



# Moolarben Coal Complex UG1 Optimisation Modification

## Environmental Assessment

### APPENDIX I

## COMMUNITY INFRASTRUCTURE ASSESSMENT



**Moolarben Coal Operations Pty Ltd**

**Moolarben Coal Complex – UG1 Optimisation  
Modification**

Community Infrastructure Assessment



When you  
think with a  
global mind  
problems  
get smaller

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## Moolarben Coal Complex – UG1 Optimisation Modification

Prepared for  
Moolarben Coal Operations Pty Ltd

Prepared by  
Coffey Environments Australia Pty Ltd  
Level 2, 12 Creek Street  
Brisbane QLD 4000 Australia  
t: +61 (0) 7 3002 0400 f: +61 (0) 7 3002 0444  
ABN: 65 140 765 902

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## Executive Summary

The purpose of the Community Infrastructure Assessment was to assess the potential community infrastructure impacts in the Study Area (i.e. the Mid-Western Regional Local Government Area [MWR LGA]) due to the UG1 Optimisation Modification (the Modification) for the Moolarben Coal Complex.

The Modification would result in an increase in the approved Moolarben Coal Complex construction and operational workforces.

The construction period associated with the Modification is anticipated to occur during 2016 and 2017. The average construction workforce (120 personnel) is below the approved Moolarben Coal Complex construction workforce (220 personnel).

The peak construction workforce (250 personnel) is expected to occur for a short period (2 months) during 2017. The peak construction workforce is approximately 30 personnel larger than the approved Moolarben Coal Complex workforce (220 personnel).

The Modification would include an increase to the approved Moolarben Coal Complex operational workforce from 440 personnel to approximately 667 personnel on average. A peak operational workforce of 740 personnel would be required for 12 to 18 months during 2016 and 2017.

The changes in the Moolarben Coal Complex workforce are expected to result in an additional:

- 530 people in-migrating to the MWR LGA for the remainder of the Moolarben Coal Complex life.
- 91 people requiring short-term accommodation during the peak construction phase (2017).
- 14 people requiring short-term accommodation after the construction phase is complete.

The additional 530 in-migrating to the MWR LGA equates to 2.4% of the 2011 MWR LGA population (22,183 people).

Based on the distribution of the existing Moolarben Coal Complex workforce and taking into account recent population trends, predicted residential distribution of the in-migrating people is as follows:

- Mudgee: 450 new residents (85% of in-migrants).
- Gulgong: 53 new residents (10% of in-migrants).
- Rylstone and Kandos: 27 new residents (5% of in-migrants).

The Modification would increase the demand for housing, education services, health services and recreational facilities in the MWR LGA. It is considered that the existing community infrastructure in the MWR LGA is capable of servicing the increased population associated with the Modification.

Notwithstanding the above, the ongoing implementation of the existing mitigation measures will assist to reduce any potential negative community infrastructure impacts.

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# 1. Introduction

The Moolarben Coal Complex is located approximately 40 kilometres (km) north of Mudgee in the Western Coalfields of New South Wales (NSW) (Figure 1.1).

Moolarben Coal Operations Pty Ltd (MCO) is the operator of the Moolarben Coal Complex on behalf of the Moolarben Joint Venture (Moolarben Coal Mines Pty Ltd [MCM], Sojitz Moolarben Resources Pty Ltd and a consortium of Korean power companies). MCO and MCM are wholly owned subsidiaries of Yancoal Australia Limited.

The Moolarben Coal Complex comprises four approved open cut mining areas (OC1 to OC4), three approved underground mining areas (UG1, UG2 and UG4) and other mining related infrastructure (including coal processing and transport facilities) (Figure 1.2).

Mining operations at the Moolarben Coal Complex are currently approved until 31 December 2038 and would continue to be carried out in accordance with Project Approval (05\_0117) (Moolarben Coal Project Stage 1) as modified and Project Approval (08\_0135) (Moolarben Coal Project Stage 2).

The current Stage 1 mining operations are undertaken in accordance with Approval Decisions (EPBC 2007/3297) granted on 24 October 2007 (and varied by notice on 25 February 2009 and 11 May 2010) and (EPBC 2013/6926) granted on 13 November 2014 under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999*. The current mining operations are also conducted in accordance with the requirements of the conditions of Mining Lease (ML) 1605, ML 1606, ML 1628 and ML 1691 granted under the NSW *Mining Act, 1992*.

Since commencement of coal mining operations in 2010, mining activities have occurred within OC1 and OC2 (Figure 1.2). Subject to all necessary approvals being in place (both State and Commonwealth), development of the OC4 pit (Stage 2) is planned to commence during 2015. The development of the UG1 (i.e. highwall stabilisation, portal construction and underground roadway development) would also commence in 2015.

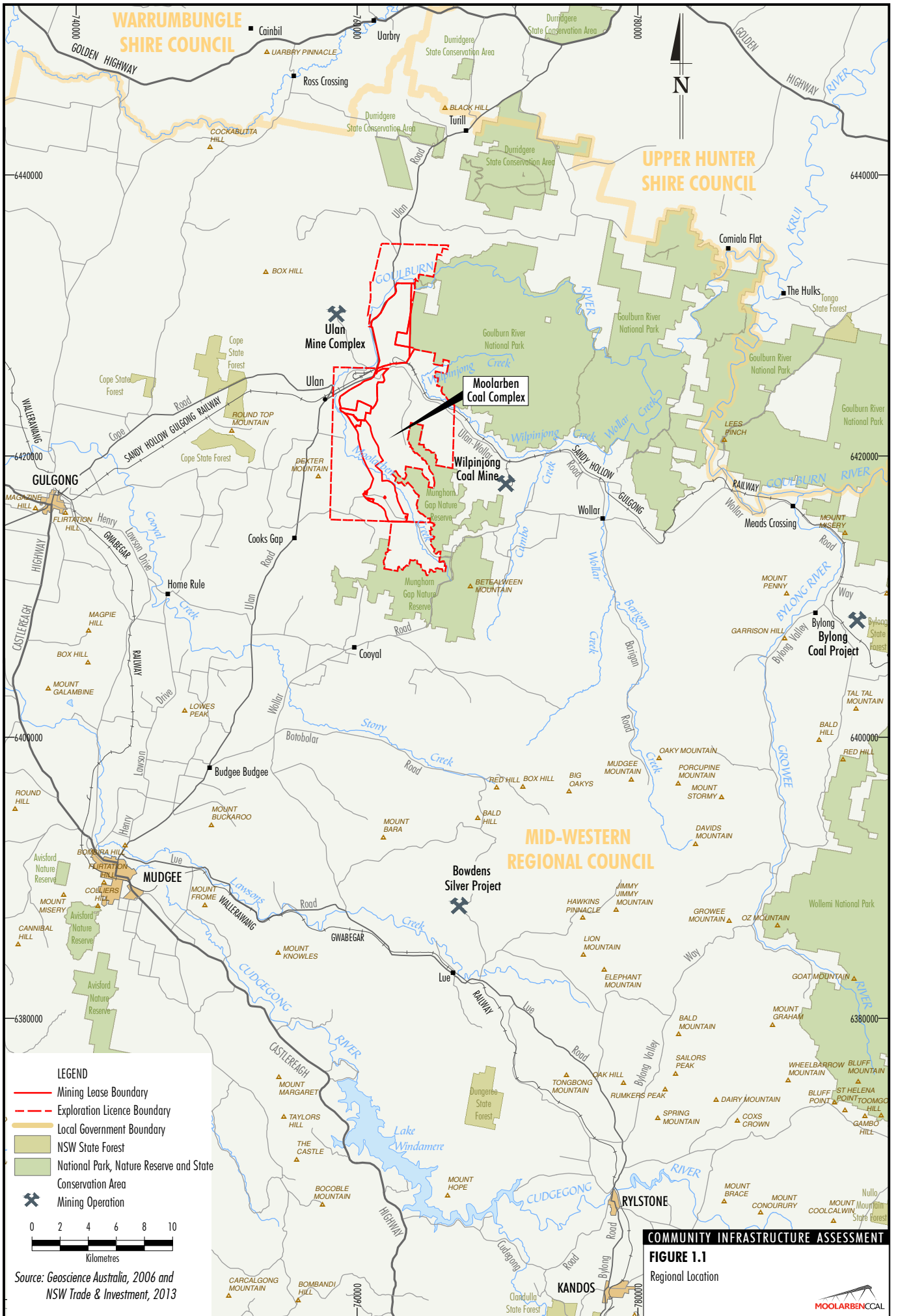
MCO is requesting to modify Project Approval (05\_0117) and Project Approval (08\_0135) under section 75W of the NSW *Environmental Planning and Assessment Act, 1979* (the UG1 Optimisation Modification).

The UG1 Optimisation Modification (the Modification) includes the reconfiguration of underground longwall panels (UG1), relocation of approved mine infrastructure and construction of coal handling infrastructure, Remote Services Facilities and rear air intake facilities. The Modification would also include an increase in the size of the Moolarben Coal Complex construction and operational workforces. The increased Moolarben Coal Complex workforce may have effects on regional and local community infrastructure such as housing/accommodation, health, education and recreation.

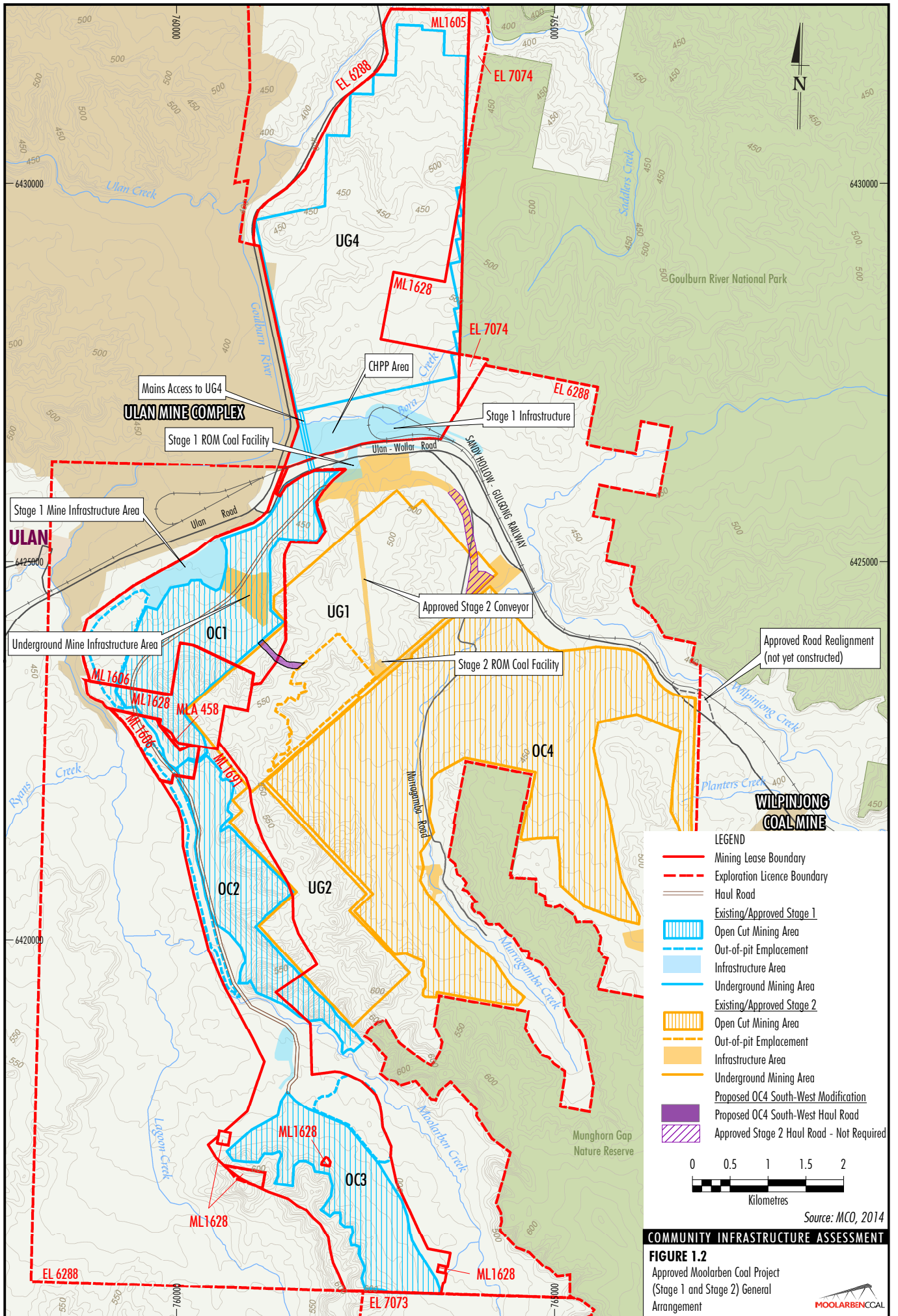
The objective of this Community Infrastructure Assessment (CIA) is to assess these potential community infrastructure impacts in the Study Area due to the Modification.

