

Alcoa World Alumina Australia

Wagerup Unit 3 –
Environmental Review and
Management Programme
*Social and Economic
Component*

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CONTENTS

1	SECTION 1: SUMMARY PROFILE OF PEEL AND UPPER SOUTH WEST	
1.1	REGIONAL HISTORY AND DEVELOPMENT	3
1.1.1	INDIGENOUS AND EUROPEAN HERITAGE	4
1.1.2	SHIRE OF HARVEY	4
1.1.3	SHIRE OF WAROONA	5
1.2	ECONOMIC OVERVIEW OF THE REGION	5
1.2.1	PEEL REGION	5
1.2.2	SOUTH WEST REGION	6
1.3	DEMOGRAPHICS OF REGIONAL COMMUNITY	7
1.3.1	PEEL REGION	7
1.3.2	SOUTH WEST REGION	7
1.3.3	INDIGENOUS POPULATION	8
1.3.4	GENERAL POPULATION DESCRIPTORS	8
1.3.5	POPULATION PROJECTIONS	10
1.3.6	SERVICES AND FACILITIES	10
1.4	CURRENT EMPLOYMENT LEVELS AND CHARACTERISTICS	15
1.4.1	PEEL REGION	15
1.4.2	SOUTH WEST REGION	16
1.5	CURRENT ALCOA AND REGIONAL WORKFORCE	17
1.5.1	CURRENT CONSTRUCTION LABOUR MARKET	17
1.6	PLANNING CONTEXT	18
1.6.1	SUMMARY	18
1.6.2	SITE LOCATION	18
1.6.3	INFORMAL LAND MANAGEMENT	21
2	CONSTRUCTION AND OPERATIONAL IMPACTS AND CONTINGENT MANAGEMENT RESPONSES	
2.1	OVERVIEW	25
2.1.1	JOB CREATION DUE TO WAGERUP UNIT 3	25
2.1.2	SKILLS REQUIREMENT	26
2.1.3	ALCOA SOURCING OF SUPPLIES	26
2.2	POTENTIAL POSITIVE IMPACTS	26
2.3	POTENTIAL ADVERSE IMPACTS	27
2.4	CONSTRUCTION IMPACTS	28
2.4.1	PROCUREMENT PROGRAM	28
2.4.2	INDIRECT ECONOMIC GROWTH	29
2.4.3	MOBILISATION OF CONSTRUCTION WORKFORCE	30
2.5	OPERATIONAL IMPACTS	33
2.5.1	ONGOING PROCUREMENT PROGRAM	33
2.5.2	DIRECT AND INDIRECT EMPLOYMENT	34
2.5.3	INCREASE IN PERMANENT POPULATION	34
2.6	MANAGEMENT RESPONSE	36
2.6.1	OVERVIEW	36
2.6.2	CONSTRUCTION IMPACTS	37

CONTENTS

2.6.3	<i>OPERATIONAL IMPACTS</i>	40
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This report is a desktop review of socio-economic aspects, impacts and opportunities of the proposed Wagerup Unit 3 project. Its purpose is to provide Alcoa and stakeholders with a greater understanding of the key issues, the significance of each issue, and a prioritisation of management responses to these issues.

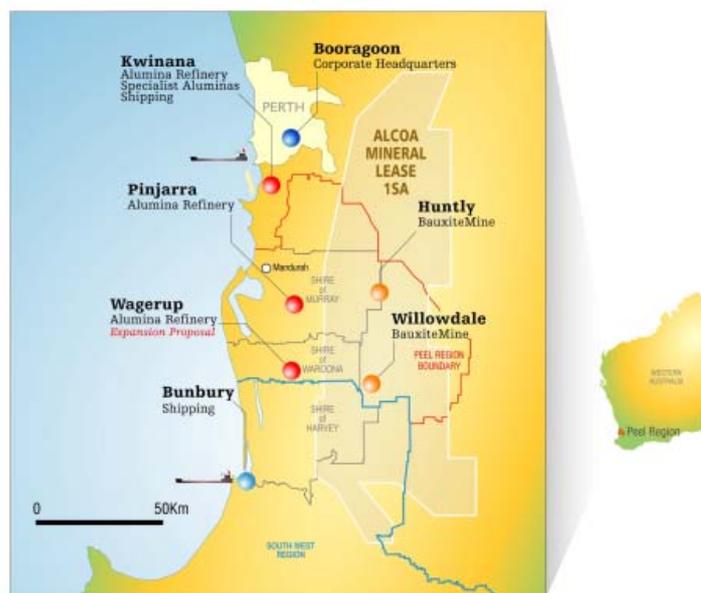
It is separated into two sections. The first summarises the current socio-economic situation in which the refinery expansion will occur. The second section introduces some of the potential impacts and opportunities it is possible to envisage based on prior experience of similar projects and through the consultation program initiated for the refinery expansion. The report canvasses some of the management options available to Alcoa to minimise the potential for impact on the local communities.

The profile of Peel and the upper South West Region of Western Australia that forms Section 1 of this report is largely the work of Acil Tasman with additional contributions from Environmental Resources Management Australia (ERM). Section 2 is the work of ERM with input from human resource specialists Reyco Consultants. Some final edits to the text have been made by Alcoa, particularly in Section 2 management measures.

1.1 REGIONAL HISTORY AND DEVELOPMENT

Figure 1.1 shows the location of the Alcoa Wagerup Refinery in relation to the Shire of Waroona, the Shire of Harvey and the Peel and South West regions of Western Australia. The Wagerup refinery is on the southern border of the Waroona shire, just north of the Shire of Harvey. The closest town to the refinery, Yarloop, is in the Shire of Harvey.

Figure 1.1 Location of the Wagerup Refinery



The history of the Shires of Harvey and Waroona is founded in agriculture. Both shires continue to support a strong agricultural base, but their economies have diversified over time to include the services sector and mining.

1.1.1 *Indigenous and European heritage*

The Shires of Harvey and Waroona have a history of Indigenous and European heritage and culture.

An indication of the wealth of Indigenous heritage of the area is the existence of 27 previously recorded Aboriginal archaeological sites within an 8 km radius of the project area including camping grounds, mythological sites and artifact scatters (archae-aus, 2000).

Indigenous tourism is growing rapidly in both the Peel and South West Regions. The development of interpretive experiences such as important sites, bush foods, herbal remedies and interpretation of landscapes is providing people with the opportunity to experience Noongar culture and Indigenous heritage¹.

European heritage is tied to the timber, farming, railway and mining industries. Timber harvesting and arts tourism opportunities exist in the region and artisan studios attract purchasers of art, furniture and novelties. Yarloop, Pinjarra, Dwellingup, Boddington and Brunswick Junction have strong ties to railway heritage. The Yarloop Railway Workshops provide a focus for tourism and community events.

1.1.2 *Shire of Harvey*

The dairy and beef cattle industries continue to be the mainstay of the economy of the Shire of Harvey. More recently, the Harvey Irrigation Scheme has facilitated the development of the horticulture and viticulture industries. There are several significant agricultural processing operations in the shire, including the Harvey Fresh milk and juice processing plant, a growing winemaking industry, the EG Green and Sons export abattoir at Harvey, and the Peters and Brownes factory at Brunswick Junction.

The timber industry has also been an important industry in the Shire but has declined in recent decades and now employs relatively few people.

¹ Peel Development Commission, Economic Perspective, 2004 and South West Development Commission, Economic Perspective, 2004

There is no current mining activity in the Shire, but there is a significant amount of minerals processing. Kemerton Industrial Park, with principal tenants being Millennium Inorganic Chemicals and Simcoa, is located in the Shire.

The tourism and recreation sector is an important contributor to the economy of the Shire of Harvey. Most tourism activity is centred on the coastal town of Australind but there are also facilities that take advantage of the Darling Range.

1.1.3 *Shire of Waroona*

Mining and minerals processing is a major economic contributor in the Shire of Waroona and agriculture remains an important industry. Dairy and beef cattle production are traditionally the most important industries but dairy deregulation and the development of the Waroona Irrigation Scheme has resulted in new industries, such as nut and citrus tree farming and horticulture, to flourish.

Mining and minerals processing in the Shire is in the form of Alcoa's bauxite and alumina processing activities at Willowdale and Wagerup. In addition, Iluka has established a new mineral sands mine in the Shire. The mining industry has resulted in the establishment of several new businesses providing services to mining in the Shire.

Tourism and recreation is also an important industry with visitors and locals taking advantage of the State forests, reserves and dams in the Shire, and the coastal strip.

1.2 *ECONOMIC OVERVIEW OF THE REGION*

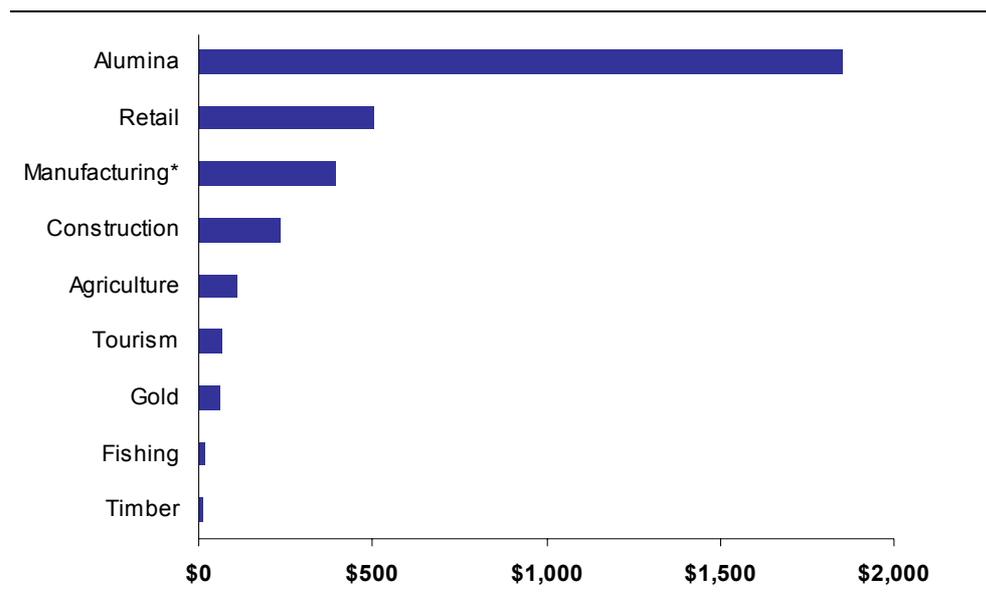
1.2.1 *Peel Region*

In 2001/02 the gross regional product of the Peel Region or the value of final goods and services produced in the region was \$2.5 billion.

The economy of the Peel Region is based predominantly on mining and mineral processing. In 2001/02 the Peel region produced \$1.85 billion worth of alumina and \$62 million worth of gold. Other significant industries are agriculture, forestry and fishing, retail, construction and tourism (*Figure 1.2*).

Bauxite mining and alumina refining is the major industry in the Peel region with Alcoa being the largest single employer. Approximately 900 people are employed at the Wagerup Refinery and Willowdale minesite (full time equivalents).

