



Taroborah Coal Project

Environmental Impact Statement

Section 4.12 – Environmental Values and Management of Impacts – Economy

Prepared for:
Shenhua International Group Pty Ltd



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4.12 ECONOMY

This section provides a description of the existing economies that may be potentially affected by the Project and an assessment from national, state, regional and local perspectives of the direct and indirect economic benefits and impacts of the Project.

4.12.1 Description of Potentially Affected Economies

4.12.1.1 Regional Economic Profile

The Project lies within the Central Highlands region spanning an area of approximately 60,000 square kilometres (km²) and covers a significant portion of the Bowen Basin, the largest coal reserve in Australia. The two main towns in Central Highlands include Emerald and Blackwater. Other communities in the area include Springsure, Rolleston, Duaringa, Capella, Tieri and the Sapphire Gemfields.

The region contributes significantly to the Queensland and Australian economy predominantly through mining and agriculture. Other activities such as ownership of dwellings and construction also contribute relatively significantly to the economic activity of the Central Highlands region.

In 2011-12, the Central Highlands regional economy contributed \$6.03 billion to the Gross State Product (GSP) of \$265.32 billion. Figure 4.160 highlights the regional significance of the mining sector, showing industry contribution to Gross Regional Product (GRP) in the Central Highlands in 2010-11. Mining accounted for 70% of the GRP in that year, contributing \$3.2 billion to the economy. Figure 4.161 shows the contribution to GRP of activities other than mining.

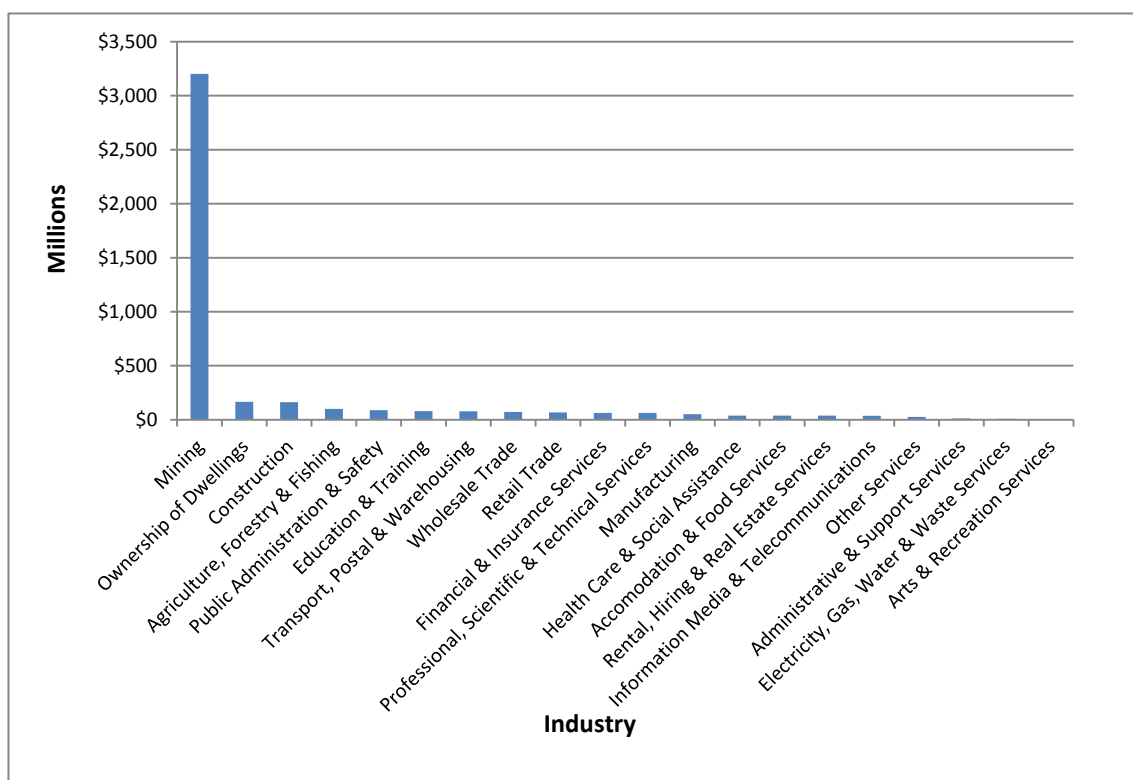


Figure 4.160 Industry Contribution to GRP in the Central Highlands Region 2010 – 11

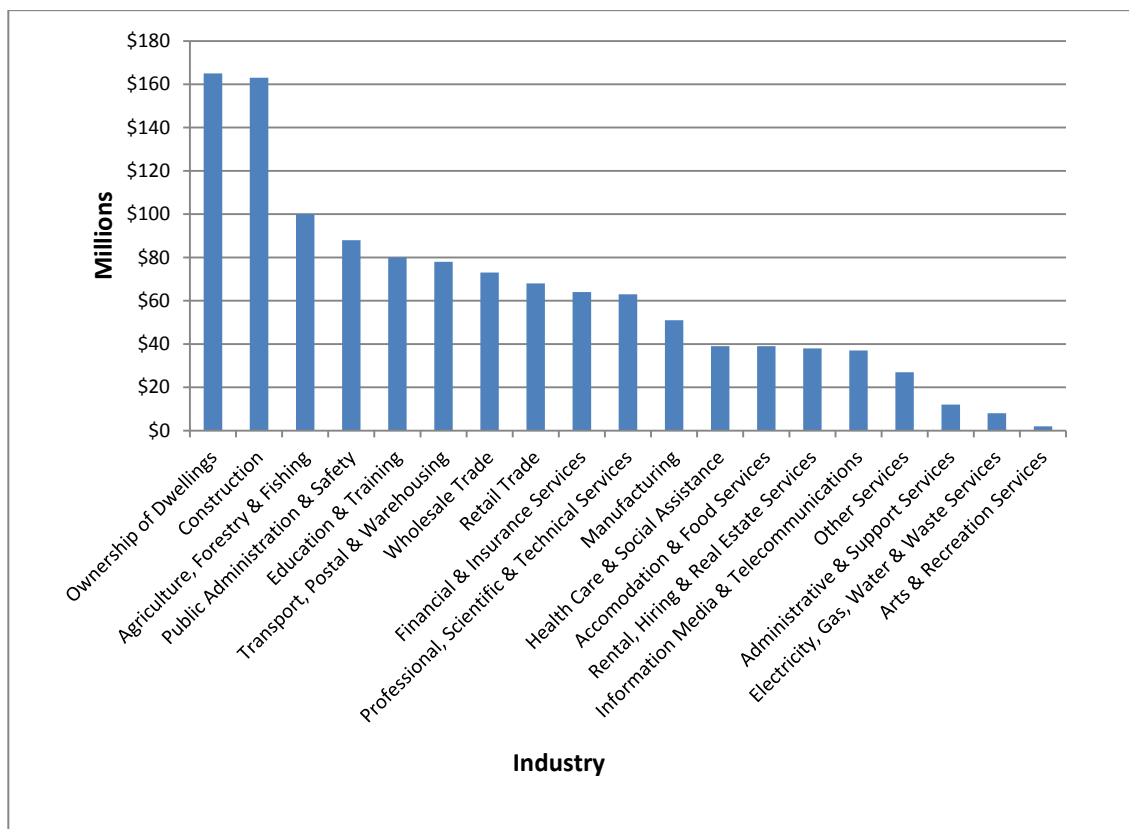


Figure 4.161 Industry Contribution to GRP (excluding mining) in the Central Highlands Region 2010 – 11

The Central Highlands region experienced an average growth in GRP of 1.0% per annum between 2005-06 and 2011-12, which is considerably lower than the average growth in GSP of 2.5% over the same period. The weak average growth can be explained by the significant decrease in GRP of 17.1% (largely due to the impact of flooding) in 2010-11.