The approach to the CIA included the following steps:

- Identification of a relevant Study Area subject to potential effects (Section 3).
- Establishing a baseline population and community infrastructure characteristics for the Study Area (Section 4).
- Assessment of potential population changes in the Study Area resulting from the Modification (Section 5).
- Analysis of potential community infrastructure impacts associated with population change (Sections 6 and 7).
- Reviewing the appropriateness of mitigation measures (Section 8).







## 2. Overview of the UG1 Optimisation Modification (the Modification)

The Modification includes the following key components (Figure 2.1):

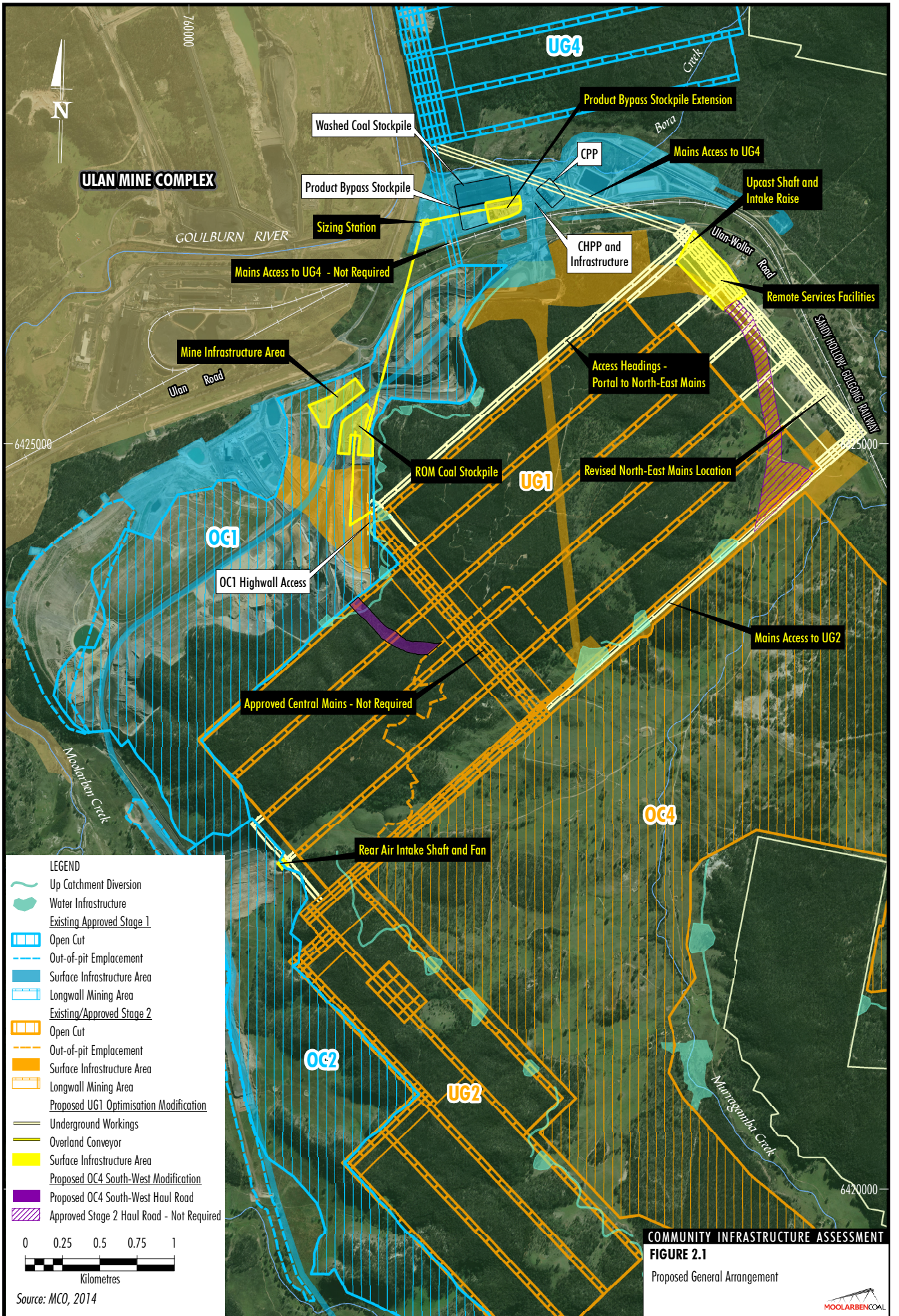
- Recovery of approximately 3.7 million tonnes (Mt) of additional run-of-mine (ROM) coal over the life of the mine.
- An extension of UG1 longwall panels in the north-east by approximately 150 to 500 metres (m).
- An extension of two UG1 longwall panels in the south-west by approximately 75 m.
- Relocation of the approved UG1 central main headings to the north-east.
- Relocation of underground access to UG2 and UG4.
- Extraction of the central panel of coal that previously contained the main headings.
- An increase in the coal seam extraction height by approximately 300 millimetres to a maximum extraction thickness of 3.5 m.
- An increase to longwall panel void width from approximately 305 to 311 m.
- Construction of a ROM coal conveyor between the UG1 pit top facilities in OC1 and the coal handling and preparation plant (CHPP) to transport underground ROM coal.
- Extension to the underground product coal stockpile in the CHPP area and relocation and expansion of the underground ROM coal stockpile at the UG1 pit top facilities.
- An increase in the maximum underground ROM coal production rate up to 8 million tonnes per annum (Mtpa) from UG1, UG2 and UG4 (combined).
- An increase in the maximum total site product coal rate to 18 Mtpa (i.e. 10 Mtpa from open cut operations and 8 Mtpa from underground operations).
- An increase in average daily rail departures from five to seven and increase in peak daily rail departures to nine.
- Construction of Remote Services Facilities and rear air intake shaft and associated fans above the extended UG1 longwall panels.
- Relocation of the underground Mine Infrastructure Area.

The Modification would increase the peak Moolarben Coal Complex workforce from approximately 439 (440) to approximately 740 personnel.

The Modification does not involve any change to the Moolarben Coal Project (Stages 1 and 2) for the following relevant approval components:

- Operational mine life.
- Hours of operation.
- Blasting limits.
- Biodiversity offset requirements.
- Site access.
- Open cut coal extraction limits.





**ULAN MINE COMPLEX**

**COMMUNITY INFRASTRUCTURE ASSESSMENT**

**FIGURE 2.1**

Proposed General Arrangement



Source: MCO, 2014



A detailed description of the proposed Modification is provided in Section 3 of the Environmental Assessment.

### Modified Workforce

The Modification includes an increase to the approved Moolarben Coal Complex construction and operational workforces with the construction period anticipated to occur during 2016 and 2017. The average construction workforce (120 personnel) is below the approved Moolarben Coal Complex construction workforce (220 personnel).

The peak construction workforce (250 personnel), an increase of 30, is expected to occur for a short period (2 months) during 2017.

The Modification includes an increase to the approved Moolarben Coal Complex operational workforce from 440 personnel to approximately 667 personnel on average. A peak operational workforce of 740 personnel would be required for 12 to 18 months during 2016 and 2017.

The approved and proposed modification to the Moolarben Coal Complex workforce are summarised in Table 2.1.

Table 2.1 Approved and Proposed Modifications to the Moolarben Coal Complex Workforce

Project period	Approved Workforce	Modified Workforce
Construction (average)	220	120
Construction (peak)		250
Operational (average)	440	667
Operational (peak)		740

### 3. Study Area

The Study Area for the CIA has been determined considering the Moolarben Coal Complex location and where personnel associated with the Modification are likely to reside.

The Moolarben Coal Complex is located in the NSW Mid-Western Regional Local Government Area (MWR LGA) (Figure 1.1). It is estimated that the existing Moolarben Coal Complex workforce resides in the following locations:

- Mudgee Urban Centre and Locality (Mudgee) (74%).
- Gulgong Urban Centre and Locality (Gulgong) (10%).
- Other locations in the MWR LGA (e.g. Rylstone, Kandos, Ulan, Cooks Gap) (10%).
- Outside of the MWR LGA (6%).

It is assumed that the additional workforce associated with the Modification would have a similar residential distribution to the existing workforce because:

- The majority of the additional workforce is expected to reside in Mudgee or Gulgong as these towns have the greatest availability of housing stock and community infrastructure and are therefore more attractive residential locations to reside for incoming workers.
- Migration to other settlements in the MWR LGA (e.g. Rylstone, Kandos, Ulan and Cooks Gap) is expected to be minimal due to the lower availability of community infrastructure in these towns and the large distance between the Moolarben Coal Complex and some of these towns (e.g. Rylstone and Kandos).

This assumption is supported by population growth trends in the MWR LGA since 2001 which shows population growth has predominately occurred in Mudgee.

Given the above, the MWR LGA has been adopted for the Study Area. The towns of Mudgee and Gulgong are the focus of the CIA as they are expected to accommodate the majority of the additional workforce.

## **4. Existing Population Characteristics and Community Infrastructure in the Study Area**

This section provides a description of the existing population characteristics and community infrastructure in the Study Area. Data described in this section is provided in more detail in Appendix A.

### **4.1. Population Characteristics**

#### **4.1.1. Population Size**

Between 2001 and 2011, the population in the MWR LGA increased by 3.9% which is substantially below the growth level of NSW (9.6%). Within the MWR LGA, Mudgee, the regional centre of the LGA, experienced a population increase of 14.3%, whereas Gulgong's population decreased by 7.7% (ABS, 2006a, d, e; ABS, 2007c, d, e, f; ABS, 2013d, f, h, i). Mudgee's higher population growth highlights its role as the primary service centre in the MWR LGA.

Between 2001 and 2006, the male/female ratio in the MWR LGA remained at approximately 50.5% male and 49.5% female. However, since 2006 the proportion of male residents increased to approximately 51.2% in 2011 (ABS, 2013h), possibly due to an increase in employment opportunities in the mining sector which has attracted a higher percentage of male workers.

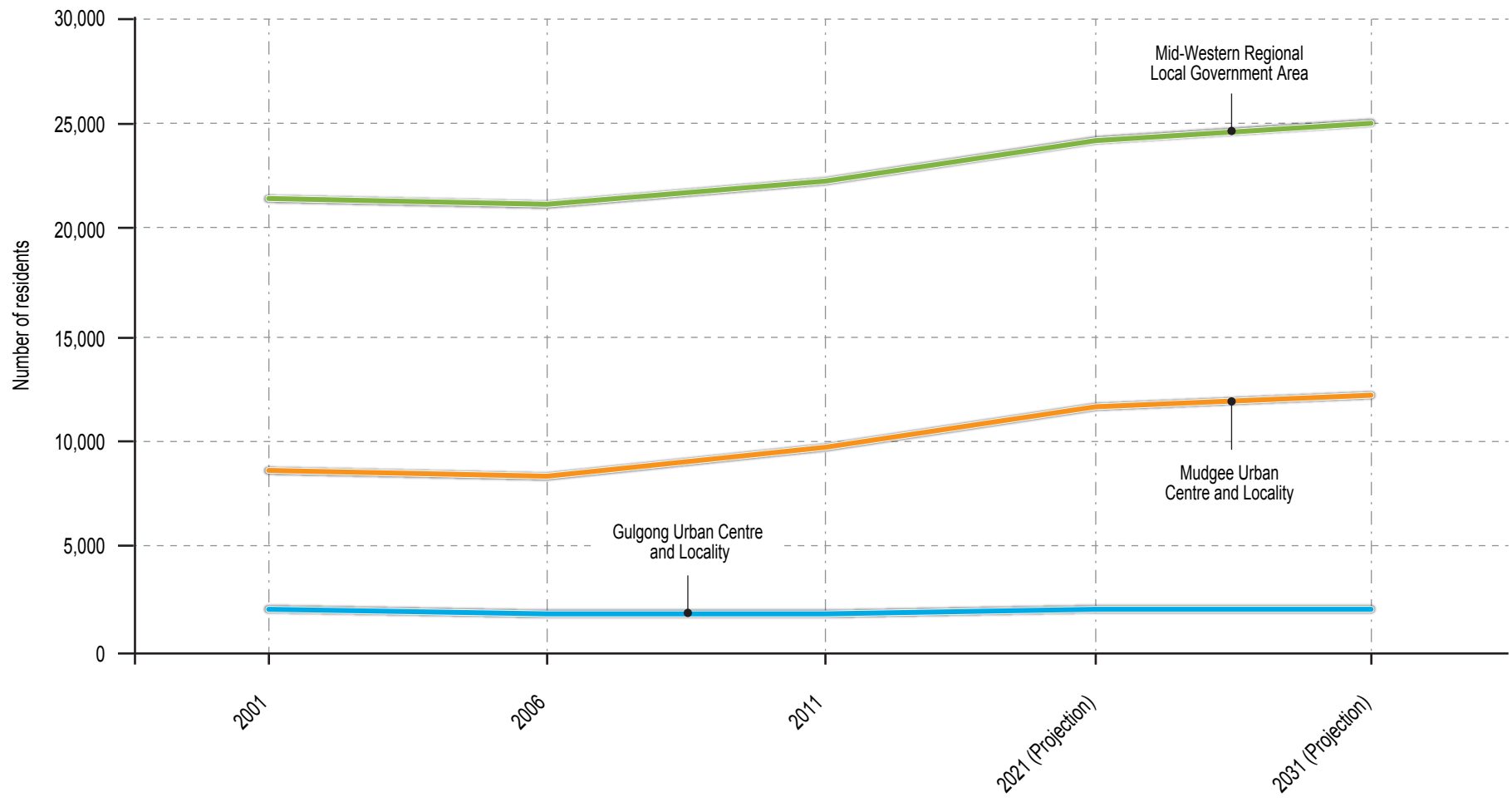
Projections from the NSW Department of Planning & Environment (2014a) forecast a population increase in the MWR LGA to 25,050 residents by 2031, an increase of 13% from the 2011 population. This compares to a 33% forecast increase in the NSW population (ABS, 2013d, f, h, i; NSW Department of Planning & Environment, 2014a, b).

