Implications of Higher Property Prices

Issue:

There is insufficient supply of local housing to meet anticipated increases in demand by mining contractors, executives and flow-on employees and their families migrating to the region, resulting in an increase in property and rental prices. This results in a subsequent issue in terms of insufficient supply of affordable housing in the region.

Objective:

Minimise the potential adverse implications of higher property prices on local residents, in particular issues of housing affordability.

Recommended Mitigation / Enhancement Strategies:

In developing strategies to minimise the adverse impacts of the China First Project on property prices it should be recognised that pressures on property prices will be driven not only by the direct workforce of the project, but also through speculative investors and people migrating to the region due to flow-on employment opportunities. Examination of recent movements in rental prices in the Bowen Basin show that even where worker camps are utilised, property prices will likely increase at a faster rate than would otherwise be achieved (refer to section 5.4 for more detail). As such, the role of mitigation strategies is to ensure that property price growth is not acute, and that the adverse impacts of an increase in property prices is minimised.

To this end, the following mitigation strategies are recommended:

- Encourage use of worker camps by all FIFO project related employees to ensure demand for housing in the local property market is minimised; and
- Support the development of local infrastructure (this is examined in more detail in section 7.2.6).

In addition to the strategies recommended above, it is recommended that:

- State Government and local Council collaborate to develop and implement affordable housing schemes in affected regions to provide affordable accommodation for low income and displaced households; and
- State Government and MISC provide funding to undertake an assessment of recent mining projects in the Bowen Basin to identify the uptake of worker camp accommodation by mining employees and contractors, the proportion of mining employees and contractors seeking accommodation outside of these worker camps, and the effects they have had on local property markets and service demand. The findings of this study should be made available to local Council to assist land planning and the development of strategies to expand infrastructure and service provision in nearby towns such as Alpha, Jericho, Emerald and Barcaldine.

Responsibility:

Waratah Coal, State Government, MISC and local Council.

7.2.6 Develop Supporting Infrastructure

Issue:

The China First Project will involve the development of key infrastructure in the local region, such as utilities (e.g., power, water, telecommunications), local roads and an air-

strip. However, additional social and economic infrastructure is required to support the needs of the China First Project and its employees, as well as flow-on business and industry growth, and employees and households migrating to the region.

Objective:

Provide sufficient social and economic infrastructure to meet the increased demand generated directly and indirectly by the China First Project.

Recommended Mitigation / Enhancement Strategies:

To ensure required social and economic infrastructure is developed to meet the direct and indirect demand generated by the China First Project, the following mitigation strategies are recommended:

- Waratah Coal identify and communicate anticipated resident and non-resident population growth and associated infrastructure requirements and impacts as early as possible to relevant government authorities (impacts on population and associated infrastructure is examined in the Social Impact Assessment undertaken as part of this EIS);
- Relevant government authorities investigate and develop anticipated cost estimates to provide social and economic infrastructure required to meet demand generated indirectly by the China First Project, and identify appropriate cost recovery strategies for developing this infrastructure. In order for Council to appropriately fund the development of required social and economic infrastructure, sources for initial funding will likely need to be negotiated between local Council and State Government, and potentially project proponents; and
- Waratah Coal and relevant government authorities negotiate appropriate contributions for social and economic infrastructure developments required as a direct result of activities of the China First Project.

Responsibility:

State Government and local Council, with contribution from Waratah Coal.

7.2.7 Minimise Adverse Impacts of Increased Traffic

Issue:

The China First Project will result in additional traffic movements due to transport of goods, services and potentially employees to support the China First Project, particularly during the construction period, potentially increasing travel times in the local area and increasing road maintenance requirements.

Objective:

Minimise impacts of additional traffic movements on local residents' travel times and other coal operators.

Recommended Mitigation / Enhancement Strategies:

A range of strategies for mitigating the adverse impacts of increased traffic are presented in the Transport section of the EIS. Please refer to this section for more detail. In addition to these strategies, the following mitigation strategies are recommended to minimise impacts on travel times:

- Develop strategies to ensure project related traffic movements (in particular for goods and services) are primarily undertaken during non-peak traffic periods on local roads; and
- Engage with other mining proponents and export facility operators to ensure coal movements are appropriately managed to not create or exacerbate bottlenecks in the rail and port network.

Responsibility:

Waratah Coal, local Council and the Department of Transport and Main Roads.

7.2.8 Consideration of Cumulative Impacts

Issue:

Cumulative impacts of the China First Project with other projects potentially being developed could significantly exacerbate the above issues.

Objective:

Minimise the impact of multiple projects competing for constrained resources.

