



SOUTH AUSTRALIAN
CENTRE FOR ECONOMIC STUDIES

ADELAIDE & FLINDERS UNIVERSITIES



Skills and HR Audit — Heavy Industry Sector of the Upper Spencer Gulf Region

Final Report

Prepared for
Global Maintenance USG Inc

Prepared by
The SA Centre for Economic Studies

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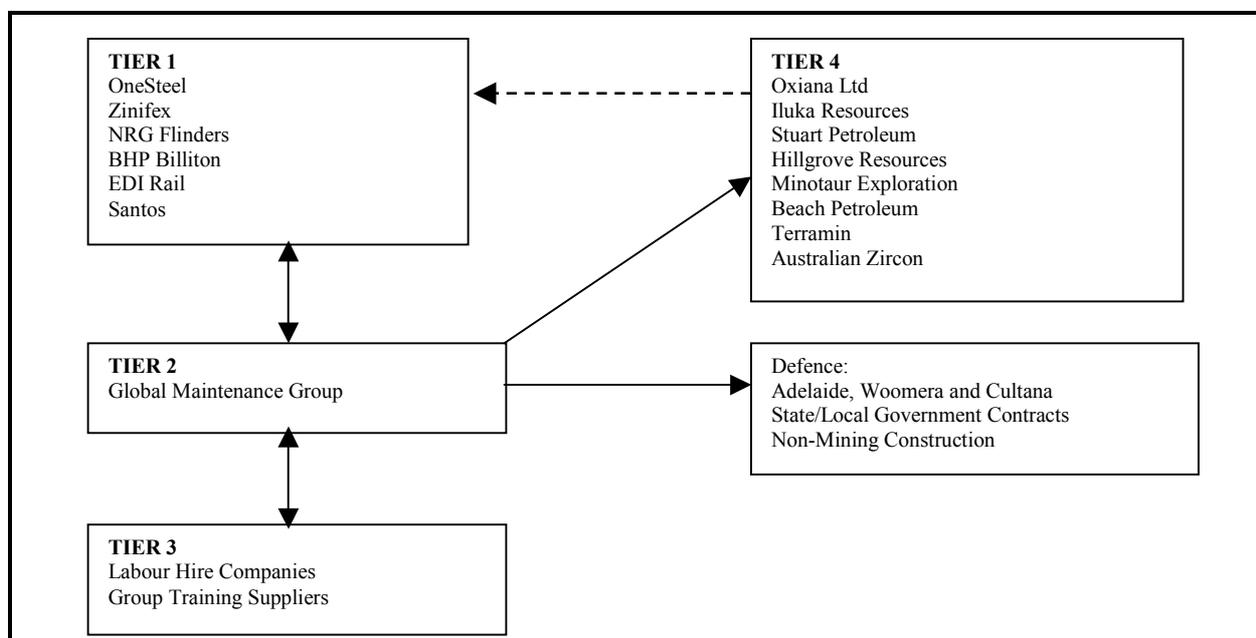
Executive Summary

Objectives and Scope of Study ...

This study was undertaken for the group of companies clustered under the title Global Maintenance Upper Spencer Gulf (GMUSG) specialising in heavy engineering and an array of maintenance services. GMUSG sought to examine issues related to workforce development, skill requirements into the future and how these could be addressed.

The study was expanded to incorporate the demand for skilled labour and education and training by the largest employers (Tier 1 companies) in the Upper Spencer Gulf (USG) region. The principal reason for expanding the study is that both Tier 1 and GMUSG companies (Tier 2) compete in the labour market for the same skill sets, but more importantly, the two sets of companies are highly interdependent through contract relationships.

Figure E.1
Heavy Industry/Resource Processing Sector



The report is based on the current workforce of all companies included in the study and from this baseline, estimates are derived for the future demand for labour. We are aware of significant new mining developments and the proposed expansion of Olympic Dam by BHP Billiton.

However, the impact of the proposed expansion at Olympic Dam (Roxby Downs), the new mining venture at Prominent Hill and other mining development projects are considered in a separate report. Each will have implications for employment and training in the region.

Notwithstanding these proposed new mining ventures, this report was commissioned by the Whyalla Economic Development Board (WEDB) on behalf of the GMUSG group of companies and our report addresses the original Terms of Reference.¹

¹ We note in this report that DTED, DFEEST, PIRSA and DTI have commissioned the Centre to research the employment and education and training impact of mining developments in the region. The Centre will also report to the WEDB and GMUSG group on the mining sector.

In essence, this report outlines the demand from employers for a skilled workforce over the period 2006 to 2010 and the demand for education and training. It documents existing employment and skills in the group of companies making up the membership of the Global Maintenance Upper Spencer Gulf (GMUSG) referred to as Tier 2 companies, the larger employers in the region and their existing workforce (Tier 1) and information on labour supply firms (Tier 3) and group training organisations.

An estimation model of labour demand provides estimates of growth in the demand for labour for Tier 1 and Tier 2 companies and for the USG region out to 2010. The model considers the impact of economic growth which is partly the result of population growth and productivity growth, retirement rates based on the age profile of the workforce and turnover and wastage from the relevant industry sectors.

The report also examines the supply side – education and training – to assess future requirements.

The labour demand estimation model is based on current employment and therefore includes BHP Billiton workforce at Roxby Downs, NRG mining workforce at the Leigh Creek coal field and Santos. Project Magnet having recently commenced is the only “new” or major expansion project included in our assessment of the demand from employers for a skilled workforce for the purposes of this report.

Evidence of Skill Shortages ...

In Chapter 1 we illustrate and describe the heavy industry sector and note the interdependency with the mining and resource processing sector. We outline the research methodology and reporting framework and stress that interviews with the larger companies and GMUSG members were critical to understanding the prospects of each company and the future demand for skilled labour.

In Chapter 2 we consider available evidence on the issue of skill shortages in the Upper Spencer Gulf (USG), specifically noting that the population of the region has stabilised and is now expanding, that residential construction is further evidence of this and, that the economic environment in the three Provincial Cities (and Roxby Downs) has experienced a rejuvenation since 2002-03. While unemployment remains high it has continued to fall while the labour force has expanded (see Table E.1).

Table E.1
USG: Unemployment, Unemployment Rate and Labour Force: 2004 and 2005

	Unemployed (Number)		Unemployment Rate (Per cent)		Labour Force
	June 2004	June 2005	June 2004	June 2005	
Whyalla	1,242	820	11.8	7.9	10,444
Port Augusta	636	467	9.9	7.3	6,388
Port Pirie	140	86	8.4	5.2	1,655
Roxby Downs	17	12	0.8	0.5	2,220

Source: DEWR, *Small Area Labour Markets: Australia*, June 2005.

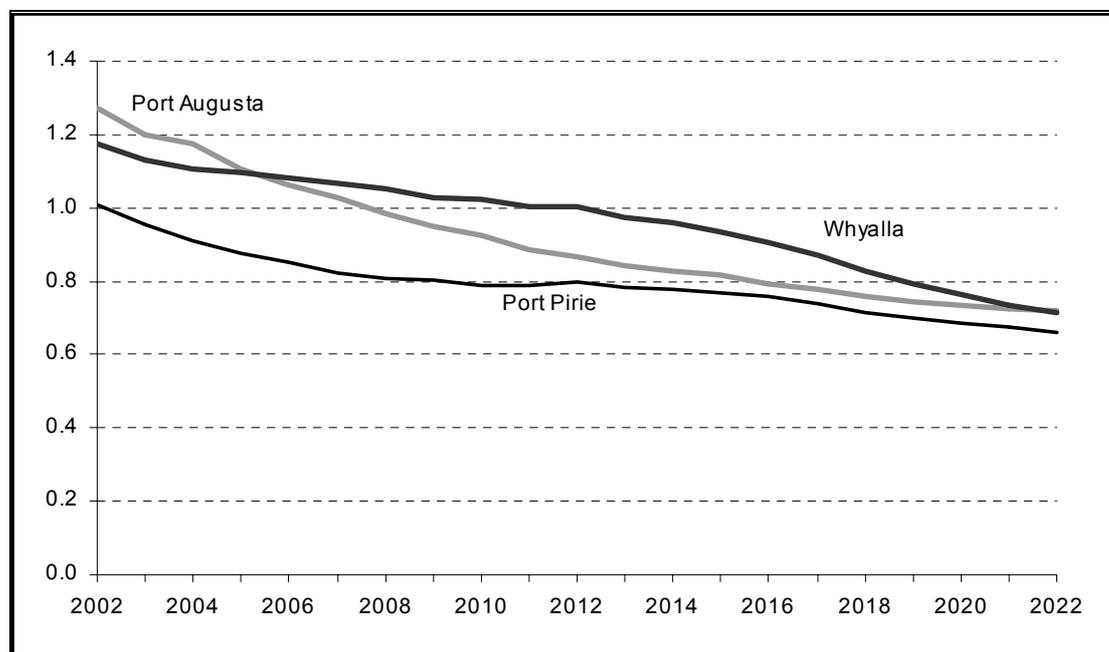
Evidence of skill shortages consists of national data (DEWR: on vacancies, skills in demand), trends in average hours worked and movement in wage rates, strong employment growth in the mining and minerals processing sector and listings of skills in demand on national and regional migration programs. There is considerable qualitative evidence that pre-vocational students are in demand by individual companies and group training organisations. Further, there are strong expectations within those companies interviewed and surveyed by the Centre that recruitment will increase out to 2010.

Survey Data, Workforce Profile ...

In Chapter 3 we report on survey data. Higher retirement rates are in prospect. The age profile of larger employers supports this fact, where in several cases more than 10-15 per cent of the workforce is expected to retire in the next five years.. For GMUSG companies the workforce profile reveals that 13 per cent of their workforce is in the age range 55-65 and 10 per cent aged 15-24 years. Approximately 3 to 3.5 per cent of the total workforce in the GMUSG group of companies will retire each year, for the next five years.

Younger people will be more difficult to recruit as they are fewer in number. The change in ratio of the population aged 15-24 years to the population aged 55-64 years from 2002 to 2022 for the three Provincial Cities and Roxby Downs (not shown in Figure E.2) is as follows: Port Augusta 1.3 to 0.7; Port Pirie 1.0 to 0.7; Whyalla 1.2 to 0.7, and Roxby Downs 3.8 to 1.5.

Figure E.2
Ratio of Population Aged 15-24 years to Population Aged 55-64 years
Port Augusta, Port Pirie and Whyalla, 2002 to 2022



Source: Projections prepared by the ABS according to assumptions agreed to by the Department of Health and Ageing.

Trade Skills and Specialisation ...

The occupational profile is quite different for the GMUSG (Tier 2) group of companies and the larger (Tier 1) employers in the region. The aggregate number of tradespersons is highest in the Tier 1 companies, while the proportion of trades to total employment is highest in the GMUSG group at 43 per cent of employees. This reflects the high degree of specialisation in the GMUSG group of companies.

Table E.2
Occupational Profile: Tier 1 and Tier 2 Companies and all Region

Occupation	Tier 1		Tier 2: GMUSG		ABS All Region
	Number	Per cent	Number	Per cent	Per Cent
Managers & Administrators	67	1.7	71	8.8	5.0
Professionals and Assoc. Professionals	417	10.5	65	8.0	25.0
Tradespersons and Related Workers	911	23.0	347	42.9	17.0
Clerical	168	4.2	56	6.9	30.0
Labourer, Production & Transport Workers	2,392	60.5	270	33.4	23.0
Total	3,955	100.0	809	100.0	100.0

Note: The Centre has not included employment data for some 200 employees in companies eligible to join GMUSG. This implies we obtained data on 5,000+ employees or more than one-fifth of the total workforce.

In the conduct of this study we have found evidence of a shortage of university trained metallurgists, geologists and engineers. There is also considerable evidence of skill shortages for specific trades, namely electrical and electronic engineers, boilermakers/welders, fitters, instrument technicians and mechanics (diesel).

Vocational Training ...

In Chapter 4 we consider current training effort. Training rates are only a partial measure of the supply of skills. However, both apprenticeships/traineeships and employer sponsored training are essential to ensuring a consistent pool of skilled tradesperson in the region.

There is evidence of difficulty in attracting young people to apprenticeship training in sufficient numbers, retaining them in training and then in the trade.

Apprenticeships need to become more attractive as current wage rates paid to first year apprentices are often less than those paid to entry level employees in other sectors. The same situation exists for adult apprentices. We note that there are barriers to the uptake of School Base New Apprentices (SBNA) in the heavy engineering sector.

However, there is very considerable support for, and active recruitment of graduates from pre-vocational courses. We consider issues relating to pre-vocational courses in some detail in Section 4.3 and 4.9.

In general, industry opinion of pre-vocational courses was very positive with most employers preferring a pre-vocational qualification when recruiting apprentices. A number of employers said they would be willing to take a wider interest in the content and design of pre-vocational courses should they be asked. This invitation needs to be acted upon.

For the six² “heavy industry/manufacturing” courses provided by TAFESA shown for the USG region at the end of Table 4.15, the total number of course enrolments was relatively stable over the period 2000 to 2004 at 1,290 course enrolments. The very positive employment outcomes for pre-vocational courses and programs to assist the young unemployed such as the Whyalla Youth Futures Alliance program suggests there is considerable scope to expand these programs.

Estimation Model of Labour Demand ...

In Chapters 5 and 6 we summarise the estimated demand for skilled labour and projected training needs in the Upper Spencer Gulf region out to 2010.

For tradespersons and related workers, Tier 1 and GMUSG Tier 2 companies are anticipated to recruit an additional 66 tradespersons per year (2006-2010) or 330 tradespersons over 5 years to meet economic growth and the need to replace an increasing number of retiring workers. This can be thought of as approximating:

- 24-26 more apprentices per year to meet economic growth; and
- 40 more apprentices to replace retiring workers,

in addition to current intake. The total additional demand is approximately 90-95 tradespersons per year or 480 over 5 years across the USG regional economy (see Table E.3).³

Table E.3
Growth in Demand for Labour: USG Region 2010

	Economic Growth	Replacement Demand	Total Demand: Tier 1 and Tier 2	USG Economy
Managers and Administrators	14	22	36	53
Professionals	50	77	127	184
Tradespersons & Related Workers	131	200	331	480
Clerical & Service Workers	23	36	59	85
Labourers & Related Workers	277	424	701	1,016
Total	496	759	1,255	1,818

Allocated across the 4 broad trade classification groups shown below, the estimated additional demand in the number of trades and related workers required each year and then for the five year period is shown below:

- Electrical Instrumentation 30 per year (150 over 5 years);
- Mechanical 27 per year (135);
- Construction 24 per year (120); and
- Automotive 19 per year (95).⁴

² Airconditioning and Refrigeration, Automotive Mechanical and Electrical, Electrical, Fabrication and Welding, Mechanical and Mining Industry.