No population projections were available for Mudgee or Gulgong, however it is assumed that Mudgee will attract the majority of the expected population growth in the MWR LGA, in line with the trend which occurred between 2001 and 2011.

Actual and forecast population in the Study Area is presented in Figure 4.1.

#### **4.1.2. Age Characteristics**

Between 2001 and 2011, in the MWR LGA the proportion of the population aged over 60 years increased from 19% to 25%. This trend is predicted to continue to the year 2031 with the 60 – 69 years cohort becoming the most populous age group, as presented in Figure 4.2. The trough in the distribution curves in the 20 – 29 years cohort is likely due to residents leaving the region to access higher education and employment opportunities. NSW is expected to experience an increase in the proportion of the population aged 60 and older, however it will be significantly less than in the MWR LGA (Figure 4.3).



Source: ABS, 2006c, d; ABS, 2007c, d; ABS, 2013d, f, h; NSW Department of Planning & Environment, 2014a, b; Coffey



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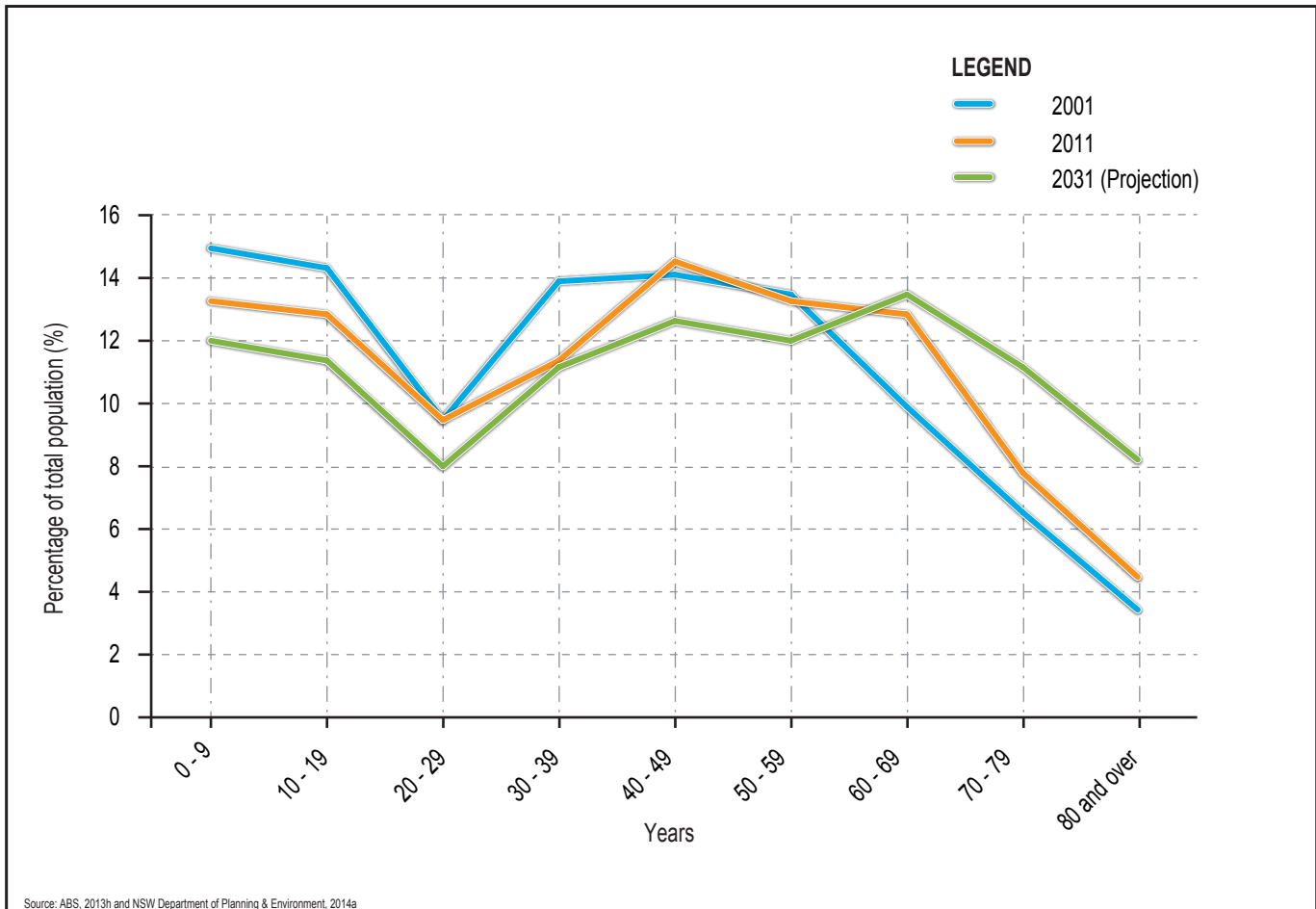
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Population change in the Study Area

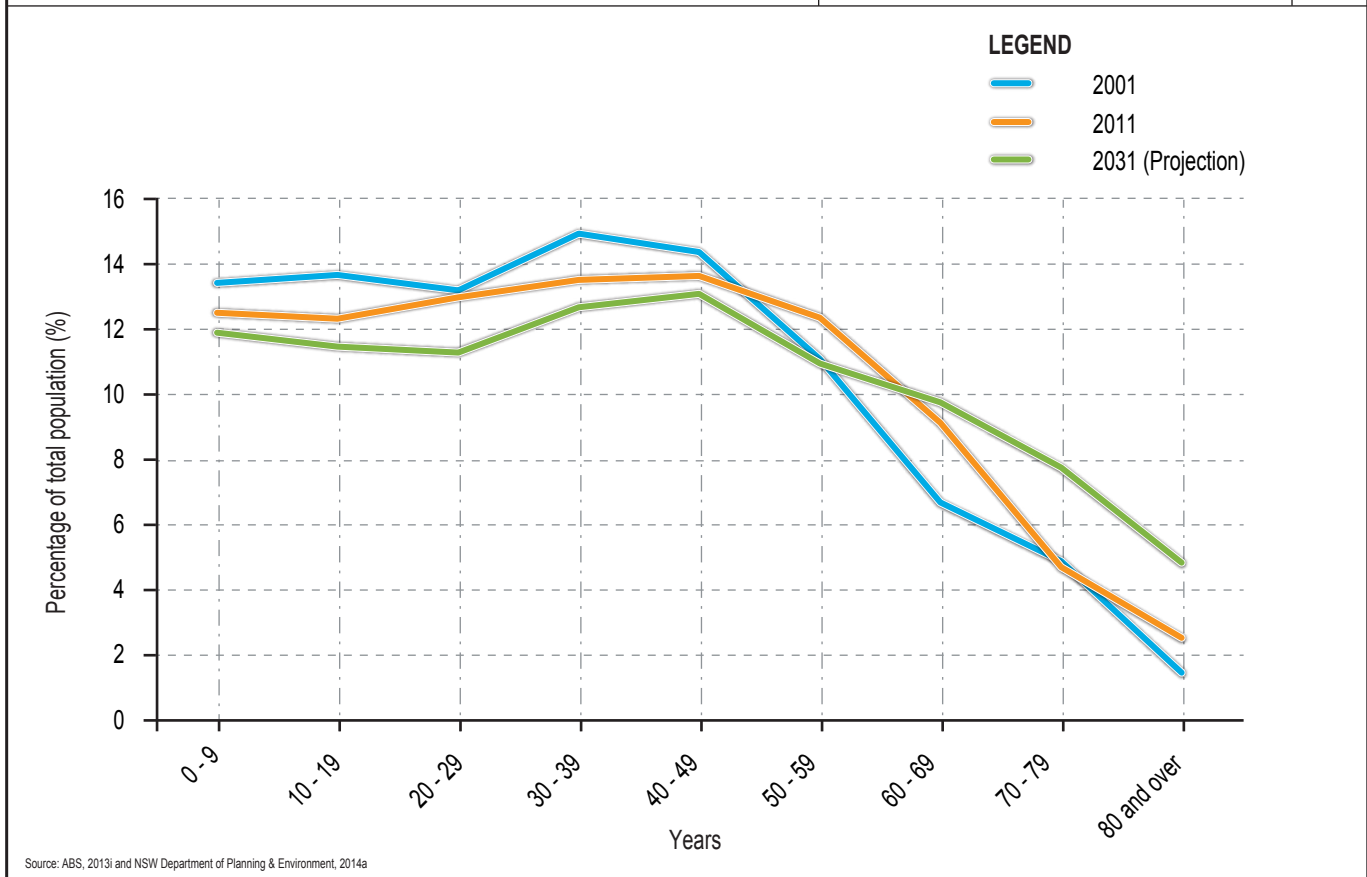
Figure No:

4.1



Age distribution in the Mid-Western Regional Local Government Area

Figure No: 4.2



Age distribution in New South Wales

Figure No: 4.3



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Except for the 60 – 69 years and 80 years and over age cohorts, Gulgong experienced a significant decrease in all its other age groups (ABS, 2006a; ABS, 2007a; ABS, 2013a). Mudgee, in contrast, experienced a population increase for all age groups. This may indicate a movement of younger people and families to Mudgee, which provides greater access to services and employment possibilities.

### 4.1.3. Employment

Between 2001 and 2011, the MWR LGA saw a significant shift in employment numbers between sectors which is likely due to the increasing prevalence of mining in the region. While agriculture, forestry and fishing has historically been the main employment sector, in the MWR LGA mining is now the primary employer followed by agriculture, forestry and fishing, health care and social assistance. Between 2001 and 2011 the number of employees in the mining sector increased by 230% in the MWR LGA, 229% in Mudgee and 132% in Gulgong, yet only by 24% in NSW (ABS, 2006a, b; ABS, 2007a, b; ABS, 2013a, c, h, i). While employment in the health care and social assistance sector and the construction sector has increased, employment in manufacturing has decreased. Figure 4.4 presents changes which occurred in selected employment sectors in the Study Area and NSW between the years 2001, 2006 and 2011.