Figure 1.2 *Value of production by industry in the Peel region (2001/02)*



Data source: Department of Local Government and Regional Development

Note: * Other than alumina

1.2.2 *South West Region*

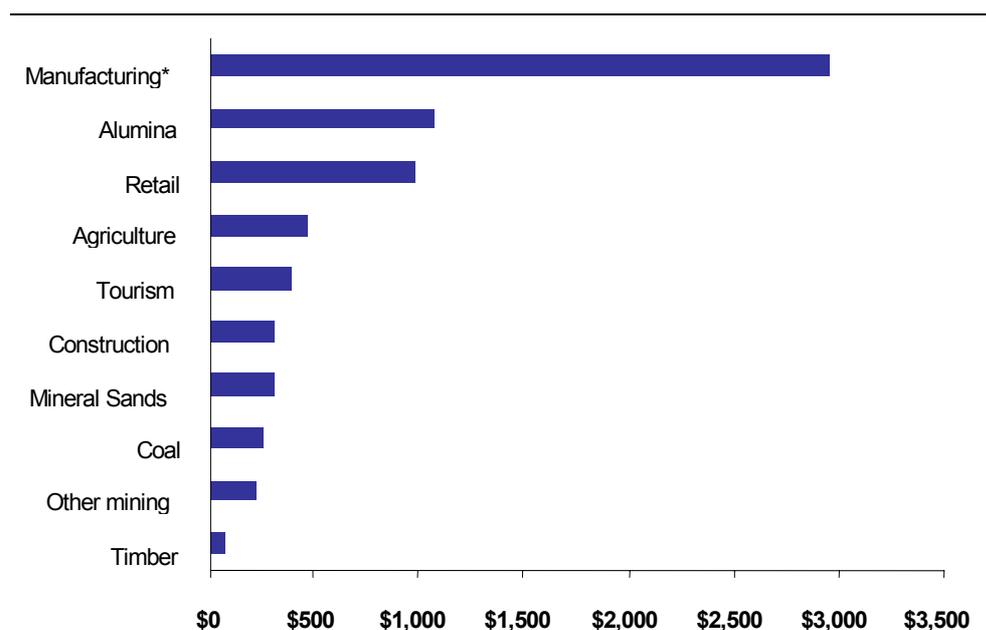
The gross regional product of the South West – or the value of final goods and services – was \$5 billion in 2001/02.

The combined activities of mineral extraction, processing and manufacturing form the most valuable industry in the South West with a total value of approximately \$2.2 billion in 2001/02 (*Figure 1.3*).

The South West produces all of the State’s coal and also produces a significant share of mineral sands, spodumene, tantalum and tin. In addition to alumina, synthetic rutile is processed in the region, and titanium dioxide pigment and silicon are manufactured.

Although dominated by mining and mineral processing, the South West has a diverse economy, with electricity generation, agriculture, agricultural processing (particularly dairy, beef production and viticulture) and tourism.

Figure 1.3 *Value of production by industry in the South West region 2001/02*



Data source: Department of Local Government and Regional Development

Note: * Other than alumina

Data source: 2001 Census, Australian Bureau of Statistics

1.3 **DEMOGRAPHICS OF REGIONAL COMMUNITY**

1.3.1 **Peel Region**

The Peel region is home to some 79,000 people or 4% of Western Australia’s population. It has the second highest population of Western Australia’s regions. Its annual population growth rate of 3.2% is the second fastest growing region behind the Perth metropolitan area.

Mandurah is the major population and business centre of the Peel region and is the largest urban centre outside the Perth metropolitan area. It is where most of the infrastructure and services for the region are located.

1.3.2 **South West Region**

The population of the South West region as at June 2002 was 132,000, or 6.9% of the population of Western Australia. This is the largest population of any region in Western Australia outside of Perth.

The population growth rate of 2% per annum exceeded the State’s average growth rate of 1.4%. The majority of the population lives in and around the major centres of Bunbury and Busselton on the coast and at Collie in the Darling Range.

1.3.3

Indigenous Population

The difficulty in accurately determining the indigenous population is shown by the range of available published population estimates. The *Peel Away the Mask* publication (Peel Development Commission, 2001), estimated the then indigenous population in the Peel Region as close to 2,000. This excludes the population of indigenous people in the Shire of Harvey, which is in the South West region. However, the 2001 ABS census showed the indigenous population of Peel and the Shire of Harvey combined to be 1,435..

In the Shire of Waroona, 2.4% of the population identified themselves as Aboriginal and in the Shire of Harvey the percentage was 1.7%.

Overwhelmingly, the Indigenous people in the Peel and upper South West areas are younger than their non-indigenous counterparts, with the majority of indigenous people concentrated in the younger age groups (0-24 years). Significantly, nearly half of the indigenous population were aged under 14 years compared with just over one-fifth (22.9%) of the non-indigenous population.

The *Peel Away the Mask* report describes poor health outcomes of the Indigenous community as being compounded by a lack of public transport access to medical services, low incomes and high unemployment.

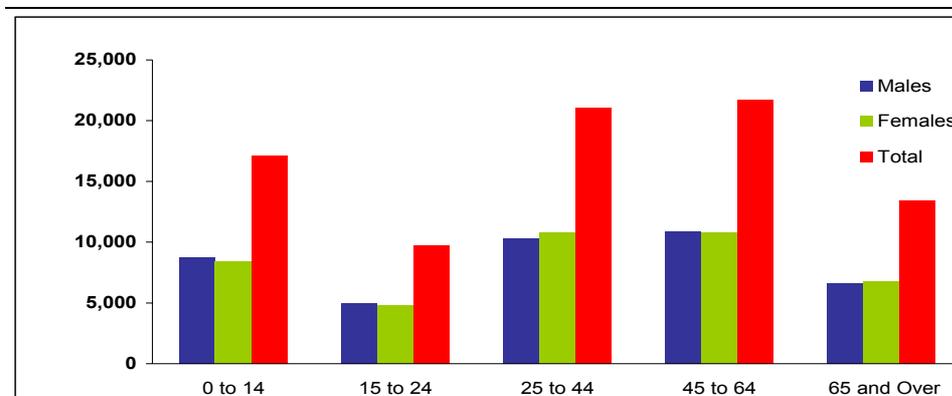
1.3.4

General Population Descriptors

Peel Region

Figure 1.4 shows the age and gender distribution of the population of the Peel Region. The lack of people in the 15 to 24 age group suggests young people tend to move out of the region to seek employment and further education and training opportunities.

Figure 1.4 *Age and gender distribution: total population: Peel (2003)*



Data source: Australian Bureau of Statistics

It is likely the high percentage of people in the older age groups reflects Mandurah's position as a preferred location for people entering retirement years.

The Shire of Waroona accounts for fewer than 5% of the population of the Peel Region, with the bulk of people living in Mandurah.

Table 1.1 *Populations by Local Government Area: Peel Region*

LGA	1991	1996	2001	2002	2003e	% of Region
Boddington	1,341	1,540	1,440	1,410	1,376	1.7
Mandurah	29,223	40,460	48,877	50,772	54,335	65.5
Murray	8,797	9,510	10,875	11,115	11,557	13.9
Serpentine-Jarrahdale	8,244	10,227	11,704	11,895	12,192	14.7
Waroona	3,010	3,194	3,524	3,509	3,501	4.2
Waroona town					2,500	
Total Peel	50,615	64,931	76,420	78,741	82,981	

Source: Australian Bureau of Statistics e preliminary estimate

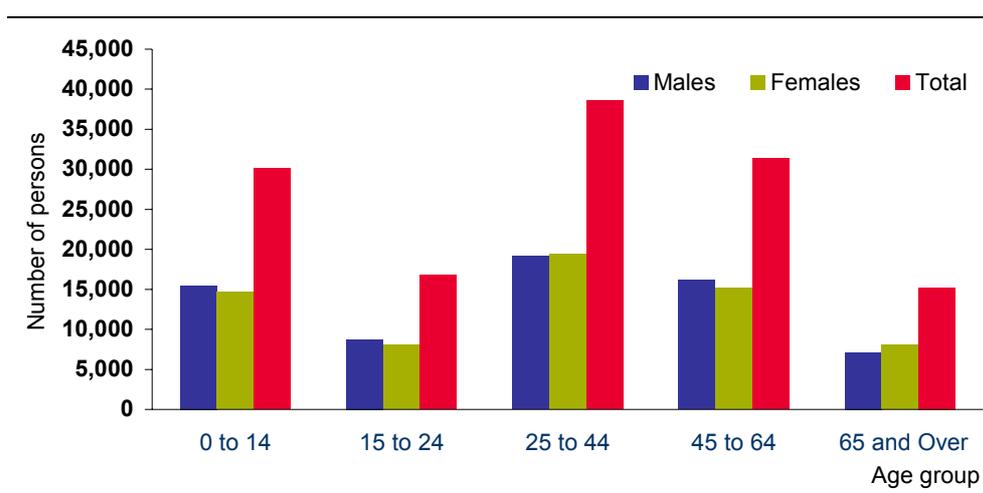
South West Region

Figure 1.5 shows the age and gender distribution of the population of the South West Region. The lack of people in the 15 to 24 age group suggests young people tend to move out of the Region to seek employment and further education and training opportunities.

The high proportion of people in the 0 to 14 and 25 to 44 age group reflects the employment opportunities and lifestyle in the region for families.

The Shire of Harvey contains 14% of the population of the South West Region

Figure 1.5 *Age and gender distribution: total population: South West (2002)*



Data source: Australian Bureau of Statistics

Table 1.2 Population by Local Government Area: South West Region

	1991	1996	2001	2002	2003e	% of Region/ Town
Augusta-Margaret River	6,218	8,106	10,187	10,514	11,013	8.3
Boyup Brook	1,847	1,747	1,642	1,627	1,609	1.2
Bridgetown-Greenbushes	4,018	4,034	4,188	4,230	4,091	3.1
Bunbury (City)	27,305	27,641	30,493	30,629	30,786	23.1
Busselton	14,592	18,158	23,099	24,333	25,028	18.8
Capel	5,452	5,989	7,107	7,625	7,988	5.9
Collie	9,842	9,015	9,072	9,092	9,079	6.8
Dardanup	5,458	6,658	8,955	9,247	9,504	7.1
Donnybrook-Balingup	4,108	4,249	4,691	4,693	4,681	3.5
Harvey	13,097	15,556	18,452	18,440	18,397	13.8
Harvey town			4,178	4,221	4,245	23.1
Yarloop town			632	642	645	3.5
Cookernup town			270	270	272	1.4
Manjimup	10,302	10,256	10,309	10,189	10,002	7.5
Nannup	1,120	1,161	1,218	1,216	1,214	0.9
Total South West		112,570	129,413	131,835	133,392	

Source: Australian Bureau of Statistics e preliminary estimate

1.3.5 Population Projections

Population for the Shire of Murray, Waroona and Harvey

The historical population, actual 2001 census and projected population figures for the Shires of Murray, Waroona and Harvey are provided in Table 1.3. The longer-term population projections should be read with caution, as previous population projections by Western Australian planning authorities have exhibited relatively large errors.