Recommended Mitigation / Enhancement Strategies:

Mitigating the cumulative impacts of multiple projects being developed at once requires significant coordination of activities and cooperation between project proponents. To ensure adverse impacts of multiple projects are minimised, relevant government authorities will be required to take a lead role in the coordination process.

To this end, the following mitigation strategies are recommended:

- State Government and proponents of major projects being developed in the region to collaborate and identify key project timings and requirements to allow adequate and appropriate planning for and mitigation of cumulative project impacts and minimise overlap between peak activity. Project sequencing requires cooperation between proponents as well as relevant government authorities to coordinate activities and source from the same labour pool rather than creating intense competition for labour; and
- Where major projects are located in close proximity, proponents and government authorities to collaborate to develop regional plans for accommodation and support services.

Responsibility:

State Government, in collaboration with major project proponents, local Council and industry organisations.

References

ABC Tropical Queensland (2008). *There are calls for the Queensland Government to step in as the population and housing prices in Moranbah continue to rise with the mining boom*. Retrieved 17 January 2010 from http://www.abc.net.au/news/stories/2008/04/09/2211818.htm?site=tropic.

Australian Bureau of Agricultural and Resource Economics (2010). *Australian Commodities, March Quarter 2010 – Volume 17, No. 1*. ABARE, Canberra.

Australian Bureau of Statistics (2010a). *Regional Population Growth Australia, 2008-09*. Cat. No. 3218.0, ABS, Canberra.

Australian Bureau of Statistics (2010b). *Building Approvals, Australia, Mar 2010*. Cat. No. 8731.0, ABS, Canberra.

Australian Bureau of Statistics (2010c). *Producer Price Index Australia: Table 15 Construction.* Cat. No. 6427.0, ABS, Canberra.

Australian Bureau of Statistics (2010d). *International Trade in Goods and Services, Australia, Feb 2010*. Cat. No. 5368.0, ABS, Canberra.

Australian Bureau of Statistics (2009a). *Australian National Accounts: Input-Output Tables - Electronic Publication, 2005-06 Final*. Cat. No. 5209.0.55.001, ABS, Canberra.

Australian Bureau of Statistics (2009b). *Australian National Accounts: State Accounts, 2008-09*. Cat. No. 5220.0, ABS, Canberra.

Australian Bureau of Statistics (2007). *2006 Census of Population and Housing.* ABS, Canberra.

Australian Bureau of Statistics (2003). *CDATA 2001, 2nd Release.* ABS, Canberra.

Australian Customs and Border Protection Services (2010). *Working Tariff Page*. Retrieved from: http://www.customs.gov.au/site/page5663.asp. Last accessed: 22nd July 2010.

Australian Taxation Office (2010). *Individual income Tax Rates, 2009-10.* Retrieved from: http://www.ato.gov.au/individuals/content.asp?doc=/content/12333.htm. Last accessed: 20th May 2010.

Coordinator-General (2009). *Terms of Reference for an Environmental Impact Statement: Galilee Coal Project (Northern Export Facility).* Coordinator-General, Brisbane.

Geoscience Australia and the Australian Bureau of Agricultural and Resource Economics (2010). *Australian Energy Resource Assessment*. Geoscience Australia and ABARE, Canberra.

Heavy Engineering Industry Reference Group (2010). *Mackay Projects*. Retrieved from: http://www.heirg.com/projects/by-region-mac.php. Last accessed: 9/6/2010.

Landline (2006). *Resources boom revitalises Queensland's Darling Downs*. Retrieved 17 January 2010 from http://www.abc.net.au/landline/content/2006/s1749914.htm.

OECD (2001). *OECD Glossary of Statistical Terms – Factor Incomes Definition*. Retrieved from: http://stats.oecd.org/glossary/detail.asp?ID=929. Last accessed: 20th May 2010.

Office of Economic and Statistical Research (2010). *Small Area Labour Market Data.* Retrieved from QRSIS Online, Office of Economic and Statistical Research, Queensland Treasury, Brisbane.

Petkova, V., Lockie, S., Rolfe, J. and Ivanova, G. (2009). *Mining Developments and Social Impacts on Communities: Bowen Basin Case Studies*. Rural Society, Vol. 19, No. 3, pp. 211 – 228.

Prime Research (unpublished). *CGE Modelling Results for the China First Project*. Unpublished data provided by Prime Research, 18 May 2010.

Queensland Department of Employment, Economic Development and Innovation (2010). *Tenure Rental Current Yearly Rates - 2009.* Retrieved from: http://www.dme.qld.gov.au/zone_files/royalties/tenure_rental_rates_2009.pdf. Last accessed: 20th May 2010.