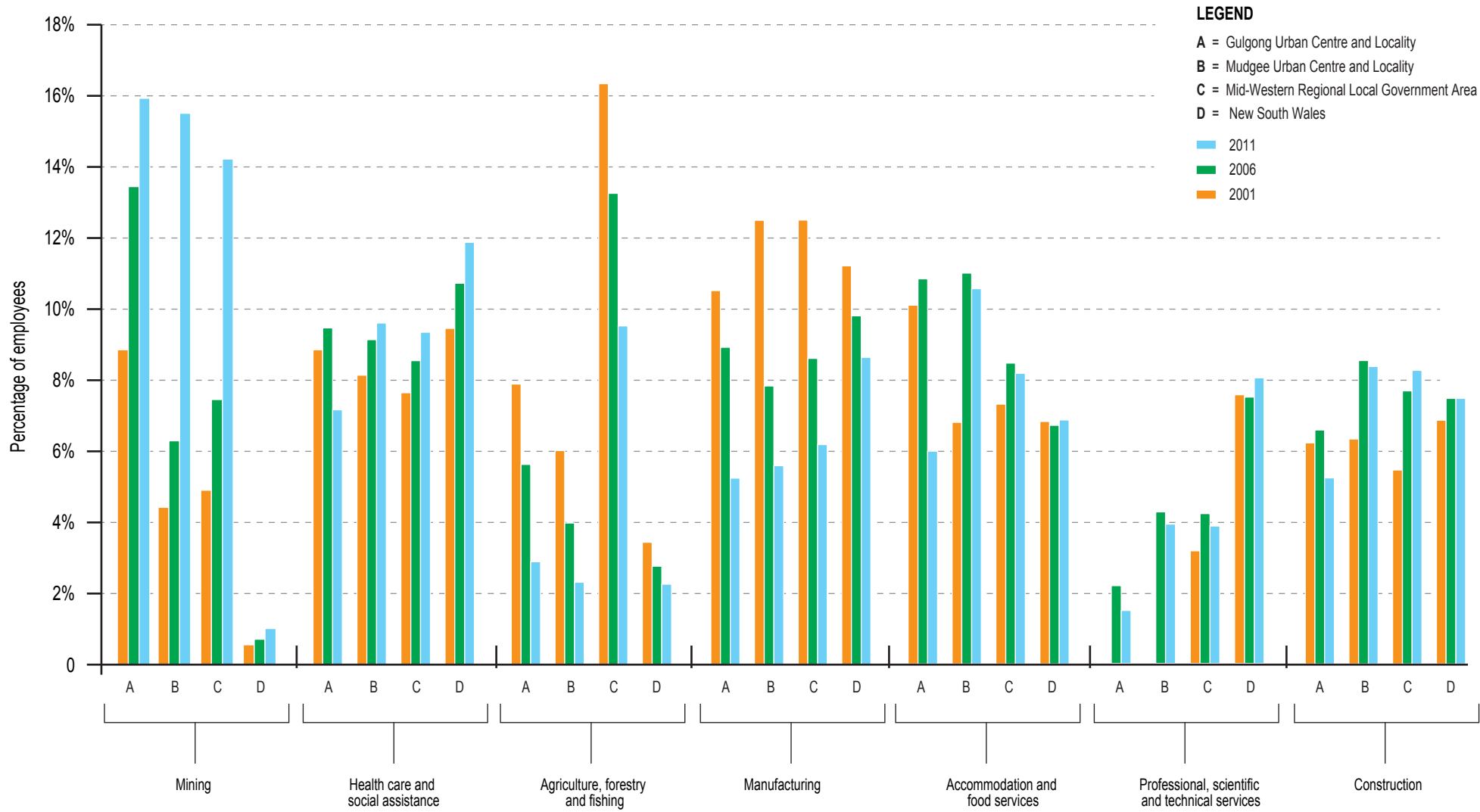
In 2011, coal mining was the largest employer in Gulgong, Mudgee and the MWR LGA, accounting for 18.6%, 13.4% and 12% of employment respectively (ABS, 2013d, e, f). In NSW, school education was the largest employer accounting for 4.4% of occupation (ABS, 2013g).

The significance of mining as a source of employment in the Study Area is also reflected in the types of occupation of the local workforces and the highest level of education. Technicians and trade workers were the most common occupation accounting for up to 20% of the employed workforce. Other common occupations in the Study Area were machinery operators and drivers, professionals, labourers and managers (Table 4.1).

Table 4.1 Top three occupations in the Study Area and NSW in 2011

Locality	Employed people aged 15 years and over		
Gulgong	Technicians and Trades Workers (19.9%)	Machinery Operators And Drivers (16.6%)	Labourers (14.7%)
Mudgee	Technicians and Trades Workers (17.9%)	Professionals (14.8%)	Machinery Operators And Drivers (12.9%)
MWR LGA	Technicians and Trades Workers (16.6%)	Managers (15.8%)	Professionals (13.5%)
NSW	Professionals (10.5%)	Intermediate Clerical, Sales and Service Workers (9.1%)	Tradespersons and Related Workers (6.6%)

Source: ABS, 2013d, e, f, g



Source: ABS, 2006a, b; ABS, 2007a, b; ABS, 2013a, c, h, i



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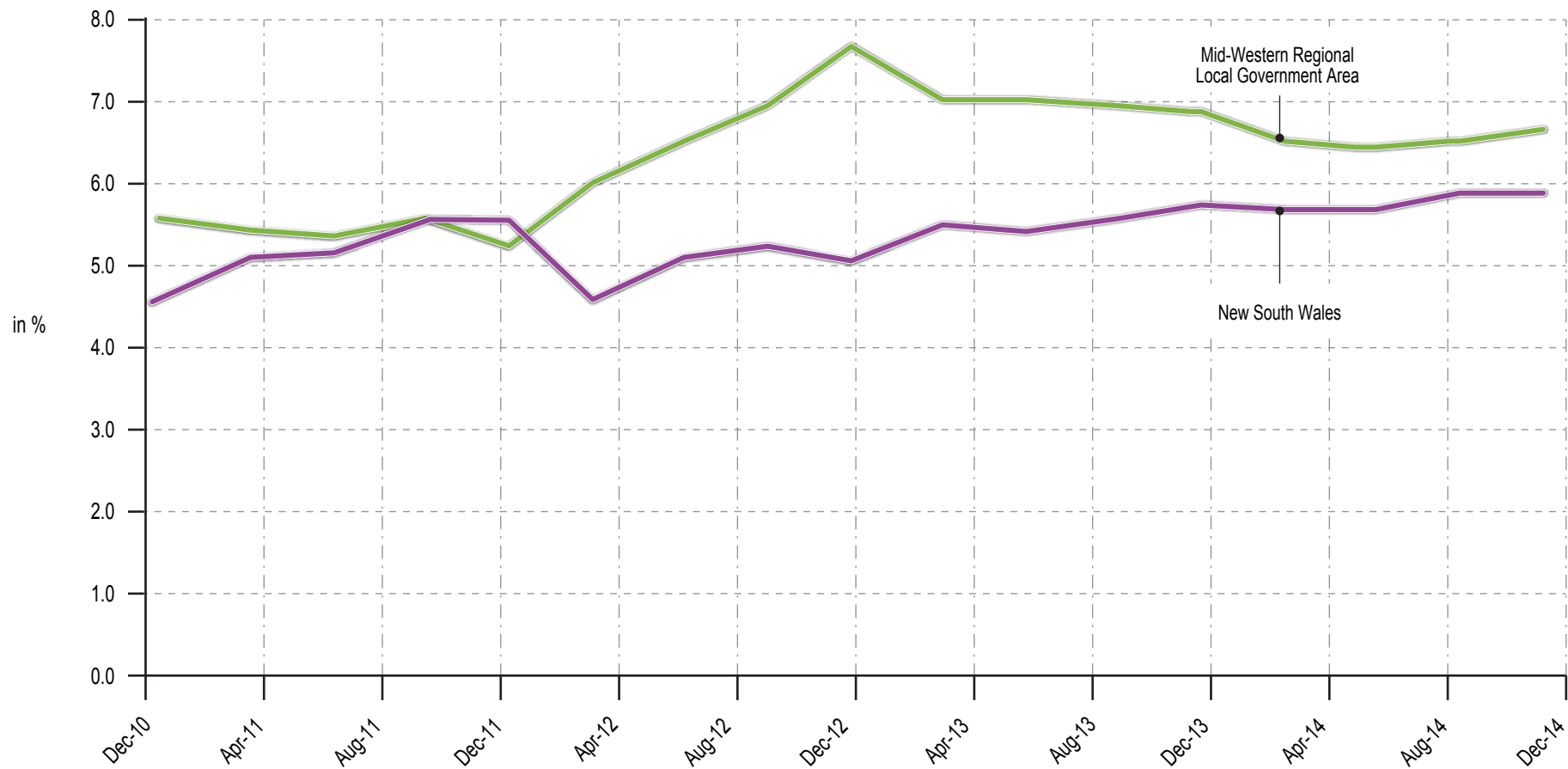
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Changes in selected employment sectors in the Study Area and New South Wales

Figure No:

4.4



Source:  
 ABS, 2015a; Australian Government, Department of Employment  
 2014a; Australian Government, Department of Employment 2015



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Unemployment rates for the Mid-Western  
 Regional Local Government Area  
 and New South Wales

Figure No:  
 4.5

The dominance of mining and agricultural industries in the MWR LGA is reflected by the education status of persons aged 15 and over. In the MWR LGA in 2011, 23% of persons had a certificate (NSW 31%), 6% had an advanced diploma or diploma (NSW 14%) and 10% had a bachelor degree or higher (NSW 35%). Mudgee had the same higher education distribution as the MWR LGA while in Gulgong, tertiary education levels were lower with the exception of persons with a certificate 24% (ABS, 2013a, b, c, i).

## Unemployment

Considering that mining is the largest employer in the region, unemployment rates in the MWR LGA are influenced by the status of the coal mining sector. Between 2001 and 2011 unemployment in the MWR LGA fell significantly from 8.3% to 5.2%, below the unemployment rate for NSW (5.6%) (ABS, 2013h; ABS, 2015a; Australian Government, Department of Employment, 2014a; Australian Government, Department of Employment, 2015). However, the dependence on mining resulted in a rise in unemployment in the years following 2012 when coal prices fell, resulting in reduced demand for mining-related employment. As such, in December 2014, 780 people (6.6% of the labour force) were unemployed in the MWR LGA (Australian Government, Department of Employment, 2015). Figure 4.5 presents the rise in unemployment in the MWR LGA and NSW for the period December 2010 to December 2014.

Regional employment projections for the period 2013 to 2018 do not indicate a significant change in the number of mining jobs in the Central West Region (of which the MWR LGA is part of) (Australian Government, Department of Employment, 2014b). As such, people who were previously employed in the mining sector but had lost their job are not expected to find alternative employment within the mining sector.

Between 2001 and 2011 the youth unemployment rate in the Central West region decreased from 17.1% to 11.6% before rising to approximately 14% in 2013 (Parliament of Australia, 2014; ABS, 2012). Recent statistics show that while youth unemployment in the Central West region decreased between February 2014 and February 2015 by 1.4 percentage points to 12.1% (ABS, 2015b and Brotherhood of St Laurence, 2014) and is now below the average rate of NSW of 12.6%, youth unemployment remains high.

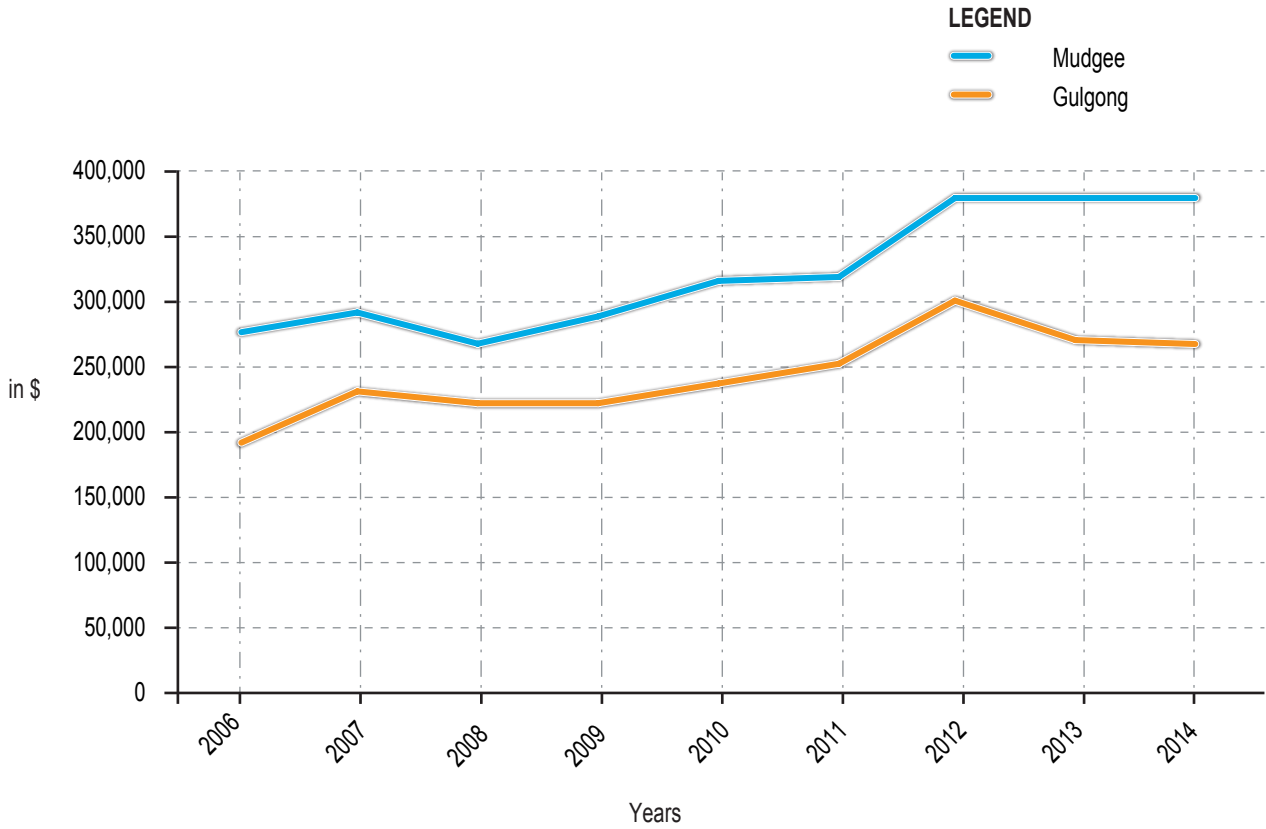
## 4.2. Housing

### 4.2.1. Permanent Housing

In 2011, in Gulgong 14.2% (120 dwellings) of all private dwellings were unoccupied, in Mudgee 10.3% (418 dwellings) and in the MWR LGA 18.6% (1,913 dwellings). The comparable rate for NSW in 2011 was 9.7% (ABS 2013d, e, f, g).