Industries and Businesses

Based on the Australian Bureau of Statistics (ABS) data, a total of 1,970 businesses in the Central Highlands region were actively trading in 2011-12. Figure 4.162 shows a breakdown of the composition of the businesses in the region indicating agriculture, forestry and fishing have the largest number of businesses (996; or 51%) in the region, followed by construction (210; or 11%), and rental, hiring and real estate services (140; or 7%).

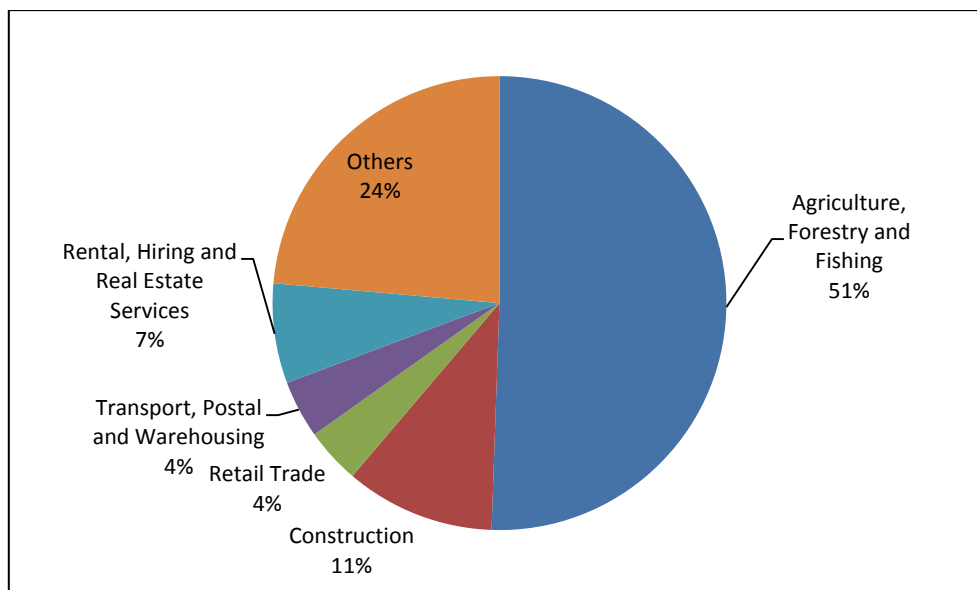


Figure 4.162 Business Counts in the Central Highland Region 2011 - 12

By comparison, there were 38 mining businesses in Central Highlands in 2011-12, representing 2% of the total number of businesses in the region. Figure 4.160 presents the number of businesses in each turnover category. The data shows that the actively trading businesses in the area are largely small businesses.

Table 4.146 Number of Businesses by Turnover in the Central Highlands Region 2012

Turnover	Number of Businesses
Less than \$50,000	542
\$50,000-100,000	295
\$100,000-\$200,000	272
\$200,000-\$500,000	378
\$500,000-\$2,000,000	357
More than \$2,000,000	126

Source: Australian Bureau of Statistics (2013a). Counts of Australian Business, including Entries and Exits, June 2008 to June 2012, Businesses by Industry Division by Statistical Area Level 2 by Turnover Size Ranges, June 2012, Catalogue 8165.0.

Economic Value of Existing Resources

As at June 2013, there were 22 mining projects in various stages of development across the Central Highlands region, including new projects and expansions of existing mines, with a total estimated investment of \$9 billion dollars.

In addition to mining projects, Coal Seam Gas (CSG) resources are currently being developed in the region. Arrow Energy is proposing to develop gas reserves in Blackwater and Norwich, as part of its Bowen Gas Project. The CSG fields in Blackwater and Norwich are located near Arrow Energy's CSG project at Moranbah, which is one of Australia's largest CSG operations. An Environmental Impact Statement (EIS) has been submitted to Government for the Bowen Gas Project, which details the economic value of the resource, and the project is expected to commence in 2015. Other CSG projects that affect the Central Highlands region include the Central Queensland Gas and Gladstone LNG pipelines which will contribute to the regional economy.

4.12.1.2 Socio-Economic Profile

This section provides an overview of the trends in the relevant economic indicators of the Central Highlands region, including population size and structure, regional employment, income levels, education attainment, housing and infrastructure and land values. Further detail on social and cultural values and demographics can be found in Section 4.10 and Appendix 23.

Population

As at the 2011 Census, the estimated resident population of the Central Highlands local government area (LGA) was 28,715 persons (0.66% of Queensland's population). Within this LGA the primary population centres include Emerald, Blackwater, Tieri and Springsure, and a number of other smaller townships. Table 4.147 indicates the estimated resident population in each town centre.

Table 4.147 Estimated Resident Population by Population Centres in the Central Highlands LGA 2011

Population Centres	Estimated Resident Population
Emerald	13,884
Blackwater	5,100
Tieri	2,012
Springsure	1,048
Capella	926
Duaringa	478
Bluff	370
Dingo	342
Rolleston	129
Central Highlands (LGA) total	28,715

Source: Australian Bureau of Statistics (2013b). 2011 Census of Population and Housing.



According to current Queensland Treasury projections (2011), the Central Highlands population is projected to reach 50,742 by the year 2031, with an average annual rate of growth of 2.4%, whilst Queensland is expected to have an average annual growth rate of 1.8%.

Overall, the Central Highland's population age structure is younger than the average for Queensland. The area has fewer elderly persons, a slightly larger population of working age adults and noticeably more children. However, from 2006 to 2011 the population of the Central Highlands aged marginally (refer to Figure 4.163).



Source: Australian Bureau of Statistics (2012). 2011 Census of Population and Housing Basic Community Profile: Table B01 Selected Person Characteristics by Sex; Australian Bureau of Statistics (2011). National Regional Profile, Central Highlands (R), 2006-2010: Table 2 Population and People.