³ For the total heavy engineering and maintenance sector within the USG, that also includes non-members of the GMUSG cluster and contracts awarded to non-resident companies.

⁴ Note, estimation of labour demand is at upper bound of 480 to 500 persons. Not possible to be more precise as a number of skilled workers with a trade are sometimes classified as “trade assistants”.

This is likely to be the upper bound, because all companies indicated they will endeavour to retain retiring workers or provide encouragement to defer retirement, and as well, we have assumed zero net inward migration.

In Table E.4, the number of trades required for Tier 1 and Tier 2 (GMUSG) companies is shown in column one and for the USG region as a whole in column 2 for the five years to 2010.

Table E.4
Estimated Growth in demand by Trades, Numbers Required per Year, 2006-2010

Occupations	Tier 1 & 2	Region
Electrical/Refrigeration	13	19
Boilermakers/ welders	10	14
Instrument Technician/Fitter	6	8
Fitters	12	17
Riggers	4	6
Machinists	4	6
Mechanics (petrol and diesel)	5	7
Plumber	3	5
Carpenters	2	3
Toolmakers	3	4
Electronic/ radio technician	2	3
Sheet metal workers	2	3
Crane Driver/Operator	1	2
	67	98

Source: SACES estimated based on survey data.

Estimates of the growth in demand for skilled labour and the contribution that education and training will be required to make are drawn together in the following way:

- for existing pre-vocational courses, fill all commencement places and seek to increase retention and completion rates. This would provide an average of 20-24 additional graduates a year (and hopefully apprentices) or approximately 100 over 5 years;
- conduct one more “regular” pre-vocational course in three locations would provide 40 additional apprentices a year or 200 over 5 years; and
- to target those currently unemployed, provide through the Whyalla Youth Futures program (and its equivalent in Port Augusta and Port Pirie)⁵ an additional intake which would provide 40 apprentices a year or 200 over 5 years.

Finally, during the course of this study we were made aware of investigations into a possible “Centre of Excellence for Education and Training in Mineral Resources and Heavy Engineering”. We believe a Centre of Excellence would receive industry support; it should involve TAFESA and the University of South Australia. It is important to include regional representatives in exploring this concept. We would encourage a representative from GMUSG group and the three RDBs to be invited to consider how such a Centre might be established.

⁵ In last two dot points we assume 3 times 15 students with up to five non-completions per course.

1. Introduction

Terms of Reference

- Describe the population of the Heavy Industry sector (including resource processing, fabrication, construction and heavy industry support organisations and labour hire firms);
- Identify capabilities and skill base of the audit population; and
- Include information on resource processing, mining and mineral processing.

1.1 Introduction

Global Maintenance Upper Spencer Gulf (GMUSG) is an incorporated body that draws its membership from businesses across the Upper Spencer Gulf region involved in engineering and maintenance services to the resource processing sector.

‘Engineering and maintenance services’ includes construction, operations, manufacturing, fabrication, staff contract services, contract management, instrumentation and electrical services, port and rail services including for major customers (described below) but also to local Councils, State government agencies and the mining and mineral exploration sector. Major customer companies in the region include OneSteel, BHP Billiton,⁶ Zinifex, NRG Flinders, Santos and EDI Rail.

Global Maintenance Upper Spencer Gulf (GMUSG) is funded through its membership base, and the Upper Spencer Gulf Common Purpose Group (USGCPG). The Board of GMUSG consists of representatives from industry, small business, the Whyalla Economic Development Board, University of South Australia, and the Spencer Institute of TAFE.

The GMUSG contracted the researchers to conduct a ‘Skills & HR Audit – Heavy Industry Sector of the Upper Spencer Gulf Region’. During the course of the study a decision was taken to expand the scope of the research. In particular, the researchers were requested to gather and analyse employment data and conduct interviews with OneSteel, NRG Flinders, Zinifex, BHP Billiton for the Olympic Dam site and Santos. These companies are active in the labour market for similar types of skilled labour as members of the GMUSG group, plus the relationship between major customers and GMUSG contractors is a highly interdependent relationship.

While the original terms of reference were retained the research placed considerably less emphasis on ‘internal HR policies’ (for example) and greater emphasis on skills training, internal training support, demographic change and its implication for recruitment and retention of staff and providing future projections for a skilled labour force. Notwithstanding the extension of the project, our principal research focus has been to assist the GMUSG group of companies.

The Heavy Industry/Resource Processing Sector has been the backbone of the Upper Spencer Gulf region in the past and continues to be the major employing industry of the region.

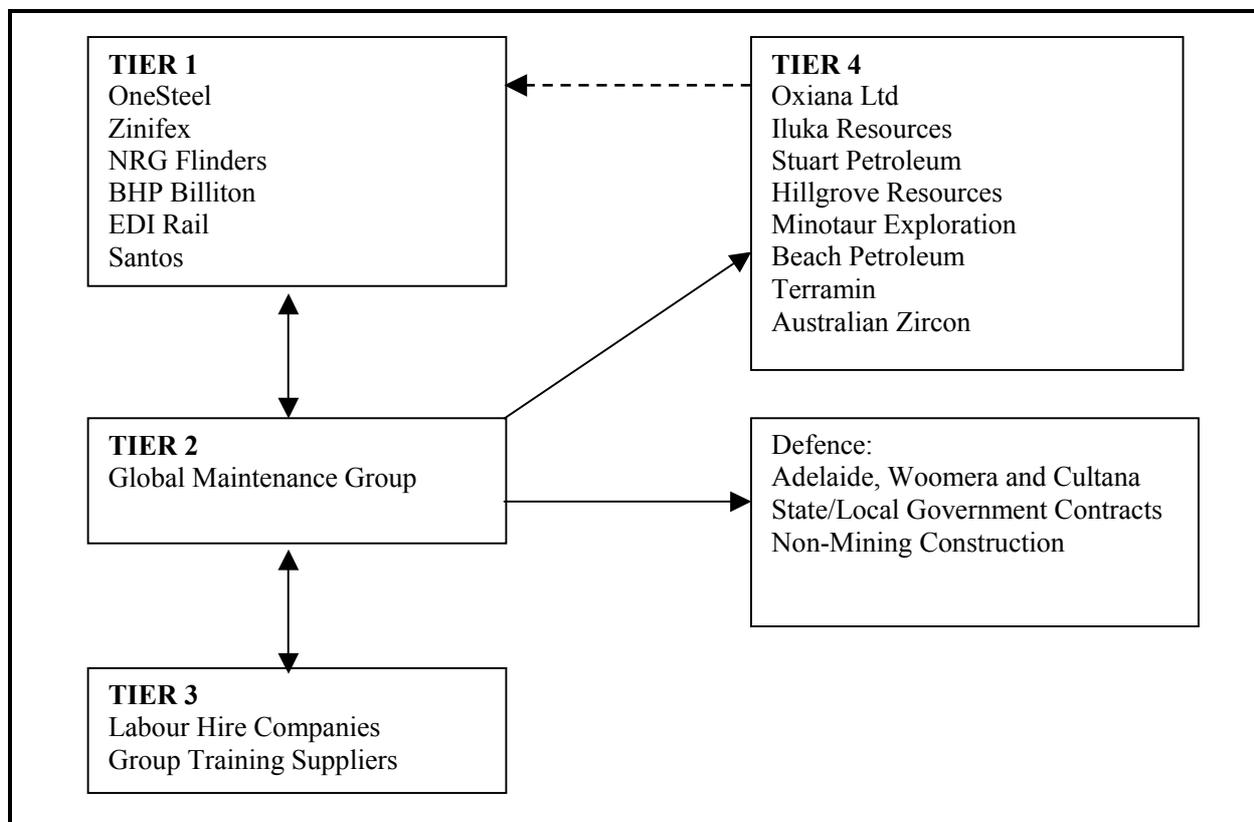
⁶ Formerly WMC. The report will use the terminology BHP Billiton or Olympic Dam. Olympic Dam is the mining site, nearby to the township of Roxby Downs.

1.2 Composition of the Heavy Industry Sector

Within the Upper Spencer Gulf and surrounding regions, the major manufacturing, mining and mineral processing and electricity and gas supply organisations include: OneSteel, NRG Flinders (at Port Augusta and Leigh Creek), BHP Billiton, Santos, EDI Rail and Zinifex. In Figure 1.1 we designate these organisations as Tier 1.

In turn, the Tier 1 companies are supported by a network of suppliers of heavy and light engineering services, construction services, instrumentation and electronics, manufacturing and fabrication, transportation logistics and equipment hire companies. In Figure 1.1 we designate this group as Tier 2 companies mostly comprised of the Global Maintenance Upper Spencer Gulf Group. Not all suppliers of these services are members of the GMUSG.

Figure 1.1
Heavy Industry/Resource Processing Sector



Supporting both the Tier 1 companies (BHP Billiton, OneSteel etc.), and Tier 2 organisations in the heavy engineering and maintenance sector are Tier 3 companies. Tier 3 companies include labour supply/labour hire, recruitment organisations and group training firms. These services may also be supplied by GMUSG members. There are three or four principal labour hire firms, sometimes as registered training organisations, operating within the region providing specialist services in the employment and management of apprentices and trainees. The labour hire firms indicate that they supply staff for on-going maintenance associated with shutdowns to BHP Billiton's operations at Roxby Downs, OneSteel, NRG Flinders, Zinifex, Leigh Creek, and Kimberly Clark in the South East.

Labour hire firms provide temporary or contract labour for personnel services, on-site administration, workforce supervision and specialist staff across all aspects of employment (e.g., HR, sales, marketing, financial services, accounting, banking, operations management).

Other services include specialising in trades people with the ability to supply high volume, highly skilled people for shutdown work at short notice. Permanent recruitment services are also provided. Recruitment and a flexible workforce include the supply of casual and temporary staff, contract and fixed term and permanent recruitment.

Tier 4 lists a number of mining and mineral and oil exploration companies that, depending upon mineral discoveries, feasibility studies, construction requirements, specialist needs or other contingencies will most likely utilise the services of GMUSG members. Tier 4 organisations consist of other mining, mineral and oil exploration companies. This is a relatively contained list for our purposes in assessing the future demand for labour from this group, as it is estimated that there are over 500 operating mines and mineral processing operations in South Australia. Tier 4 organisations are included as they will require a range of contract services in the construction and operations phase of site development with potential implications for the GMUSG group of companies.⁷

Figure 1.1 is intended for illustrative purposes but also to guide the preparation of this report. For example, the labour demand forecasts reported on, and the current and projected workforce are confined to Tier 1, 2 and 3 companies and any expansion plans or investment already in the public domain. A separate report will examine the mining sector. Further, BHP Billiton while included in Tier 1 is essentially a mining operation and could readily be grouped in Tier 4. However, as an existing operation at Olympic Dam they maintain a significant workforce and have a demand for skilled labour.⁸ In this report we will not examine the impact of the Olympic Dam expansion (although a summary of the scale of the expansion is noted). It is shown here:

- a) because it is an existing operation with significant employment levels, subject to turnover of staff and retirement and like NRG Flinders, Leigh Creek, has an existing demand for a skilled workforce; and
- b) to illustrate the interdependency of companies and the mining and heavy engineering sector, and a shared interest in a skilled workforce.

Analysis of the “heavy industry” sector of the Upper Spencer Gulf region indicates a wide representation of industries in the following classifications:

- Refining of petroleum, manufacturing of basic iron and steel, smelting and refining of copper, silver, lead and zinc;
- Manufacture of rail, mining and construction machinery;
- Heavy engineering and maintenance services including shut down maintenance, abrasive blasting and protective coating;
- Fabrication of structural steel and component products;
- Construction (major infrastructure projects) and construction services (e.g., housing) including building, labour hiring and training, and equipment hire.
- Electricity generation; and
- Road, rail and sea transport and transport logistics.

⁷ The Centre is conducting a separate study into the mining sector for PIRSA, DTED and DFEEST with a particular emphasis on the demand for labour.

⁸ For example, the NRG Flinders mining operation at Leigh Creek is also included in Tier 1 companies.

Supported by businesses located in the three major Provincial Cities and Roxby Downs are the following:

- Gas supply (Moomba), and the Point Bonython refractory plant, wholesaling of petroleum, refining of metal and minerals;
- Mining and extraction of coal (Leigh Creek), oil, iron ore, copper ore, gold, silver, lead, uranium and zinc ore, including exploration and mining services and specialist mining of opal (Coober Pedy, Andamooka);
- Civilian/military launch facilities (Woomera); and
- Agriculture including pastoral activities, wheat and barley production.

Global Maintenance: USG

The Global Maintenance USG group is an industry cluster of engineering and engineering service firms from the Upper Spencer Gulf that collaborate in an effort to improve their businesses and win work outside of the region. The purpose of Global Maintenance USG is to establish and promote the Upper Spencer Gulf as a regional centre of excellence in the provision of “maintenance services” to the local, national and international resource-processing sector.

The survey undertaken by the Centre of the GMUSG companies, found that their major clients were, in order of importance:

- OneSteel;
- Zinifex;
- NRG Flinders;
- EDI Rail;
- BHP Billiton; and
- Santos.

In addition we were informed that members of the GMUSG are contracted to supply to not only Tier 1 companies but to other companies and organisations in the region, including *inter alia* ETSA Utilities, ElectraNet, Pacific National, Australian Rail Road Group, Australian Rail Track Corporation, BOC Gases, Kellogg Brown and Root, Thiess, Henry Walker, NDC Thyssen Krupp Engineering, MetServ, Gas Works, Ausmel, Telstra, Alstom Power the three City Councils of Port Augusta, Whyalla and Port Pirie and the township of Roxby Downs.

Table 1.1 lists current membership of the GMUSG. There are a number of engineering and maintenance employers who are not members of the GMUSG group but that also supply to major clients; they include Allied Engineering (Port Pirie, est. 1965: metal fabrication services to Zinifex), Aztec Analysis (est. 1982 with branches in the three cities specialising in Fabrication and Machinery), and Total Electrical Services (Port Pirie, est. 1998: 10 electrical and mechanical contractors).

While not intended to be an exhaustive list, a summary of capabilities illustrates the diversity and scale of contract work undertaken by the heavy machinery and maintenance sector for major construction sites, mineral processing and mining sites including design, construction

and operations of plant, to then include shutdown repairs and maintenance, installation of electrical and electronic systems, sophisticated instrumentation and repair work, for the energy sector and minerals processing, port storage and handling, rail and the manufacture of rolling stock.