Table 1.3 Population Projections

LG Area	Historical Population				Actual 2001	Population Projection			
	1981	1986	1991	1996		2001	2006	2011	2016
Murray	6,580	7,050	8,797	9,510	10,875	10,500	13,000	14,900	16,700
Waroona	2,460	2,626	3,010	3,194	3,524	3,500	3,700	3,900	4,000
Harvey	8,310	10,461	13,097	15,556	18,452	18,600	20,700	22,000	23,500

Source: Projections Department for Planning and Infrastructure (2000) Actual ABS (2001)

1.3.6 Services and Facilities

Education

The Shire of Harvey has a total of 13 pre-primary and primary schools and two secondary schools. The Harvey Agricultural College and two technical and further education campuses are also located in the shire.

Harvey is well serviced by the education sector from pre-primary education through to a TAFE centre. The towns of Cookernup and Yarloop provide for primary education only.

The Shire of Waroona has two primary schools and one secondary school (to year ten). The secondary school is located in Waroona. Year 11 and 12 students in the area commute to senior high schools in the towns of Pinjarra, Mandurah or Harvey.

Health

The Shire of Harvey has two small public hospitals, one of which is located in Harvey and the other in Yarloop. The hospital at Harvey provides a 24 hour accident and emergency service.

There are aged care facilities in Harvey. In Yarloop, the hospital performs a care function for the ill elderly.

There are no public hospitals located in the Shire of Waroona. There are aged care facilities in Waroona as well as several doctors and a dentist. A new Health and Community Resource Centre has been built in Waroona. It is the first multi-purpose built facility in rural WA and includes child health services, private medical practitioners, physiotherapist, podiatrist and other allied health services, and family and youth support services.

There are community concerns about contraction of bed numbers in Harvey and Yarloop hospitals, temporary closure of the Yarloop Hospital and ability of existing health services to cope with additional demand. The Yarloop hospital is being upgraded to meet required safety standards which caused its temporary closure, following which the South West Area Health Service will lift the cap on patient numbers at the Yarloop hospital².

Housing

Shire of Harvey

Demand for housing in the Shire of Harvey is very robust and led by development along the coastal strip near Australind.

A housing development near Harvey called "Korijekup Heights" has eased demand pressures for residential land in the town but Harvey Shire has indicated there is a need for more affordable housing.

Shire of Waroona

² Parliament of Western Australia, hansard records 402, 29 June 2004

There is a growing demand for new houses in the Shire of Waroona, which is principally driven by development along the coastal strip. There are housing developments at Preston Beach and nearby rural residential areas of Tuart Grove, Armstrong Hills, Harvey River Sanctuary and Drakesbrook Meadows Estate.

There is also a steady growth in new housing development in the town of Waroona. However, a shortage of serviced residential land in Waroona could inhibit population growth³. All land within Waroona is serviced by bitumen roads, scheme water, telephone and Western Power

Demand for housing in Yarloop is low. There are no new housing developments in the area and little demand for existing housing stock. A relatively higher quality of housing has resulted in a good demand for houses in Hamel.

Recreation

Shire of Harvey

Recreation activities in the Shire of Harvey are concentrated in the coastal strip at Australind and in the Darling Ranges. The larger towns in the Shire have good built recreation facilities.

Harvey is the social centre for many of the surrounding towns. It has a swimming pool, outdoor sports facilities, public parks, and a recreation centre. Nearby attractions include Stirling Dam, Harvey Dam and the Darling Ranges which cater for water skiing, fishing, swimming and bushwalking activities.

A number of sporting and recreation groups are active in the Shire with the majority in both Harvey and Australind.

Shire of Waroona

The bulk of built recreational activities in the Shire of Waroona are located in Waroona. A new recreation and aquatic centre in the town caters for indoor aquatic activities, indoor sports, and gymnasium based activities and includes a child care facility. There are also outdoor sports facilities in the town, a golf course and several parks.

There are a number of attractions located in the shire including the Drakesbrook Weir, Waroona Dam, Darling Range, and the coastal strip that cater for bushwalking, swimming, sailing, water skiing and fishing pursuits.

³ Dept for Planning & Infrastructure, Identification of Issues and Audit of Plans/Strategies, Jan 2004, p6

There are a myriad of sporting and recreation groups in the Shire, most of which are based in Waroona.

Emergency Services

The Shire of Harvey has three police stations located in Harvey, Yarloop and Australind, whilst the Shire of Waroona has one police station. The district wide State Emergency Service group is also located in Waroona. There is a St John Ambulance and a State Emergency Service located in the towns of Harvey and Waroona. Local bush fire brigades are located in Yarloop, Cookernup and Harvey. The local community has expressed concern about the ability of current emergency services to cope with demand.

Shire of Harvey

The Shire of Harvey has a strong commercial sector supported by large populations in the towns of Australind, Brunswick and Harvey. Kemerton Industrial Estate houses a number of major businesses including an abattoir, a piggery, the Millennium Inorganic Chemicals' titanium dioxide pigment plant, and Simcoa silicon plant.

The business profile of the town of Harvey is one of a vibrant commercial centre and a number of larger businesses located on the outskirts of town. The commercial centre supports supermarkets and major retail outlets plus a range of small businesses. The small business profile includes restaurants and cafes, food services, fashion and other general retail, banks, real estate agencies and others. The town also has a number of small businesses that service the agricultural industry.

A light industrial area on the outskirts of town supports a number of businesses including several that service the mining industry. Major businesses close to the town include E.G Greens abattoir and Harvey Fresh.

The business profiles of the towns of Cookernup and Yarloop are less sophisticated. Both towns support limited commercial services. The Sotico timber mill is located in Yarloop along with associated air drying kilns and a veneer plant.

Shire of Waroona

The majority of businesses in the Shire of Waroona are located in the Waroona townsite. The Waroona commercial centre consists of several supermarkets plus numerous small shops including food outlets, fashion and other retail, a commercial laundry, a bank, agricultural services, vehicle and machinery services, real estate agencies and others.

Other businesses located in the town are a veterinary clinic and tourist facilities including two hotels.

There is a small industrial area from which a number of larger businesses operate including those involved in aluminium window and door manufacture, concrete products manufacture, steel fabrication and machinery hire.

Infrastructure

Peel Region

The quality and quantity of community infrastructure in the Peel Region tends to vary in relation to the size of each community. Mandurah has excellent community infrastructure due to the large population whilst smaller communities such as Waroona tend to be less well provided with infrastructure. The Shire of Waroona reports that a lack of government medical facilities and sporting and educational facilities for youth (new swimming complex notwithstanding) is of concern to some residents.⁴

There is a general lack of low cost, serviced light industrial land in the Peel⁵ including in the Shire of Waroona⁶, which inhibits the growth of local service industries that are necessary to serve the fast-growing population in Mandurah and could help to diversify the Peel economy.

There is no domestic/commercial gas supply to Waroona, which limits energy options for industry.

The South West Highway is the gazetted major haulage road but is considered by some local stakeholders to have some inadequacies for growing truck traffic, notably:

- the highway is undulating and winding and has no overtaking lanes between Waroona and Harvey; and
- it passes through the centre of all towns on its route, with the volume of truck traffic in Pinjarra raising safety, amenity and commercial concerns.⁷

South West

The quality of community infrastructure in the South West Region varies in relation to the size of each community. The City of Bunbury and surrounding coastal communities have facilities that reflect the large population base.

⁴ DPI, Identification of Issues and Audit of Plans/Strategies, Jan 2004

⁵ Peel Development Commission
<http://www.peel.wa.gov.au/content/thePDC/initiatives/infrastructure.cfm>Industrial Parks

⁶ Shire of Waroona, Community Strategic Plan 1999 - 2004, Status Report May 2004 p1

⁷ DPI, Identification of Issues and Audit of Plans/Strategies, Jan 2004

The medium-sized communities such as Harvey and Collie have good infrastructure. Small communities such as Yarloop and Brunswick tend to have limited infrastructure and rely on nearby towns for many services such as high school education, retail shopping, specialised health facilities, and business services.

There is a general lack of low cost, serviced light industrial land in Harvey, Brunswick and Yarloop.

The South West Highway between Waroona and Harvey is undulating, winding and has no overtaking lanes, and is inadequate for growing truck traffic from industry and agriculture expansion.⁸

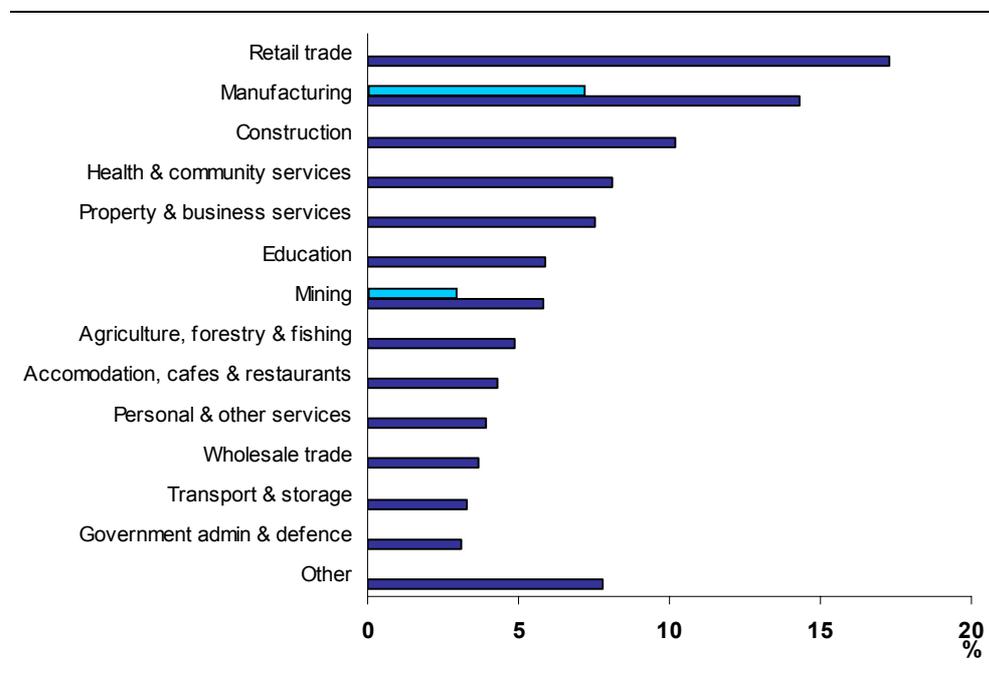
1.4 CURRENT EMPLOYMENT LEVELS AND CHARACTERISTICS

1.4.1 Peel Region

The 2001 Census reported the largest source of employment for people living in the Peel was in the service industries, with retail trade the biggest employment sector. The manufacturing sector employed 14.3% of the workforce, and the mining sector 5.8% as illustrated in *Figure 1.6*. Alcoa is the largest single employer.