Figure 4.163 Change in the Population Proportion in Each Age Group in the Central Highlands Region 2006 to 2011

In 2011, the Central Highlands attracted approximately one quarter (4,830) of non-resident workers in the Bowen Basin with more than 90% of these found in three areas within the Central Highlands: Duarunga (2,140), Emerald (1,420) and Peak Downs (1,010). This was almost double the number of non-resident workers in the Central Highlands in 2006, with the majority of growth occurring between 2010 and 2011. This growth spurt is attributed in part to construction associated with flood recovery efforts.

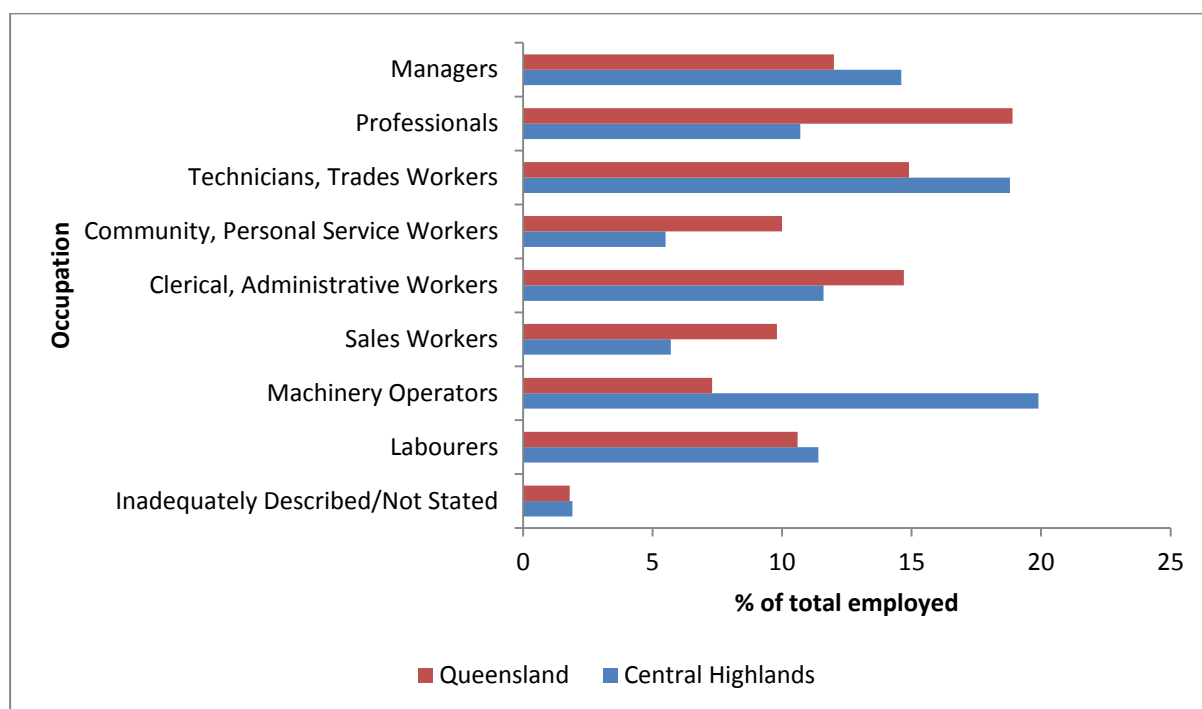
Labour Force

Based on Department of Education, Employment and Workplace Relations (DEEWR) quarterly data on Small Area Labour Markets, for the June quarter 2013, the unemployment rate in the Central Highlands was approximately 2.8%, with 561 persons unemployed among a labour force of 19,812, slightly higher than the same time in 2012.

The unemployment rate in the Central Highlands is significantly lower than Queensland's unemployment rate of approximately 5.8%, reflecting a tight labour market in the region. The labour force participation rate is also higher in the Central Highlands (54.5%) compared to Queensland

(50.1%) and Australia (49.6%).

Residents' occupations are an indicator of the skills base of the area's labour force. Figure 4.164 shows that the most common occupations in Central Highlands region are 'Machinery Operators' and 'Technicians and Trade Workers'. This is reflective of the area's strong resource-based focus with 27.8% of people employed in the mining industry and 9.4% of people employed in the agriculture, forestry and fishing industry. Queensland overall is comparatively less resource oriented, with the top three occupations being 'Professionals', 'Technicians and Trades Workers', and 'Clerical and Administrative Workers'.



Source: Australian Bureau of Statistics (2013c). National Regional Profile, 2007-2011, Catalogue 1379.0.55.001.

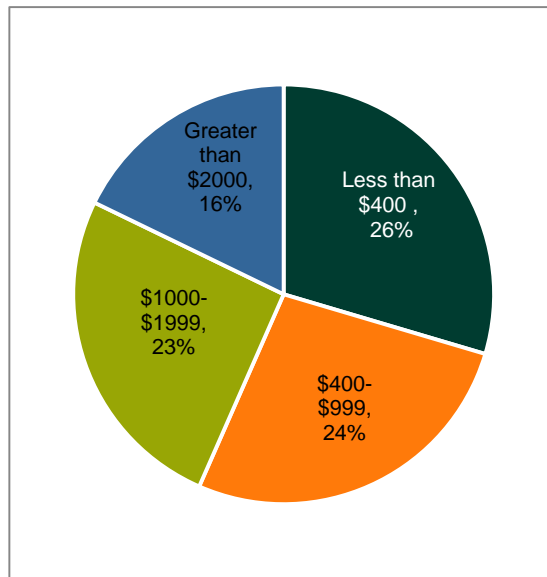
Figure 4.164 Employment by Occupation in the Central Highlands Region and Queensland, 2011

As can be seen from the above analysis, the Central Highlands region is characterised by a low unemployment rate and a relatively tight labour market. Historically, other resource projects located in the same region have been unable to meet skilled labour requirements, resulting in a workforce sourced from outside of the Central Highlands region, however, this shall be avoided where possible. This may also be the case for the Taraborah Project, although recent downsizing at other regional resources projects and the relatively close proximity of Taraborah to Emerald could act to temper this disparity.

Income

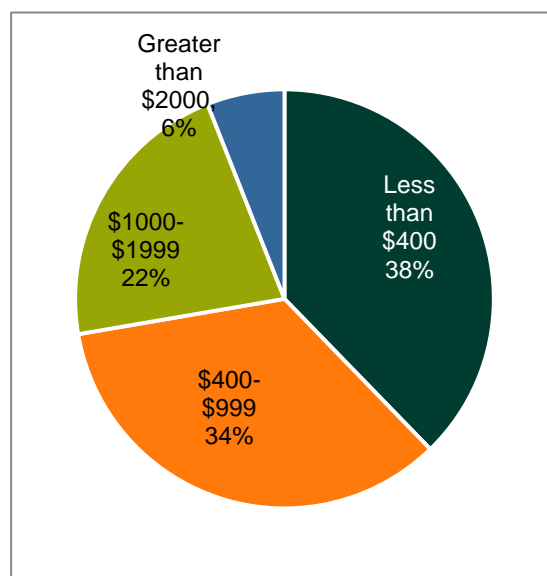
At the time of the 2011 Census, on average, individuals in Central Highlands earn more than their fellow Queenslanders, with a smaller proportion of individuals earning less than \$1,000 per week and a significantly larger proportion of individuals earning greater than \$2,000 per week.