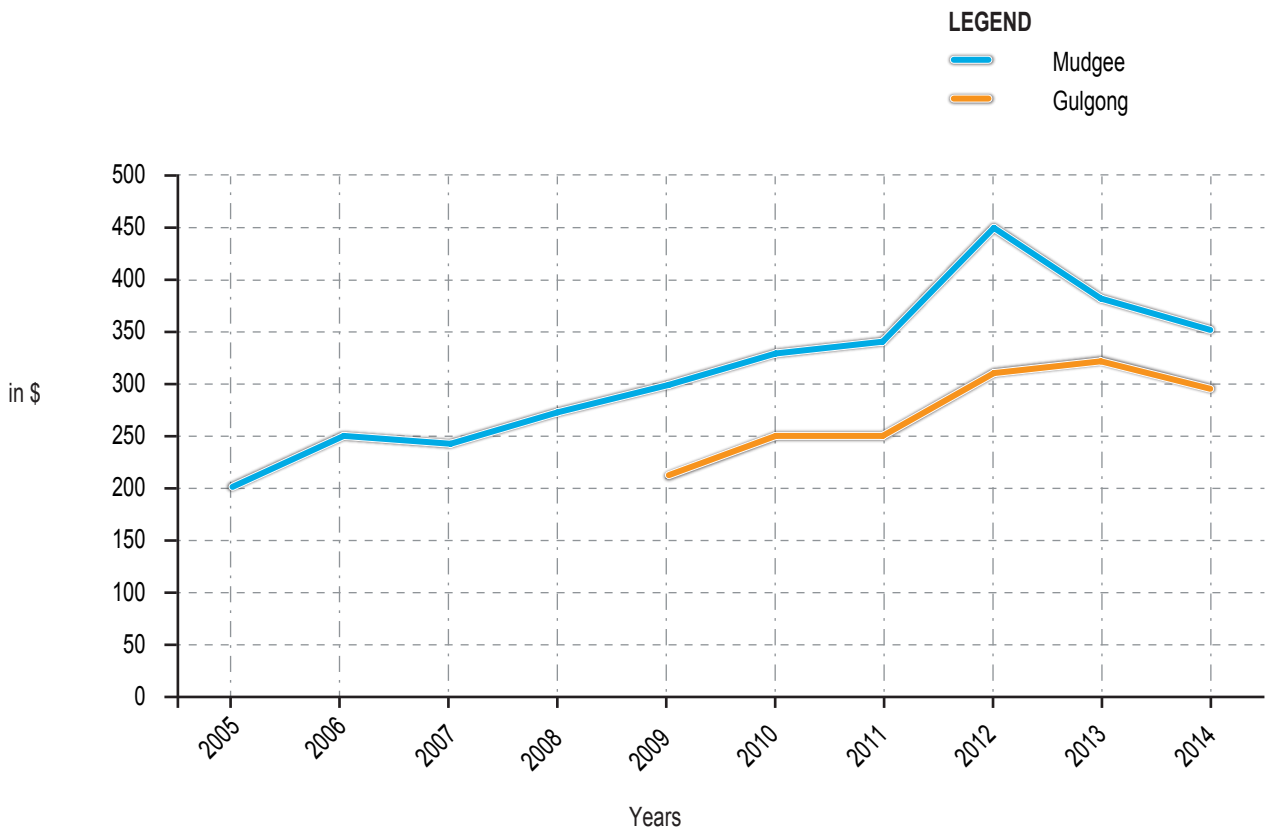
Median house prices and median weekly rental prices for Gulgong and Mudgee for the last 8 years (Realestate.com, 2015) are presented in Figures 4.6 and 4.7. Since 2012 housing sale prices in Mudgee have plateaued while in Gulgong prices fell by 10% prior to stabilising. Median weekly rental prices for both towns have fallen by approximately 20% in Mudgee and 6% in Gulgong.

Median mortgage repayments between 2001 and 2011 in the MWR LGA increased by 94% compared to 86% for NSW. While there is no data available for the year 2001 for Mudgee and for Gulgong, mortgage repayment increases from 2006 to 2011 were significant, 45% and 46% respectively.



Source: Realestate.com.au, 2015

Median house prices in Mudgee and Gulgong **4.6**



Source: Realestate.com.au, 2015

Median weekly rental prices in Mudgee and Gulgong **4.7**



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Figure No:

In February 2015, the residential vacancy rate for rental property in Mudgee was 7.1% and for Gulgong 9.3%. A healthy vacancy rate is considered to be around 3% (SQM Research, 2015a, b). As such, the data indicates that Mudgee and Gulgong currently have available residential property.

## **4.2.2. Temporary Accommodation**

In 2014, temporary accommodation options in the MWR LGA included 24 tourist accommodation facilities. These comprised of various accommodation types, of which hotels, motels and serviced apartments provided a total of 274 rooms with a recorded room occupancy rate of 73.6% (June 2014) (Destination NSW, 2014). Furthermore, in 2011 there were three caravan parks in the MWR LGA with 95 on-site vans and 90 cabins/ units/ flats/ villas, which could be used for housing personnel who commute to the MWR LGA for work (Destination NSW, 2011).

## **4.3. Education**

### **4.3.1. Primary and Secondary Education**

In Mudgee and Gulgong there are eight existing childcare and day care centres as well as pre-schools. In addition, an early childhood centre which includes an early intervention centre and pre-school services is currently under construction in Mudgee, providing up to 200 additional pre-school places once completed (Mid-Western Regional Council, 2015b).

Mudgee has three public schools: Cudgegong Valley Public School (a primary school), Mudgee Public School (a primary school), Mudgee High School, and one private school, St Matthews Central (a primary and secondary school). St Matthews Central began offering Year 11 in 2015 and will offer Year 12 in 2016. Gulgong has two public schools: Gulgong Public School (a primary school) and Gulgong High School, and a private primary school, All Hallows School.

Data from the Commonwealth Government's myschool.edu.au website indicates an increase in primary school enrolments in Mudgee in recent years. Enrolment numbers at St Matthews Central increased the most with almost 100 additional students since 2010, with the highest increase from 2012 onwards. In contrast, All Hallows School, the private primary school in Gulgong, experienced a decrease of 26 students since 2012 while student numbers at Gulgong Public School rose by 22 students in the same period.

The student-teacher ratio provides an indication of class sizes and the attention a teacher can give to each student individually. As no data for the average student-teacher ratios of public primary schools in NSW in 2014 was available, the student-teacher ratio in 2013 (15.5) has been used as a reference value (ABS, 2014). In 2014, all three public schools in Mudgee and Gulgong had higher ratios (between 17.6 and 21.3), indicating limited capacity for additional students without additional employment of staff.

For secondary public schools in NSW the student-teacher ratio in 2013 was 12.3. In 2014, Mudgee High School had a ratio of 12.6 and Gulgong High School of 7.7. As such, it is expected that Mudgee High School is near capacity in terms of number of students per teacher and Gulgong High School may have some capacity for additional students.

Student-teacher ratios of the private schools All Hallows School and St Matthews Central were below their 2013 reference ratios, indicating some additional student capacity.

The introduction of Years 11 and 12 at St Matthews Central will provide additional capacity for students in Years 11 and 12 in Mudgee.

### **4.3.2. Higher Education**

Higher education infrastructure and services in the region are limited to TAFE Western, which has a college in Bombira and a campus in Mudgee, offering courses in horticulture; hospitality; work, health and safety; aged care; animal studies; business; business administration; community services; cookery; construction; early childhood education and care; engineering and electrotechnology. Some of these are offered as online courses.

The NSW government has plans to consolidate the two campuses at the Bombira site and to refurbish existing buildings in order to increase capacity and resources at the site (Mid-Western Regional Council, 2014).

## **4.4. Healthcare**

The MWR LGA is part of the Western NSW Health District which operates major rural referral hospitals in Bathurst, Dubbo and Orange. The four district hospitals at Cowra, Mudgee, Parkes and Forbes provide emergency, maternity, acute medical, subacute, elective diagnostic and ambulatory care services, such as outpatient clinics, chemotherapy and renal dialysis (NSW Ministry of Health - Western NSW Local Health District, 2013).

Mudgee Hospital, being the main hospital in the MWR LGA, offers elective surgery, cancer surgery, gynaecological surgery, cardiovascular, childbirth, urological and other surgeries as well as radiology and pathology services. The hospital has an emergency department and has a built capacity of 52 beds (NSW Ministry of Health - Western NSW Local Health District, 2014). It is estimated that Mudgee has approximately 5.1 public hospital beds per 1,000 population and the MWR LGA (serviced by Mudgee Hospital as well as the Multi-Purpose Service facilities in Gulgong and Rylstone) approximately 2.9 public hospital beds per 1,000 population. In comparison, in the years 2009 to 2013, NSW had 2.8 public hospital beds per 1,000 population (Australian Institute of Health and Welfare, 2014). Statistics from the Bureau of Health Information (2015) show that in the period October to December 2014 100% of patients who needed urgent elective surgery received it within 30 days. This indicates that Mudgee hospital may have some existing service capacity.

Health services in Gulgong include a Multi-Purpose Service (MPS) centre with four sub-acute beds, six high care residential aged care beds and two treatment beds in the emergency department. Gulgong HealthOne, being part of the MPS, is a healthcare facility which provides emergency care, community nurse, allied health (dietitians, physiotherapy, occupational therapy and speech therapy), child and family health, palliative care, mental health, drug and alcohol, and women's health services (NSW Ministry of Health - Western NSW Local Health District, 2015).

Gulgong has one aged care facility with 28 beds and Mudgee has three with a total of approximately 209 beds.

There are a range of allied health services, such as dentists, podiatrists, and chiropractors etc. in the MWR LGA, most of which are located in Mudgee.

Western NSW Health has highlighted the challenges the region faces due to an ageing population and its large and sparsely populated area consisting of many small and remote communities with high health needs. Meeting the needs of some rural communities for general practice and local hospital care has become increasingly problematic in the past and is likely to continue to do so in the near future. Additional population and higher income levels may result in private providers of health care expanding their services in rural areas, taking the pressure off the public sector.

## **4.5. Sports and Recreation**

Mudgee and Gulgong are serviced by a range of parks and recreation areas, such as swimming pools; regional, neighbourhood and pocket parks; golf clubs; the Glen Willow Regional Sporting Complex and two nature reserves as well as two libraries. Both towns have a wide range of interest groups, community groups, support groups, sports clubs and associations (Mid-Western Regional Council, 2015a).

## **4.6. Emergency Services**

Fire and police services are stationed in Mudgee and Gulgong, however the police station in Gulgong is not permanently occupied. The local ambulance service is in Mudgee.

The NSW volunteer rescue association has stations in Gulgong and Mudgee and State Emergency Services are based in Mudgee (Mudgee Business Directory and Tourist Guide, 2015).

## **4.7. Road Network**

A description of the road network in the vicinity of the Moolarben Coal Complex is provided in the Road Transport Assessment (GTA Consultants, 2015) prepared for the Modification.



## 5. Estimated Population Changes

This section estimates the population changes associated with the additional Modification construction and operational workforces. The population change estimates take into account direct and indirect employment changes and family members that may also in-migrate to the MWR LGA.

### 5.1. Construction Workforce-related Population Changes

#### Direct Employment

The proposed average construction workforce (120 personnel) is smaller than the approved Moolarben Coal Complex construction workforce (220 personnel) (Section 2).

The peak construction workforce (i.e. 250 personnel) would however be approximately 30 personnel greater than the approved Moolarben Coal Complex workforce (220 personnel). This level is expected to occur for a short period (2 months) during 2017.

Due to the recent history of mining in the MWR LGA and the current unemployment level, it is anticipated that some of the necessary skills required for the project construction may be able to be sourced from within the MWR LGA.

Notwithstanding the above, it is expected that some of the additional construction workforce would be sourced from outside the MWR LGA. Given the short term nature of the peak construction workforce (i.e. 2 months), it is anticipated that these personnel would not permanently relocate to the MWR LGA and would utilise short-term accommodation.