Alcoa's refinery operations are included in the manufacturing sector figures whilst its mining operations are reflected in the mining figures.

Figure 1.6 Major industries by employment in the Peel Region



Data source: 2001 Census, Australian Bureau of Statistics ■ Alcoa's share of employment

⁸ DPI, Identification of Issues and Audit of Plans/Strategies, Jan 2004

The unemployment rate for the Peel Region as of June 2003 was 8.1%, which shows a significant decline since 1996/97 when it was 13.5%. Nevertheless, this rate remains high compared to regional Western Australia as a whole, which had an unemployment rate of 5.6% and the State as a whole (5.9%) at June 2003. The latest unemployment estimates available from the ABS at the shire level are 2001 (updated April 2004⁹) and show Waroona (5.4%) and Harvey (4.7%) to have relatively low rates of unemployment.

1.4.2 *South West Region*

The South West has an unemployment rate that is similar to that of regional Western Australia and also to that of Western Australia. This probably reflects the diverse economy and the relatively high amount of manufacturing in the region. The importance manufacturing (including alumina manufacture) plays in providing jobs is illustrated in *Figure 1.7*. *Table 1.4* shows how employment in the three closest shires of Murray, Waroona and Harvey have relatively large proportion of their populations employed in manufacturing. At June 2003 there were 4300 unemployed people in the SouthWest Region, which equates to an unemployment rate of 6.0%¹⁰.

Figure 1.7 *Major industries by employment in the South West Region*

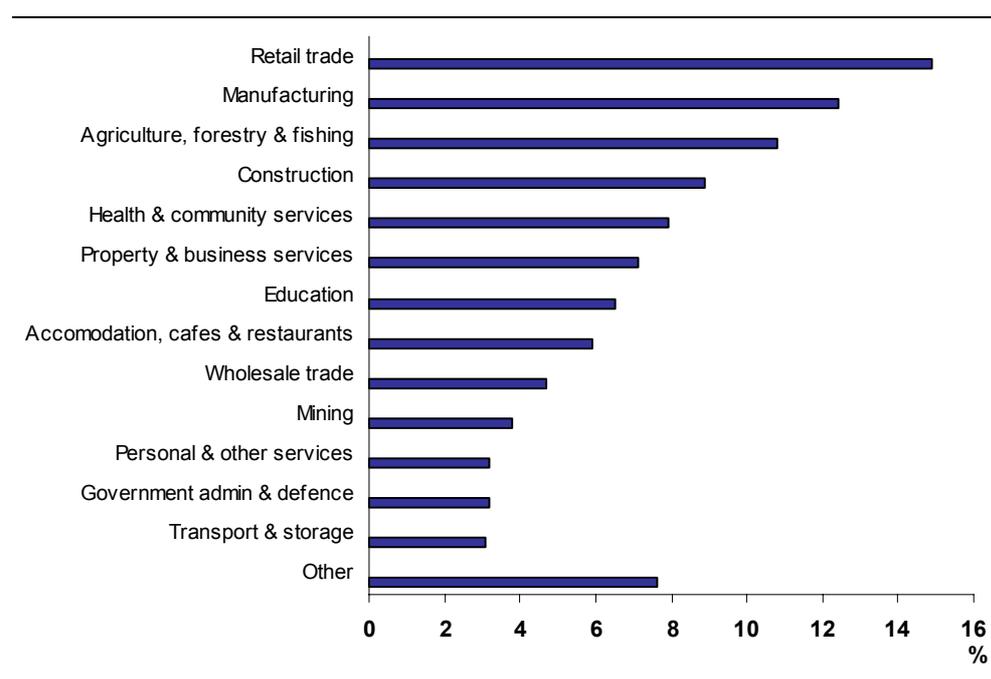


Table 1.4 *2001 Percentage of the Total Employed by Industry: Shires of Murray, Waroona and Harvey and WA State Comparison*

Industry of Employment	Combined Shires	WA State
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⁹ ABS cat. 1379.0.55.001:

¹⁰ *ibid*

Industry of Employment	Combined Shires	WA State
Agriculture Forestry and Fishing	10%	4%
Mining	4%	3%
Manufacturing	17%	10%
Electricity Gas and Water Supply	1%	1%
Construction	9%	7%
Wholesale Trade	5%	5%
Retail Trade	15%	14%
Accommodation, Cafes and Restaurants	4%	5%
Transport and Storage	3%	4%
Communication Services	2%	1%
Finance and Insurance	1%	3%
Property and Business Services	7%	11%
Government Administration and Defence	3%	4%
Education	6%	7%
Health and Community Services	7%	7%
Cultural and Recreational Services	2%	2%
Personal and Other Services	3%	4%
Non-Classifiable Economic Units	<1%	<1%
Not Stated	2%	1%

1.5 *CURRENT ALCOA AND REGIONAL WORKFORCE*

Alcoa currently employs approximately 900 people (full time equivalents) at the Willowdale mine and Wagerup refinery. 230 of these people are Shire of Waroona residents and over 100 live in the Shire of Harvey. Total payroll contributions over the past four years averaged approximately \$13 million to employees living in the Shire of Waroona and approximately \$6 million to employees living in the Shire of Harvey.

1.5.1 *Current Construction Labour Market*

Insight Logistics tracks the availability of skilled labour in the major projects construction sector of the Western Australian economy. Its database currently shows 13,396 as active participants in this sector, and categorises them by the occupation in which they were most recently mobilised. *Table 1.5* lists the number of workers in the most relevant categories. When overlaid with the labour requirements of the Wagerup expansion project and other major construction projects potentially proceeding in a similar timeframe, this base data allows potential skill shortages to be estimated.

Table 1.5 *Occupation of WA Construction Workers on Insite Logistics Database*

Building trades	288
Carpenters	402
Concrete workers	216
Electrical trades	957
Engineers	728
Insulation and refractory	106
Labourers	1054
Metal trades	2340
Plant ops / mobile plant	1461
Riggers	563
Scaffolders	332
Steel fixers	110
Supervisors	792
Welders	261

Source: Insite Logistics

1.6 *PLANNING CONTEXT*

1.6.1 *Summary*

Town planning schemes are created as the law to guide land use. Certain uses are permitted by zones, reserves and the text of Town Planning Schemes and, depending on the particular zone of an area, certain uses are excluded or not permitted. The intent of town planning schemes is essentially to enable particular types of land use to occur in particular locations such that there is compatible land use within and adjoining localities.

In the Waroona Shire Town Planning Scheme the Wagerup Refinery is zoned 'Special Industry Zone' for both the Residue Storage Area and the Refinery itself. This zone enables or permits the operations of the Wagerup Refinery and it also enables other agricultural use to occur where refinery uses may not be in operation.

Immediately north, west and south of the refinery there are agricultural uses and to the east of the refinery is essentially the Hills Face Zone, a conservation area with large rural holdings. From time to time the Town Planning Scheme can be changed by way of a Town Planning Scheme Amendment. An example of this would be the proposed industrial zoning in the current adjoining Rural Zone. Similarly an industrial buffer can be defined in a Town Planning Scheme, which might prescribe the setbacks to sensitive land uses from the refinery.

The Shire of Waroona Town Planning Scheme No.7 is known as the District or Local Planning Scheme as controlled by the Shire Council. At the State Government level or the West Australian Planning Commission level there are Regional Town Planning Schemes, in this instance the Peel Region Scheme.

The Peel Region Scheme may prescribe particular uses and buffers with which the Local Authority Town Planning Schemes needs to comply.

The procedures and process and technical details required to establish an industrial buffer are prescribed in the State Industrial Buffer Policy. This is a State Planning Policy No.4.1 which gains its power through the Town Planning and Development Act as a Section 5A part of the Town Planning and Development Act.

1.6.2 *Site Location*

The Peel Region Scheme (PRS) reserves the Alcoa Wagerup Refinery site for "Industrial" purposes, with majority of land uses adjoining the site being reserved for "Rural" purposes.

The Shire of Waroona Town Planning Scheme (TPS) No.7 reserves the Alcoa Wagerup Refinery as a "Special Industry" zone. The refinery is surrounded

by predominantly “Rural” zones, namely General Farming, Irrigated Agriculture and Hills Face (*Figure 1.8*).

Figure 1.8 *Shire Waroona Town Planning Scheme Wagerup Refinery (See overleaf)*

The Council’s objective of the Rural zones are to:

- Preserve the rural character of the District’s farming lands;
- Ensure that these continue to contribute to the District’s economy; and
- Recognising that changes in land use practices will affect land management and the landscape.

Council’s policies for Rural zones are to:

- Permit land uses consistent with achieving the objectives of the zone;
- Permit, at the discretion of the Council, Rural Industry;
- Require that Intensive Agriculture be subject to the Planning Consent of the Council;
- Support community endorsed objectives towards minimising phosphorous run-off to the Peel Harvey Estuary including the protection of remnant vegetation; and
- Maintain open rural atmosphere by encouraging generous setbacks.

As identified in *Figure 1.8*, the Refinery is surrounded by the following reservations:

- Rural 1 (General Farming), Public Purposes (Timber and Gravel), Peel Harvey Coastal Plain Boundary to the east;
- Rural 1 (General Farming) to the north;
- Rural 1 (General Farming) and Rural 2 (Irrigated Agriculture) to the south;
- Rural 2 (Irrigated Agriculture) to the west;
- Rural 2 (Irrigated Agriculture), Rural 4 (Hills Face) zone and mining tenement to the north east; and
- Rural 4 (Hills Face) zone and mining tenement to the south east.

Table 1.6 provides the above zones and their prescribed uses that are permissible in these zones, subject to Planning Consent.