Figure 4.165 and Figure 4.166 indicate the gross individual weekly income at the time of the 2011 Census in the Central Highlands Region and Queensland respectively.



Source: Australian Bureau of Statistics (2012). 2011 Census of Population and Housing Basic Community Profile, Table B17: Total Personal Income (weekly) by Age by Sex.

Figure 4.165 Gross individual Weekly Income in the Central Highlands Region, 2011

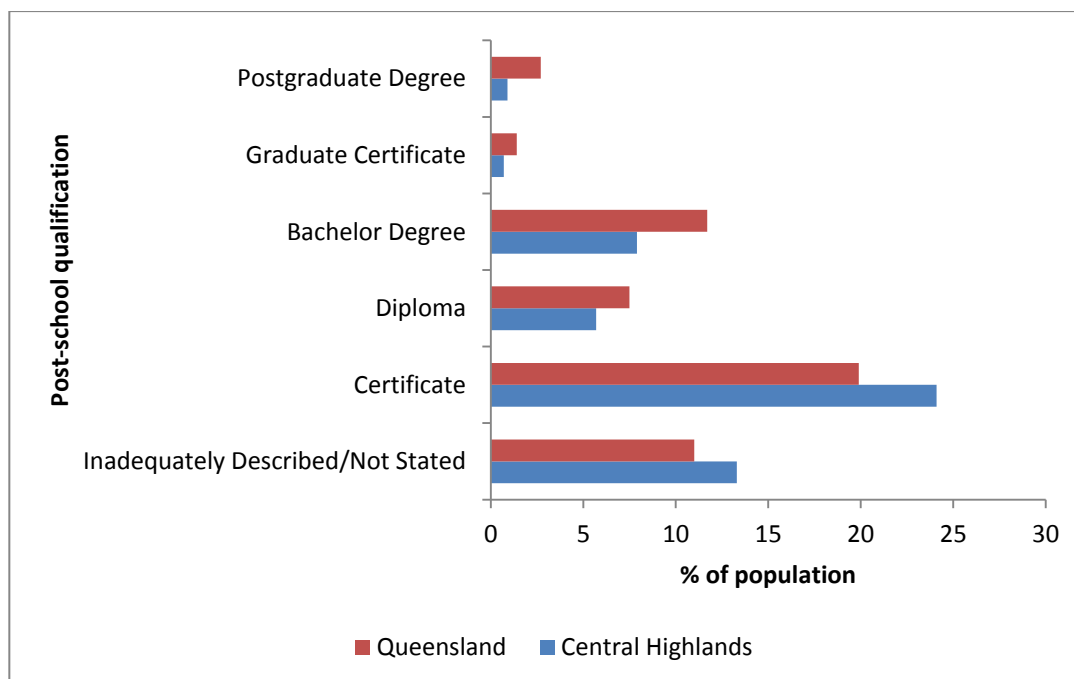


Source: Australian Bureau of Statistics (2012). 2011 Census of Population and Housing Basic Community Profile, Table B17: Total Personal Income (weekly) by Age by Sex.

Figure 4.166 Gross individual Weekly Income in Queensland, 2011

Education

At the time of the 2011 Census over half (58.8%) of the Central Highlands' population aged 15 years and over no longer attending school had either failed to complete year 12 or an equivalent level of school (9,894 people), or did not state their level of schooling (2,371 people). This compares to the state-wide figure of 52%. The proportion of people in the Central Highlands with a post-school qualification was 52.7%, which was lower than that of Queensland at 54.3%. Figure 4.167 provides a breakdown of post-school qualifications by type of qualification.



Source: Australian Bureau of Statistics (2013c). National Regional Profile, 2007-2011, Catalogue 1379.0.55.001.

Figure 4.167 Post-school Qualifications by Level of Education in the Central Highlands Region and Queensland, 2011

Infrastructure

The infrastructure of the Central Highlands is typical of that found in rural regions and towns in Australia, while having an increasing emphasis on addressing mining industry needs.

Increased mining activities can place pressure on social infrastructure and investing in services and community infrastructure is important in order to maintain a liveable community. As at June 2013, total investment in all active community infrastructure projects (including those completed in 2012) within the Central Highlands Region reached a total of approximately \$40 million.

Currently, Central Highlands is addressing constraints by upgrading existing infrastructure or building new infrastructure. Proposed works include upgrades and construction of road and railway, construction of new gas pipelines and power stations, development of CSG fields, and flood mitigation works.

Appendix 24 provides an overview of key infrastructure in the Central Highlands region and community infrastructure projects currently under construction.

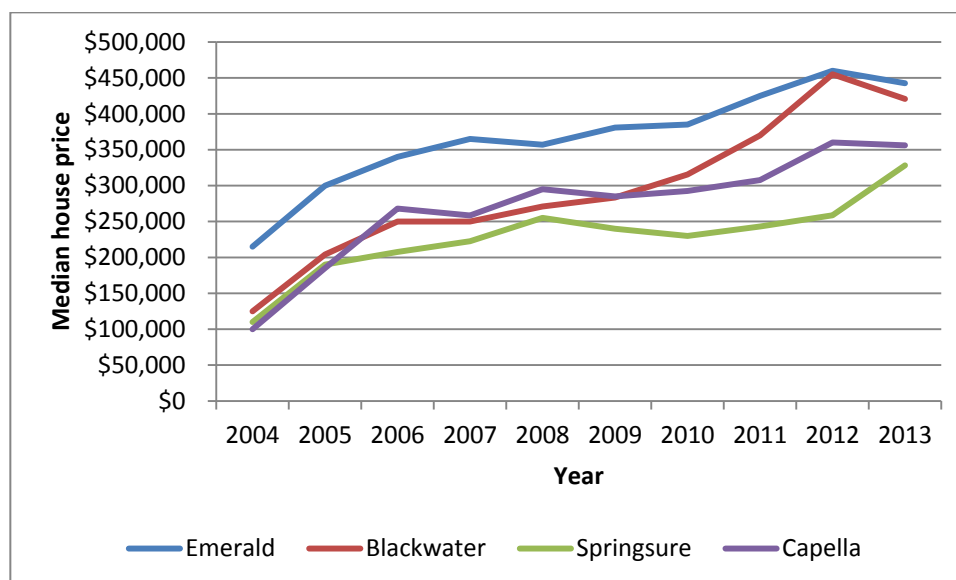
Housing Markets and Housing Prices

Increase in mining activities and population in the Central Highlands region has impacted on housing markets, causing increases in both housing prices and housing rents.