Queensland Department of Employment, Economic Development and Innovation (2009). *Queensland's coal seam gas overview August 2009*. Qld Government, Brisbane.

Queensland Department of Environment and Resource Management (2010). *Current EIS Processes.* Retrieved from: http://www.derm.qld.gov.au/environmental_management/impact_assessment/eis-processes/current.html. Last accessed: 9/6/2010.

Queensland Department of Infrastructure and Planning (2010). *Coordinator-General's Projects*. Retrieved from: http://www.dip.qld.gov.au/coordinator-general-projects/index.php. Last accessed: 9/6/2010.

Queensland Department of Mines and Energy (2010a). *Royalty Rates*. Retrieved from: http://www.dme.qld.gov.au/mines/royalty_rates.cfm. Last accessed: 9th April 2010.

Queensland Department of Mines and Energy (2010b). *Mining and Petroleum Royalties – Revenue Statistics.* Retrieved from: http://www.dme.qld.gov.au/mines/mining_royalties.cfm. Last accessed: 9th April 2010.

Queensland Office of State Revenues (2010). *Office of State Revenue Homepage.* Retrieved from: http://www.osr.qld.gov.au. Last accessed: 20th May 2010.

Queensland Treasury (2008). *Queensland's future population 2008 edition (based on 2008 ASGC)*. Planning Information and Forecasting Unit (PIFU), Office of Economic and Statistical Research, Queensland Treasury, Brisbane.

Real Estate Institute of Queensland (2010). *REIQ Market Monitor*. REIQ, Brisbane.

Residential Tenancies Authority (2010). *Median Rents & Bonds for Selected Areas throughout Queensland*. Residential Tenancies Authority (RTA), Brisbane.

Residential Tenancies Authority (unpublished). *Median Weekly Rents for selected Postcodes in the Central Queensland and Mackay and Whitsunday regions*. Unpublished data provided by the Residential Tenancies Authority, 4 June 2010.

Rolfe, J., Miles, B., Lockie, S. and Ivanova, G. (2007). *Lessons from the Social and Economic Impacts of the Mining Boom in the Bowen Basin 2004 – 2006.* Australasian Journal of Regional Studies, Vol. 13, No. 2, pp. 134 – 153.

Tourism Queensland (2010). *Queensland Data Sheet, Year Ended March 2010*. Retrieved from: http://www.tq.com.au/fms/tq_corporate/research%20%28NEW%29/Summary%20Visitor%20Statistics/queensland_data_sheet.pdf. Last accessed: 10th August 2010.

Tourism Whitsundays (2010). *Whitsunday Tourism Regional Summary*. Last accessed on 31/3/2010 from http://www.whitsundaytourism.com/

Waratah Coal (unpublished, a). *Investment Estimates for the China First Coal Project.* Correspondence from M.Imber, Waratah Coal, 18/03/2010.

Waratah Coal (unpublished, b). *Estimates of Operating Expenses for the China First Coal Project*. Correspondence from M.Imber, Waratah Coal, 29/03/2010.

Appendix A: Computable General Equilibrium Methodology

Model Overview

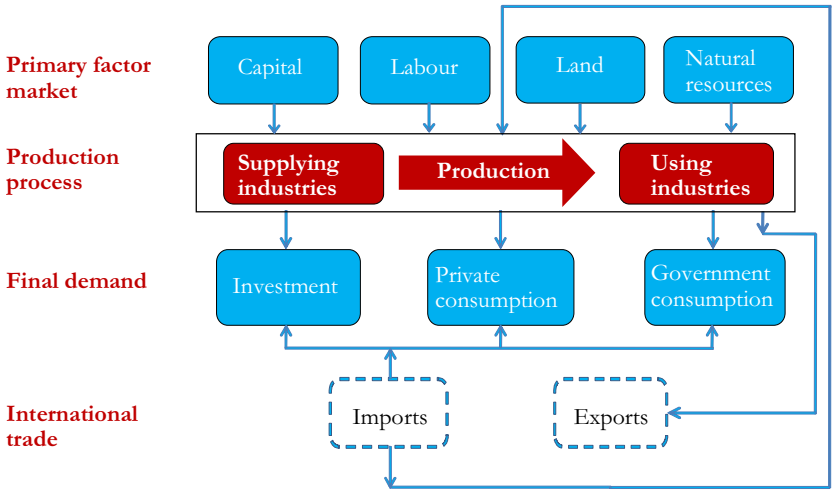
Computable General Equilibrium (CGE) economic models represent the workings of the economy through a system of interdependent behavioral and accounting equations linked to an input-output database.