Table 1.1
GMUSG Companies and Their Location

Company	City/Suburb	Year Established
Roche Engineering Services	Olympic Dam Village	N/A
Crossroads Concepts	Port Augusta	N/A
EDI Rail	Port Augusta	1198
Max Crane & Equipment Hire (SA) Pty Ltd	Port Augusta	2002
Pearce Earthmoving	Port Augusta	N/A
Gadaleta Steel Fabrications	Port Pirie	N/A
Gobell Engineering*	Port Pirie	1944
SJ Cheesman	Port Pirie	1908
Sherrin Hire	Whyalla	1968
Sudel Industries Pty Ltd	Whyalla	1991
United Kilpatrick Green - Whyalla	Whyalla	1999
Whyalla Fabrications & Structural Engineers	Whyalla	1974
Northern Scaffolding	Whyalla	1971
Broadspectrum	Whyalla	N/A
Cognis (Betatene)	Whyalla	N/A
Brambles Industrial Services	Whyalla	1959
Action Engineering	Whyalla	1990
Amdel	Whyalla	1960
C&M Asperti	Whyalla Norrie	1969
Marand Precision Engineering	Whyalla Norrie	1998
ICE Engineering	Whyalla Norrie	N/A
Whyalla Hose and Fittings	Whyalla Norrie	1994
Indec Consulting	Adelaide	1998

Note: * Formerly Skewes Engineering. Potential numbers from Port Pirie include Link Engineering, Pisani Engineering, Total Electrical Services, Tell, quarry suppliers and electrical suppliers.

Source: Whyalla Economic Development Board (WEDB).

The scope of capabilities includes, *inter alia*:

- Project feasibility for various sectors of industry including scoping, engineering drafting and design, costing and plant design, construction management and commissioning, construction of electrical sub-station and upgrades;
- Plant construction and installation for the energy and mining sectors, including mechanical, electrical, piping, technical advise on electronic systems and process control, operation and maintenance of fixed plant and equipment, maintenance planning/scheduling;
- Mine design and construction management including underground facilities, location of processing plants including refurbishment, site preparation and crushing of ores, repair work, etc;

- Design and construct electrical sub-stations and transmission lines, design and construct wastewater treatment systems, major shutdown work, mechanical and electrical maintenance work;
- Instrumentation, design, calibration and validation, ongoing electrical installations and instrumentation maintenance, maintenance of mechanical systems (e.g., belt weighers, hoppers and weight bridges);
- Workshop activities including steelwork fabrication, surface treatment fitting and machining, hydraulics design, specialised welding of componentry, fabrication and construction of major works, electrical maintenance fitting and turning;
- Heavy machinery hire; and
- Maintenance and calibration work for a diversity of industry sectors including petrochemical, pharmaceuticals, vineyard/winery, bakery, industrial/commercial furnaces, brewery, food processing (e.g., temperature calibrations to 'Safe Food Australia' of HACCP food standards), cold storage, and many more industries.

The provision of contract services is very significant highlighting the interdependence of the heavy engineering industry and maintenance sector with the manufacturing, mining and resource processing sectors. For example, Brambles Industrial Services and EDI Rail are major contractors to OneSteel with a large on-site presence.⁹ The port handling, storage and loading and rail facilities at OneSteel are managed by contract service providers. This underscores the need to separate out the demand for skilled labour by Tier 1 and Tier 2 organisations and the requirement to ensure that double counting in the demand for skilled labour does not arise.

1.3 Surveys and Methodology

The Centre undertook a range of activities to address the Terms of Reference including, *inter alia*:

- mail out surveys to members of the GMUSG group (Tier 2), and then separately to Tier 1 companies and Tier 3 labour hire and group training organisations;
- personal interviews were conducted with nine GMUSG member companies and interviews with OneSteel, NRG Flinders, Zinifex and EDI Rail;
- meetings were held with the three regional Economic Development Boards;
- data requests to the ABS, DFEEST, NCVET, DEWR and other organisations; and
- multiple visits were conducted to the region (and to Leigh Creek).

Considerable effort was expended to document the often complex relationships between companies and contractors, to record the size and profile of the current workforce, the timing of investment and scale of projects and to differentiate the construction workforce (and skills required) as compared to the on-going operations workforce and skills required.

We were assisted in this task by the level of co-operation we received from every company referred to in this report and government agencies (e.g., DFEEST, PIRSA, DTED, the regional development boards).

⁹ In the same way Pacific National And Works Infrastructure are contractors to NRG Flinders at Leigh Creek to transport mining products to Port Augusta.

In addition to the above, the Centre collected employment data from current mining operations, plus surveyed mining companies that were planning construction and future operations in the region.

Reporting Framework

This report is confined to estimating the demand for labour for the GMUSG group of companies (Tier 2) and Tier 1 companies. In Tier 1 we include two mining operations – BHP Billiton at Roxby Downs and NRG Flinders, Leigh Creek – based on their current workforce.

To derive the baseline assessment for Tier 1 and Tier 2 companies for 2006 out to 2010 **we do not include** the proposed expansion at Olympic Dam or other mining projects. **We do include** Project Magnet at Whyalla's OneSteel operations.

There are important reasons for this approach, including *inter alia*:

- the very real potential for double counting in forecasting labour demand;
- to reflect the existing inter-relationships between Tier 1 and Tier 2 companies and to again ensure that double counting is avoided;
- the more limited time scale for a construction workforce and the size of construction relative to future operations; and
- the recent developments in the mining sector warrant separate analysis as well as the future implications for the region and the GMUSG group.

Our initial starting point or baseline is the level of current employment, current recruitment, potential retirement rates, demand for apprentices and the skilled trades. From this baseline we model for:

- sectoral growth, exports and their sustainability, and economic growth as they are expected to impact on employment;
- age of the workforce and retirement rates, wastage and turnover;
- current recruitment of apprentices and projected future recruitment, current and future estimates of skills in demand (where the views of Tier 3 companies were specifically sought); and
- the already commissioned Project Magnet because contracts have been let and future skills in demand could be estimated.

A separate report will consider the impact of several mining projects on the education and training sector, plus the likelihood of further benefits to the GMUSG group and subsequent demand for labour.

This approach helps to avoid the problem of double counting and better enables the construction and on-going operations of mining activities to be more accurately forecast.

2. Skills Shortages and The South Australian Economy

Terms of Reference

- Examine the issue of skill shortages and outline the situation in the Upper Spencer Gulf (USG);
- Identify why there is a skills shortage in these industry sectors in the USG region; and
- Consider the situation in the context of state and national skills shortage.

2.1 Introduction

The Northern Statistical Division (SD) of South Australia covers over 800,000 square kilometres (82 per cent of South Australia's total area). Within this statistical division, the Upper Spencer Gulf cities of Port Pirie, Whyalla, and Port Augusta provide the heavy industrial base for the region with their associated mining, oil and gas, iron and steel, lead smelting, mineral processing and power generation. In the far north, mining operations are significant at Olympic Dam in the Roxby Downs area, the Beverly Uranium mine, Leigh Creek, Coober Pedy and natural gas from the Cooper Basin.

The economy of the Upper Spencer Gulf has been through a number of phases in the last thirty years with the loss of major activities such as ship building in the 1970s and rail in the 1990s, declining population and loss of employment in Commonwealth and State agencies. More recently, the region has experienced a revitalisation accompanied by an expanding population. The two most recent periods, firstly 1995 to 2000-01 was marked by business closures, privatisation of utilities and significant job losses and outward migration. Only the investment at Roxby Downs, several construction projects in the three major cities and some limited, but nevertheless important local diversification of the economic base of the region notably in agriculture and aquaculture, contributed to growth and employment. During the second period from 2002-03 until today, the region and the three Upper Spencer Gulf cities have grown very strongly. The veil of gloom has been replaced with optimism and obvious signs of economic development and growth.

A Participant, Not a Spectator ...

What makes the situation different in South Australia and in the Upper Spencer Gulf in 2005 and beyond, from previous experiences where there has been a "mining boom", accompanied by growth in mineral exports and favourable commodity prices, is the following:

- the South Australian mining sector has expanded quite significantly and a series of projects are planned to come on-line in roughly the same time period;
- the scale of the planned expansion at Roxby Downs is very large;
- there have been and are currently very major investments by companies involved in mineral processing, steel, energy and rail;
- significant mining activity is export oriented and conditions appear favourable over the medium term;
- the State has enjoyed strong employment growth in the manufacturing sector (2000 to 2005); and

- South Australia was recently awarded the Air Warfare Destroyer contract and several minor defence projects that are likely to add to the demand for skilled labour.

Contributing to this remarkable change has been a number of factors, notably that in each city and at Roxby Downs, a single large scale event or project has transformed the business environment:

- in Whyalla, growth in the core business of steel production and now Project Magnet at OneSteel;
- in Port Pirie, the success of Zinifex and export growth;
- in Port Augusta, the growth and expansion of EDI Rail and the rail link to Darwin¹⁰; and
- in Roxby Downs, the planned expansion at the mine.

In addition, there has been very favourable economic conditions, export growth, favourable mineral and commodity prices and very extensive mining exploration activity and mineral discoveries. The region has received a second boost – the mineral discoveries have been significant and several sites are near to construction and operation. These subsidiary benefits for the USG follow the announcement of the massive expansion of the Olympic Dam site (\$5-\$6 billion) and the potential doubling of population at Roxby Downs.

The population of the Provincial Cities has stabilised and expanded; residential and commercial construction has been strong and labour market conditions have improved although unemployment remains above the State average.

However, to achieve the benefits of economic growth, higher levels of local employment and incomes, and lower unemployment across the region, then labour supply side constraints will need to be addressed. The employment market in the region is different in character than in the last two decades. At the time ETSA was privatised (a workforce that declined from 700 persons in the mid 1980s to 200 persons by 2001) displaced labour was partly absorbed at Roxby Downs, by GMUSG members and by EDI Rail. Some of the ANR workforce was similarly absorbed; many workers left the region, others retired and unemployment increased. The labour market in 2005 has dramatically changed. It is now characterised by strong demand for skilled labour in the GMUSG group, in the Tier 1 companies and across the mining sector. Retiring workers need to be replaced. Apprentice intakes are rising and will need to increase further.

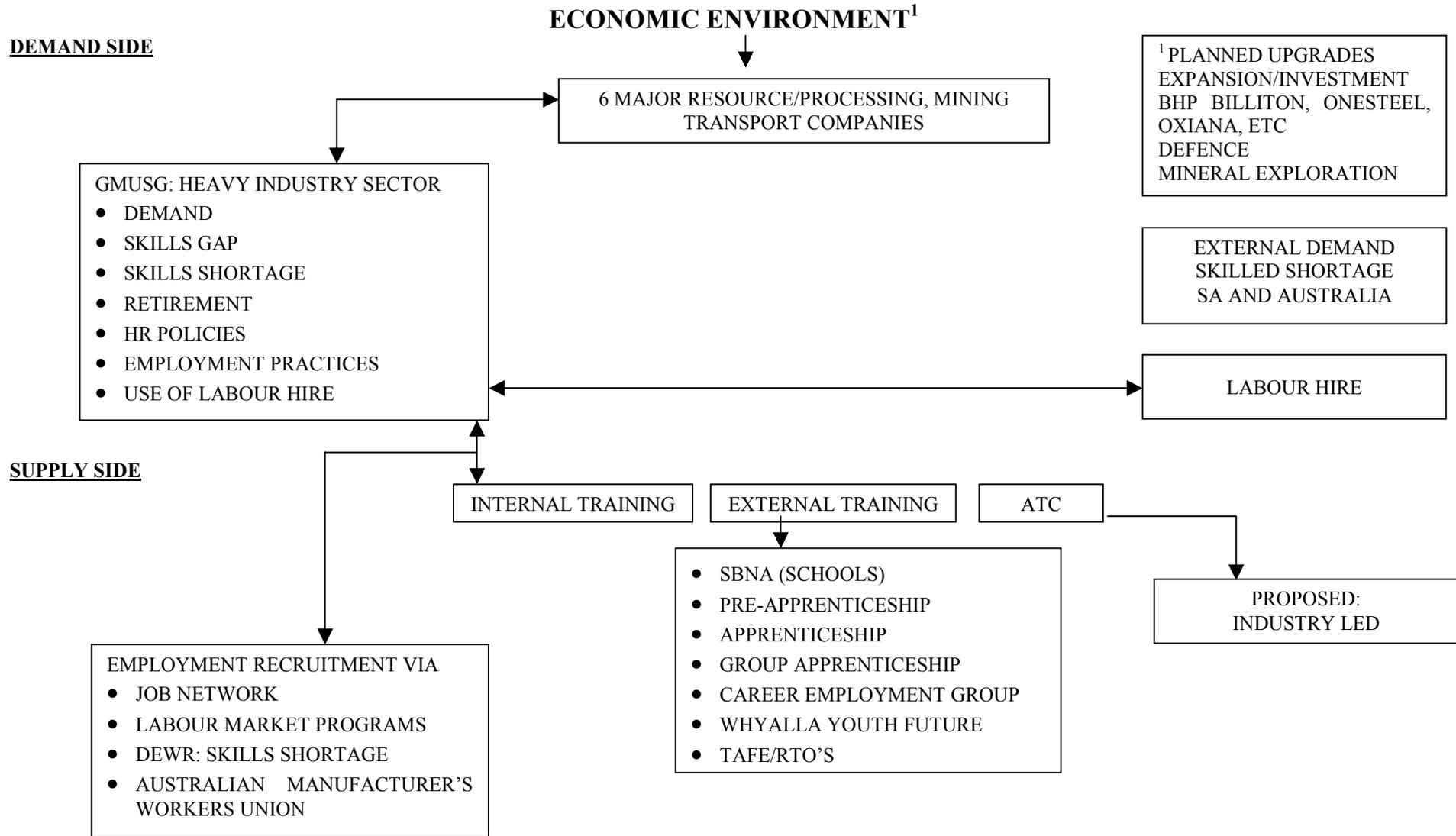
The scene is set for South Australia and especially the Upper Spencer Gulf Region to be a participant, not a spectator, in the growth of the mining and processing sector.

Figure 2.1 outlines those factors such as the demand and supply of labour, skills gaps and an ageing workforce that are important in determining the economic environment in the Upper Spencer Gulf region over the next 5 years.

The following sections will discuss the economic environment and the demand for labour in the Upper Spencer Gulf region with reference to the heavy industry sector and skills shortages.