Historical housing prices

As of September Quarter 2011, median house prices (based on sales data) for Central Highlands region was \$375,000, a 9.5% increase over the previous year, and 32.2% over the last 5 years. Further, median units and townhouse prices (based on sales data) had increased by 11.1% over the 5 year period. The Central Highlands' median house price was still below that of Brisbane (\$427,500) and its neighbours Mackay (\$410,000) and Gladstone (\$440,000), although it was above Rockhampton's (\$312,000).

Figure 4.168 illustrates median house prices for selected urban centres in the Central Highlands from 2004 to 2013. It can be seen that house prices increased rapidly over the period 2003 to 2012, particularly in Blackwater, where median prices grew from \$125,000 in 2004 to \$455,000 in 2012. However, median house prices fell from 2012 to the beginning of 2013 for all the major towns except Springsure.

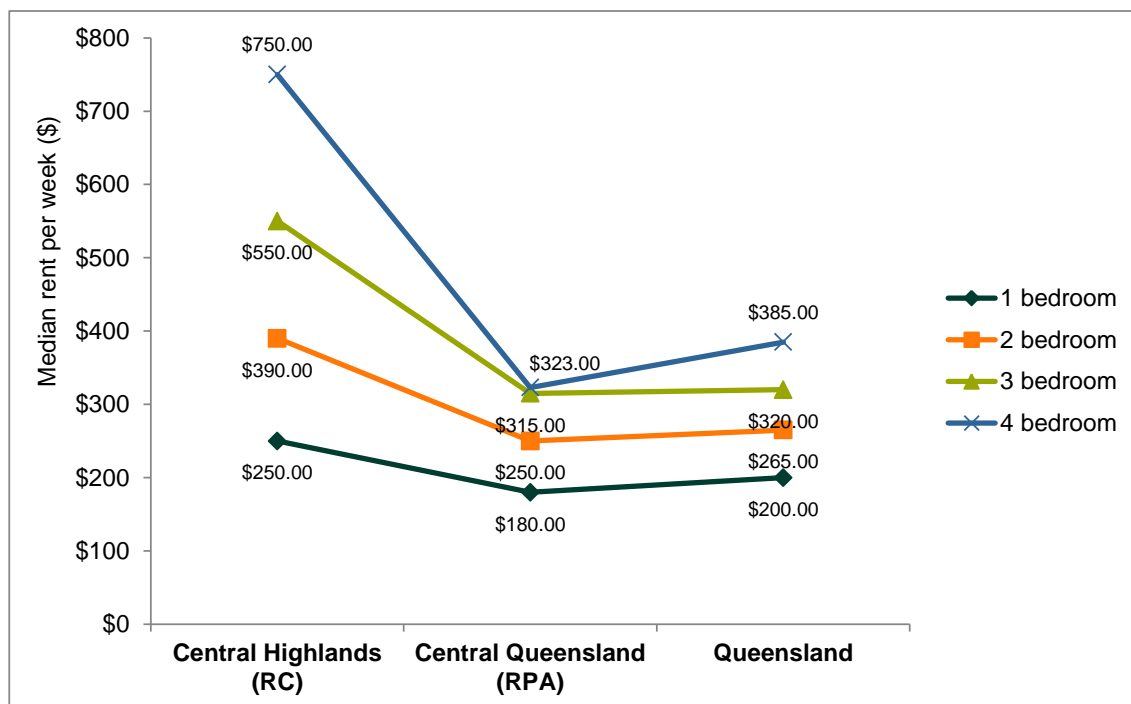


Source: RP Data Ltd, Local, State, Commonwealth Government. Available from: <http://www.rs.realestate.com.au/cgi-bin/rsearch?a=sp> [Accessed 19 September 2013].

Figure 4.168 Median House Price in the Central Highlands Region by Major Urban Centres, 2004 - 2013

Rental Price

Studies conducted by the Department of Communities on housing affordability in CHRC area have found that average weekly rent is far above that of the Queensland average. Raw data from the Residential Tenancies Authority (RTA) shows median weekly rent levels by number of bedrooms in March 2012 in Central Highlands region is significantly higher as compared to the rest of Queensland illustrated by Figure 4.169.



Note: Dwelling types include house, townhouse, and flat/unit.
Source: Residential Tenancy Authority (RTA), Synergies calculation.

Figure 4.169 Median Rent by Bedrooms for Central Highlands, Central Queensland and Queensland, March 2012

In March 2012, median weekly rent for a four bedroom dwelling in Central Highlands was almost double the Queensland average. Rental price for smaller dwellings were also less affordable in Central Queensland than in Queensland on average, with a 3 bedroom dwelling being 72% more expensive, a 2 bedroom dwelling being 47% more expensive, and a 1 bedroom dwelling 25% more expensive.

Undersupply of rental properties and high demand for housing, especially from non-resident workers, is likely to have contributed to the rapidly increasing median rental prices for Central Highlands. In 2009, the rental vacancy rate in Central Highlands was approximately the same as the Queensland average (3.6% and 3.5% respectively).

Dwelling Approvals

Based on the number of building permits issued in the Central Highlands region, 496 residential dwellings were approved for construction by the Central Highland Regional Council (CHRC), representing a 111% increase from the previous year. The value of total building approvals for the financial year 2012-13 was \$230 million and accounted for 1.4% of the overall total for Queensland.

Data indicates that dwelling approvals decreased 5.1% in year 2011 from 2010 after two years of rapid increase from the 2008 level. However, as previously stated, there was a significant increase in residential dwelling approvals in 2012 compared with 2011.

Land Endowment and Land Values

Land values

The Department of Natural Resources and Mines (DNRM) released its annual valuation for Central Highlands on 20 March 2013. The valuation provides a snapshot of land values as at 1 October 2012.

Table 4.148 provides a summary of the valuations for the largest centres in Central Highlands.

Table 4.148 Residential Land Values in the Central Highlands Region

Location	No. of residential lands valued	Median value	% change from median value as at 1/10/2011
Blackwater	2,050	\$152,500	0.00%
Capella	265	\$119,000	25.3%
Emerald	3,533	\$155,000	14.8%
Springsure	330	\$86,000	30.3%
Tieri	496	\$75,000	0.00%
All of CHRC	7,211	\$152,000	12.6%

Source: Department of Natural Resources and Mines (2013). Annual valuations released for Central Highlands Regional Council area. Available from: <http://www.dnrm.qld.gov.au/news/article/2013/march/annual-valuations-released-for-central-highlands-regional-council-area> [Accessed 16 September 2013].

Residential land values have either increased or remained steady in the Central Highlands, resulting in an overall increase of 12.6% since the last valuation. The increase in land value is, according to DNRM, due to the following:

- Shortage and inconsistent supply of residential land;
- The need for immediate accommodation; and
- Affordability issues.

Residential Land Development

The Queensland Treasury publishes broadhectare profiles to indicate the potential capacity of residential development in an area. The Queensland Treasury (2012) defines broadhectare land as follows:

"Broadhectare land is defined as the amount of unconstrained residential land under the current planning scheme including the existing residential developments by council".