Beginning with the production processes of individual industries, supported by inputs from other industries and the use of the primary factors of production, then adding in investment demand, private and government consumption, imports and exports, CGE modelling represents a fully integrated model of the world economy. In the model used for this assessment, production technology, individual markets, investment, trade and consumption are represented by equations with strong microeconomic foundations. The simultaneous solution of these equations in response to external changes (or 'shocks') generates the model solutions. When an economic shock, such as a new project, is applied to the model, each of the markets adjusts to a new equilibrium according to the economic theory and behavioral parameters that underpin the model.

In addition to recognising the linkages between industries in an economy, CGE models also recognise the constraints that apply in an economy (e.g. increased demand for labour will push the costs of labour up if there is full employment).

The CGE model used for this assessment is a dynamic model, which means it solves year-by-year, allowing a stream of annual results to be reported. Results are presented as deviations from a base (or reference) case, where the base case represents an anticipated growth path of the economy without the project.

Figure A.1. Representation of a Single Region in the CGE Model



Modelling Assumptions

The economic impacts of the China First Project within the project Study Area, Queensland and the national economy has been assessed by Prime Research utilising the Tasman Global Computable General Equilibrium (CGE) modelling framework.

Dynamic simulations using CGE modelling require two separate model runs. The first model run, known as the 'base case', simulates one view of the economic future. In this view of the future the China First Project does not proceed.

In the second model run, known as the 'with project case', an alternative view of the economic future is simulated. In this view of the future the China First Project development proceeds, and includes activities associated with coal extraction, coal transport via rail to coal stockyards and transfer facilities in Abbot Point, and export of coal to international markets.

Economic growth rates used in the modelling are based on near-term projections from Australian Government and State Treasuries, and medium to long term projections are a function of assumptions regarding changes in population, and particularly changes in the working age population, workforce participation rates and changes in labour productivity.

Regional population growth used in the modelling has been projected using an in-house demographic model. This model projects how populations change in each region and subsequently estimates changes in the working age population, which flows through to regional labour supply and participation rates. Population growth for the eight Australian States and Territories incorporates detailed ABS data on population levels, births, deaths and migration. Population growth within the project's Study Area are based on information referenced from Queensland Treasury.

Labour productivity growth is influenced by many factors, including capital intensity, training and education and composition of the workforce. Over the last 30 years Australia's labour productivity growth has averaged around 1.75% per annum. In the 'base case' Australian labour productivity growth is assumed to gradually slow from around 1.75% per annum in 2020 to 1.5% per annum in 2030.

Table A.1. Base Case Economic Growth Assumptions

Region	Average Annual Growth (%)
Queensland	3.6%
Australia	3.0%
Rest of the World	3.1%

Source: Prime Research (unpublished)

A constrained labour mobility assumption has been utilised, with labour mobility assumed to be motivated by real wage differentials. Labour mobility assumptions include both inter-industry labour movement within regions as well as inter-regional and interstate labour movement. Labour is assumed to not be sufficiently mobile to remove these real wage differentials completely (i.e., in order to attract labour, real wages will increase).

Appendix B: CGE Modelling Results

The tables and figures provided in the Appendix provide a summary of the economic impacts generated by the China First Project within the Study Area and Queensland.

Table B.1. Key Economic Indicators – Percentage Deviation from Base (Without Project) Scenario

Indicator / Catchment	2010 / 11 to 2012 / 13	2013 / 14 to 2017 / 18	2018 / 19 to 2036 / 37
Output			
Mine Catchment	2.1%	43.4%	30.7%
Abbot Point Catchment	5.1%	5.3%	3.6%
Broader Service Area	0.5%	1.5%	1.1%
Queensland	0.0%	0.8%	0.7%
GRP / GSP			
Mine Catchment	0.6%	36.5%	26.1%
Abbot Point Catchment	1.7%	5.6%	4.0%
Broader Service Area	0.3%	1.7%	1.2%
Queensland	0.1%	1.1%	0.8%
Employment			
Mine Catchment	9.4%	8.5%	4.1%
Abbot Point Catchment	7.5%	1.2%	0.5%
Broader Service Area	0.6%	0.5%	0.3%
Queensland	0.1%	0.2%	0.1%
Income			
Mine Catchment	2.6%	3.6%	2.2%
Abbot Point Catchment	4.2%	1.6%	1.0%
Broader Service Area	1.0%	1.1%	0.6%
Queensland	0.3%	0.5%	0.3%
Real Wages			
Mine Catchment	1.2%	1.9%	1.3%
Abbot Point Catchment	2.4%	0.9%	0.5%
Broader Service Area	0.5%	0.6%	0.3%
Queensland	0.2%	0.3%	0.2%

Source: Prime Research (unpublished).