¹⁰ The construction and operations of the Baxter Detention Centre at Port Augusta was also important.

Figure 2.1



2.2 Understanding a Skills Shortage

A skills shortage exists when the supply of labour is insufficient to meet the demand at the going wage rate. A skills shortage may arise as a result of structural change in the economy (e.g., growth of new industries), rapid expansion of an existing industry, under investment in training and skills development, cyclical factors such as a mining boom, and low levels of unemployment in an expanding economy. Potential flow-on effects include demand for higher wages, increased competition for skilled labour which may sometimes result in “poaching”, recruitment of less skilled staff, deferred investment or search for more efficient technologies and an eventual slowdown in economic growth.

The **demand** for labour derives from three main sources: economic growth and a general expansion in the number of employed persons, on-going replacement of an existing labour force due to retirement, staff turnover, and/or re-location of skilled workers leaving the region, the firm or the industry¹¹ and from investment in plant, equipment and new technologies resulting in an expanding workforce, replacing some skills sets, but increasing demand for others.

The **supply** of labour within a region includes not only those skilled workers currently employed in an industry, but also those trained but employed in similar industries and those workers or potential workers currently undertaking training. Skilled labour may also come from interstate or overseas.

An increase in the supply of skilled labour within a region is most quickly achieved by an increase in overtime or average hours worked by existing employees. It may also come from attracting skilled ex-employees back into the industry or increasing the proportion of trainees and apprenticeship within the industry. The supply of skilled workers may be supplemented from targeted migration schemes to attract overseas and interstate workers.

In the short-term, demand is rarely stable. It is greatly influenced by the boom/bust characteristics of the industry, the outlook for economic growth, international conditions and so on, while the supply of labour may expand and contract depending on, for example, the terms of employment offered in the industry and in competing industries (remuneration, management practices, employment conditions and general working life, etc.), internal restructuring and/or takeovers, and the level of training undertaken. The dynamic nature of the labour market implies that it is in a constant state of adjustment.

The nature of the imbalance in the labour market serves as a guide to understanding the adjustment process; whether government or industry action is required, the main reasons for any imbalance, the severity of a skills shortage and how best to respond.

A “true skills shortage” is where there are simply insufficient numbers of persons possessing essential technical skills in demand. In the conduct of this study we have found evidence of a shortage of university trained metallurgists, geologists and engineers. There is also considerable evidence of a skills shortage for specific trades, namely electrical and electronic engineers, boilermakers/welders, fitters, instrument technicians and mechanics (diesel).

Long lead times in training and any capacity constraints in training organisations can exacerbate existing shortages.

¹¹ Two examples: In the Mining Industry there is currently a turnover of skilled labour as high as 20 to 30 per cent per year in remote areas. Qualified tradespersons leave the occupation in which they trained for other employment.

A “skills mismatch” may arise to the extent people possess the skills required but are working in either other industries or occupations paying higher wages but in the same industry; they may require various forms of incentives to return to the trade or occupation. A “quality gap” may arise where an individual possesses the skill but lacks some important attribute desired by an employer.

In the Upper Spencer Gulf region there is evidence of a “true skills shortage” currently and into the future. There is evidence of a skills mismatch. There is evidence of difficulty in attracting young people to apprenticeship training in sufficient numbers, retaining them in training and then in the trade.

In addition, the mining and mineral processing sectors are experiencing structural change with the planned development and investment in new mines, the expansion of existing mines and strong overseas demand for mineral commodity exports. This is associated with rapid employment growth. That is to say, the mining industry and associated sectors are experiencing underlying growth as the industry expands as well as favourable (or “boom”) conditions. There is evidence of a “true skills shortage” across some important occupations within the mining and mineral processing sectors.

To accurately estimate the type and quantum of skills training, and to determine whether a demand or supply side response is most appropriate, it is important to understand those factors driving growth in the economy and variables relevant to specific industries (e.g., longevity and expectations of the boom, the scale of projects, the expected life of projects including the timing and possible synchronisation of projects, extent of labour shedding in associated industries etc.).

2.3 Evidence of a Skills Shortage?

In the short term, indicators of growth in the demand for labour and potential for the emergence of skills shortages in an industry include:

- Expectations of domestic and world economic growth and expansion of the industry;
- Increased average hours worked;
- Rising wages;
- Increased employment levels; and
- High vacancy levels.

Other less important factors that could indicate a potential skills shortage in an industry include:

- Low levels of redundancy;
- High levels of staff turnover (including poaching);
- Greater reliance on migration, or older workers, “non-traditional” workers; and
- Employment of workers with lower skills levels.

With reference to indicators outlined above we briefly examine the demand for skilled labour in the Upper Spencer Gulf and South Australia. In some instances data is only available on an Australia-wide level, although in the mining sector and mineral resource processing the competitive demand for labour is nationwide.¹²

Expectations of Domestic and World Economic Growth

Domestic and international growth prospects for the mining and the mineral processing sector appear to be favourable and more importantly, sustainable into the medium term. Table 2.1 gives selected forecasts for the growth of the Australian and global economy in 2004-05 and 2005-06. Expectations are, that both the Australian and global economy will experience positive growth over the next couple of years. In Australia much of this growth will be driven by an expansion of the domestic mineral production and mineral exports sector with continued strong growth in mineral exports. Rising oil prices in the international economy raise the spectre of higher inflation, while the demand for skilled labour in the domestic economy, and especially in the mining sector, has flowed through to higher remuneration. Notwithstanding, higher benchmark contract prices especially for iron ore and selected metals are likely into 2006-07.

Table 2.1
Selected Growth Forecasts Australia 2004-05 and 2005-06
(Per cent)

	2004-05	2005-06
Australian Economic Growth	2.0	3.0
World Economic Growth	3.7	4.7
Mineral Exports Growth	14.0	28.4
Mineral Production Growth	22.9	30.1
Business Investment Growth	8	6

Source: ABARE 2005, Australian Treasury.

The Australian Bureau of Agricultural and Resource Economics (ABARE) report that Australia's minerals and energy sector will continue to grow strongly in 2005-06. The total value of Australia's minerals and energy exports is forecast to be \$84.8 billion in 2005-06,¹³ an increase of 23 per cent from the \$69 billion estimated for 2004-05. Reflecting this positive outlook, the total volume of Australian mineral and energy production is forecast to rise by 8 per cent in 2005-06.

Table 2.2 summarises domestic growth forecasts for selected industries undertaken by the forecasting consultants Econtech. For the period 2005 to 2008 they indicate that the four sectors shown here will expand output with the largest growth to come from the mining sector. In terms of growth in employment, mining will again have the strongest and most sustained growth.

¹² The Centre has recently investigated the demand for skilled labour in the Northern Territory and for the construction of the LNG plant and other major projects.

¹³ ABARE recently revised estimates to \$87.2 billion, up 28 per cent from 2004-05, but warned that mine production would increase more gradually due to labour constraints and difficulty in sourcing mining supply materials.

Table 2.2
Selected Industry Growth Forecasts Australia: 2005 to 2008
(Per cent)

Industry	2005	2006	2007	2008
Mining				
Output ¹	6.3	13.3	7.4	6
Employment	19.1	6.7	2.2	1.3
Manufacturing				
Output	-2.4	8.9	4.6	5.3
Employment	2.3	2.4	-1.9	-2
Electricity/Gas/Water				
Output	4.3	8.3	5.2	5.2
Employment	2.8	1.5	0.7	0
Construction				
Output	3	-0.7	7	8.3
Employment	2.1	0	-0.7	-0.1

Note: ¹ ABARE estimate mine production volumes to increase at 5 to 6 per cent in 2006.

Source: Econtech, October 2004.

The outlook forecast in Tables 2.1 and 2.2 across each of the sectors are particularly significantly for the Spencer Gulf Region. They indicate that employment growth will come from industries supported by the heavy industry and maintenance sector as they expand to meet increased domestic and international demand. They also indicate that the competition for skilled labour is likely to intensify.

Consistent with the recent growth in the Australian mining industry is a National Centre for Vocational Education Research (NCVER)¹⁴ report, that documented skills shortages that currently exist in the industry. The report highlighted the recent growth in the demand for skilled labour of over 50 per cent between 2002 and 2004, particularly for the mechanical trades (heavy diesel mechanics, fitters, welders, mechanics, and technicians) and electrical trades (technicians). This growth has been a consequence of 74 new mineral projects across Australia (\$22.6 billion) either committed or under construction since 2002. A summary of that report can be found in Appendix 4.

Trends in Average Hours Worked and Wages

Already there are signs of strong competition for labour. Recall that underlying indicators of demand for labour and the potential for the emergence of skills shortage are an increase in the average hours worked and rising wages. In the construction trades and fabrication engineering trades, average hours worked have grown, whilst wages growth has been strong for occupations grouped in mechanical and fabrication engineering. While the data for selected trades in South Australia in Table 2.3 are presented as nominal wage growth, inflation does not account for growth rates of 12 and 23 per cent in average weekly earnings for mechanical and fabrication tradespersons respectively. Wages growth and the increase in average hours worked suggest underlying strong demand for these skilled trades.

¹⁴ NCVER, (2005), *Prospecting for Skills: Current and Future Skill Needs for the Minerals Sector*.

Table 2.3
Average Weekly Earnings and Average Hours Worked:
South Australia May 2002 and May 2005

Trades	May 2002		May 2005		May 2002 to May 2005	
	AWE (\$)	Hours	AWE (\$)	Hours	Earnings: Percentage Change	Hours: Percentage Change
Mechanical engineering tradesperson	977	43	1,069	43	12	1
Fabrication engineering tradesperson	811	42	994	44	23	4
Automotive tradesperson	722	41	788	40	9	-2
Electrical and electronics tradesperson	965	41	1,004	42	4	1
Structural construction tradesperson	880	42	949	42	8	-1
Final finishes construction tradesperson	815	36	858	38	5	6
Plumbers	784	43	816	40	4	-8
Average	851	41	928	41	9	0

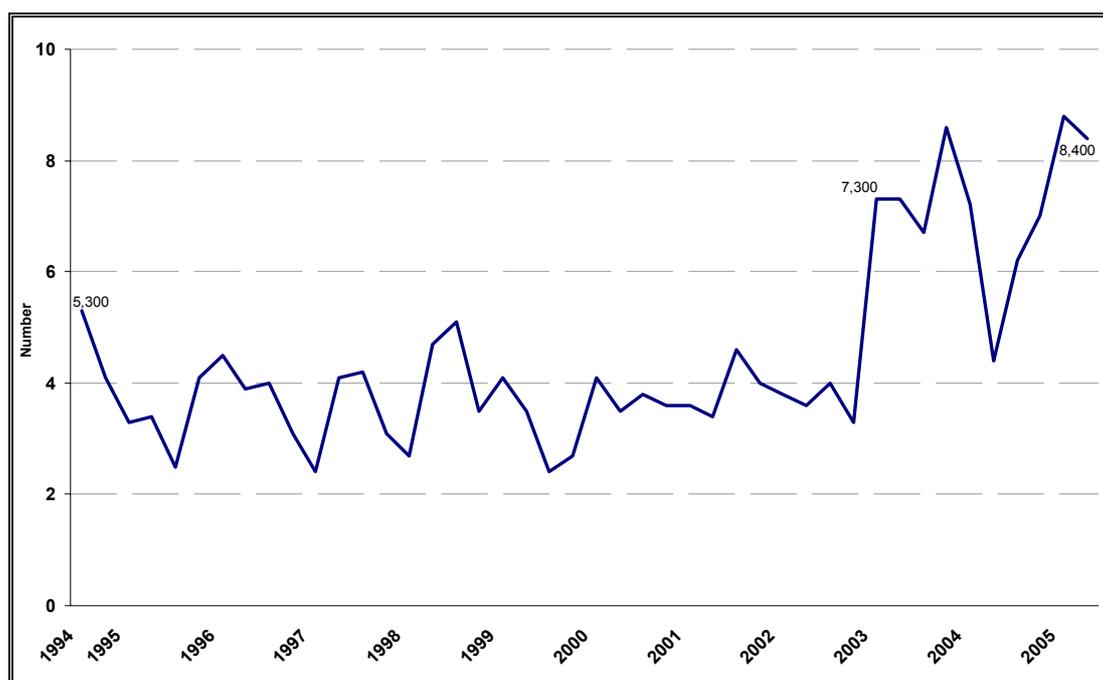
Note: Nominal wage growth has not been adjusted for increases in inflation.

Source: SACES calculations based on Employee Earnings and Hours, Australia, Cat. No. 6306.0

Employment Growth

Recent trends in employment in South Australia confirm the strong performance of the mining, manufacturing and construction sectors. Employment in mining and associated activities declined from a peak of 5,300 in 1994 to remain at approximately 4,000 persons until 2002, when employment “took off” to reach 8,400 persons by 2005. The share of total employment in mining in South Australia rose from 0.8 per cent to 1.2 per cent. See Figure 2.2.

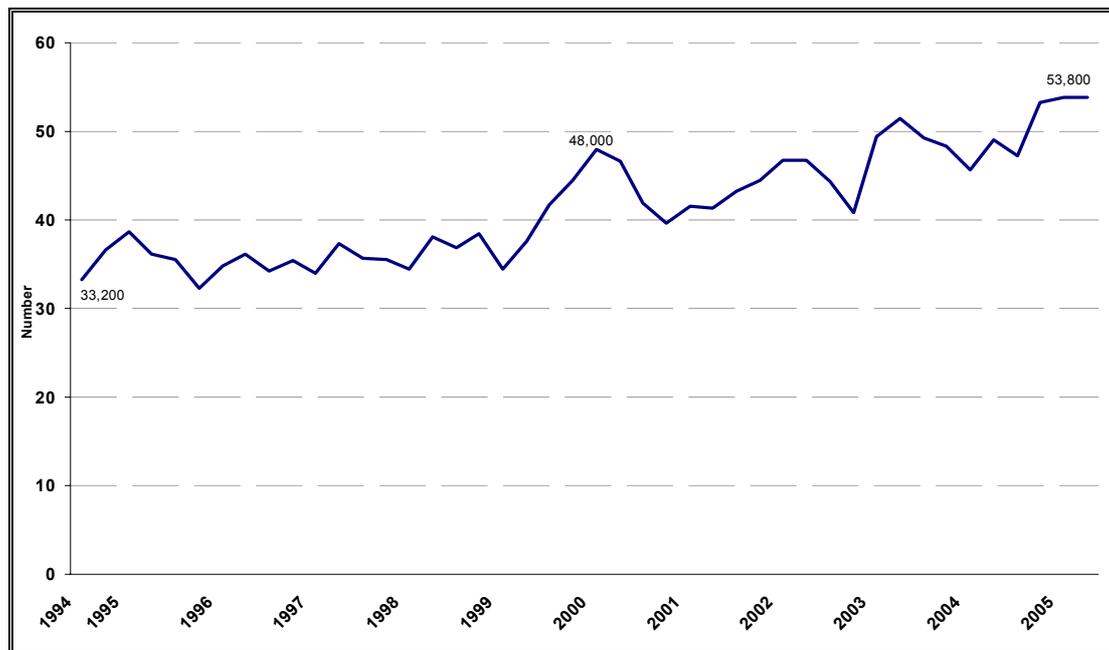
Figure 2.2
Employment in the Mining Industry, South Australia, 1994 – 2005, (000s)



Source: ABS, *Labour Force, Australia, Detailed - Electronic Delivery, Quarterly*, (Cat No. 6291.0.55.001).