The total amount of broadhectare land available for residential development identified in the 2013 profile for Central Highlands is 1,351 hectares, which at full potential can accommodate 4,300 dwellings (12,200 persons). Using population projections and average household size, it is estimated that the total area of broadhectare land in Central Highlands will provide another 10 years of residential land supply.

Government Strategies and Policies for the Economic and Industrial Sectors

A number of economic strategies and development plans have been developed for the Central Highlands region that address the region's long-term economic development.

These strategies cover a wide range of issues, including economic development, planning, employment, skills development and training, and regional infrastructure. The purpose of many of these strategies is to ensure that the region is able to benefit to the greatest extent possible from the economic growth driven by the development of energy resources. This includes ensuring that there is adequate planning to provide the necessary economic and community infrastructure, addressing skills shortages in the region and maximising opportunities for local businesses and the community to benefit from the energy sector-driven growth.

A common feature of these plans and strategies is the recognition of the potential impact of recent and expected future growth in resource development in the region and a desire to plan for this to ensure regional businesses and the community benefit from this growth and retain the livability of the region.

A description of the relevant strategies and policies is provided in Appendix 24 within the Economic Impact Assessment developed by Synergies Economic Consulting Pty Ltd (Synergies) in 2013.

4.12.2 Potential Impacts And Mitigation Measures

4.12.2.1 Cost-Benefit Analysis

A Cost Benefit Analysis (CBA) has been undertaken for the Project to determine the net impact of the Project on the economic welfare of the affected population.

The CBA identified the gross impact of the changes associated with the Project together with the type and value of impacts on stakeholders to determine the impact of the Project on the community as a whole.

In general terms, the CBA supports a project when the gains (benefits) resulting from the change exceed the losses (costs); that is, when there is a 'positive net benefit'.

During the CBA, two scenarios were assessed – the 'base case' and the 'alternative case'. The 'base case' provides a baseline against which all direct impacts of the Project are measured. The base case assumes no mine development, with continuation of the current land use in the study area, such as low intensity cattle grazing and rain fed cropping. The 'alternative case' assesses the cost and benefits to the community if the Project were to be undertaken.

In this case, the Project is said to improve economic efficiency as it increases the overall level of economic welfare of the affected population.

Assumptions

The CBA model for the Project has been developed using real values with the application of a real discount rate of 2.6%. The discount rate of the model determines the Net Present Values (NPV) of the results and reflects the opportunity cost of the resources used to invest in the Project. The Project cash flows are modelled in calendar years over a 25-year timeframe from 2014.

The NPV of the Project is calculated as at 1 January 2014 and annual cash flows are in 2013 Australian dollars, assumed to occur at end of year. The key assumptions used in the estimation of future cash flows are provided in Table 4.149. Project revenues reflect assumptions relating to



tonnages, the price of coal and the exchange rate which have been provided by Shenhua.

Table 4.149 Key assumptions

Parameter	Value
Discount rate (real)	2.6%
Modelling period (years)	25
Project evaluation date	1 January 2014
Opencut production period	2018-2024
Underground production period	2022-2038
Coal selling price base (\$US, 6322kcal)	90
Exchange Rate (\$US/\$A)	0.85
Corporate tax rate (% pa)	30%
Research levy (\$/sales tonne)	0.25
State Government Royalties (% pa)	7%

Note: The coal selling price base is given in US 2012 dollars.

Source: Shenhua International Group Pty Ltd (Shenhua)

Base Case

The base case assumes the continuation of the existing land use in the areas identified for mining activities. To estimate potential future revenue from cattle grazing and rain fed cropping in the absence of the Project, it was assumed that the sale price of an area of agricultural land is a reflection of the possible future stream of income associated with the use of that land.

Since the market price of the affected area is not available, recent rural land sale prices of similar areas of land were investigated. Taking into account factors such as location, land use and size, a price per hectare for the affected land is estimated to be \$1,185/ha.

Alternative Case

This analysis involved only one alternative, which was the development of the Project. The possible benefits and costs associated with the development of the mine, including non-market impacts, are described throughout the following sections.

It has been assumed that 473 hectares of land used for the construction of the mine (beginning in the last quarter of 2017) will not be available for grazing and rain fed cropping.

Table 4.155 in Section 4.12.2.5 identifies major stakeholder groups that may be affected by the Project and whether the impact of the Project is anticipated to be positive or negative.

Benefits

Based on the forecast sale volumes and coal selling price (provided by Shenhua during the CBA), the present value of gross project output is \$5.3 billion.

Costs

Mine Construction Costs

Capital costs associated with preproduction engineering, surface infrastructure, open cut mining and underground mining are estimated to be approximately \$638 million in present value terms.

Operating Costs

The present value of operating costs is estimated to be \$2.7 billion (including costs relating to mining, processing and transport). The assumptions applied to the CBA to calculate the approximate transportation costs associated with the operations are provided in Appendix 24.

Infrastructure Costs

To the extent that the Project creates additional demand for infrastructure, then the costs should be included in the CBA. However, there are no major infrastructure requirements for government directly triggered by the Project. Moreover, the rail and port services will not impose any infrastructure costs on Government as the contracting will occur with private sector entities. These costs are included in the Project costs.

In addition, there are no road construction costs from the Project that have to be met by government. The costs of roads to be upgraded and / or maintained as a result of the Project are included in the Project construction costs.

Non-Market Impacts

In order to capture the full range of costs and benefits associated with the Project, environmental and social impacts have also been considered during the CBA. These 'social' costs and benefits differ from private (financial) costs and benefits in that they typically are not accounted for (in full or in part) in market transactions. As such, these non-market impacts have been valued by assuming the value of the environmental resource is equal to the cost of preventing or mitigating the damage, or replacing or restoring the environmental asset.

The estimation of Total Economic Value for the Project (TEV) of environmental effects addresses both the use and non-use values of the environmental asset. Accordingly, any depreciation in an environmental asset is included in the costs, the TEV of the lost asset. Similarly, for any enhancement in an environmental asset, the change in the TEV of the asset is counted as a benefit.

Several environmental, cultural and land use impacts have been identified throughout this EIS such as those associated with erosion and subsidence, noise, dust, impacts on aquatic ecology, groundwater and surface water, visual amenity, terrestrial flora and fauna and greenhouse gas emissions and have been assessed to evaluate the TEV for the Project.

It was identified during the analysis that most of the environmental impacts will be internalised to the Project through expenditure on mitigation actions. The exception to this is greenhouse gas emissions, groundwater and terrestrial flora and fauna impacts, which are valued at a cost of \$21.6 million in

present value terms.

A detailed description of the assumptions used in the calculation of non-market impacts is provided in Appendix 24.

Net Impacts

Table 4.150 summarises the net impact of the Project on the Australian economy generally and the disaggregation of that impact by major stakeholder groups.