For the purposes of this CIA, it has been conservatively assumed that all of the additional construction workforce would be sourced from outside of the MWR LGA (Table 5.1).

#### Indirect Employment

Direct construction employment will stimulate indirect employment opportunities and hence may cause changes in population. For the Moolarben Coal Project Stage 2 Environmental Assessment, the Hunter Valley Research Foundation (2008) estimated a construction flow-on employment multiplier of 0.65.

Based on an employment multiplier of 0.65, the Modification would result in indirect employment opportunities for 20 persons during the peak construction period.

Consideration needs to be given to where these induced jobs may be created. The Hunter Valley Research Foundation (2008) input-output model was based on the Hunter Region, however assumed that 'a substantial proportion of the induced impacts will accrue in the townships of Mudgee and Gulgong'. The basis of this assumption was not declared, and it would appear to be overly optimistic given the maturity of the coal mining industry and associated support industry in the Hunter Region. By way of example, in 2012-13, direct spending of the mining industry on goods and services, wages and salaries, local councils and community groups amounted to approximately \$6.3 billion in the Hunter Region and \$1 billion in the Central West Region (which includes the MWR LGA) (NSW Minerals Council, 2014), a ratio of approximately 6 to 1. Applying this ratio to induced employment effects would result in 84% of induced job creation occurring in the Hunter Region with 16% occurring

in the MWR LGA. The favourable lifestyle attributes available in the MWR LGA, together with improved communication links and competitive business costs, may act to encourage a higher level of employment in the MWR LGA. Hence for this study it has been conservatively assumed that 30% of the flow on employment would occur in the MWR LGA (rather than 16%), and 70% in the Hunter Region.

Based on this ratio, the additional Modification construction workforce would result in indirect employment opportunities for six persons in the MWR LGA. It is assumed that these positions would be filled from within the existing MWR LGA labour force (Table 5.1).

## Associated Family

Given the short term nature of the peak construction workforce (i.e. 2 months), it is anticipated that additional construction workforce would not permanently relocate to the MWR LGA and would utilise short-term accommodation. The additional construction workforce is therefore not expected to bring family members with them to the MWR LGA.

Table 5.1 Population changes during average and peak construction periods

Construction Period	Additional Direct Workforce			Additional Indirect Workforce		Additional Family
	Existing MWR LGA Resident	In-migrating	Commute from Outside MWR LGA	Existing MWR LGA Resident	In-migrating	In-migrating
Average	No increase above approved construction workforce.					
Peak	0	0	30	6	0	0

## 5.2. Operational Workforce-related Population Changes

### Direct Employment

The currently approved Moolarben Coal Complex operational workforce is 440 personnel. The Modification would result in an increase to the approved operational workforce of 227 personnel on average and 300 personnel during a 12 to 18 month peak period in 2016 and 2017.

Based on the existing Moolarben Coal Complex workforce residential distribution, approximately 94% of the additional average operational workforce (i.e. 213 personnel) is expected to permanently reside in the MWR LGA. The remaining 6% (i.e. 14 personnel) is expected to commute from outside the MWR LGA.

In the 2011 census, approximately 26% of the labour force in the MWR LGA was employed in mining and mining-related industries such as construction and professional, technical and scientific services (ABS, 2013h). Given the existing mining-related skills in the MWR LGA and the availability of personnel due to current elevated levels of unemployment, it is anticipated that 35% of the additional average operational workforce that would permanently reside in the MWR LGA (75 personnel) may be sourced from within the MWR LGA. This would result in an in-migration of 138 personnel (Table 5.2).

For the peak operational period, it is expected that the additional 73 personnel needed would not permanently relocate to the MWR LGA but rather would be sourced from within the MWR LGA (35%) or use short-term accommodation if residing outside the MWR LGA (65%). Therefore the additional peak operational workforce would not increase the permanent population in the MWR LGA (Table 5.2).

## **Indirect Employment**

The operational phase of the Moolarben Coal Complex (including the Modification) would create direct employment opportunities, and would also induce employment through the stimulation of additional production and consumption in the region. The important parameters to assess in considering this effect are the flow-on jobs multiplier, and where in the region these jobs may be created.

For the Moolarben Coal Project Stage 2 Environmental Assessment, the Hunter Valley Research Foundation (2008) estimated an operational flow-on employment multiplier of 3.26. This was a significant increase in the multiplier of 1.9 used in a 2006 input-output model assessment of the Moolarben Coal Project (Stage 1), justified on the basis of an expanded and more diversified economy, where leakages outside the region had been reduced and 'the size of multiplier impacts within the region have increased' (Hunter Valley Research Foundation, 2008). While there is an element of uncertainty surrounding the use of the 2008 multiplier (due to a significant industry downturn in the past three years), it has been adopted in this study as it will result in a conservative assessment of job creation (i.e. a higher level of job creation).

Hence, based on an employment multiplier of 3.26, the Modification would result in indirect employment opportunities for 740 persons during the standard operational period, and a further 238 persons during the peak operational period.

Flow-on employment assumptions applied to the construction period have been applied to the average operational period. As such, it is expected that approximately 222 jobs would be created in the MWR LGA and approximately 518 jobs are expected to be generated in the Hunter Region. Of the jobs created in the MWR LGA, it is assumed that 74 (or 33%) would be filled by persons who move to the region.

Given the short term nature of the peak operational period (i.e. 12 to 18 months), it is anticipated that the additional indirect employment opportunities (i.e. 238) would be taken up either by existing MWR LGA residents and businesses in the form of new employment, changes to current employment agreements and productivity improvements, or by businesses and workers from outside of the MWR LGA (Table 5.2).

## **Associated Family**

The Modification is expected to result in 212 people in-migrating into the MWR LGA through direct and indirect employment over a period of 20 years.

Adopting the average household size for in-migrating personnel of 2.5, results in an increase of 530 residents to the area (Table 5.2).

Table 5.2 Population changes during average and peak operational periods

Operational Period	Additional Direct Workforce			Additional Indirect Workforce			Additional Family
	Existing MWR LGA Resident	In-migrating	Commute from Outside MWR LGA	Existing MWR LGA Resident	Hunter Region	In-migrating	In-migrating
Average	75	138	14	148	518	74	318
Peak (additional demand)	26*	-	47	238		-	-
Peak (total)	101	138	61	904		74	318

\* Additional peak workforce numbers include changes to existing employment agreements and the utilisation of unused capacities. As such, the number of new positions created is expected to be lower.

### 5.3. Summary of Estimated Population Changes

A summary of the population changes during key employment phases of the modified Moolarben Coal Complex is provided in Table 5.3.

Table 5.3 Additional workforce numbers during the key employment phase

Moolarben Coal Complex Phase	Additional Direct Workforce		Additional Indirect Workforce	Additional Family	Total	
	In-migrating	Commute from Outside MWR LGA	In-migrating	In-migrating	In-migrating	Commute from Outside MWR LGA
Average Construction and Peak Operational Phase (2016)	138	61	74	318	530	61
Peak Construction and Operational Phase (2017)	138	91	74	318	530	91
Average Operational Phase (2018 to 2038)	138	14	74	318	530	14

## 6. Potential Community Infrastructure Impacts

This section discusses the potential community infrastructure impacts within the MWR LGA associated with the Modification.

### 6.1. Population Distribution

The Modification is expected to result in additional population, including (Table 5.3):

- 530 people in-migrating to the MWR LGA for the remainder of the Moolarben Coal Complex life.
- 91 people requiring short-term accommodation during the peak construction phase (2017).
- 14 people requiring short-term accommodation after the construction phase is complete.

The additional 530 people in-migrating to the MWR LGA equates to 2.4% of the 2011 MWR LGA population (22,183 people).

Based on the distribution of the existing Moolarben Coal Complex workforce (Section 2) and taking into account recent population trends, predicted residential distribution of the in-migrating population is as follows:

- Mudgee: 450 new residents (including an estimated 72 families) (85% of in-migrants).
- Gulgong: 53 new residents (including an estimated 8 families) (10% of in-migrants).
- Rylstone and Kandos: 27 new residents (including an estimated 4 families) (5% of in-migrants).

Mudgee, having a higher growth rate than the MWR LGA, is expected to experience the largest population increase, receiving 85% of the in-migrating population.

Gulgong experienced population decline between 2001 and 2011. However, due to the town's proximity to the Moolarben Coal Complex it is assumed that 10% of an in-migrating population would settle here.

While the existing workforce distribution of the MCO indicates that approximately 10% of residents live in Rylstone and Kandos (Section 3), population trends between 2006 and 2011 do not support a similar assumption for an in-migrating future workforce. Furthermore, Rylstone and Kandos have a significantly longer travel time to the project site, in excess of more than one hour. As these two settlements are likely to experience minimal in-migration, impacts on community infrastructure are considered to be minor.

### 6.2. Housing

#### 6.2.1. Permanent Housing

The increased population associated with the Modification could potentially reduce housing availability and affordability, if housing demand outpaces supply.

The proposed additional in-migrating operation workforce would create demand for 138 dwellings for a period of approximately 20 years until the year 2038. Flow-on employment would create additional demand for 74 dwellings. This equates to a total demand of approximately 212 dwellings in the MWR LGA.

The additional demand for the dwellings is expected to be distributed as follows:

- Mudgee: 180 dwellings.
- Gulgong: 21 dwellings.
- Rylstone and Kandos: 11 dwellings.

As described in Section 4.2.1, it is considered that there is currently available residential property in Mudgee and Gulgong. It is therefore considered that although the additional demand for dwellings may temporarily increase housing prices and rents, there are sufficient dwellings available for the expected additional population.

The declining population in towns outside of Mudgee in the MWR LGA suggest that there would be existing available housing stock in these towns.

## **6.2.2. Temporary Accommodation**

The Modification is estimated to result in an additional:

- 91 people requiring short-term accommodation during the peak construction phase (2017).
- 14 people requiring short-term accommodation once the construction phase is complete.

As described in Section 4.2.2, hotels, motels and serviced apartments in the MWR LGA currently provide 274 rooms and have a room occupancy rate of approximately 74% (203 rooms). While bed and breakfast accommodation facilities provide additional rooms, it is expected that short-term accommodation requirements during the peak construction phase would have a temporary impact on the availability of accommodation for tourists. However, it is assumed that accommodation providers will utilise the increased demand to expand and upgrade services and invest in additional capacity within a short timeframe.

## **6.3. Education**

The increased population associated with the Modification would result in an increase in demand for education and training services in the MWR LGA.

### **6.3.1. Primary and Secondary Education**

The Modification is estimated to result in an in-migration of 212 additional people through direct and indirect employment opportunities. It is assumed that 40% of these employees would move with their family (assumption of two children per family), resulting in a maximum increase in demand of approximately 170 students seeking primary and secondary education in the MWR LGA.

The additional demand for the places at educational facilities is expected to be distributed as follows:

- Mudgee: 145 places.
- Gulgong: 17 places.
- Rylstone and Kandos: 8 places.

Mudgee has experienced a rise in enrolments of approximately 200 students between 2009 and 2014 without significant changes in the teacher-student ratio. While the anticipated increase in students (approximately 145 students) would outpace the rate of enrolments of recent years, it is expected that the schools would be able to adjust to these numbers within a reasonable time.

As described in Section 4.3.1, St Matthews Central in Mudgee began offering Year 11 in 2015 and will offer Year 12 in 2016. The introduction of Years 11 and 12 at St Matthews Central will provide additional capacity for students in Years 11 and 12 in Mudgee.

Student numbers in Gulgong have remained fairly steady between 2009 and 2014 with the exception of 2012. As the teacher-student ratio has improved in the same period, in particular in the years 2013 and 2014, it is expected that schools in Gulgong have sufficient capacity for the additional 17 students which are expected due to the Modification.

The expected increase in demand for places in Rylstone and Kandos is minor (i.e. 8 places) and there is expected to be sufficient capacity at these educational facilities in these towns.

The provision of education is primarily the responsibility of the public sector. Yet, the increase in population with higher incomes in the mining industry may result in a higher demand for private education. It is expected that private education providers would expand their services in the region, reducing the demand on public schools.

### **6.3.2. Higher Education**

The Moolarben Coal Complex requires a range of skills and occupations. Due to the history of mining in the MWR LGA, there is potential for a substantial share of the required workforce with existing skills and experience in the mining sector to be sourced within the MWR LGA. In addition, it is anticipated that the majority of the people in-migrating to MWR LGA for mining-related work would already have the relevant skills and experience in the mining sector and would therefore not significantly impact demand for training in the MWR LGA.

People without skills or experience may enrol in appropriate TAFE courses in anticipation of employment opportunities. TAFE Western with its campuses in Bombira and Mudgee offers a range of courses catering for the mining industry, such as construction; work, health and safety; and engineering. It is assumed that TAFE Western has sufficient capacity for an increased intake of students as an increasing number of courses are offered online, reducing the necessity of on-site facilities, such as class rooms.