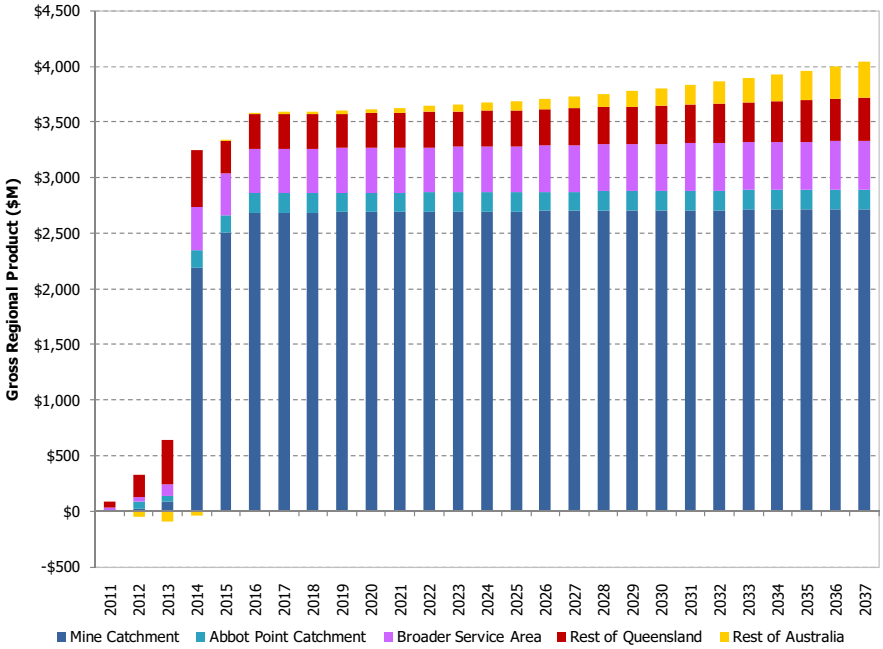
Table B.2. Average Annual Impact on Industry Output, Deviation from the Baseline (Without Project) Scenario

Catchment / Industry	Change in Industry Output (%)		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Mine Catchment			
Agriculture	-1.0%	-0.4%	0.0%
Mining	-1.4%	67.2%	47.0%
Manufacturing	11.1%	5.1%	2.3%
Electricity and water	-2.0%	1.6%	2.5%
Construction	46.3%	18.5%	2.5%
Trade	3.3%	2.1%	0.9%
Transport and storage	1.9%	4.1%	3.0%
Business, finance and insurance services	4.5%	2.7%	1.1%
Public administration, defence, health and education	-1.4%	-0.2%	0.3%
Recreation and other services	-3.4%	0.0%	1.3%
Ownership of dwellings	-1.6%	0.3%	0.6%
Total Change in Industry Output	**2.1%**	**43.4%**	**30.7%**

Catchment / Industry	Change in Industry Output (%)		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Abbot Point Catchment			
Agriculture	-2.5%	-0.5%	-0.1%
Mining	-4.4%	-0.9%	-0.5%
Manufacturing	-4.4%	-1.5%	-0.6%
Electricity and water	-6.2%	-0.3%	0.1%
Construction	94.7%	6.7%	-0.3%
Trade	0.5%	0.4%	0.3%
Transport and storage	-6.0%	40.2%	32.3%
Business, finance and insurance services	11.1%	1.0%	0.1%
Public administration, defence, health and education	-2.2%	0.0%	0.1%
Recreation and other services	-5.0%	-0.6%	-0.1%
Ownership of dwellings	-2.4%	0.9%	0.7%
Total Change in Industry Output	**5.1%**	**5.3%**	**3.6%**
Broader Service Area			
Agriculture	-0.4%	-0.4%	-0.1%
Mining	-0.6%	-0.6%	-0.3%
Manufacturing	4.1%	-0.3%	-0.6%
Electricity and water	-0.4%	2.9%	2.2%
Construction	1.7%	0.9%	0.1%
Trade	0.6%	0.7%	0.4%
Transport and storage	-0.1%	32.1%	26.0%
Business, finance and insurance services	1.6%	1.8%	1.1%
Public administration, defence, health and education	-0.3%	-0.1%	0.0%
Recreation and other services	-0.8%	-0.5%	-0.2%
Ownership of dwellings	-0.2%	0.4%	0.3%
Total Change in Industry Output	**0.5%**	**1.5%**	**1.1%**
Queensland			
Agriculture	-0.2%	-0.2%	-0.1%
Mining	-0.5%	8.0%	5.7%
Manufacturing	-0.2%	-1.0%	-0.7%
Electricity and water	-0.3%	-0.2%	0.1%
Construction	1.2%	0.2%	-0.1%
Trade	0.1%	0.4%	0.2%
Transport and storage	-0.2%	2.1%	1.6%
Business, finance and insurance services	0.2%	0.2%	0.1%
Public administration, defence, health and education	0.0%	0.3%	0.2%
Recreation and other services	0.0%	0.3%	0.3%
Ownership of dwellings	0.1%	0.9%	0.7%
Total Change in Industry Output	**0.0%**	**0.8%**	**0.7%**