Table 4.150 Net Impact by Stakeholder Group

Stakeholder group	Approximate NPV (million)
Resource developer	\$1,064
Commonwealth Government	\$535
Qld Government	\$335
Existing Land Users	-\$0.52
Non-market impacts	-\$22
Total Net Impact	\$1,911

The CBA demonstrates the Project will result in a net increase in social welfare of \$1,911 million in NPV terms.

The Benefit Cost Ratio (the ratio of the benefits and costs identified) of the Project is 1.45 and the Project yields an internal rate of return (IRR) of 22.9%.

Sensitivity Analysis

The sensitivity analysis considered several parameters such as thermal coal prices and mine operating costs, in addition to the discount and exchange rates assumed during the CBA. The results of the sensitivity analysis are provided in Table 4.151, which indicates the exchange rate, coal sales (revenues) and mine operating costs will be the major determinants to the overall economic impact of the Project.

Table 4.151 Results of Sensitivity Analysis – Percentage Change in Overall Project NPV

Parameter	Base Value	-10%	% Δ	+10%	% Δ
Discount rate	2.60%	2.34%	5.07%	2.86%	-4.82%
Exchange rate	0.85	0.77	30.89%	0.94	-25.27%
Coal sales (revenues)	5.3 billion	4.8 billion	-27.34%	5.8 billion	22.03%
Mine operating costs	2.7 billion	2.5 billion	14.81%	3.0 billion	-16.13%
Mine construction costs	638 million	574 million	3.00%	701 million	-3.81%

The sensitivity of the overall NPV to adjustments in the assumed price per tonne of CO₂ equivalent emissions, utilised during the CBA, is presented in Table 4.152. The results show that the assumed price does not have a significant impact on the overall Project NPV.

Table 4.152 Price Per Tonne CO₂-e - Percentage Change in Overall Project NPV

Parameter	Base Value	Minimum value	% Δ	Maximum value	% Δ
Price per tonne CO ₂ -e	\$15.39	\$6.64	0.53%	\$24.15	-0.53%

4.12.2.2 Economic Impact Model

The impact assessment is based on a general equilibrium analysis, which seeks to capture the impact of the Project on multiple markets in the economy simultaneously. This analysis uses the Queensland Non-Linear Regional Model (QNLRM) to quantify the economic benefits across Queensland regions as well as for the rest of the Australian economy.

To account for change over time the economic impact analysis divided the anticipated mine life into four time periods, which included:

- 1) Period 1: 2017 – 2021;
- 2) Period 2: 2022 – 2026;
- 3) Period 3: 2027 – 2031; and
- 4) Period 4: 2032 – 2038.

Economic impact models are typically driven by what is called 'shifts in final demand', which means that new expenditure on finished products represents a stimulus to economic activity because it represents additional demand. The demand for final demand products also requires a boost in demand for intermediate products used in their production. The higher the percentage of intermediate goods, the higher this multiplied effect.

The primary economic impact measures reported by the model are listed below:

- **Gross Output** - Refers to the value of increased production from an additional economic activity and is a good indicator of the level of turnover in the economy and hence a valuable measure of the total level of economic activity;
- **Value Added** - Refers to added or net output. Value added is equivalent to Gross State/Regional Product as used by the ABS. It measures the added value placed on intermediate products (raw materials) from the productive process. It is made up of margins, wages, profits and transfers;
- **Factor Income** - Relates to the share of value added (and gross output) which is directly paid to individuals or firms in the form of wages and or profits. By definition it is a percentage of value added and cannot exceed value added; and

- **Jobs** - Relates (usually) to the amount of labour required for the level of production. Depending upon the type of activity, job numbers measure either the use of existing labour (continuing jobs) or hiring new staff. Full Time Equivalent (FTE) employment refers to the number of full time person-years of employment generated by a particular project or event.

4.12.2.3 Significance of the Project to the Regional Economy

The project has a total determined resource of 202.1 million tonnes (Mt) of coal, to be mined at a rate of up to 2.3 Mtpa run of mine (ROM) for opencut operations and up to 5.7 Mtpa ROM for underground operations, with an expected mine life of 21 years.

The Project is one of many coal mining projects located in the Central Highlands region. There are currently 22 mining projects in various stages of development across the region, with a total estimated investment of \$9 billion. The economic impact of the Project is nevertheless significant and is discussed throughout the following sections.

4.12.2.4 Economic Impacts During Construction and Operation

The economic impact assessment indicated a significant proportion of the value added from the Project will originate in the region. The Project will result in an addition to GSP of \$852 million during the construction phase and \$3,826.5 million in the operational phase. Factor income (direct and indirect wages, profits and dividends) will increase by \$595.4 million during the construction phase and \$2,778.3 million during the operational phase.

Gained opportunities can be viewed in terms of direct and indirect employment impacts. During the construction period a total of 1,475 jobs are supported by the Project. Of these, 793 are direct jobs as a result of the Project and 682 are 'linked' jobs created as a result of consumption effects. In the operational period, the Project supports an average of 1,082 jobs throughout Queensland (of which 610 are direct production-linked jobs and 472 are consumption-driven).

A significant proportion of the benefits of the Project remain in the Central Queensland economy in both the construction and operational phases. During construction, nearly 52% of gross output, 46% of value added and 44% of factor income generated by the Project remain in the Central Queensland economy (refer to Table 4.153). In terms of employment impacts, during construction, approximately 30% of jobs supported by the Project are located in the region, with the majority (62%) of the jobs supported by the Project located outside the Central Queensland region in the rest of Queensland. This reflects the nature of the construction industry, with head offices located in Brisbane or interstate.

Table 4.153 Spatial Distribution of Benefits from Construction

Region	Gross output	Value added	Factor income	Total jobs	Linked jobs
Central & west	708.14	390.5	263.7	256	179
Rest of QLD	567.52	384.8	278.2	470	456
Rest of Australia	96.02	68.2	53.6	67	47
Total	1,371.68	851.9	595.4	793	682

During the operational phase, 56% of gross output, 49% of value added, 51% of factor income and 62% of jobs generated by the Project are retained in the Central Queensland region (refer to Table 4.154).

Table 4.154 Spatial Distribution of Benefits from Operations

Region	Gross output	Value added	Factor income	Total jobs	Linked jobs
Central & west	3,805.7	1,875.0	1,416.9	390	280
Rest of QLD	2,514.5	1,607.1	1,111.3	150	136
Rest of Australia	475.7	306.1	250.0	70	56
Total	6,795.8	3,826.5	2,778.3	610	472

Ongoing expenditure on maintenance and capital expansion, which is set to continue over the life of the Project, will have a stabilising and reinforcing impact on the Construction, Transport and Machinery and Equipment industry, further enhancing gained opportunities in the state and national economies.

4.12.2.5 Distribution of Impacts and Mitigation

Some existing land users are negatively affected by the Project in that their current land use is discontinued and they will potentially face noise, dust and visual amenity impacts. However, these impacts are mitigated through purchase of properties and additional actions to prevent or alleviate impacts. Table 4.155 defines the distribution of positive and negative impacts among associated stakeholder groups that may be affected by the Project.