Table 1.6 *Permissible Land Uses in Rural Zones*

Zone	Permissible Use
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Zone	Permissible Use	
<i>Rural 1 - General Farming</i>		
Commercial	Carpark (IP)	Garden Centre (AA)
	Nursery (AA)	Petrol Filling/Service Station (SA)
Residential	Single House (P)	Residential Building (AA)
	Family Day Care Centre (AA)	Home Occupation (AA)
Community	Civic Use (AA)	Community Facility Depot (AA)
	Educational Establishment (AA)	Private Recreation (AA)
	Public Recreation (P)	Public Utility (P)
	Veterinary Consulting Rm/ Hospital (AA)	
Industrial	Depot (AA)	Cottage (AA)
	Extractive (AA)	Hazardous (SA)
	Noxious (SA)	Rural (AA)
	Sawmill (AA)	
Rural Use	Equestrian Activity (AA)	Kennels/Cattery (AA)
	Produce Store (AA)	Intensive Agriculture (AA)
	Abattoir (AA)	Afforestation (AA)
	Aquaculture (AA)	Dairy (AA)
	Horse Stables (AA)	Horticulture (AA)
	Piggery (AA)	Poultry Farm (AA)
	Rabbitry (AA)	Stock Feedlot (AA)
	Rural Pursuit (P)	Wayside Stall (AA)
Other Uses	Camping Area (AA)	Caravan Park/Park Home Park (AA)
	Holiday Accommodation (AA)	
<i>Rural 2 - Irrigated Agriculture</i>		
Commercial	Nursery (AA)	Carpark (IP)
Residential	Single House (P)	Residential Building (AA)
	Family Day Care Centre (AA)	Home Occupation (AA)
Community	Public Recreation (P)	Public Utility (P)
Industrial	Depot (AA)	Extractive (AA)
	Rural (AA)	
Rural Use	Equestrian Activity (AA)	Kennels/Cattery (SA)
	Intensive Agriculture (AA)	Abattoir (AA)
	Afforestation (AA)	Aquaculture (AA)
	Dairy (AA)	Horse Stables (AA)
	Horticulture (AA)	Piggery (AA)
	Poultry Farm (AA)	Rabbitry (AA)
	Stock Feedlot (AA)	Rural Pursuit (P)
	Wayside Stall (AA)	
<i>Rural 4 - Hills Face</i>		
Commercial	Nursery (AA)	Carpark (IP)
Residential	Single House (P)	Residential Building (AA)
	Family Day Care Centre (AA)	Home Occupation (AA)
Community	Private Recreation (AA)	Public Recreation (P)
	Public Utility (P)	
Industrial	Depot (AA)	Extractive (AA)
Rural	Intensive Agriculture (AA)	Abattoir (AA)
	Afforestation (AA)	Aquaculture (AA)
	Dairy (AA)	Horse Stables (AA)
	Horticulture (AA)	Piggery (AA)
	Poultry Farm (AA)	Rabbitry (AA)
	Rural Pursuit (AA)	Wayside Stall (AA)
Other Uses	Camping Area (SA)	Holiday Accommodation (SA)

Zone	Permissible Use
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Note:

P = means the use is permitted provided that it complies with the relevant standards and conditions laid down in the Scheme and any Town Planning Scheme Policy adopted in accordance with clause 2.4 and all conditions imposed by the Council in granting Planning Consent.

AA = means that the Council may, at its discretion, permit the use.

SA = means that the Council may, at its discretion, permit the use after notice of application has been in accordance with Clause 8.2.

IP = means that the use is not permitted unless such use is incidental to the predominant use of the land as determined by the Council.

Table 1.6 highlights the following for Rural zones:

- Planning Consent will not be granted to more than one single house to be erected on a lot used for rural activity;
- Planning consent will be granted for public utilities, public recreation and rural pursuit (except for Rural 4) as these uses are permitted within this zone (no Council determination required);
- Planning consent, at the discretion of the Council, will be granted to Extractive Industries, numerous industrial, community and commercial uses, and rural uses such as Intensive Agriculture, Abattoir, Dairy, Horse Stables, Horticulture, Piggery, Poultry Farm, Rabbitry and Wayside Stall; and
- Planning consent will not be granted to the development of car parks, unless otherwise determined by the Council.

The Shire of Waroona Draft Local Planning Strategy, reserves the Alcoa Wagerup Refinery as an area for a potential structure plan, for "Strategic Industry". The site is surrounded by the proposed areas of:

- Rural to the east, north east and south;
- Rural Irrigation Area to the north and south;
- Rural Hills to the east;
- Strategic Mineral and Basic Raw Materials Policy area to the north east and south east; and
- Tourist Route along South Western Highway.

The Local Planning Strategy reflects the zones in the Town Planning Scheme.

1.6.3 *Informal Land Management*

In October 2001, residents in Yarloop and Hamel received a "Wagerup Land Management Draft Proposal" from Alcoa for community comment. The stated aims of the proposal were to:

1. Give people choice about whether they continue to live where they do;
2. Protect property values; and
3. Invest in the future of Yarloop and Hamel.

The Draft Proposal identified an area around the Wagerup refinery – Area A – where Alcoa proposed to establish a Special Control Area to restrict further residential development. It also identified an Area B where, in order to protect property values, Alcoa would, for 12 months, buy properties if residents wished to sell. In light of community feedback, the proposal was revised and adopted in January 2002. The policy was strengthened again in November 2004.

Revised Proposal – January 2002

The Wagerup Land Management Revised Proposal, dated January 2002, contained the following key changes:

1. Identification of only a single area – Area A – where Alcoa would seek changes to the local Town Planning Scheme to ensure land use is compatible with refinery operations;
2. In the townships of Yarloop and Hamel, a commitment to purchase any property at unaffected value for the next five (5) years (assuming no unforeseen events, unrelated to Alcoa, that may lower property values);
3. A commitment to talk to people who live outside the townships of Yarloop and Hamel on a case-by-case basis; and
4. A commitment to liaise directly with business owners who may wish to sell, and to support a process for developing strategies to enhance business opportunities in the local community.

The revised proposal provided that Alcoa would purchase properties in Area A for the operating life of the Wagerup refinery. This Area A included some 118 properties in northern Yarloop.

The commitment to purchase properties in the townships of Yarloop and Hamel (Area B) was extended for a period of five years (ie. until December 2006) with a five year extension if a study of valuations found house prices had fallen in the town due to Alcoa or publicity about Alcoa.

The boundary of ‘Area A’ was chosen for three reasons:

- People in this area may experience noise levels above the night time limit allowed under noise regulations (based on the modelled 35dbA noise contour plots surrounding the refinery);
- It corresponds with areas where people may be most annoyed by refinery emissions (at the time this was also the area where over 95 % of community odour complaints were being reported); and

- It allows for future expansion of Alcoa's bauxite residue area to the west of its current site and was chosen to fit the life of the refinery.

The Revised Proposal highlighted Alcoa's commitments to the following:

- Reducing odour and other emissions;
- Reducing noise;
- Investigating health concerns;
- Protecting property values;
- Supporting the integral nature and quality of the community and encouraging people to stay in the area; and
- Making it easy for those who wish to leave to sell their properties.

Alcoa proposed to those living in Area A the following:

- Offer to buy their home at the unaffected market value;
- Plus 35% to cover replacement costs; and
- Plus \$7,000.00 to cover relocation costs.

The policy allows individual properties to be purchased only once (ie. from original residents at the time of the policy announcement). The policy set out three methods of valuation and a valuation management process. It required that two valuations be prepared at Alcoa's expense; one by the owner's valuer and one by a licensed valuer chosen by Alcoa.

November 2004

In November 2004, Alcoa wrote to residents of Area B. The letter addressed recommendations of a community group (Land Management Working Group) that were drafted following an open forum in Waroona in September 2004. With the objective of providing security for those homeowners, the community group recommendations were adopted as:

For property owners that were resident in Yarloop and Hamel on or before January 2002, and who remain resident in what Alcoa describes as Area B:

1. Alcoa will extend its offer to purchase the property (at any time) from 31st December 2006 to 31st December 2011 (in accordance with the Wagerup Land Management Revised Proposal, January 2002); and
2. Alcoa will offer to purchase a property after 2011, if the owner has first marketed the property for six (6) months but has been unable to find a buyer at fair market value.

In accordance with the group's proposal, this undertaking applies for the life of the property owner or the life of the Wagerup refinery, whichever comes

first. In the case of a deceased estate, the same option is available to the executor of that estate or to the person or person(s) to which land title is transferred in accordance with a Last Will and Testament, for a period of up to twelve (12) months after the property owner's death.

The Land Management Working Group continues to examine issues associated with Alcoa's land purchase policy, including valuation methods used to determine market value.

2.1 OVERVIEW

This section of the report is a desktop review of the potential social and economic impacts that could result from the Wagerup Unit 3 project proceeding. This section includes information on the expected workforce and accommodation requirements for construction and operational workforces.

The potential consequences of impacts and possible management responses to minimise impact on potentially affected communities is included. Further understanding, consequence, and management of these impacts will be developed through consultation with relevant stakeholders to ensure the full range of issues is addressed.

A summary of potential impacts, consequences and management responses forms *Table 2.1 at the end of this section*.

2.1.1 Job Creation Due to Wagerup Unit 3*Direct Jobs during Construction*

The peak construction workforce is expected to be about 1500 – the equivalent of 500 full-time jobs during the entire three-year construction period.

Direct Jobs during Operation

The Wagerup 3 expansion will result in an increase of about 150 permanent employees at the Wagerup refinery, Willowdale minesite and Bunbury Port, including refinery and mining operators, support personnel and administration.

Direct and Indirect Jobs during Operation

ACIL Tasman has estimated, using the Prime General Equilibrium model, that total employment (direct in the operational phase plus flow on employment in other industries) in Western Australia would increase by 3000 as a result of the Wagerup 3 expansion.

The majority of the jobs creation potential of the Wagerup 3 expansion arises from the flow-on benefits of production.

In the Peel and South West regions it is estimated that Wagerup 3 will create around 1500 new jobs during the operational phase.

2.1.2 *Skills Requirement*

Direct Employment

During construction, the majority of workers employed on the expansion will be in engineering, administration and construction activities such as site preparation, concreting, welding, and scaffolding.

Flow on Employment

The economic growth that results from construction and operation of the facility will stimulate further 'flow-on' employment. The majority of flow-on employment creation in the construction and operation phases will be in the service sector with the main demand coming from the health, education, and business and personal services sectors. Significant employment gains will also be realised in the trades and transportation sector, including in wholesale trade, retail trade, accommodation, cafes and restaurants, and road transport.

2.1.3 *Alcoa Sourcing of Supplies*

Alcoa assists local suppliers in the Shire of Waroona and the Shire of Harvey to do business with Alcoa and the Wagerup refinery. The company invites local business to bid on every locally supplied or manufactured good or service and it gives preference to local businesses. Alcoa works with local business groups to identify and utilise local suppliers and where possible, structures bids to enable local supplier participation.

2.2 *POTENTIAL POSITIVE IMPACTS*

The key positive impacts relate to economic development in the most proximate shires (Harvey and Waroona), the Peel region, the State and Australia and include:

- Economic development of the Peel Region through local procurement and 'multiplier' effects
- Increased employment security for existing Alcoa workforce and employees of suppliers
- Increased employment opportunities in the local and wider region
- Targeted investment by Alcoa on training and development in the region
- Potential for local businesses to capitalise on the opportunity by supplying goods and services during the construction phase

- Potential for population growth in adjacent shires, and
- Revenues from taxes and royalties to State and Commonwealth governments.

2.3

POTENTIAL ADVERSE IMPACTS

Potential adverse impacts to occur as a result of Wagerup Unit 3 are summarised below. An assessment of the likelihood of these impacts occurring is made in subsequent sections:

- Local companies might miss opportunities due to lack of investment in their capacity to supply Alcoa's needs or under-investment by governments (eg lack of light industrial land)
- Local companies may be over-optimistic about demand for their products and services as a result of the expansion and make investment decisions that harm the ongoing sustainability of their businesses
- Second tier suppliers and local businesses may be ill-prepared in transitioning their businesses out of the expansion "boom" period, resulting in a subsequent "bust" or economically depressed period post-construction
- Additional demands on government services and infrastructure due to temporary workforce
- Labour shortages could lead to wage inflation during construction and result in increased local business costs
- Short-term accommodation may be in heavy demand during the construction phase and 'squeeze out' tourists and tourism attraction spending
- Potential for anti-social behaviour associated with the presence of temporary construction workforce, and
- Slower growth of export value from South-West region due to an appreciating Australian dollar.