Given the above, the Modification is not expected to cause a significant demand for training services in the MWR LGA.

## **6.4. Health**

The Modification is expected to result in an increase in demand for health services, such as hospitals, general practitioners, dentists, and allied health professionals in the MWR LGA.

It is assumed that 85% of the in-migrating population would reside and hence access health facilities and services in Mudgee. As such, pressure on health services in remote communities would not increase.

In the short-term the increased population in the MWR LGA is unlikely to increase intensive care needs as it is expected that the majority of in-migrants would be of younger age and in good health. Chronic and severe diseases which need more intensive and stationary care tend to occur in higher age cohorts.

A higher population could improve the viability of private sector provided health services and may result in an improved level and wider range of healthcare options in the long-term.

## **6.5. Sports and Recreation**

Mudgee and Gulgong have a range of sports facilities, parks and recreation areas. While demand for these areas and facilities would rise with an increased population, the population increase associated with the Modification is relatively small compared to the total population of the MWR LGA. It is subsequently unlikely that the Modification would have any noticeable effect on the availability and capacity of recreational infrastructure.

## **6.6. Emergency Services**

The increase in population associated with the Modification is small compared to the total population of the MWR LGA and is not expected to significantly increase demand on emergency services. Notwithstanding the above, the Modification, being a large industrial project, has potential for accidents and emergency situations which may place additional demand on emergency health facilities, in particular Mudgee Hospital, though on an infrequent basis.

## **6.7. Road Network**

An assessment of potential road network impacts associated with the Modification is provided in the Road Transport Assessment (GTA Consultants, 2015).



## **7. Potential Cumulative Community Infrastructure Impacts**

The NSW Department of Planning & Environment Major Project Register lists a range of proposed new and expanded mining projects in the MWR LGA. As these projects would have potential community infrastructure impacts in the MWR LGA, they have been considered in this CIA.

### **7.1. Other Mining Projects**

#### **Ulan Coal Complex**

The Ulan Coal Complex is a coal mine located to the immediate north of the Moolarben Coal Complex with an approved workforce of 931 people. No changes in workforce numbers are currently proposed and as such no changes on community infrastructure and housing are expected.

#### **Wilpinjong Extension Project**

The Wilpinjong Coal Mine is located to the east of the Moolarben Coal Complex. The proposed Wilpinjong Extension Project would increase its workforce from approximately 550 to 625 personnel and require a short-term (12 to 18 months) construction workforce of approximately 100 personnel (Resource Strategies, 2014).

It has been assumed that the Wilpinjong Extension Project would commence in 2017.

#### **Bylong Coal Project**

The Bylong Coal Project is a proposed coal mine which would be located approximately 55 km to the north-east of Mudgee. The Bylong Coal Project is estimated to have a workforce of approximately 1,000 personnel during construction and an operational workforce of approximately 550 personnel (Hanson Bailey, 2014).

An accommodation facility is proposed to be constructed near the mine site that would be able to accommodate “a fair proportion” of the construction workforce and the entire operational workforce (Hanson Bailey, 2014).

Based on information on the Bylong Coal Project website, it is anticipated that construction would commence in late 2016 and operational would commence in late 2018.

#### **Bowdens Silver Project**

Bowdens Silver Project is a proposed silver mine located approximately 26 km to the east of Mudgee. It has a proposed construction workforce of up to 300 personnel and an operational workforce of 200 personnel (R.W. Corkery & Co, 2012).

It has been assumed that construction of the Bowdens Silver Project would commence during 2017 and operations would commence in 2018.

## Cobbora Coal Project

The Cobbora Coal Project is an approved coal mine located approximately 58 km north-west of Mudgee, mainly in the Warrumbungle Local Government Area. The proponent of the Cobbora Coal Project is the Cobbora Holding Company which is owned by the NSW Government.

The proposed average construction workforce is approximately 350 (550 at peak) and the operation workforce is expected to be 300 in 2016, peaking at 590 around 2030 (EEM, 2013).

EMM (2012) estimated that 10% to 30% of the in-migrating Cobbora Coal Project workforce will reside in the MWR LGA (others will reside in the Dubbo, Warrumbungle and Wellington LGAs). The in migrating workforce is expected to result in the following population changes in the MWR LGA (EMM, 2012):

- 2015 – 42 people.
- 2020 – 215 people.
- 2027 – 272 people.

The development of the Cobbora Coal Project has not commenced and in December 2014 the NSW Government announced that *“further analysis of future coal prices and market conditions would be undertaken before the Government made a decision regarding the future of the Cobbora Holding Company and the development of the mine”* (NSW Treasurer Minister for Industrial Relations, 2014).

Given the uncertainty surrounding the commencement of the Cobbora Coal Project, it is anticipated that it would not commence until after the peak workforce stage of the Moolarben Coal Complex (incorporating the Modification).

Given the above, the Cobbora Coal Project has not been considered further in this cumulative assessment.

## 7.2. Estimated Cumulative Population Changes

Based on the limited information about these proposed mining projects, an estimate of the associated potential population changes is provided in Table 7.1. In estimating the population changes, the same assumptions adopted for the Modification (Section 5) have been adopted with the exception of the Bylong Coal Project where it has been assumed that the proposed accommodation facility would be used, as indicated in Hanson Bailey (2014).

It is noted that the Environmental Assessments for these mining projects will provide a more accurate estimation of the population changes as more detailed project information will be available.

Table 7.2 provides a summary of the potential cumulative population changes associated with the Modification and the other mining projects during key employment phases of the modified Moolarben Coal Complex. Based on these estimates, the total workforce demand for MWR residents would exceed the number of currently unemployed persons in the MWR LGA (see Section 4.1.3). As such, a higher number of temporary residents and in-migrating persons is expected if all projects were to be approved. The likelihood of this is considered low at this stage.

Table 7.1 Summary of other mining project estimated population changes

Project	Direct Employment			Indirect Employment			Family	Total		
	Existing MWR LGA Residents	In-migrating	Commute from Outside MWR LGA	Existing MWR LGA Residents	In-migrating	Hunter Region	In-migrating	Existing MWR LGA Residents	In-migrating	Commute from Outside MWR LGA
Wilpinjong Extension Project										
Construction (2017/2018)	-	-	100	19	-	46	-	19	-	100
Operational (2018)	25	45	5	49	24	172	104	74	173	5
Bylong Coal Project										
Construction (late 2016)	-	-	1,000	195	-	455	-	195	-	1,000
Operational (late 2018)	-	-	550	359	179	1,255	268	359	447	550
Bowdens Silver Mine										
Construction (2017)	-	-	300	58	-	137	-	58	-	300
Operational (2018)	66	122	12	130	65	457	280	196	467	12
Total										
Construction (2017)	-	-	1,400	272	-	638	-	272	-	1,400
Operational (2018)	91	167	567	538	268	1,884	652	629	1,087	567

Table 7.2 Summary of estimated cumulative population changes during the key Modification employment phases

Moolarben Coal Complex Phase	UG1 Optimisation Modification		Other projects		Total	
	In-migrating	Commute from outside MWR LGA	In-migrating	Commute from outside MWR LGA	In-migrating	Commute from outside MWR LGA
Average Construction and Peak Operational Phase (2016)	530	61	-	1,000	530	1,061
Peak Construction and Operational Phase (2017)	530	91	-	1,400	530	1,491
Average Operational Phase (2018)	530	14	1,087	567	1,617	581

### 7.3. Potential Cumulative Impacts

The estimated additional 1,617 persons in-migrating to the MWR LGA represent an approximate 7% increase to the 2011 MWR LGA population (22,183 people) over the coming years.

If the other mining projects are approved and coincide with the Modification, they would create significant community infrastructure impacts including:

- Increased demand for housing.
- Increased demand for health services.
- Pressure on education facilities.
- Increased demand for recreation facilities.

These impacts would occur gradually over the next three years (but potentially longer depending on the timing of the commencement of the other mining projects) which would allow time for housing levels and health and education facilities to adjust to the increasing service demands.

It is noted that the estimated potential cumulative population changes provided in Table 7.2 are dependent on the various projects commencing as scheduled. It is considered that the commencement of the various projects is more likely to occur over a longer period than the next three years given the current market conditions and uncertainty regarding approval timing. This would reduce the potential peak community infrastructure impacts.

It is anticipated that as with other recent mining projects in NSW, a planning agreement in accordance with Division 6 or Part 4 of the NSW *Environmental Planning and Assessment Act, 1979* would be required by the Development Consent for these other mining projects. The proponents of these other mining projects would therefore likely be required to make financial contributions to the Mid-Western Regional Council (MWRC) to assist manage potential impacts on community infrastructure.

## 8. Recommended Mitigation Measures

MCO has entered into a Planning Agreement with the MWRC in accordance with Division 6, Part 4 of the NSW *Environmental Planning and Assessment Act, 1979* that requires MCO to make financial contributions to the MWRC to assist fund community infrastructure in the MWR LGA. MCO contributed \$180,000 to the MWRC in 2014 (MCO, 2015).

MCO also makes contributions to the MWRC in accordance with Condition 14, Schedule 2 of Project Approval (08\_0135):

*From the commencement of construction until mining operations under this approval cease, the Proponent shall pay to Council a total of \$515 a year for each full-time equivalent employee/contractor at the Moolarben mine complex in excess of 320. This payment is for the provision of infrastructure and services generated by the project. It is also to be indexed in accordance with the CPI for the previous quarter.*

It is noted that MCO would make additional contributions to the MWRC in accordance with Condition 14, Schedule 2 of Project Approval (08\_0135) as a result of the Modification.

In addition, MCO runs a Community Support Program that provides funding to assist a range of community-focused initiatives right across the MWR LGA and surrounding areas, helping local community groups in the fields of education, environment, health and safety, infrastructure projects, the arts, leisure and research. Between September 2013 and December 2014, MCO donated and/or sponsored approximately \$255,000 to local groups listed in Table 8.1:

Table 8.1 Donations and sponsorships by MCO between September 2013 and December 2014

<ul style="list-style-type: none"> <li>• Moolarben Coal Celebrity Golf Classic (charity event)</li> <li>• Mudgee District Hospital</li> <li>• Ulan Public School</li> <li>• Mudgee Scouts</li> <li>• Lifeskills Plus Mudgee</li> <li>• Mudgee Police Cup</li> <li>• Mudgee Chamber of Commerce</li> <li>• Rotary Club Mudgee Sunrise</li> <li>• Cooks Gap Bushfire Brigade</li> <li>• Cudgegong Cruiser</li> <li>• Gulgong Cricket</li> <li>• Arts Council Gulgong</li> <li>• Australian Breastfeeding Mudgee Group</li> <li>• Mudgee Public School</li> <li>• Mudgee Region Dragon Boats</li> <li>• Rylstone Show Society</li> <li>• Cooyal Tennis Club</li> <li>• Gulgong Pre School</li> </ul>	<ul style="list-style-type: none"> <li>• Gulgong Golf Club</li> <li>• Mudgee Valley Writers</li> <li>• Merriwa Tennis Club</li> <li>• Pioneer House Nursing Home</li> <li>• Mudgee Little Athletics</li> <li>• Gulgong Country Women's Association</li> <li>• Rotary Club Mudgee Sunrise</li> <li>• Henry Lawson Festival</li> <li>• Mid- Western Dance Festival</li> <li>• Mudgee Junior Rugby</li> <li>• Rylstone/Kandos Rescue</li> <li>• Mudgee Dragons Rugby League</li> <li>• Gulgong Fishing Club</li> <li>• Sculptures in the Gardens</li> <li>• Mudgee Readers</li> <li>• Mudgee Bowling Club</li> <li>• Hargraves Public School</li> <li>• Gulgong High School</li> <li>• Gulgong Folk Club</li> </ul>
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Table 8.1 Donations and sponsorships by MCO between September 2013 and December 2014 (cont'd)

<ul style="list-style-type: none"><li>• North West Falcons Ladies Soccer</li><li>• Gulgong Aviculture</li><li>• Mudgee Men's Shed</li><li>• Mudgee Triathlon Club</li><li>• Mudgee Tennis Club</li><li>• Kandos Public School</li><li>• Eurunderee Provisional School</li><li>• Pioneer House Nursing Home</li><li>• Country Women's Association Mudgee</li></ul>	<ul style="list-style-type: none"><li>• Mudgee Fine Foods</li><li>• Mudgee Public School</li><li>• Mudgee Junior Cricket</li><li>• Mudgee District Cricket</li><li>• Vision Australia Mudgee</li><li>• Dunedoo Lions Club</li><li>• Turill Community Committee</li><li>• Gulgong Hostel</li><li>• Gulgong Pony Club</li></ul>
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Source: Moolarben Coal, 2015

MCO's continued contributions to the MWRC in accordance with the existing Planning Agreement and Condition 14, Schedule 2 of Project Approval (08\_0135) and donations to/ sponsorships of community groups will assist reducing potential negative community infrastructure impacts.