Employment in construction increased from 33,200 persons in 1994 to 48,000 persons in 2000 following the introduction of the GST and reached 53,800 persons in 2005 (see Figure 2.3). Manufacturing employment declined from 17 per cent of the total South Australian workforce in 1994 to be 13 per cent or 97,500 persons in 2005. Changes in the composition of manufacturing employment continue, notably growth in manufacturing employment in the wine industry.

Figure 2.3
Employment in the Construction Industry, South Australia, 1994 – 2005, (000s)



Source: ABS, *Labour Force, Australia, Detailed - Electronic Delivery, Quarterly*, (Cat No. 6291.0.55.001).

Total factor income (contribution to GDPI at factor prices) over the period 1990-2004 was the following (Year 2004 shown and compound average annual growth rate):

- mining (\$1,020m: 2.1 per cent);
- manufacturing (\$6,647m: 2.3 per cent);
- construction (\$3,307m: 4.3 per cent);
- utilities (\$1,707m: 5.3 per cent).

Vacancies, Index of Skills in Demand

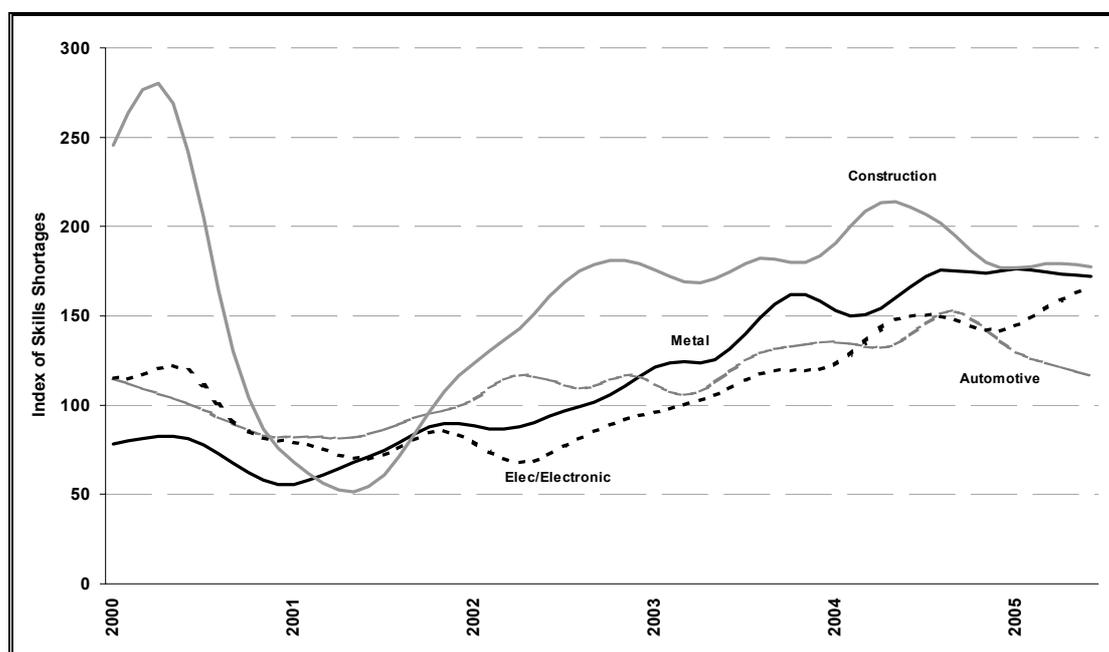
The evidence thus far – the outlook for the mining sector, mineral processing, construction and engineering, recent trends in employment, wages pressure and an increase in average hours worked – points to very strong employment prospects. Add to this, the number of mining projects coming on-stream and demand for skilled labour from other sectors, then the weight of evidence suggests the demand for skilled labour will be strong.

This situation is likely to be exacerbated by higher retirement rates as the workforce ages and fewer new entrants to the labour force.

Surveys to measure skills shortages, trends in trade training, vacancy rates and priorities for skilled immigration are important indicators of the state of the labour market.

The Department of Employment and Workplace Relations (DEWR) publishes the *Skilled Vacancy Index*, to monitor trends in demand for skilled labour. For the June 2005 Skilled Vacancy Index, the level of vacancies in those trades associated with the heavy engineering sector, electrical and mechanical trades has continued to increase while the demand for construction and automotives trades have only recently plateaued. In both electrical and mechanical trades, demand has increased by 3.4 and 10.3 per cent respectively since June 2004.

Figure 2.4
Index of Skills Shortages by Occupation,
Australia: 2000-2005



Source: DEWR *Skilled Vacancy Index*, June 2005.

More specifically, DEWR¹⁵ has identified a range of trade-based occupations that they considered to be in short supply in South Australia as shown in Table 2.4.

Table 2.4
Skills Shortages in South Australia, December 2004

Metal Fitter	Motor mechanic (petrol and diesel)
Metal Machinist	Electrician/electrical fitter
Tool Maker	Electronic Equipment/instrumentation trades
Metal Fabricator	Plumber
Welder/Boilermaker	Carpenter/joiner

Source: DEWR, National and State Skills Shortage Lists 2005.

¹⁵ DEWR national and State Skills Shortage Lists 2005.

In addition, evidence of skill shortages in the electrical and mechanical trades comes from the Federal Government's Skills Occupation List (SOL), which is issued for immigration purposes and is a list of particular occupations that are required in Australia. All electrical and mechanical trades have a high priority rating.

Localised shortages also arise due to high labour turnover, particularly in remote locations and mining sites. The NCVER point out that the turnover of tradespersons in regional and remote centres can approach as high as 20 per cent.¹⁶

Migration is one avenue to alleviating a skills shortage and Federal and State governments have recognised that regional centres have considerable difficulty in attracting skilled workers. One program available to attract skilled labour to a region is the Regional Skilled Migration Program. The Department of Immigration and Multicultural and Indigenous Affairs (DIMIA) announced on 1st July 2005 that skilled migrants wanting to work in regional and low growth areas will be granted an additional 10 points under the Skilled Independent Regional Visa (SIR).

With the support of Federal and State government, South Australia has achieved an increase in migrants who are issued a visa under State-specific or regional migration mechanisms. In 2003-04 South Australia received 16.3 per cent (= 2,070 persons) of skilled migrants under these targeted programs, while one year later this had climbed to 26.5 per cent of State-specific visa and regional migration programs (= 4,950 persons).

In conclusion, we observe an increase in employment in the mining sector (and construction and manufacturing) at the same time as an increase in the level of vacancies for those skilled trades most closely related to heavy engineering (i.e., Skilled Vacancy Index) and continued growth in investment, production and export of mineral resources and commodities. Vacancy levels for a range of electrical and mechanical trades have also increased.

This situation is in marked contrast to the mid-1990s when labour shedding was very strong resulting from the full sale of government owned enterprises, the privatisation of others and reforms within private companies, particularly involving the outsourcing or contracting out of non-essential activities.

¹⁶ NCVER (2005), "Prospecting for Skills", refer Section 1.3.2.

3. Analysis of Survey Data

Terms of Reference

- From survey data and interviews identify skills and occupations in demand in the region;
- Identify training requirements;
- Categorise the age profile of the existing workforce.
- Review recruitment and training support policies; and
- Highlight any potential implications for the qualitative and quantitative data.

In this section we summarise the information provided by all companies, profile their workforce, current recruitment and intake of apprentices and consider the demand for labour as reported by the companies.

Three surveys were developed and delivered to GMUSG members (Tier 2), larger employers (Tier 1) and labour hire firms (Tier 3) to gather information on the following:

- profile of the organisation;
- employment data including number, age, gender, apprenticeship intake;
- assessment of current and future skills in demand; and
- support for employee training, H-R policies, etc.

In addition to the survey data the Centre conducted personal interviews with more than 16 companies, with training providers, labour hire firms and collected data outside of the survey from the mining and heavy engineering sector. At the time of interview the Centre sought to document the inter-relationships (i.e., contracting) between Tier 1, 2 and 3 companies in order that any modelling of the demand for labour avoided the potential problem of double counting.

We commence with a summary of interviews for four Tier 1 companies and an outline of the scale of expansion of the Olympic Dam project.

3.1 Company Summary

OneSteel (Whyalla)

The OneSteel plant, formerly BHP Steel's Long Products Division recently announced a \$325 million commitment to convert the plant to the use of magnetite ores (Project Magnet)¹⁷ This follows recent investment and upgrades to reline smelting and blast furnaces. Project Magnet will involve significant contract work (e.g., Thiess, Brambles and others) with a reliance on local labour input. The project also extends to new pipelines, rolling stock and rail facilities and the construction of barges to facilitate exports. The diversity and scale of the projects presents an obvious demand for a range of engineering skills. Project Magnet has already commenced and will run until the end of 2007.

¹⁷ BHP Billiton will act as the exclusive agent to market products from Project Magnet, particularly in the Asia Pacific. Additional mining contracts will also be let to mine the ores.

It is reported that at the peak of construction the contractors (all contractors in total) will have 290 employees in Whyalla and OneSteel will be looking to employ around another 100 persons. Fifty per cent of contract employees will come from the local region with the break-up being around 150 trades and 140 semi-skilled.

After the project, OneSteel will employ approximately 100 employees and with new contracts, then contractors will demand anywhere between 50-100 additional employees.

The OneSteel plant currently employs 1,230 permanent staff in the core business of making steel and further 900 full-time equivalent contractors are employed on-site. Contractors include, *inter alia*, for maintenance, machine operators, security, supervising the movement of large machinery and equipment, port facilities, all rail facilities, water and filtration.

OneSteel estimate that 25 per cent of the permanent workforce are “tradespersons or related workers” although additional tradespersons are employed as specialist machine and plant operators. On average, each year OneSteel recruits 12-14 new apprentices, while at May 2005 it has some 50 apprentices in training, principally electricians, electrical fitters and instrument fitters. Due to Project Magnet, OneSteel is looking to recruit a further 20 to 30 apprentices or pre-vocational students. They estimate that up to 20 per cent of the workforce could retire in the next 5 years and will therefore need to progressively increase their intake of apprentices.

OneSteel has devoted considerable attention already to succession planning, to replace skilled staff who have either left or “been poached”. They have done this through an increase in wages, salary increments related to years of service and the use of incentives to attract staff.

The current skill gap is in the professionally qualified, university graduate group of engineers – project engineers, designers, operators and process controllers – and OneSteel indicated recruitment difficulties in attracting engineers. They indicated a potential worsening of the situation due to the WMC expansion, the mining boom generally and the Air Warfare Destroyer Project with its requirement for defence engineers.

The three professional and associate professional groups in high demand, and where future skill shortages are anticipated, were mechanical engineers, electrical engineers and metallurgy engineers. The three trade based qualifications most in demand were described as electrical fitters, instrument technicians and fitters.

The expansion of industries in the region, the potentially high retirement rate and normal turnover of staff were assessed as most likely to influence the demand for skilled labour.

Outlook for future employment: Will increase in the short term with up to an additional 300+ person construction workforce although most of this demand will be felt by the successful contractor (e.g., Thiess, Brambles, EDI Rail). Most of the workforce will be locally sourced. In the long term, expansion of production and exports will see an increase in OneSteel’s workforce of 100 persons, and possibly greater employment in the contracting workforce of around 50 to 100 persons, particularly for maintenance and export shipments.

Zinifex¹⁸

Zinifex is one of the world's largest integrated zinc and lead companies that operates two mines and two smelters in Australia (in Hobart and Port Pirie). The smelter at Port Pirie produces refined lead and lead alloys, silver, zinc, copper, gold and sulphuric acid. Located adjacent to port facilities it is the largest primary lead smelter in the world with a capacity of 270,000 tonnes per annum. Current employment is approximately 700 persons with 144 (about one fifth) being classified as tradespersons or related workers. In addition, there are 100 contractors on the site at any one time handling transport and shipping and various maintenance and security functions. On average, Zinifex recruits 8 first year apprentices although it had 17 as at May 2005, proposed to recruit 25 in 2006 and up to 33 in 2006-08 period. The principal trades in which current shortages and future demand was said to exist were for instrument technicians and electronic technicians. The highly technical nature of the smelting process underscores the requirement for electronic and instrumentation skills. In para-professional occupations mechanical, electrical and electronic engineers were identified as a significant skill shortage, as well as metallurgy and chemical engineers and environmental professionals (although their website lists 'no current vacancies'). We note that H-R policies emphasise training and development, career pathways, the restructuring of working hours to involve 4 day, 12 hour shifts and higher wages to promote scheduling flexibility.

Zinifex employs some 430 "labourers, production and transport workers and machine operators" and indicated to the Centre that a number of operators in this classification hold a trade qualification. It is likely therefore, that replacement demand coupled with the "normal intake" of apprentices will lead to even higher demand for apprentices. Electrical apprentices were identified as the group most in demand.

Zinifex expressed a concern about the decline in university graduates with qualifications relevant to the mining sector, with a decline in enrolments in mining and metallurgical education. The University of Queensland is the only university currently providing relevant degree courses; we note that Zinifex actively recruits skilled graduates with mining and metallurgical experience from overseas, including South Africa.¹⁹ The market is international for graduates with these qualifications.

Outlook for future employment: increase demand for apprentices especially with electrical/electronic qualifications, instrument technicians to meet replacement/retirement demand, but additional skilled staff required to operate the plant. Average intake of apprentices likely to double, within the range 18-24 each year to 2008.

Increased demand for university graduates in all fields of engineering, metallurgy and environmental professionals.

¹⁸ Formerly Pasmaenco, located at Port Pirie.