Other amenity impacts not covered in the socio-economic section of the ERMP are covered elsewhere in the document. The potential health impacts associated with the proposed expansion of the Wagerup Refinery are addressed through a specific health risk assessment (HRA). Other amenity impacts such as traffic, public safety risk, noise, and water supply, are covered in other sections of this ERMP.

2.4 CONSTRUCTION IMPACTS

2.4.1 *Procurement Program*

The proposed expansion program will involve an Alcoa investment of around \$1.5 billion. Alcoa's long-standing commitment to Australian Industry Participation will be preserved and direct expenditure in the Peel and South West region is likely to be greater than \$50m. This procurement will significantly boost wider economic activity including increased (1) direct and indirect employment, (2) supporting services and industries and (3) subcontract opportunities.

Greater Economic Activity

The growth in the economy due to Wagerup Unit 3 will be strongest in the Peel Region and will also stimulate direct growth in the South-West Region, Perth, Western Australia, the rest of Australia and internationally.

The stimulus to the Peel and upper South West economies is expected to particularly support the growth of businesses linked to earthworks, concrete foundations, metal fabrication/installation, equipment and other construction services.

Increased Direct Employment

Direct employment in the construction phase is expected to be greater than 1500 – equivalent to approximately 500 full-time jobs each year during the construction period. The expansion of Wagerup Refinery will mostly increase employment opportunities for those living between Perth and Bunbury.

With strong economic growth and with several other major construction projects underway or planned in the south of Western Australia, there is potential for labour shortages in the construction sector. Modelling of labour markets by Reyco Consultants has taken into account five other major construction projects that may proceed at the same time as Wagerup Unit 3 (BHP-Billiton Ravensthorpe, Worsley Alumina, Bunbury Harbour, Kwinana desalination plant, and baseload power station). It is estimated the labour pool in southern Western Australia will meet approximately 70% of Wagerup Unit 3 construction employment demand. The research also indicates mechanical engineering skills are most in demand.

An effect of this strong demand for skilled and semi-skilled construction labour will be some wage inflation in the sector, potentially adding to costs for businesses in the region relying on a similar workforce.

2.4.2

Indirect Economic Growth

As the first round of construction procurement spending is in turn spent by construction workers and businesses, the initial economic stimulus is multiplied. This will result in economic growth in the shires of Harvey and Waroona, the Peel and South West regions, Perth and Western Australia several times larger than the initial procurement expenditure. This positive economic effect will be experienced most in the Peel Region.

This economic growth will result in increased total employment and, despite some inward migration, may cause labour shortages and wage inflation locally in more sectors than just construction. The growth may place pressure on light industrial property markets and its temporary nature could be the source of investment over-confidence.

Increased Total Employment

The project will increase the total number of persons employed in Australia, Western Australia, Perth, the Peel and South West regions, and in the adjacent shires. Employment is expected to be in the order of 2-2.5% higher in the Peel Region (or approximately 400-600 jobs) than would be the case without the project.

Investment Over-Confidence

Given business-manager expectations of strong growth or the experience of strong demand during the early phases of construction, businesses in the region may over-invest and be saddled with excess capacity when economic activity returns to more normal levels. If over-investment occurs, a period of higher earning (boom) could be followed by a period of slow or even negative growth in a range of businesses (bust).

Reduction in Available Experienced Local Workforce

The reduced availability of labour noted for industries directly related to the procurement programme, will be mirrored in the broader economy where these 'economic multipliers' will act to increase total employment. This may result in some additional costs to local businesses (higher wages, recruitment, lost productivity from higher turnover).

Pressure on Light Industrial Property Markets

Shire planners believe commercially viable demand for light industrial land will shortly exhaust supply in the Shires of Murray, Waroona and Harvey and that demand is currently constrained by a lack of supply. Sales data from industrial areas owned by State developer LandCorp does not fully support this view. Future growth in service businesses may be inhibited by the lack of

suitable and competitively priced industrial land due to high land development costs.

2.4.3 *Mobilisation of Construction Workforce*

Modelling by Reyco Consultants shows that a large pool of labour exists in the south of Western Australia, therefore the majority of the construction workforce will commute daily from home, with the remaining seeking temporary accommodation. Past construction projects in the south west of Western Australia have contributed to the availability of a large pool of construction workers (see Table 2.2 below).

Compared to past projects where up to 90% of a construction workforce has been local, the level of other construction activity may mean that approximately 70% will be located in a 100km radius to the refinery and commute to work. Therefore, approximately 30% of the required construction workforce may need to relocate into the area.

Table 2.2: Historic information – construction projects in the South West

Project	CAPEX	Peak Workforce
Wagerup Unit 1 1979 – 82	\$320M	1500
Worsley Unit 1 1981 – 84	\$1,100M	3500
Worsley Round Out 1989 – 91	\$100M	220
Wagerup Unit 2 1990 – 92	\$316M	600
Collie Power Station 1996 – 98	TBA	600
Wagerup 6000tpd 1998 – 99	\$256M	600
Worsley Unit 2 1999 – 2001	\$880M	2000
Worsley DCP 2004 – 05	\$234M	400 (estimate)
Pinjarra Efficiency Upgrade 2004 - 05	\$440M	1000 (estimate)

Of the 30% classed as ‘distance workers’ requiring accommodation, it is expected that 70% will choose to reside in Mandurah, with the remaining 30% choosing to seek accommodation in the towns of Bunbury, Waroona, Harvey, Yarloop and coastal areas. One could also assume the temporary construction workforce would choose to relocate into regional towns in similar proportions to the existing Wagerup workforce. If this were the case, there would be a peak requirement (at different stages of construction) of about 300 beds in Mandurah, 70 in Serpentine-Jarrahdale, 70 in Murray Shire, 20 in Waroona, and about ten in Boddington.

The impact from the temporary workforce is not expected to be significant. As with all large construction projects appropriate strategies will be in place to manage potential impacts, including localised shortages of accommodation; disruption to tourism businesses; increased traffic and accident risk; disruption to family life of temporary workers; reduced townsite amenity due to increased traffic movements; additional demands on local government and services, and anti-social behaviour. Positive impacts include, employment, economic growth, high levels of demand for locally owned and managed accommodation and services, and the opportunity for local businesses and the community to take advantage of the requirements of the construction workforce.

Accommodation availability

The construction workforce would result in an increased population which in turn will result in additional demand for accommodation.

The Reyco study investigated temporary accommodation demand and in the region between Mandurah and Bunbury, including Waroona, Yarloop, and Harvey.

Based on the this survey it is anticipated that the majority of demand for temporary accommodation for the Wagerup related construction workforce will be satisfied in Mandurah and a proportion will be required between Pinjarra and Waroona.

The Reyco study concluded based on construction workforce estimates, the following:

- No need for new construction accommodation
- The 'affordable' accommodation market is robust, especially within Mandurah
- Slow population build up and short peak shown by the recruitment profiles allows for adjustment by service providers

Planning officers in the inland town have identified strong rising demand for residential land relative to the currently approved areas of residential land. Particular types of accommodation will be particularly hard to find. Low maintenance rental accommodation close to shops and food outlets will be required for a construction contractor management who typically work long hours and will typically live away from home.

Any imbalance of demand in excess of supply in the short-term has the potential to contribute towards higher rents. It may also be that seasonal agricultural workers are deterred from working in the area or need higher wage rates to compensate for higher accommodation costs/longer travel time.

Fatigue Crash Risk

Additional traffic (including light and heavy vehicles) will be generated due to construction of the Refinery, particularly along the South West Highway. This may result in an increase of traffic incidents. Fatigue from tired construction shift workers travelling longer distances to and from work could contribute to an increased incidence of traffic collision.

Dislocation of Families of Workers Away from Home

Construction workers from elsewhere in the State may commute on a weekly basis from the Perth southern metropolitan area. In addition to the effects on workers often documented in these circumstances such as social isolation, alcohol and abuse and depression, there will be effects on the family left behind. The consequences for family life often cited include conflicts around parenting roles; inconsistency in parenting on the working partner's return home, and anxiety and resentment; additional workload for the parenting partner; and marital relationship difficulties. This is not likely to affect a large number of families.

Movement of Workers and Materials On and Off Site

Additional traffic (including light and heavy vehicles) will be generated along the South West Highway in the vicinity of the Wagerup refinery. Several towns are planning townscape improvement projects during the construction phase and heavy vehicles and peak commuter traffic could impact on the success of these efforts unless adequately managed.

Temporary Population Increase

An increase in the temporary population in Mandurah will have negligible effects on the quality or cost of services provided. In the inland towns too, this impact would appear to be small.

The demands on local services and infrastructure from workers commuting daily from southern Perth or Mandurah may place some strain on existing services (eg. queues at the bank) and impose some additional costs on local government (eg. parking wardens).

Services that are most likely to be in additional demand in proportion to increased temporary population include: hospitals, doctor surgeries, and recreational services. Demand for education is unlikely to be significant as the majority of workers will not be residents and those that are resident are less likely to have family with them.

Demographic changes to an existing population may result in isolated difficulties with integration and social disorder. The transient construction workforce is likely to be predominantly male and a significant number will be

single. A minority of these workers may be more prone to engage in anti-social behaviour.

The workforce demographic has changed substantially over the past 20-30 years. The majority of construction workers are now over 41 and the vast majority (about 90%) are married. Table 2.3 below shows data sourced from three major northwest construction projects on construction age profile. The marital status estimates are based on a reasonable assumption and anecdotal evidence for distance workers requiring accommodation.

Table 2.3: Expected age profile and marital status of construction workforce

Age profiles	Percentage	Marital status	Percentage
Age 41+	52%	Single	30%
Age 31 - 40	26%	Married but requiring accommodation on a single status	60%
Age 21 - 30	21%	Married accompanied by spouse	8%
Age up to 21	1%	Married accompanied by spouse and family	2%

2.5 *OPERATIONAL IMPACTS*

On completion of the construction phase the expanded Wagerup refinery will employ an additional 150 permanent employees. This is expected to have a flow on effect, resulting in approximately 1500 new jobs (multiplier effect) in the Peel and South west regions.

2.5.1 *Ongoing Procurement Program*

The procurement and workforce expenditure will have an impact on economic growth in Western Australia and the South West, and in particular the Peel Region.

When combined with the temporary and ongoing procurement programs of other proposed construction projects in the region, the nature of the potential cumulative impact changes. The efforts of Alcoa to create opportunities for

local companies to supply its ongoing needs, especially long-term supply contracts, may provide the critical mass for businesses to access new markets.

These new markets could enable existing local businesses to access a wider geographical area (eg mining technology to the Pilbara and South Africa) or innovating to create new products/services to meet the emerging needs of Alcoa (eg refurbishment of valves) and other industrial operations in the area. Either route leads to diversification of the local economy and greater resilience in the face of external changes in demand.