## **9. Conclusion**

The purpose of the CIA was to assess the potential community infrastructure impacts in the Study Area (i.e. the MWR LGA) due to the Modification.

The Modification is expected to result in in-migration, increasing the demand for housing, education services, health services and recreational facilities in the MWR LGA. It is considered that the existing community infrastructure in the MWR LGA is capable of servicing the increased population associated with the Modification.

Notwithstanding the above, the ongoing implementation of the existing mitigation measures (Section 8) will assist to reduce any potential negative community infrastructure impacts.



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## **Appendix A - Data Tables**

Note: In tables in this Appendix *Gulgong Urban Centre and Locality* is referred to as *Gulgong UCL*, *Mudgee Urban Centre and Locality* as *Mudgee UCL*, the *Mid-Western Regional Local Government Area* as *Mid-Western Regional LGA* and *New South Wales* as *NSW*.

### Population change in the study area

Locality	2001	2006	2011	2021 (Projection)	2031 (Projection)
Gulgong UCL	2,021	1,907	1,866	2,010	2,066
Mudgee UCL	8,603	8,249	9,830	11,578	12,258
Mid-Western Regional LGA	21,357	21,116	22,193	24,250	25,050
NSW	6,311,168	6,549,177	6,917,658	8,230,400	9,228,350

Source: ABS, 2006a, d, e; ABS, 2007c, d, f; ABS, 2013d, f, h, i; NSW Department of Planning & Environment, 2014a, b; Coffey

### Age distribution in Mudgee Urban Centre and Locality

Age group	2001	2006	2011
0-9 years	1,369	1,158	1,429
10-19 years	1,254	1,203	1,360
20-29 years	1,001	899	1,222
30-39 years	1,271	1,097	1,236
40-49 years	1,091	1,116	1,332
50-59 years	941	926	1,065
60-69 years	694	790	941
70-79 years	575	608	706
80 years and over	425	452	538

Source: ABS, 2006b; ABS, 2007b; ABS, 2013c

**Age distribution in Gulgong Urban Centre and Locality**

Age group	2001	2006	2011
0-9 years	322	251	279
10-19 years	315	292	249
20-29 years	225	185	206
30-39 years	239	203	223
40-49 years	269	250	198
50-59 years	244	266	252
60-69 years	156	207	220
70-79 years	152	157	138
80 years and over	88	96	101

Source: ABS, 2006a; ABS, 2007a; ABS, 2013a

**Age groups in the Mid-Western Regional Local Government Area**

Age group	2001	2011	2031 (Projections)
0-9 years	3,186	2,936	3,000
10-19 years	3,053	2,868	2,850
20-29 years	2,019	2,118	2,000
30-39 years	2,971	2,532	2,800
40-49 years	2,992	3,208	3,200
50-59 years	2,894	2,926	3,000
60-69 years	2,092	2,869	3,400
70-79 years	1,385	1,701	2,800
80 years and over	720	981	2,050

Source: ABS, 2013h and NSW Department of Planning &amp; Environment, 2014a



**Age groups in NSW**

Age group	2001	2011	2031 (Projections)
0-9 years	868,324	892,905	1,145,950
10-19 years	881,652	882,260	1,110,400
20-29 years	855,234	921,508	1,095,800
30-39 years	951,527	954,492	1,208,250
40-49 years	920,595	962,032	1,241,550
50-59 years	738,297	884,274	1,069,550
60-69 years	495,093	688,468	972,450
70-79 years	394,921	421,046	810,600
80 years and over	205,525	289,743	573,800

Source: ABS, 2013i and NSW Department of Planning & Environment, 2014a

**Number of employees in Mudgee Urban Centre and Locality**

Industry of Employment	2001	2006	Change compared to 2001	2011	Change compared to 2001
Mining	152	212	+39%	652	+229%
Health care and social assistance	280	308	+10%	404	+44%
Agriculture, forestry and fishing	207	134	-35%	97	-53%
Manufacturing	430	264	-39%	235	-45%
Accommodation and food services	234	371	+59%	444	+90%
Professional, scientific and technical services	N/A	144	N/A	165	+15%*
Construction	218	288	+32%	352	+61%

Source: ABS, 2013c; ABS, 2007b; ABS, 2006b

\*Note: Value shows change between 2006 and 2011.

**Number of employees in Gulgong Urban Centre and Locality**

Industry of Employment	2001	2006	Change compared to 2001	2011	Change compared to 2001
Mining	64	98	+53%	149	+132%
Health care and social assistance	64	69	+8%	67	+5%
Agriculture, forestry and fishing	57	41	-28%	27	-53%
Manufacturing	76	65	-14%	49	-36%
Accommodation and food services	73	79	+8%	56	-23%
Professional, scientific and technical services	N/A	16	N/A	14	-13%*
Construction	45	48	+1%	49	+1%

Source: ABS, 2006a; ABS, 2007a; ABS, 2013a

\*Note: Value shows change between 2006 and 2011.

**Number of employees in Mid-Western Regional Local Government Area**

Industry of Employment	2001	2006	Change compared to 2001	2011	Change compared to 2001
Mining	397	632	+59%	1,311	+230%
Health care and social assistance	619	725	+17%	862	+39%
Agriculture, forestry and fishing	1,323	1,124	-15%	878	-34%
Manufacturing	1,012	730	-28%	570	-44%
Accommodation and food services	592	718	+21%	754	+27%
Professional, scientific and technical services	257	358	+39%	357	+39%
Construction	442	652	+48%	762	+72%

Source: ABS, 2013h

**Number of employees in NSW**

Industry of Employment	2001	2006	Change compared to 2001	2011	Change compared to 2001
Mining	14,823	20,019	+35%	30,809	+108%
Health care and social assistance	254,381	303,686	+19%	363,406	+43%
Agriculture, forestry and fishing	92,358	78,100	-15%	69,014	-25%
Manufacturing	301,561	277,680	-8%	264,406	-12%
Accommodation and food services	183,533	190,249	+4%	210,185	+15%
Professional, scientific and technical services	203,469	212,323	+4%	246,198	+21%
Construction	184,508	211,721	+15%	228,893	+24%

Source: ABS, 2013i

**Top three areas of employment in 2011**

Locality	Employed people aged 15 years and over		
Gulgong UCL	Coal Mining (18.6%)	School Education (7.1%)	Supermarket and Grocery Stores (4.1%)
Mudgee UCL	Coal Mining (13.4%)	Cafes, Restaurants and Takeaway Food Services (5.4%)	School Education (5.1%)
Mid-Western Regional LGA	Coal Mining (12%)	Sheep, Beef Cattle and Grain Farming (6.9%)	School Education (5.5%)
NSW	School Education (4.4%)	Cafes, Restaurants and Takeaway Food Services (4.1%)	Hospitals (3.2%)

Source: ABS, 2013d, e, f, g

**Top three occupations in 2011**

Locality	Employed people aged 15 years and over		
Gulgong UCL	Technicians and Trades Workers (19.9%)	Machinery Operators And Drivers (16.6%)	Labourers (14.7%)
Mudgee UCL	Technicians and Trades Workers (17.9%)	Professionals (14.8%)	Machinery Operators And Drivers (12.9%)
Mid-Western Regional LGA	Technicians and Trades Workers (16.6%)	Managers (15.8%)	Professionals (13.5%)
NSW	Professionals (10.5%)	Intermediate Clerical, Sales and Service Workers (9.1%)	Tradespersons and Related Workers (6.6%)

Source: ABS, 2013d, e, f, g

**Highest level of education**

Locality	Highest year of school completed (2011)		Tertiary education applicable to persons aged 15 years and over (2011)		
	Number of persons, %		Number of persons, %		
	Year 10 or equivalent	Year 12 or equivalent	Certificate	Advanced Diploma or Diploma	Bachelor degree or higher
Gulgong UCL	503 (36%)	368 (26%)	350 (24%)	58 (4%)	86 (6%)
Mudgee UCL	2,449 (33%)	2,479 (34%)	1,771 (23%)	475 (6%)	785 (10%)
Mid-Western Regional LGA	5,835 (34%)	5,411 (32%)	4,110 (23%)	1,096 (6%)	1,743 (10%)
NSW	1,278,047 (24%)	2,631,287 (49%)	982,307 (31%)	460,520 (14%)	1,104,917 (35%)

Source: ABS, 2013a, b, c, i

**Median total household income in the study area**

Median	2001	2006	Change compared to 2001	2011	Change compared to 2001
Gulgong UCL	N/A	661	N/A	818	+24%*
Mudgee UCL	N/A	729	N/A	1,023	+40%*
Mid-Western Regional LGA	603	721	+20%	938	+56%
NSW	826	1,039	+28%	1,233	+49%

Source: ABS 2007a, b; ABS, 2013a, c, h, i

\*Note: Value shows change between 2006 and 2011.

### Unemployment rates for the Mid-Western Regional LGA (in %)

Locality	Dec-10	Mar-11	Jun-11	Sep-11	Dec-11	Mar-12	Jun-12	Sep-12	Dec-12	Mar-13	Jun-13	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14
Mid-Western Regional LGA	5.5	5.4	5.3	5.5	5.2	6.0	6.5	6.9	7.6	7.0	7.0	6.9	6.8	6.5	6.4	6.5	6.6
NSW	4.6	5.1	5.2	5.5	5.6	4.7	5.2	5.3	5.1	5.5	5.4	5.6	5.8	5.7	5.7	5.9	5.9

Source: Australian Government, Department of Employment, 2015; ABS, 2015a

### Median house prices in Mudgee and Gulgong (in \$)

Locality	2006	2007	2008	2009	2010	2011	2012	2013	2014
Mudgee	276,000	290,000	266,000	286,000	315,000	317,000	379,000	378,000	379,000
Gulgong	189,000	228,000	220,000	219,000	235,000	252,000	300,000	269,000	266,000

Source: Realestate.com.au, 2015

### Median weekly rental prices for houses in Mudgee and Gulgong (in \$)

Locality	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Mudgee	200	250	240	270	300	330	340	450	380	350
Gulgong	n/a	n/a	n/a	n/a	210	250	250	310	320	295

Source: Realestate.com.au, 2015

### Student enrolments in Mudgee

Year	Cudgegong	Mudgee High	Mudgee Public	St Matthews	Total
2008	563	977	470	557	2567
2009	581	1020	444	471	2516
2010	582	1064	481	447	2574
2011	583	1059	503	460	2605
2012	591	1050	515	486	2642
2013	591	1005	523	578	2697
2014	574	955	565	629	2723

Source: Australian Curriculum, Assessment and Reporting Authority, 2015

### Student enrolments in Gulgong

Year	Gulgong Public	All Hallows	Gulgong High	Total
2008	211	106	264	581
2009	203	111	259	573
2010	192	110	262	564
2011	206	118	266	590
2012	225	120	276	621
2013	223	112	251	586
2014	247	94	247	588

Source: Australian Curriculum, Assessment and Reporting Authority, 2015

### Teacher per school in Mudgee

Year	Cudgegong	Mudgee High	Mudgee Public	St Matthews	Total
2008	28	73	28	43	172
2009	27	75	29	40	171
2010	28	77	30	42	177
2011	28	78	30	40	176
2012	28	77	33	41	179
2013	28	80	32	44	184
2014	27	74	32	50	183

Source: Australian Curriculum, Assessment and Reporting Authority, 2015

### Teacher per school in Gulgong

Year	Gulgong Public	All Hallows	Gulgong High	Total
2008	12	8	31	51
2009	11	9	31	51
2010	10	9	31	50
2011	11	10	30	51
2012	11	10	32	53
2013	13	12	32	57
2014	14	11	32	57

Source: Australian Curriculum, Assessment and Reporting Authority, 2015

### Student-teacher ratios in Mudgee

Year	Cudgegong	Mudgee High	Mudgee Public	St Matthews	Total
2008	20.1	13.4	16.8	13.0	14.9
2009	21.5	13.6	15.3	11.8	14.7
2010	20.8	13.8	16.0	10.6	14.5
2011	20.8	13.6	16.8	11.5	14.8
2012	21.1	13.6	15.6	11.9	14.8
2013	21.1	12.6	16.3	13.1	14.7
2014	21.3	12.9	17.7	12.6	14.9

Source: Australian Curriculum, Assessment and Reporting Authority, 2015

### Student-teacher ratios in Gulgong

Year	Gulgong Public	All Hallows	Gulgong High	Total
2008	17.6	13.3	8.5	11.4
2009	18.5	12.3	8.4	11.2
2010	19.2	12.2	8.5	11.3
2011	18.7	11.8	8.9	11.6
2012	20.5	12.0	8.6	11.7
2013	17.2	9.3	7.8	10.3
2014	17.6	8.5	7.7	10.3

Source: Australian Curriculum, Assessment and Reporting Authority, 2015