¹⁹ The General Manager, Mr Ivan Cauley specifically provided correspondence on this issue to the Centre following personal interview.

NRG Flinders²⁰

In 1986 the company employed approximately 700 staff with a large component of apprentices who received training in supervised workshops, making all replacement parts and fittings for the power generation plants. Ten years later the workforce numbered 200 and by 2005 current employment was 181 with approximately 20 additional contract staff. Planned investment in instrumentation and control systems at the plant to occur progressively out to 2010 will probably reduce maintenance operating staff levels. In the short term training will be required for instrumentation technicians (electronic engineers) as the workforce is upgraded in skill levels. We were informed that the average age of maintenance operator group is 46 years. Instrumentation technician was the only reported current shortage and this occupation was identified as in high demand in future. Currently there are limited job vacancies at the plant and there appears to be significant H-R policies devoted to retaining and rewarding a highly skilled workforce.

The power generation plant is a sophisticated operation requiring that 50 per cent of the current workforce has attained either a professional and associate professional qualification or a trade. At May 2005 the number of apprentices employed totalled 19, plus a clerical trainee and two drafting trainees. On average NRG Flinders has employed 4 first year apprentices each year over the last two to three years. This compares to approximately 25 first year apprentices employed by ETSA in earlier times.

Because of the high level of technical expertise/competence required to operate the plant NRG Flinders looks to recruit and develop skills within its existing workforce and places a strong emphasis on internal training and supervision.

NRG Flinders, while generally happy with the quality of trade training provided by TAFESA, considered that TAFESA was relatively costly and that communication channels needed to be more responsive (“they sent out timetables too late and take too long to get back to you”). Overall, these are minor concerns; the critical training role for TAFESA together with NRG Flinders will be to supply the instrument technicians required in the near future. The company has a relatively stable workforce and continues to hire apprentices in recognition of an ageing workforce but more importantly, the demand for skilled and trained technicians it requires to operate the plant.

Outlook for future employment: Stable, replacement of retirees. Likely to maintain a small recruitment program for first year apprentices.

EDI Rail

In 1998 the company employed 55 permanent staff and 5 contractors, a total of 60 employees. By 2005 the total workforce had trebled to 180 comprised of approximately 114-120 permanent staff and 60 contractors. The contractors are sourced through labour hire firms and are all skilled contractors. Two thirds of EDI Rail permanent workforce are classified as “tradespersons or related workers”.

²⁰

The Port Augusta ETSA owned power generation plant was separated from ETSA in January 1997, became Optima Energy in 1998, then Flinders Power and in July 2000 NRG Flinders. NRG Flinders also owns and operates the Leigh Creek coal field. There are approximately 185 permanent employees at the Leigh Creek mine site. Pacific National is contracted to rail the coal to the power generation plant at Port Augusta, while Works Infrastructure maintains the rail link.

There are three critical trades important to the operations of the company – boilermakers, fitters and electrical trades. Recent “drivers of growth” include the Adelaide to Darwin rail link requiring the modification of freight carriages and 8 locomotives, the building of 4 new locomotives, 65 Ballast Wagons and 55 5Pack container wagons. Planned work includes the build of 58 new wagons for OneSteel to replace older wagons not suitable to transport new ores. EDI Rail has supplied a variety of rolling stock to Pacific National, to sites in Queensland and New South Wales.

The recent trades skill shortage is the result of higher demand but also a “catch-up” from the old system where the major enterprises took on excess apprentices and trained them in their workshops (e.g., ANI, ETSA Utilities, OneSteel, SA Water [E&WS]). This arrangement provided the opportunity for mid-sized and smaller enterprises who did not train apprentices to secure the “overflow from major employers”. However, EDI Rail noted that this system has gone forever, so smaller companies need to train staff and they particularly need to commit to apprentices.

Outlook for future employment: positive growth, but slower than the expansion achieved in the period 1998 to 2005. Rail freight will continue to expand and higher transport costs from the recent “bubble” in oil prices will help the rail freight sector; mining boom will further enhance demand for rolling stock, continued demand from Pacific National, Freightlink, Queensland Rail.

BHP Billiton: Olympic Dam

BHP Billiton currently employ 243 tradespersons and related workers at Olympic Dam with a further 1,046 “labourers, production and transport workers and machine operators”. Many employees in this occupational classification have achieved a trade such as diesel fitters/diesel mechanics. The company expects to increase its apprenticeship in 2006 with up to 15 apprentices required, principally electricians, fitters and diesel mechanics.

Table 3.1
Olympic Dam: Current Operations and Future Expansion

CURRENT		EXPANSION	
GSP	\$1,040 million	GSP	\$2,430 million
GSP	2 per cent	GSP	3 per cent
Employment – Roxby ¹	2,060	Not calculated	-
Direct Employment	1,750	Direct Employment	3,250
Total Employment (SA)	6,240	Total Employment (SA)	14,660
SA Exports	12 per cent	SA Exports	15 per cent

- Notes:
- ¹ Census 2001 there were 2,058 persons employed at Roxby.
 - ² Current population of Roxby Downs is approximately 3,700 (June 2003).
 - ³ Impact on the township would be substantial.
 - ⁴ Direct employment would increase by 1,500 possibly up to 2,000 depending on type of operation, other factors.
 - ⁵ Number of jobs associated with mining activities and flow on impacts estimated to be around 8,400 plus. Total employment impacts are the result of production impacts at the site and induced production elsewhere to support the project, and then additional activity generated as a result of household spending.
 - ⁶ Drawn from report “The Gross Economic Impact of the Proposed Expansion of Olympic Dam on the South Australian Economy”, by the South Australian Centre for Economic Studies, March 2005.

Table 3.1 summarises the current operations and the impact of the proposed expansion, notably an increase in the workforce from 1,750 to somewhere between 3,250 to 3,500. As we indicated earlier, this expansion and the impact on the demand for labour is not analysed in this report, but is taken up in a study on the mining sector. Suffice to say, the proposed construction and operations workforce will require additional skilled workers for all facets of operations (engineering, EH&S, mining and processing).

3.2 Comparison of Tier 1 and Tier 2

The profile of employment in the larger Tier 1 companies and the heavy engineering and maintenance sector, Tier 2 GMUSG group, is quite different as illustrated in Table 3.2

Table 3.2
Occupational Profile: Tier 1 and Tier 2 Companies and all Region

Occupation	Tier 1		Tier 2: GMUSG		ABS All Region
	Number	Per cent	Number	Per cent	Per Cent
Managers & Administrators	67	1.7	71	8.8	5.0
Professionals and Assoc. Professionals	417	10.5	65	8.0	25.0
Tradespersons and Related Workers	911	23.0	347	42.9	17.0
Clerical	168	4.2	56	6.9	30.0
Labourer, Production & Transport Workers	2,392	60.5	270	33.4	23.0
Total	3,955	100.0	809	100.0	100.0

Note: The Centre has not included employment data for some 200 employees in companies eligible to join GMUSG. This implies we obtained data on 5,000+ employees or more than one-fifth of the total workforce.

The aggregate number of tradespersons is highest in the Tier 1 companies, while the proportion of trades to total employment is highest in the GMUSG group at 43 per cent of employees. This reflects the high degree of specialisation in the GMUSG group of companies. Table 3.2 probably understates the number of employees with a trade qualification; for instance, diesel mechanics, general mechanics and diesel fitters are classified under “transport workers” by some companies.

Compared to the profile of total employment in the USG region, for Tier 1 and Tier 2 companies tradespersons represent 26 per cent of the workforce (17 per cent for the region) and labourers, production and transport workers represent 56 per cent of the combined workforce (23 per cent for the region).

Employee characteristics of GMUSG members²¹ are summarised in Tables 3.3 and 3.4.

The typical employee within a GMUSG company is a male tradesperson aged between 25 and 39 and employed full time. Approximately 98 per cent of females were employed in the clerical, administration or management areas. When interviewed the majority of companies indicated they would employ a female as an apprentice/trainee, however none have actively pursued this as a source of increasing their labour supply pool.

²¹ There were 22 respondents to the Centre’s survey.

Table 3.3
Employee Characteristics of GMUSG Members: Age

Employee Characteristics	Number	Per cent
Age		
15-24	83	10
25-39	391	48
40-54	231	29
55-64	94	12
65+	9	1
Total	808	100

Source: SACES Calculations based on returned surveys and projections.

Table 3.4
Employment Characteristics of GMUSG Members: Employment Status and Gender

Employment			Gender		
	Number	Per cent		Number	Per cent
Full-Time	760	94	Males	768	95
Part-Time	48	6	Females	40	5
Total	808	100		808	100

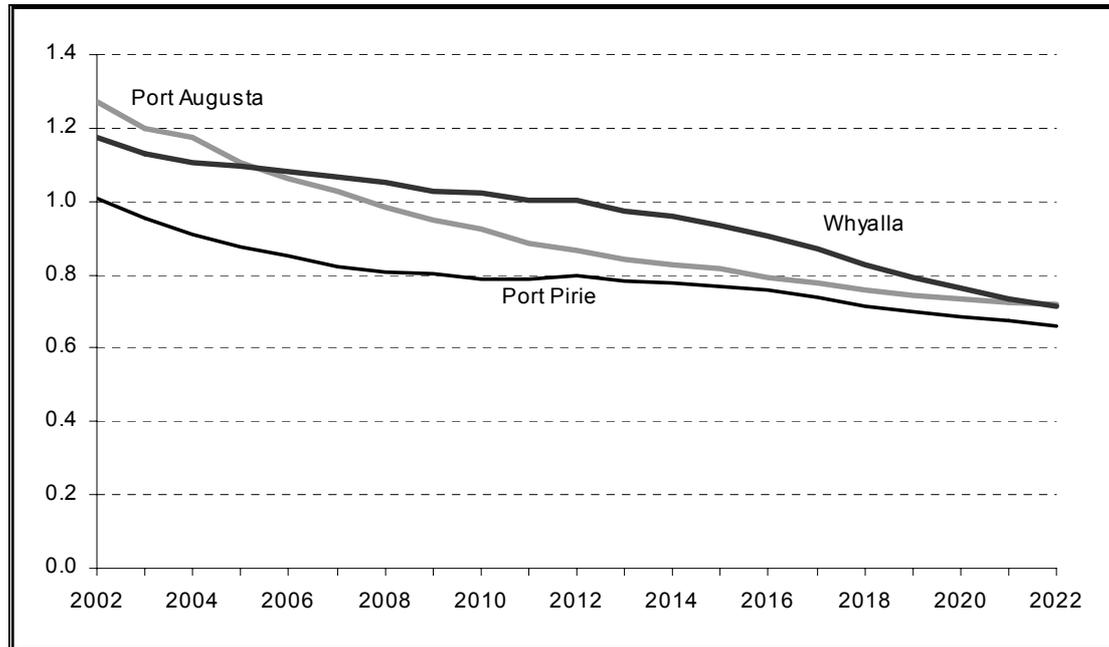
Source: SACES Calculations based on returned surveys and projections.

From Table 3.3 it can be seen that those in the 55 to 65 age group represent 13 per cent of the GMUSG workforce, while those more recent entrants to the labour force aged 15-24 years represent 10 per cent of all employees. Further, in interviews respondents announced their expectation that some 3 per cent of the workforce would retire each year over the next 5 years (i.e., an average of 24 to 25 persons per year). All this suggests that the intake of younger employees will need to increase simply to maintain a constant number of employees, but increase still further to accommodate a replacement rate for retirees (and increase still further to accommodate expansion and growth).

An ageing workforce presents a larger problem than simply finding a replacement for retiring workers through recruitment of younger workers. With retirement comes a considerable loss of skills and experience to industry, much of which has been built up over a number of years. As well, it leaves fewer personnel to train younger workers, which can result in a downward spiral in the number of skilled workers. With this in mind considerable effort must be undertaken to ensure that the skills, knowledge and experience of an ageing workforce is not lost to GMUSG members and the heavy engineering industries in the USG region.

Further, Figure 3.1 shows that the population of persons aged 15-24 in the USG region is likely to decline relative to the population of persons aged 55-64 between now and 2022 which is likely to place further pressure on the supply of young persons to replace retiring workers. It will become more difficult to recruit younger employees.

Figure 3.1
Ratio of Population Aged 15-24 years to Population Aged 55-64 years
Port Augusta, Port Pirie and Whyalla, 2002 to 2022



Source: Projections prepared by the ABS according to assumptions agreed to by the Department of Health and Ageing.

The change in ratio of the population aged 15-24 years to the population aged 55-64 years from 2002 to 2022 for the three Provincial Cities and Roxby Downs (not shown in Figure 3.1) is as follows: Port Augusta 1.3 to 0.7; Port Pirie 1.0 to 0.7; Whyalla 1.2 to 0.7, and Roxby Downs 3.8 to 1.5.

3.3 Skills Demand and H-R Policies

Specifically, for GMUSG members there were 6 occupations consistently referred to as difficult to recruit – and a perception this situation would persist into the future:

- electrical/electronic engineers;
- fitters;
- boilermakers/welders;
- instrument technicians;
- electricians; and
- mechanics.

Some companies interviewed indicated that the inability to attract skilled workers (for example, two companies stated it could employ 10-15 more tradespersons if available) in the occupations of high demand is having a negative impact on the performance of their company in terms of constraints in bidding or accepting new projects. Other companies indicated that although these skills shortages were only impacting at certain times of the year, for example shutdown periods or major projects, this required considerable planning and scheduling effort to overcome.

While some companies indicated that the average hours worked by its employees had increased (in one case from 40 hours to 52 hours per week, in another a 20 per cent increase in overtime) other firms stated that their employees were not working longer hours or undertaking more overtime than normal. A number of companies indicated that they were willing to offer above award wages, productivity bonuses, or other terms such as paid untaken sick-leave to attract and maintain good employees. However, the general perception amongst most companies was that the larger companies had more scope to offer these conditions to attract the skills most in demand.

The agreement amongst most companies interviewed was that skill shortages in the region had emerged in 2002 and were increasing. Within the USG region there is other evidence that the skills listed above have been in demand in the region and for an extended period of time. The identified shortages also match the findings of the Department of Employment and Workplace Relation of those skills in high demand South Australia in 2004.

A review conducted in mid-2003 for the Whyalla Economic Development Board (WEDB) of skills in demand by the heavy engineering and maintenance firms based in Whyalla,²² found specific skilled trades identified by the report as being in shortage were the metal and electrical trades – skills in pressure welding, automated electronic systems (programming and maintenance) and programmable logic controllers, electricians, instrumentation, boilermakers and fitters. A more detailed analysis of this review can be found in Appendix 2.