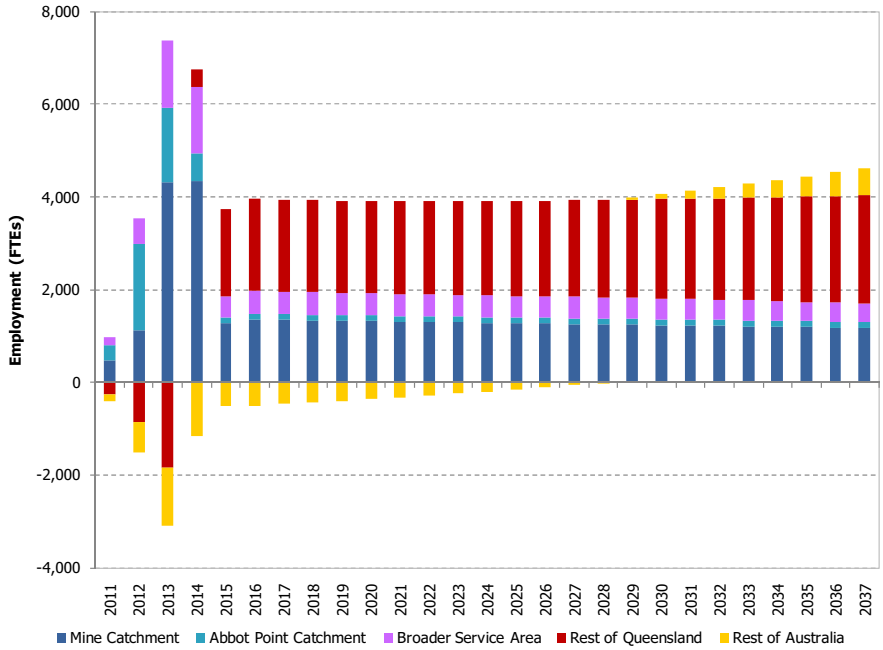
Source: Prime Research (unpublished).

Figure B.1. Gross Regional Product ($M2008 / 09), Deviation from Base (Without Project) Scenario, 2010 / 11 to 2036 / 37



Source: Prime Research (unpublished).

Figure B.2. Employment (FTEs), Deviation from Base (Without Project) Scenario, 2010 / 11 to 2036 / 37



Source: Prime Research (unpublished).

Table B.3. Average Annual Impact on Employment by Industry, Deviation from the Baseline (Without Project) Scenario

Catchment / Industry	Change in Employment (%)		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Mine Catchment			
Agriculture	-1.2%	-0.4%	0.0%
Mining	-1.7%	19.5%	13.6%
Manufacturing	9.8%	3.6%	1.4%
Electricity and water	-2.6%	-0.4%	1.3%
Construction	75.2%	26.6%	1.8%
Trade	2.7%	1.3%	0.3%
Transport and storage	1.7%	2.9%	2.1%
Business, finance and insurance services	4.3%	2.1%	0.8%
Public administration, defence, health and education	-1.1%	-0.2%	0.2%
Recreation and other services	-2.9%	-0.3%	0.9%
Ownership of dwellings	0.0%	0.0%	0.0%
Total Change in Employment	**9.4%**	**8.5%**	**4.1%**
Abbot Point Catchment			
Agriculture	-2.6%	-0.5%	-0.2%
Mining	-4.8%	-1.1%	-0.5%
Manufacturing	-0.5%	-0.9%	-0.4%
Electricity and water	-3.4%	-0.1%	0.1%
Construction	55.6%	3.7%	-0.2%
Trade	2.3%	0.4%	0.1%
Transport and storage	3.0%	9.7%	7.6%
Business, finance and insurance services	11.8%	0.9%	0.1%
Public administration, defence, health and education	-1.1%	0.1%	0.1%
Recreation and other services	-1.7%	-0.7%	-0.4%
Ownership of dwellings	-0.8%	0.6%	0.5%
Total Change in Employment	**7.5%**	**1.2%**	**0.5%**
Broader Service Area			
Agriculture	-0.4%	-0.4%	-0.2%
Mining	-0.7%	-0.8%	-0.5%
Manufacturing	4.2%	0.4%	-0.2%
Electricity and water	-0.5%	2.4%	1.9%
Construction	2.1%	1.0%	0.1%
Trade	0.4%	0.5%	0.3%
Transport and storage	-0.1%	3.8%	3.1%
Business, finance and insurance services	1.4%	1.5%	0.9%
Public administration, defence, health and education	-0.2%	0.0%	0.0%
Recreation and other services	-0.6%	-0.4%	-0.1%
Ownership of dwellings	-0.5%	-0.1%	0.0%
Total Change in Employment	**0.6%**	**0.5%**	**0.3%**