Table 4.155 Distribution of Impacts Among Stakeholders Associated with the Project

Stakeholder	Description of impact	Net Impact	
		Positive	Negative
Owners of Shenhua	Shareholders will benefit from the project by the value of the expected net revenues	✓	
Local community	The local community will benefit from employment opportunities, economic growth, enhanced opportunities for existing businesses to supply the project, and new businesses for the local community. While there might be certain negative impacts on the local community such as – among other factors - additional pressure on infrastructure and services and reduced housing affordability, the net impact on the local community is expected to be positive.	✓	
Existing land users	The major land use in the mining lease area is grazing and homesteads. There is a negative impact to the extent that some existing land users cannot use the land as they currently do during mining.		✓
Other regional industries	Opportunities exist for other industries to supply inputs to the project.	✓	
Central Queensland economy	A significant proportion of the total economic impacts will be retained in the Central Queensland economy. However, the project is not so large compared to the size of the regional economy to be likely to create supply constraints and therefore significant upward pressure on wages and input prices for other existing industries.	✓	
Port and rail infrastructure providers	Providers of port and rail infrastructure services will benefit as a result of the additional revenue associated with the increased tonnages of coal that will be transported in the region.	✓	
Queensland Government	The Queensland Government will benefit directly from the revenue generated from the scheme and by the contribution of the scheme to its development objectives for the region.	✓	
Commonwealth Government	The Commonwealth government benefits through increased taxation revenue.	✓	

During the assessment it was also identified that the Project is unlikely to have a material impact on energy self-sufficiency, security of supply or the balance of payments given the relatively small scale of the Project compared to the overall market.

4.12.2.6 Potential for Direct Equity Investment by Local Business and Communities

Shenhua is a Chinese state-owned mining company. As such, there is little scope for local businesses or the community to take a direct equity interest in the Project.

However, the coal industry is closely integrated with regional suppliers, generating flow-on activity in the following sectors: Rail and Pipeline Transport; Finance; Property and Business; and Trade sectors. The Project generates significant benefits from construction (and ongoing capital expenditure) as well as from the ongoing operation of the Project.

Shenhua's preferred option is to have a local workforce rather than a fly-in-fly-out operation, subject to workforce availability. Historically, other resource projects located in the same region have been unable to meet skilled labour requirements, resulting in a workforce sourced from outside of the Central Highlands region. Although this may prove similar for the Project, recent downsizing at other regional resources projects and the relatively close proximity of the Project to Emerald may enhance the likelihood of sourcing skilled labour regionally.

4.12.2.7 Cost to Government of Infrastructure and Regulatory Functions

There is no direct cost to government for infrastructure, other than the already planned upgrade to the power grid servicing Emerald, as any necessary infrastructure upgrades for the Project are met by Shenhua and are included in Project costs.

The cost of the rail capacity upgrade required to the Queensland Rail (QR) Ltd-owned Central West railway system will be met by Shenhua and is therefore already included in project costs. The additional rail traffic on the Blackwater system caused by the Project is within the planned capacity for that system. Similarly, coal from the mine can be accommodated within the planned capacity at the Wiggins Island Coal Export Terminal (WICET), with the costs of this port access reflected in Project costs. The additional airport capacity required to service the anticipated percentage of fly-in-fly-out workers of the Project will be incorporated into future planning for Emerald Airport. The Social Impact Assessment (refer to Appendix 23) identified possible impacts on local community services such as childcare, which is addressed as part of the Social Impact Management Plan (refer to Appendix 23).

4.12.2.8 Implications for Future Economic Development in the Region

There are a range of economic and regional development strategies for the Central Highlands region. The purpose of many of these strategies is to manage the economic development in the region to ensure it is able to benefit to the greatest extent possible from the regional economic growth that is occurring as a result of the development of energy resources.

The Project will contribute significantly to these objectives by generating income and employment (particularly in the operational phase) in the region.

The Project is consistent with the development of the region in terms of its competitive advantage in coal production. The analysis shows that moving from grazing to coal mining produces a significant increase in the value of economic output.

The estimated net impact to the Australian economy in net present value terms from the Project is \$1,911 million, whereas the estimated net present value for the alternative land use of grazing and



broadacre cropping is \$0.5 million.

4.12.2.9 Potential Impacts of Mining Hazards

A number of hazards associated with the Project have been identified and are discussed in detail in Appendix 25 and Section 4.13.

These risks are to be mitigated through engineering design, operational procedures and on-going preventative action. The costs for these actions are included in Project costs.

4.12.2.10 Economic Impact on Local Property Values

The increase in mining activities and population in the Central Highlands region has also had an impact on housing markets, causing increase in housing prices, housing rents and land values. This impact on housing price is a cumulative impact of all the projects in the region.

Average weekly rent in the Central Highlands is above the Queensland average. In addition, house prices have increased rapidly in the Central Highlands region over the period 2004 - 2012, particularly in Blackwater where median prices grew from \$125,000 in 2004 to \$455,000 in 2012. However, median house prices fell from 2012 to the beginning of 2013 for all the major towns except Springsure (refer to Figure 4.168).

There were 496 residential dwelling approvals in the Central Highlands in 2012, representing a 111% increase from the previous year.

Although housing availability is a key mining community concern, Emerald has no obvious development constraints, since there is good availability of appropriately zoned vacant-blocks and a solid number of existing houses available for purchase or rental.

The social impact analysis provided in Appendix 23 indicates Emerald could increase its housing and unit stock by more than 50%, from 3,843 (2011 Census) to almost 6,000. When compared to Emerald's projected resident population growth by 2021 (42.6%) and coupled with the coal industry downturn, it appears that Emerald will not suffer from short to medium-term housing availability pressure.

4.12.2.11 Local Content Plan

The development of a Local Industry Participation Plan (LIPP) for the Project is a requirement of the Terms of Reference for local procurement of products and services in the resource and energy sectors. However, since March 2013, an alternative to the LIPP has also been implemented in the form of the Queensland Resources and Energy Sector Code of Practice for Local Content, which is administered by the Queensland Resources Council. This is a voluntary code underwritten by a reporting, information sharing and administrative framework in order to help resources and energy companies operating in Queensland refine their local content strategies.

The proponent has elected to adopt the Queensland Resources and Energy Sector Code of Practice for Local Content rather than a LIPP.

4.12.2.12 Mitigation and Monitoring

The measures to avoid or mitigate Project impacts will be implemented through a range of management and monitoring plans that will be established following approval of the Project. Achievement of environmental and social objectives will be monitored and compared against



quantitative indicators (where possible) to determine successful mitigation of impacts associated with the Project.

Efforts to enhance local community and business involvement in the Project are aimed at enhancing economic benefits to the local community. The results of the impact assessment indicate that significant Project benefits in terms of income and employment will be achieved in the Central Highlands region. Community involvement by Shenhua throughout the Project life will ensure negative impacts are addressed and economic benefits experienced by the local community continue during this time.