The feeling amongst GMUSG companies is that the current levels of skills shortages in the region are both cyclical (caused by favourable economic conditions in the region) and structural (caused by a change in the structure of employment in the region particularly with the growth in the mining sector) in nature and therefore, will continue over the medium to longer term.

Expectations amongst GMUSG companies are that the primary influence on their demand for skilled labour in the USG region over the next 5 years will be the introduction and/or expansion of new industries in the region, the largest of which is likely to come from the impact of the expansion of Olympic Dam. Other influences outlined by firms (in order of importance) were:

- Market growth of clients;
- Market growth of own company;
- Upgrades in regional infrastructure; and
- Retirement rates.

Some companies have indicated that in an effort to tackle future levels of skill shortages in the region a greater level of co-ordination and planning was required between larger companies and their contractors in terms of information on up-coming projects etc.

The expectations amongst the larger companies are that the primary influence on their demand for skilled labour in the USG region over the next 5 years will be the level of outsourcing of their maintenance work, with approximately 50 per cent of companies

²² Skills Audit - Heavy Industry Sector of Whyalla, INDEC Consulting 2003. A summary of this study can be found in Appendix 2.

surveyed stating that they expect to increase their use of contractors over the next 5 years. Other influences outlined by firms (in order of importance) were:

- Market expansion of operations;
- Introduction/ expansion of industries; and
- Upgrades of regional infrastructure

Labour hire companies expect the greatest influence on demand over the next 5 years to come from an ageing workforce in the region and from the expansion of the mining sector most notably Olympic Dam. The companies surveyed indicate that their main methods of recruiting labour came from the existing workforce in the region, followed by their own network of offices and finally from the workforce outside of the USG region.

Labour hire companies have in the past been criticised for taking away skilled workers from the core industries in the region, as they can offer higher wages due to their lower overheads (for example lower Workcare levels on employees). One argument put to us was that fewer skilled workers employed in Tier 1 and Tier 2 companies may result in less tradespersons to train apprentices and other workers and as the labour hire companies do not employ apprentices or train their workforce,²³ then over time the overall level of skilled workers in the region will decline.

Indeed this is a view held by some GMUSG companies. However, as stated above approximately 77 per cent of GMUSG companies use contract labour, some of which is sourced from labour hire companies. Since their introduction in the region in approximately 1992, labour hire companies have increasingly facilitated GMUSG companies and others to maintain a smaller, more skilled or ‘core’ workforce in the knowledge that during periods of peak demand labour can be sourced from elsewhere.

3.4 Current Recruitment Methods

A recent study of labour demand in the minerals sector²⁴ across Australia reported shortages of skills and high labour turnover in the following key trades and regions:

- in the mechanical trades (heavy diesel mechanics, fitters, welders, mechanics and technicians) and electrical trades;
- shortage exist at both construction and operational sites;
- skill shortages are most acute in remote regions; and
- turnover is relatively high within both construction and operational sites.

Recruitment difficulties were most severe for technicians and trade areas — specifically many of the skilled trades employed in the heavy engineering and maintenance sector. The nationwide shortage of particular trades is similar to the experience of the GMUSG group. The industry has identified that this has resulted in a lowering of the quality of applicants and new hirers, increased the likelihood of a salary-bidding war, placed greater reliance on contractors and labour-hire firms and heightened concern in relation to an ageing workforce and low apprenticeship intakes.

²³ While one labour hire company did indicate that it undertook training of its workforce and employed apprentices, it is true that most did not.

²⁴ “Prospecting for Skills: The Current and Future Skills Needs in the Minerals Sector”, by NCVET and NILS (2005).

The principal methods of recruiting for GMUSG companies is shown below and are in order of most popular methods used.

- Advertising in Newspaper;
- Employment Recruitment agency;
- Apprentice Schemes; and
- Word of Mouth.

The Internet, which is growing in importance as a source of job advertisements in all industries, was used only marginally by GMUSG companies in attempts to recruit employees.

A number of firms interviewed had attempted to recruit employees over the past year either locally, within the broader Spencer Gulf Region or throughout the State. The response rate for advertisement varied substantially with one company reporting a large response and another only one response. However, it was acknowledged by most companies that they were competing for a shrinking labour pool in the region. Thus the expectation of application/response rates for advertisements was low. As a consequence several companies placing advertisements for new employees, indicated that they were required to lower their 'quality control' and accept applicants that may not wholly match the requirements of the advertised position.

A number of companies indicated an interest in Skilled Migration Programs as a source of recruitment. However, while one firm interviewed had attempted to recruit workers through migration schemes, the perception amongst the majority of GMUSG companies was that the process of recruiting skilled migrants would take considerable time and effort and even if the skilled employee arrived in the region there was no guarantee they would remain for an extended time period.

The majority of companies indicated a willingness to try other Federal and State Government recruitment programs such as the National Indigenous Cadetship Program or the Skills Matching Database. Table 3.5 list some of these programs. However, similar to the Skilled Migration Program, a lack of knowledge of the Government schemes on offer was evident and was deterring a number of firms from pursuing these options. In this context a role exist for a central 'one-stop' information source on the various recruitment options for firms located in regional areas experiencing a skills shortage.

Table 3.5
State and Federal Government Skilled Recruitment Programs - Indicated Willingness to Try/More Information Required – GMUSG companies

Willingness to Try	More Information Needed
Structured Training and Employment Project (STEP)	STEP
Wage Assistance	Employment Innovation Fund
Supported Wage System	Supported Wage System
Regional Sponsored Migration Scheme	School Based New Apprenticeships

Source: SACES.

In recruiting employees, the GMUSG companies listed the four most important grounds for attracting an employee as being:

- Availability of full-time employment;
- Provision of adequate training;
- Good employment conditions; and
- Relationship with co-workers.

In recognition of these factors a number of GMUSG companies were offering improved management practices through supervisory training and up-skilling and multi-skilling options to their workforce, as well as recognising the need to create good morale in the working environment. Other options such as offering career paths to employees proved difficult for a number of companies due to their small size.

Because traditionally, recruitment by companies within the USG region has come from persons living within the region, three grounds for attracting employees that were not given a high level of importance by the GMUSG companies were:

- The availability of social networks;
- Transport and health services; and
- The provision of adequate housing.

However with a shrinking labour pool in the region, firms will need to recruit from a wider area (with the internet being complementary to achieving this) and to potential employees re-locating to a new region these factors can be as important as the availability of full-time employment or remuneration levels.

3.5 Group Training

Group Training Organisations (GTO) such as Statewide and Career Employment Group are very active in the recruitment market for new apprentices. As an indication of the competitiveness of the labour market, TAFESA informed the Centre that GTO's were more active in recent times competing to "get pre-vocational students and sign them up". Individual employers were also more active, working closely with TAFESA and RTOs to attract and recruit pre-vocational students. The Centre has reviewed outcomes for pre-vocational students (see Section 4.3) noting that 82 per cent of pre-vocational students gained employment; further, many students withdrew from their course to take-up an apprenticeship or some other employment.

3.6 Conclusion: Demand for Labour in the Upper Spencer Gulf

The Centre surveyed large companies, the GMUSG group, labour hire firms and group training organisations to ascertain those occupations/skills in most demand at this time and to assess those likely to be in most demand out to 2010. The first "test of skills in demand" was to assess positions recently advertised or notices listing current vacancies. In several of the companies visited and most of the larger companies, we were shown recent job advertisements or listings of positions vacant. A second "test" was to review the list of contract workers by occupation supplied by labour hire firms to GMUSG members.

Some 77 per cent of the GMUSG companies surveyed had used contract workers within the past year. Table 3.6 indicates those occupations for which contract worker were sourced. As expected trades such as fitters, boilermakers and electricians experienced the greatest demand, as they are traditionally associated with the heavy engineering sector. These trades are also those nominated by GMUSG firms as being in greatest demand to fill permanent employment positions.

Table 3.6
Occupations in High Demand From Labour Hire Firms by GMUSG Companies

Contract Workers	Per cent	Contract Workers	Per cent
Fitters	18	Truck drivers	9
Boilermakers	18	Instrument Technician	3
Electrical Fitter	15	Electrician	3
General labourers	9	Machinists	3
Welders	9	IT Technician	3
Trades assistants	9	Crane Drivers	3
Scaffolder/ riggers	9	Total	100

Source: SACES.

Other occupations, which appear in high demand from GMUSG companies as both permanent and contract employees, include Instrument Technicians, Scaffolder/Riggers and Crane Drivers.

Finally, using the data on current and future skill shortages in the USG region collected from surveys and interviews with the GMUSG companies, large companies and labour hire companies, Table 3.7 summarises those occupations that are considered to be in very high, high and moderate demand now and over the next 5 years.

Table 3.7
Summary of Occupations in Demand –USG Region - Now and 5-Years

Now	Next 5 Years
Very High	
Electrical Fitters	Electrical Fitters, Electrician
Boilermakers/Welders	Boilermakers/Welders
Fitters (Mechanical and Diesel)	Fitters (Mechanical and Diesel)
Instrument Technicians	Instrument technicians
High	
Electricians	
Electrical Engineers	Riggers/Scaffolders
Riggers/Scaffolders	Electrical Engineers
Mechanics	Mechanics
Machinist	Machinist
Carpenter	Carpenters
Moderate	
Electronic Technicians	Toolmakers
Welder	Welder
Crane Drivers	Electronic Technicians
Toolmakers	Crane Drivers
Sheet Metal Workers	-

Source: SACES.

It appears that evidence is widespread in the USG region of the existence of skill shortages in a number of occupations traditionally associated with the heavy engineering sector. Skill shortages in the region began to emerge in 2002 and over recent years there has been an acceptance by a number of companies that these shortages are as much structural as cyclical and are therefore likely to remain for a number of years.

In an effort to combat the smaller pool of skilled workers in the region and as a result of difficulties experienced when trying to recruit workers from surrounding regions, a number of firms have concentrated on up-skilling and multi-skilling of their current workforce, as well as improving working conditions and remuneration. This is being undertaken not only to improve the efficiency and productivity of employees, but as an attempt to insure against approaches from other companies in a competitive labour market where ‘poaching’ is evident.

The “labour market environment” and potential responses can be understood as:

- increasing competitive pressure to acquire skilled labour;
- active recruitment of pre-vocational students and strong competition for these students;
- an ageing workforce combined with a number of larger projects means there is more emphasis on recruitment;
- given the above conditions, the internet will need to be used more often by GMUSG, government programs to attract skilled labour will need to be harnessed, while the labour pool could be expanded to include young women and indigenous workers; and
- there will need to be more commencements in pre-vocational courses and an increase in the number of courses.

4. Analysis of Current Training Response

Terms of Reference

- Describe the current training response and consider opportunities for new recruits to enter the workforce;
- Identify training programs and opportunities to increase intake to meet projected skills/occupation shortages; and
- Consider current training support by GMUSG members.

4.1 Introduction

Changes in management practices including, *inter alia*, the use of contractors and outsourcing of specific functions, staff downsizing, changes in the IR environment, growth of labour hire firms and privatisation of government utilities have all contributed to a long-term reduction in apprenticeship training in the USG region.²⁵ In the past, a number of Government and larger private organisations in the region were responsible for employing large numbers of apprentices, and annual intakes by these companies would exceed 50 or 100 apprentices. After completing their 4-year term, many of these apprentices were then released to the labour market increasing the pool of skilled workers in the region.

On the supply side apprenticeships have been less attractive to young people for a number of reasons. While the training system and employer groups have endeavoured to respond through group training schemes, changes to the length of training, the development of new curriculum based on modules to acquire specific skills, and the introduction of training levies, etc., it remains an open question as to whether the responses have been sufficient, especially when faced with major demographic change in workforce and lower numbers of young people entering the workforce.

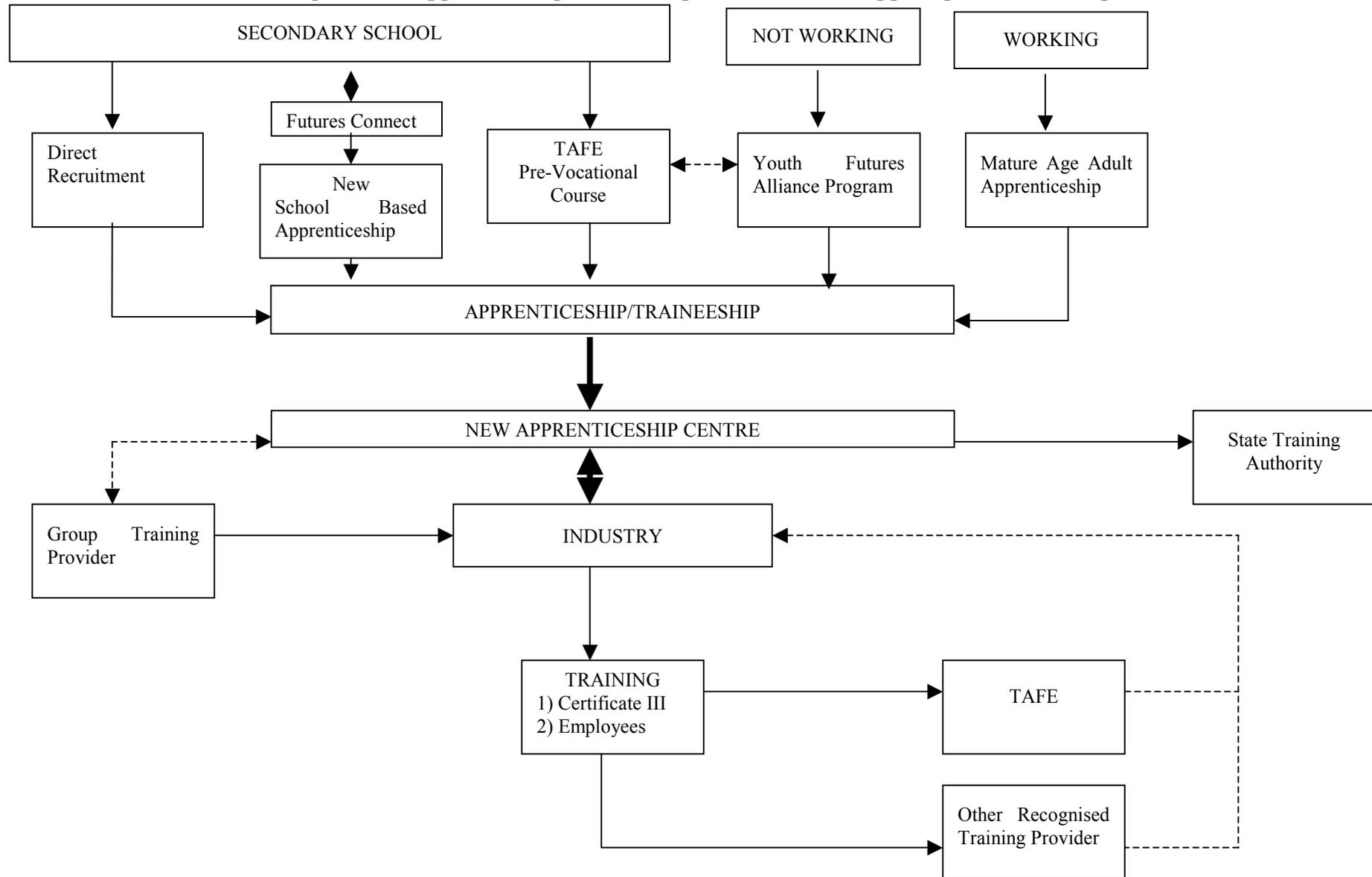
Now, as pressure increases on the available pool of skilled labour in the upper USG region employers are recognising the need to train and up-skill their current workforce for their own benefit and to retain employees. However, there is also recognition amongst employers that once trained an employee becomes a more valuable asset to all companies in the region and there is already some evidence of a degree of ‘poaching’. Evidence also exists of a number of firms willing to take on employee’s whose skills do not completely match the job requirement and train them to suit.