Catchment / Industry	Change in Employment (%)		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Queensland			
Agriculture	-0.2%	-0.2%	-0.1%
Mining	-0.6%	1.7%	1.2%
Manufacturing	-0.1%	-0.8%	-0.6%
Electricity and water	-0.5%	-0.4%	0.1%
Construction	1.1%	0.2%	0.0%
Trade	0.1%	0.4%	0.2%
Transport and storage	0.0%	0.5%	0.4%
Business, finance and insurance services	0.2%	0.2%	0.1%
Public administration, defence, health and education	0.0%	0.3%	0.2%
Recreation and other services	0.0%	0.4%	0.3%
Ownership of dwellings	0.0%	1.0%	0.7%
Total Change in Employment	**0.1%**	**0.2%**	**0.1%**

Source: Prime Research (unpublished).

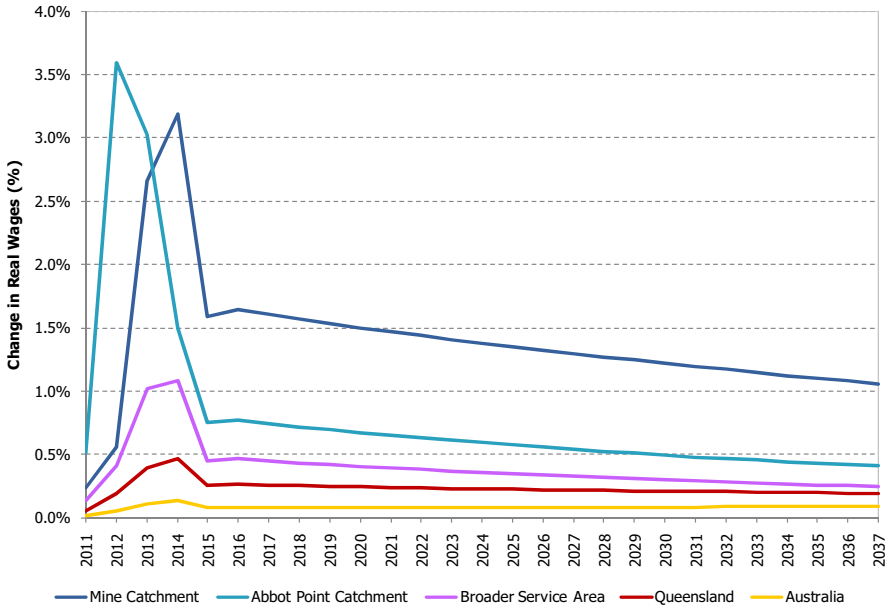
Table B.4. Average Annual Impact on Employment by Occupation, Deviation from the Baseline (Without Project) Scenario

Catchment / Industry	Change in Employment (%)		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Mine Catchment			
Managers	6.3%	4.4%	1.8%
Professionals	2.3%	4.9%	3.0%
Technicians and trades workers	21.7%	13.9%	5.1%
Community and personal service workers	0.8%	1.0%	0.6%
Clerical and administrative workers	8.4%	6.1%	2.6%
Sales workers	4.3%	2.2%	0.6%
Machinery operators and drivers	3.7%	12.5%	8.0%
Labourers	18.5%	8.6%	2.1%
Abbot Point Catchment			
Managers	3.3%	0.6%	0.3%
Professionals	3.7%	0.8%	0.4%
Technicians and trades workers	21.0%	1.8%	0.2%
Community and personal service workers	1.4%	2.0%	1.4%
Clerical and administrative workers	8.0%	1.8%	0.9%
Sales workers	3.8%	0.9%	0.4%
Machinery operators and drivers	6.6%	2.2%	1.2%
Labourers	7.3%	0.7%	0.2%
Broader Service Area			
Managers	0.4%	0.3%	0.2%
Professionals	0.4%	0.5%	0.3%
Technicians and trades workers	1.3%	0.7%	0.2%
Community and personal service workers	0.1%	0.4%	0.2%
Clerical and administrative workers	0.7%	0.8%	0.4%
Sales workers	0.8%	0.8%	0.4%
Machinery operators and drivers	0.4%	0.6%	0.3%
Labourers	0.7%	0.4%	0.2%