The engineering, trade and transportation, utilities and services sectors will benefit directly from Wagerup Unit 3.

2.5.2 *Direct and Indirect Employment*

The project will have positive direct employment impacts. The indirect impacts will be both positive and negative. An additional 150 full-time jobs will be created on completion of the Wagerup expansion. However, significantly more jobs will be created as a result of business and employee spending and investment stimulated by Alcoa's ongoing expenditure on salaries, products and services ('multiplier' effects). The increase in full-time jobs in the Peel and South West regions (over levels that would occur without the project progressing) is expected to be close to 2000 with around another 1000 or more elsewhere in Western Australia.

As a result of appreciation of the Australian dollar caused by the significant increase in exports from Wagerup, slower growth in jobs is expected in export sectors in the South West than would be the case without Wagerup Unit 3. Agriculture and mining are likely to be most impacted by a higher dollar. However, with several projects likely to commence in the period under consideration, the overall picture is likely to be one of strong jobs growth in the region.

2.5.3 *Increase in Permanent Population*

With an increase in full-time jobs at Wagerup, there will be some additional population in the region and in the shires closest to the refinery. Employment is a strong driver of population growth. Irrespective of whether jobs are taken by existing residents or new people moving into the area, the net effect will be a population increase in the wider region. If 35% of the current Wagerup refinery workforce lives in the Shire of Waroona and 10% in the Shire of Harvey, this would equate to approximately 53 more employees living in Waroona and 23 in Harvey if the expansion occurs. Taking into account families of direct employees and the households employed by indirect effects, it is unlikely there will be more than 150 new households and perhaps 450 residents in the adjacent shires (than would be the case without the project).

Any additional population in Mandurah and Bunbury will make demands on a range of services and existing infrastructure but these will not be significant given the size of these population centres. The expected increase in population

in the adjacent shires, however, will have some implications for service provision and demand for accommodation. This demand will be small relative to the construction phase and its nature will be different. In the operational phase, services needed by families will be more in demand (eg. family accommodation, recreation and tourism, health-care/pharmacy, essential council services and State social services) and most of this demand will be positive and beneficial to existing residents and businesses.

The indirect economic growth associated with the expansion project will stimulate further permanent population growth in the Peel Region.

The Shires of Murray, Waroona and Harvey have expressed a concern about the lack of land suitable for residential development. Potential demand for between 75 and 150 dwellings is significant in the local context. The issue likely to remain will be the development of sufficiently attractive housing options to attract a higher proportion of employees to live in the inland towns rather than coastal locations. A barrier to the market providing appropriate housing options could be the high fixed costs of small-scale subdivision and regional planning policies.

The social life and community activities in the settlements where workers reside may benefit from additional participants/volunteers and fresh ideas and from retaining residents that may otherwise have left the community.

Additional demand for public services could have the consequences of imposing additional workload and costs on service providers or reducing the availability of other services through congestion (eg longer waits for routine appointments with a GP; occupied swimming lanes). A three to five percent rise in population in the inland towns is not likely to be critical but is likely to support marginal service delivery and make more marginal enterprises viable. In time, additional charges and rates revenue will flow to local government to provide these services. In the short-term, where development-associated costs may be incurred ahead of new rateable property being created, local government may experience fiscal pressures. The impact on existing public services of up to 450 additional permanent residents in the two adjacent shires is not likely to be significant.

Revenue to the State and Commonwealth Governments

The State will benefit from royalties on increased alumina production and from payroll tax - both as a result of direct employment with Alcoa and the employment generated in the wider economy from subsequent rounds of spending. Total royalties each year will be measured in the single-figure billions and payroll tax each year in the hundreds of thousands of dollars.

Revenue generation from the one-off extraction and processing of the resource has implications for the revenue base of future government and taxpayers. The significance of this potential impact will depend upon how the Government chooses to use the revenue and particularly what balance of debt-reduction, infrastructure provision/economic capacity development, and consumption on current needs is decided upon. The project creates infrastructure important to future economic growth potential and builds local skills and entrepreneurial capacity to use the infrastructure.

The Commonwealth's base for company taxes will increase with the additional turnover (GST) and profits. In addition to taxes paid by Alcoa, revenue will flow from companies that benefit from growth in the economy (as a result of the 'multiplier' effect).

A consequence of the increased revenue flow to governments may be a strengthening of the adjacent shires' positions in requesting provision of infrastructure and services from State and Federal Governments.

Government Policy

Economic growth in regional economies is an aim of the Western Australian Government Regional Development Policy (2003): "*Regional Western Australia – a Better Place to Live*" and "*Hope for the Future – The State Sustainability Policy*" (2003). The Regional Development Policy provides a framework for the development of the State's non-metropolitan regions to achieve '*social, economic and environmental progress in a sustainable way*'. The Wagerup refinery expansion would assist in the achievement of these policies and in particular would help to further enhanced regional investment, skilled regional communities and enhanced quality of life in the regions.

2.6 **MANAGEMENT RESPONSE**

2.6.1 **Overview**

For each of the potential impacts detailed in Sections 2.1 and 2.2, outline management responses have been developed. These impacts are based on experience gained from other projects and through the consultation program for the proposed expansion. Alcoa will seek to make decisions on the best management through partnering with community, government, industry, and NGOs.

2.6.2

Construction Impacts

Procurement Program

The procurement program will develop a greater economic base and increase direct employment opportunities within the Peel and South West regions, as well as Perth, Western Australia, Australia and abroad. The Company can gain ongoing cost efficiencies and process innovations by continuing to work closely with local companies through its procurement program. Specifically, it can assist local businesses in their forward planning by providing a preview of the opportunities likely to occur. It will be particularly useful to provide advance notice of procurement needs in a timeline that allows local companies to tool/staff up or partner with other suppliers.

To increase the proportion of local content, Alcoa, the Shires and the development commissions have worked to compile databases of local suppliers. Alcoa has facilitated contractor recruitment through Murray House in Pinjarra. There is also an opportunity to enlist the support of amenity/progress groups and economic development officers in the shires to identify appropriate employees for contractors.

By supporting construction apprenticeships, Alcoa could benefit indirectly from reduced supplier labour costs. In addition to the existing Alcoa apprenticeship, New Apprenticeship programs and initiatives such as Future Women of Industry, Alcoa could add credibility to the current recruitment campaign for mechanical trades of TAFE WA.

Alcoa could similarly assist to expand the pool of potential construction workers by sharing with local businesses its experience of recruiting among sections of the community under-represented in the workforce and reducing barriers to equal opportunities at work.

To the extent unskilled workers are recruited into the construction workforce (for Wagerup and other major projects) there will be an impact of reduced availability of seasonal agricultural workers. Growers associations may be assisted to plan targeted migration programs with Federal and State Government support.

Indirect Economic Growth

The growth in the economy that happens outside the alumina and construction sectors has mostly positive impacts. A downside is the risk of over and under-investment based on unrealistic expectations of growth and as a consequence, a 'boom and bust' scenario develops. Alcoa can reduce this potential impact by talking to the business community not just about the nature and quantum of its own procurement strategies, but also the type and size of growth predicted by economic modelling.

A lasting benefit to the business community would be a government-sponsored business development advisor with access to the Shire's, development commissions, Alcoa and State Government economic development agencies. This resource would coach local businesses with an identified need in managing the risks of expansion, provide marketing advice and facilitate networking with potential customers and collaborators.

If growth in the local economy is substantial, any shortage in the supply of suitably serviced and priced light industrial land may become acute. Irrespective of the commercial merits of the development of more light industrial land in Pinjarra/Murray, Waroona, Harvey and Brunswick Junction, there could be significant social benefits to its provision. A business and social investment case could be constructed as a pre-cursor to an application for shortfall funding under the Townsite Development Programme.

Mobilisation of Construction Workforce

Certain types of accommodation may be harder to find when a temporary workforce is mobilised. A detailed breakdown of the construction workforce phases in numbers and duration would assist local entrepreneurs to identify and assess viable opportunities for tourism or residential development. Such a review would allow developers and tourism operators to assess the reduced risk of projects due to initial high occupancy during the construction phase. This breakdown is unlikely to be available until further detailed planning for the expansion is undertaken.

The majority of workers will choose to live in coastal communities, but for those selecting to live closer to the refinery, an alternative to providing work camps, contractors to Alcoa could sign medium term contracts with accommodation providers for at least part of their workers' needs. Local planners and tourism industry workers have identified budget tourist accommodation options to be lacking. Certainty of occupancy would allow new premises such as backpackers and motels to be developed by tourism operators with a view to serving latent markets.

The same principal applies to apartments in the towns and rural lifestyle/resort style cabins. In the short-term, the construction workforce might occupy such premises and in the longer term these would offer more options for weekend breaks from Perth at the higher end of the market.

Other options for marginal longer term uses include: residential education campuses (such as the current Harvey Agricultural School site); sports camps (especially in proximity to Waroona Dam); equestrian resort/village; corporate training/retreat accommodation and meeting facilities; arts school retreats; and a co-housing (eco-village) settlement.

Encouraging construction workers' families to move into Yarloop properties where feasible, may be the best temporary use of vacant housing stock. Given

the level of construction activity in the wider region, targeted migration programs and a welcoming community-produced prospectus could encourage temporary residents to stay and provide sustainable growth for Yarloop and Hamel.

Attracting families is one way to address the potential impacts of construction workers being away from home. This may require the prioritisation reservation of housing near schools and shops for temporary workers with families. Emotional and practical support for new arrivals and especially facilitation of neighbourly support would assist the prospects of construction workers remaining in these communities.

Movement of Workers and Materials

During the construction phase, there will be more traffic movements of both materials and workers. A traffic coordinator will be nominated to manage construction vehicle movements. Strategies such as staggered shift start times, alternative routes, early road construction and park and ride/shuttles could be employed. Temporary parking at the entrances to towns along the South West Highway could also assist in reducing congestion.

The transport coordinator would consult with local police, Main Roads and local shires on large traffic movements.

If the high demand for construction workers means they are drawn from a wider area than might otherwise be the case and some choose to commute, there is a probability that more workers will drive tired. Alcoa actively addresses such issues at the refinery and will continue to promote occupational health and safety risk awareness efforts during the construction phase.

Temporary Increase in Population

A temporary increase of population in the in-land towns is unlikely to have acute impacts on the quality of services to existing residents, especially as the construction workforce is generally not with family and therefore not drawing largely upon local services, such as schools and health facilities.

The increase in daytime workers (peaking at 1600) will likely increase demand on a range of other goods, services, infrastructure and government/not-for-profit provided services. In the short-term, market forces may not increase temporary supply quickly enough. If existing residents are not to be disadvantaged the capacity constraints and funding limitations of existing services will need to be better understood. Government could conduct a study to identify current capacity constraints and potential service gaps.

Alcoa will also seek to ensure construction workers have access to the local services they require. This may require the addition of local health practitioners to service the workers.

2.6.3 *Operational Impacts*

Procurement

Procurement socio-economic impacts on the economy are largely positive in the operational phase. However, the degree to which local companies benefit will depend on the effort put into refining the existing procurement policy and practices. The management responses appropriate in the operational phase are extensions and adaptations of strategies required in the construction phase.