Catchment / Industry	Change in Employment (%)		
	2010 / 11 – 2012 / 13	2013 / 14 – 2017 / 18	2018 / 19 – 2036 / 37
Queensland			
Managers	0.1%	0.1%	0.1%
Professionals	0.1%	0.2%	0.2%
Technicians and trades workers	0.3%	0.1%	0.1%
Community and personal service workers	0.1%	0.3%	0.2%
Clerical and administrative workers	0.1%	0.2%	0.1%
Sales workers	0.1%	0.2%	0.2%
Machinery operators and drivers	0.1%	0.2%	0.2%
Labourers	0.2%	0.1%	0.1%

Source: Prime Research (unpublished).

Figure B.3. Annual Percent Change in Real Wages Resulting from the China First Project, 2010 / 11 to 2036 / 37



Source: Prime Research (unpublished).

Appendix C: Risk Assessment Framework

Likelihood and Consequence Risk Assessment Framework

Risk based impact assessment frameworks are well recognised as an appropriate approach for assessing economic, social and environmental impacts. The cumulative impact assessment undertaken as part of the economic impact assessment has utilised a risk assessment framework in line with that used throughout the EIS process.

The first step in applying the risk assessment framework is identifying the possible impacts (cost or benefit), followed by an assessment of the likelihood of the impact occurring and the anticipated consequences of the impact should it occur. Impacts have been identified in Chapter 5, and these have been consolidated and assessed in the context of a cumulative impact where a number of projects are conducted concurrently. The combination of the likelihood (described in Table C.1) and consequence (described in Table C.2) of each impact identifies the associated risk and impact level (described in Table C.3).

Table C.1. Likelihood of the Consequence Occurring

Score	Descriptor	Description
5	Almost Certain	Is expected to occur
4	Likely	Will probably occur
3	Possible	Might occur
2	Unlikely	Unlikely to occur
1	Rare	May occur in exceptional circumstances

Table C.2. Consequence if the Impact Occurs

Score	Descriptor	Description
5	Severe	Massive temporal and spatial effect
4	Major	Major temporal and spatial effect
3	Moderate	Moderate temporal and spatial effect
2	Minor	Minor temporal and spatial effect
1	Negligible	Slight temporal and spatial effect
	Positive effect	A positive outcome is expected

Table C.3. Potential Impact Assessment Matrix

	Consequence					
Likelihood	Severe	Major	Moderate	Minor	Negligible	Positive
Almost Certain	Extreme (10)	High (9)	High (8)	Medium (6)	Medium (6)	Positive Effect
Likely	High (9)	High (8)	Medium (7)	Medium (6)	Medium (5)	Positive Effect
Possible	High (8)	Medium (7)	Medium (6)	Medium (5)	Low (4)	Positive Effect
Unlikely	Medium (7)	Medium (6)	Medium (5)	Low (4)	Low (3)	Positive Effect
Rare	Medium (7)	Medium (5)	Low (4)	Low (3)	Low (2)	Positive Effect

THIS PAGE LEFT INTENTIONALLY BLANK

Brisbane	Level 5, 131 Leichhardt Street Spring Hill QLD 4000	PO Box 942 Spring Hill QLD 4004	T F	+61 7 3831 0577 +61 7 3831 3899
Melbourne	Level 27, 101 Collins Street Melbourne VIC 3000	PO Box 1092 Hawthorn VIC 3122	T F	+61 3 9653 9312 +61 3 9653 9307
Sydney	Level 3, 507 Kent Street Sydney NSW 2000	PO Box Q569, QVB Sydney NSW 1230	T F	+61 2 9283 8400 +61 2 9264 9254
Townsville	233 Flinders Street East Townsville QLD 4810	PO Box 5804MC Townsville QLD 4810	T F	+61 7 4771 5550 +61 7 4771 5152
Perth	Level 18, Central Park 152 - 158 St Georges Terrace Perth WA 6000		T F	+61 8 9288 4456 +61 8 9288 4457