Work packages for tenders are currently broken down into commercially manageable elements so local businesses can gear up to provide. The longer the term of these contracts and the more notice of its needs Alcoa provides, the more effective the program will become as the balance of risk and potential return is less of an inhibiting factor for the smaller potential suppliers.

Consolidation of suppliers has allowed relationships to be strengthened enabling better understanding and anticipation of Alcoa's requirements. Development of stronger relationships with local businesses may require tender evaluation to include a component to assess the customer service quality/relationship history of suppliers.

Another area where Alcoa can help itself and the local business community simultaneously is to facilitate collaborations between suppliers to deliver on new needs or improve cost/quality/time delivery of existing services. Significant innovation has been associated not only with close cooperation between customer and supplier, but also cooperation between complimentary suppliers and even former competitor suppliers. Such collaboration is one possible route to local businesses accessing larger contracts and achieving sufficient scale to bid for work, other than Alcoa.

Direct and Indirect Employment

A small proportion of the significant job creation that results from Wagerup 3 will be direct employment with Alcoa. Alcoa can maximise the pool of available workers living locally by continuing to provide training placements in line with predicted workforce requirements and targeting skilled residents for these placements.

Alcoa could assist local communities to build a lifestyle prospectus selling the benefits of living in the inland towns. The community could offer an

attractive lifestyle package to interstate and overseas skilled migrants to benefit itself and the economic and social life of the settlements closest to the refinery.

The impact of slower growth of commodity exports, especially agriculture and mining outputs from the South West, could be managed by support of initiatives aimed at higher value-adding to exports.

Increase in Permanent Population

The increase in permanent population will have minimal impact on congestion of existing services and is likely to create a requirement for disproportionate service provision.

If there is potential on-going demand for housing in the adjacent shires, then supply and diversity of attractive accommodation options will be an important factor in whether the shires realise sustainable population gain. The range of housing options can be improved in conjunction with support of the townscaping initiatives being promoted by the adjacent shires. To the extent such amenity improvements would make it easier for Alcoa to attract and retain employees, it will have an interest in supporting these initiatives.

Attracting medical and other professions to work (and live) in the inland areas has been a particular concern for local stakeholders. There may be opportunities to aggregate the existing health and fitness needs of smaller communities, Alcoa and other industrial business to make an attractive package of customers that can attract additional medical service providers into the area.

Revenue to the State

The issue of intergenerational equity is raised by mining of the bauxite resources by this generation if the wealth generated is consumed rather than invested for future wealth creation potential. Alcoa has a strong commercial and ethical interest in the long-term health of the State and communities in which it operates. The Company can continue to be a voice for prudent investment of this revenue including road, rail, power, water wastewater, waste infrastructure provision supportive to the continued economic development of the region.

Revenue to the Commonwealth

Calls for additional government spending in the adjacent areas will need to be answered in a way that is equitable but does not create dependency that can undermine community and personal growth. Alcoa can play a part in this by ensuring the partnerships into which it enters are aimed at developing the short to long-term capacity of the adjacent areas to improve their own

environment and quality of life in more sustainable ways. This approach would resist short-term philanthropy or 'donations' that lacked the potential to add to local stocks of social, environmental, physical or financial capital.

Table 2.1 Project Activities and Socio-Economic Potential Impacts and Management

Project Phase	Source of Impact	Potential Impact	Location of Impact	Potential Consequence/s of Impact	Management Response
Construction	Procurement program	Greater economic activity	Most significant in Peel and South West (depending upon final procurement plans); also Perth, WA and rest of Australia	Stimulation of additional local business activity especially in earthworks, concrete foundations, metal fabrication/installation, equipment, services (eg. painting)	Assist local businesses to realise opportunities for long-term benefit for company, employees, local economy by previewing nature of services and advising local businesses, via briefings and communication
		Increased direct employment (peak over 1600 during construction - excluding co-generation plant)	Mandurah to Bunbury, principally the Murray, Harvey and Waroona shires.	Employment opportunities for local people Labour shortages	Develop database of construction-skilled amongst local people; use local shop-front for contractor recruitment; upskilling and reskilling programs in partnership with industry and Government Assist major contractors and suppliers in developing attraction and retention programs; develop programs for under-represented of the community including: female, indigenous, people of non-English speaking background, and older workers to remove barriers of opportunity; training provision by Alcoa, industry and Government in skills anticipated to be required
	Economic growth	Increased total employment	Perth, Peel and South West, principally shires of Waroona, Harvey and Murray.	Employment opportunities for people regionally	Work with PDC and SWDC to assist in maximisation of job opportunities from construction program.
		Investment under/over-confidence	Pinjarra to Brunswick Junction	Businesses under/over-invest expecting lesser/greater opportunities from procurement program Businesses under/over-invest expecting lesser/greater opportunities from on-spend 'multiplier' effects of initial procurements spend causing subsequent rounds of consumption and business investment	Preview of Alcoa procurement program to regional companies (nature, size and duration of demand; local content policy) Estimate of construction workforce numbers and duration of peak to local companies to better understand the quantum and nature of demand from workers and suppliers
		Reduction in available experienced labour pool for local companies	Principally Pinjarra, Waroona and Harvey	Increased cost of labour may result in reduced competitiveness of local businesses in fabrication, construction and engineering fields	Support and facilitate industry group for greater understanding of complementary businesses, future demand and potential skill shortages; develop and implement strategy with local businesses in areas of skill shortages.

Project Phase	Source of Impact	Potential Impact	Location of Impact	Potential Consequence/s of Impact	Management Response
				Subsequent unemployment 'bust' following construction 'boom'	Support and facilitate industry group, including Alcoa, and investigate support for business development/risk planning facilitator in the first instance. Assist in sourcing government funds for person to assist local business in sourcing additional Australian and global mining markets to reduce dependence on Alcoa business.
		Pressure on light industrial property markets	Pinjarra to Harvey	Local business expansion and new businesses in region, restricted by lack of suitable and competitively priced serviced industrial land	Encourage regional development commissions, via the Pinjarra-Brunswick Sustainable Communities Strategy Study, with LandCorp to bring forward industrial land provision in Pinjarra/Murray, Waroona, Harvey, Brunswick Junction and Yarloop Work with Waroona shire to assess acceptability of light industry to locate into Wagerup refinery land area,
	Mobilisation of construction workforce	Shortage of accommodation	Principally the shires of Waroona and Harvey, and City of Mandurah	Increased rental prices; seasonal agricultural workers priced out of local accommodation	Investigate accommodation demand and compare with regional accommodation availability NB: detailed investigation undertaken indicates accommodation availability will cater to peak construction workforce. Dialogue with regional real estate agents and tourism outlets to ensure accommodation requirements to not unduly impact on tourism business. Major contractors included in dialogue. Encourage local tourism operators, property developers and local community groups, to maximise business opportunities from a temporary workforce requiring accommodation, for example, establish short-term worker accommodation which in the long term can be used for holiday accommodation (motel, self-catering short-stay family, backpackers, camping/caravan grounds) Investigate use of Alcoa-owned housing in Yarloop and Hamel for management Maximise employment of local workforce first With government, develop prospectus to attract families as part of a targeted migration program; encourage housing options for families to stay in the area
		Dislocation of families of workers away from home	Statewide, interstate, overseas	Social effects similar to those documented in fly-in, fly-out families (eg. role conflict, isolation, alcohol and drug abuse, depression, relationship difficulties)	

Project Phase	Source of Impact	Potential Impact	Location of Impact	Potential Consequence/s of Impact	Management Response
		Symptoms of illness	Construction site and local towns	Construction worker illness; disruption to construction program; use of services and facilities	Request major contractors have outreach counselling services available to relocated workforce OHS policies including health checks before work begins on site; ongoing reporting/ monitoring; availability of health personnel for construction workforce.
	Movement of workers and materials onto/off site	Increased traffic	Principally SW Highway	Reduced amenity	Traffic management coordinator appointed upon construction commencing to consider strategies including staggered shift start times, alternative routes, park and ride
		Fatigue crash risk	Principally SW Highway	Death or serious injury to construction employees	OHS training; encourage local employment
	Temporary increase in population	Supply constraints of social services eg, health, emergency, recreation and commercial services	Pinjarra to Brunswick – Boddington to Preston	Pressure on local and state government budgets to supply additional services; delays in seeing health care professionals for local community; increased pressure on recreation and commercial services	Liaise with government to quantify likely demands and develop service and facility response plan.
	Transient population	Increased anti-social behaviour	Pinjarra to Harvey	Disruption to existing communities, increase policing efforts	Close liaison with Police and community groups; welcome events and social/sport inclusion programs.
Operational	Procurement	Substantial economic growth in Peel and growth in Western Australia	Principally Mandurah to Bunbury	High temporary workloads from this project and the sustained operational procurement program result in local companies to develop competitive offerings to export products and services to other mining regions on an ongoing basis. Particular opportunities in Peel region include: engineering, utilities, trade and transportation , and services	Policy to structure contract work packages to enable local businesses to compete; PDC and SWDC to develop databases and provide resource to identify local businesses with relevant services.
	Direct and indirect employment	Substantial growth in jobs	Peel, Upper SW and WA	Labour shortages in wider economy	Continue to tailor Company training initiatives to job requirements
		Decline in South West (-0.5%)	South-West	Reduced jobs in agriculture and manufacturing; but substantial overall employment	Support export development activities in Harvey and wider region
	Increase in permanent population	New people moving into the region	Pinjarra to Brunswick Junction	Need to make towns attractive including greater range of housing options	Participate in studies and work being completed by development commissions, state government and shires in supporting town improvement programs and development of serviced residential land

			Some additional pressure on services (eg. medical, family services; recreational services; emergency services; education).	Liaise with shires and State to assist in anticipating any demands on social services that require altered service provision programs; Assess possibilities to consolidate community, Alcoa and other industrial company needs into attractive package for health care professionals; Encourage Government to underwrite disproportionate service provision during medium term attempt to capitalise on one-off population growth opportunity
			Social integration difficulties into rigid social networks	Induction programs, community development plans, organised events, language/culture learning support for new families.
Revenue to State	Increased State royalties and payroll tax	Statewide Pinjarra to Harvey	Improved State finances; options for enhanced public services. Additional negotiating point for local communities to claim State and local government funding for upgraded services and facilities	Participate in discussions around use of royalties and payroll tax to maximise benefit to WA Support provision of equitable services and facilities in surrounding communities, which match the infrastructure being developed by Alcoa.
Revenue to Commonwealth	Company taxes from Alcoa and companies benefiting from economic stimulus	Australia	Additional negotiating points for local communities to claim Federal Government funding for upgraded services and facilities	Support provision of services and facilities in surrounding communities, which matches the infrastructure being developed by Alcoa Assist in development of community, government and industry planning to support funding for projects.
Alcoa Investment	Government Regional Development Policy	Peel	Enhanced regional investment; skilled regional communities; and enhanced quality of life.	