Training rates are only a partial measure of the supply of skills. However, both apprenticeships/traineeships and employer sponsored training are essential to ensuring a consistent pool of skilled tradesperson in the region.

This section describes both the intake of apprentices in the Upper Spencer Gulf region and the level of training that is occurring within companies in the region to up-skill and maintains their current workforce. The following discussion commences at the school level with school based training to pre-vocational enrolments, to programs to involve the unemployed and mature age apprenticeships. There is no “one to one” or “exact” matching of skills in demand to either specific course enrolments or the volume of enrolments. Matching the demand for

²⁵ Apprenticeship training refers to the traditional trade trainers and not “new apprenticeships”, pre-vocational entry courses or school based new apprenticeships.

Figure 4.1: Apprenticeship/Traineeship - Process in the Upper Spencer Gulf Region



labour with then, specific training to match occupations can never be that precise. Our principal interest therefore, is with the actual number of enrolments, completions or graduations to assess whether the supply of graduates is at least sufficient to match demand.

Figure 4.1 provides an outline of the process involved with the intake of apprentices and trainees in the Upper Spencer Gulf Region. Applicants gain an apprenticeship or traineeship either having undertaken one of the listed vocational programs, with current industry experience or whilst currently enrolled at secondary school. A Training Contract is then signed which complies with industrial agreements or awards and is forwarded to a New Apprenticeship (or other relevant) Centre for registration with the State Training Authority. The employer selects a registered training organisation (RTO), and a Training Plan is agreed with the apprentice/trainee. When all the units of competence specified in the training program have been attained a Certificate Level II or III qualification is awarded and the RTO informs the State Training Authority, which enables the completion of the training contract.

4.2 Secondary Schools and School Based New Apprenticeship (SBNA)

With over 2000 secondary school students (of relevant apprenticeship age) in the USG region, secondary schools are a prime source of supply for apprenticeships and traineeships. A number of apprentices and a larger share of trainees employed in the region are recruited from secondary schools (rather than pre-vocational courses) either directly through advertising etc., or to a lesser degree through the School Based New Apprenticeship (SBNA) scheme.

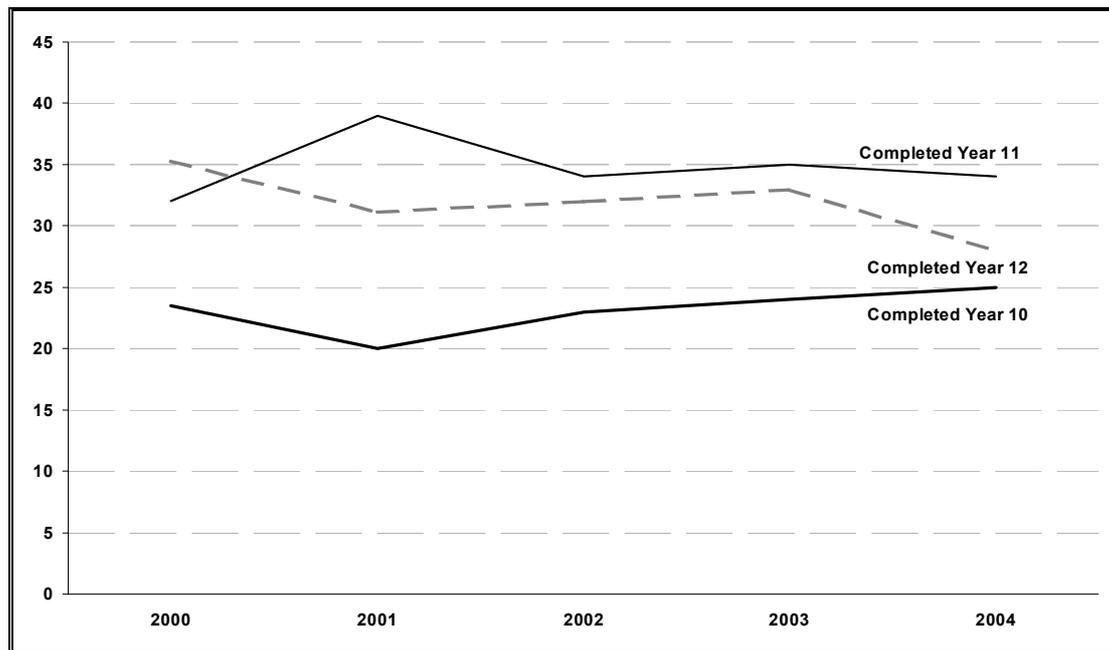
Figure 4.2 shows the highest grade of school completed by apprentices and trainees during the period 2000-2004. Here, the trend over the period shows a decrease in the number of trainees and apprentices who had completed Year 12 from 35 per cent in 2000 to 27 per cent in 2004 and an increase in numbers who completed Year 10 (from 20 per cent in 2001 to 25 per cent by 2004 and little change in the Year 11 group.

With the increase in COT by Year 10 students and smaller declines for Year 11 and Year 12, a perception has taken hold that schools are primarily concerned with preparing students for university entrance. This is despite TAFE and a number of larger and smaller companies in the region being actively involved in secondary schools to promote apprenticeships to students. Notwithstanding these efforts, there may be a view that a university course leads to a more secure future than a trade.

Until recent times the issue of apprentice wages relative to wages paid to new entrants in other industries has not been raised.

Tables 4.1 below gives a comparison of wage rates paid to first year apprentices in the metal trades (fitters, boilermakers etc) and job classifications that could be thought of competing against apprenticeships for school leavers. It shows for the metal trades a first year apprentice is paid more than an unapprenticed junior but less than a Clerical Officer Class 1. For similar classifications in different industries, a first year apprentice is paid less than an entry-level employee in the retail sector, in hospitality sector consisting of hotels/clubs and accommodation industries.

Figure 4.2
Contracts of Training Commenced During Year by Highest Grade Student Completed Prior to Commencement, 2000-2004 - Upper Spencer Gulf Region (Per cent)



Source: Department of Further Education, Employment, Science and Technology, unpublished data.

Table 4.1
First Year Apprentice Wages and Competing Classifications

Award	Classification	Weekly Rate \$
Metal Industry	Unapprenticed Junior (18 years and under)	229.00
Metal Industry	First Year Apprentice	240.74
Metal Industry	Clerical Officer Class 1 (16 years and under)	260.90
Clubs Hotels and Motels	Level 1 (16 years)	253.50
Retail Industry	Clerical Officer Class 1 (16 years and under)	263.20

Source: Relevant Federal and State Based Industry Awards (Metal, Building etc), July 2005.

For a first year adult apprentice,²⁶ Table 4.2 shows that while wage rates are higher, a large differential still exist between adult apprentices, process workers, and trades labourers in the metal industry.

Table 4.2
First Year Adult Apprentice Wages and Competing Classifications

Award	Classification	Weekly Rate \$
Metal Industry	Adult Apprentice – First Year	443.04
Metal Industry	Process Operator (Level 14)	467.40
Metal Industry	Trades Assistant	527.50

Source: Relevant Federal and State Based Industry Awards (Metal, Building etc), July 2005.

²⁶ An Adult Apprenticeship means a person over 21 years of age when entering an apprenticeship

Table 4.3 compares both first year and adult apprenticeship wages with relevant entry classifications under the OneSteel Employees award. It indicates that both first year and adult apprentices wages are less than entry-level wages for process workers at OneSteel.

Table 4.3
First Year and Adult Apprentice Wages and Competing Classifications –
OneSteel Employees Award

Award	Classification	Weekly Rate \$
OneSteel Employees Award	First Year Apprentice	267.04
OneSteel Employees Award	Unapprenticed Junior (18 years and under)	358.40
OneSteel Employees Award	Adult Apprentice – First Year	358.40
OneSteel Employees Award	Production Worker – Level 0	535.50

Source: OneSteel Employees Award.

It may very well be that a “short-term employment focus” contributes or deters students from applying for apprenticeships or attendance at pre-vocational courses, but without a guarantee of future employment it is understandable that an apprenticeship appears less attractive than other employment/occupations.

In terms of the number of School Based New Apprenticeships commenced in the Upper Spencer Gulf, Flinders and Far North regions between 2001 and 2004, Table 4.4 shows the Certificate II in Retail Operations (12 months) followed by the Certificate II in Farming (12 months) were the most popular. For the automotive engineering and electrical sectors in the region, the number of SBNA increased from 1 in 2001 to 13 in 2004. The majority of these were at the Certificate II level in Automotive Mechanical (Vehicle Servicing) and Engineering Production Employee Level III.²⁷ While the increase in these trades from 3 per cent to 14 per cent of all SBNA in the region between 2001 and 2004 is encouraging it represented 10.7 per cent of all the SBNA, whereas employment in construction, mining and manufacturing is 12 per cent in Port Augusta, 27 per cent in Port Pirie and 33 per cent in Whyalla. Retail on the other hand is 19 per cent of total employment in the region, yet enrolments represent more than 50 per cent of all SBNA.

Table 4.4
Number of School Based New Apprenticeships and Traineeships
Northern Region, Upper Spencer Gulf, Flinders 2001-2004

Year	Retail	Agric/Fish	Auto/Eng/Elec	Other ⁽¹⁾	Total	Auto/Eng/Elec as Percentage of Total
2001	6	21	1	3	31	3
2002	37	16	3	2	58	5
2003	48	15	11	8	82	10
2004	48	8	13	22	91	14
Total	139	60	28	35	262	10

Note: ⁽¹⁾ Includes Hairdressing, Clerical, Bar and Waiting.

Source: Department of Education and Children’s Services

²⁷ Certificate II level is traineeships, Certificate III level is an apprenticeship.

Amongst the companies interviewed, only very small minority was actively involved in the SBNA scheme at the apprentice or trainee level and less than 5 per cent of apprentices and traineeships employed by GMUSG companies came from SBNAs.

Some of the smaller companies stated that they would be attracted to the part-time employment nature of the SBNA scheme where an apprentice would attend the workplace for 1 or 2 days of the week. However, many of the larger organisations viewed the scheme less favourably with most commenting on the need to have an apprentice full-time as part of the team building process. One important reason for this, whatever the educational merit of SBNA, is that a SBNA student is offered without skills to an employer on a part-time basis, whereas a pre-vocational student has attended a training course, possesses skills that are useful to an employer and is more valuable to an employer.

In general, we identify a lack of knowledge amongst companies interviewed of the SBNA scheme and an unwillingness to commit to this form of employment and training. The majority of firms did not know of the availability of support staff acting for industry and secondary schools who were responsible for coordinating the scheme with industry in South Australia.

There are significant barriers to the uptake of SBNA²⁸; a lack of information, the part-time nature of attendance and rostering, management and supervision issues that arise in the workplace, and OH&S concerns for the student in unfamiliar work environments.

4.3 Prevocational Courses

In the Upper Spencer Gulf region, a number of apprentices in the construction and engineering sectors (mechanical, fabrication, electrical, automotive, building trades) come from persons who have completed a pre-vocational course at TAFE.

Table 4.5 which is for selected pre-vocational enrolments between 2000 and 2004 at the four campuses of the Spencer Institute of TAFE Port Augusta, Port Pirie, Whyalla and Roxby Downs, indicates that over this period the number of pre-vocational places in the region increased from 109 to 129 places. We are informed that the region which also includes Kadina has funding for 135 pre-vocational places in 2005 but not all places are filled. Anecdotal evidence provided by the Spencer Institute of TAFE indicates a degree of difficulty in achieving the full quota of enrolments of approximately 15 students per course in some pre-vocational courses each year.

We estimate that 82 per cent of pre-vocational students either completed their course, completed and received the TAFE parchment and/or withdraw from a course to take up employment. For example, in Table 4.5 for Roxby Downs, 100 per cent of the 2004 Certificate II Vocational Education – Multi – Trades – General course withdrew to accept an apprenticeship near to the time of completion or actually completed the course. Approximately 18 per cent of all students withdraw and fail to complete their course. This 18 per cent of 135 pre-vocational places equates to 24 students – 24 potential apprentices or 120 over 5 years. This is approximately one-fifth of the estimated requirement out to 2010.

²⁸ There may be more barriers in the heavy industry sector because of the work environment than compared to the retail sector, community services or health sectors.

Table 4.5
Prevocational Enrolments at the Spencer Institute of TAFE, 2000-2004

Year	Course	Intake	Graduates	Non Grad ⁽¹⁾
Pre - vocation Numbers - Port Augusta				
2000	Cert II Vocational. Education – Multi-Trades- General	29	25	4
2000	Cert I Vocational. Education – Multi-Trades- Auto	23	0	23
2001	Cert II Vocational. Education – Multi-Trades- General	29	24	5
2001	Cert I Vocational. Education – Multi-Trades- Auto	16	0	16
2002	Cert II Vocational. Education – Multi-Trades- General	22	15	7
2003	Cert II Vocational. Education – Multi-Trades- General	29	15	14
2003	Cert I Vocational. Education– Multi-Trades- Electrical	11	8	3
2004	Cert II Vocational. Education – Multi-Trades- General	24	8	16
Pre - vocation Numbers - Port Pirie				
2000	Cert II Vocational. Education – Multi-Trades- General	21	17	4
2001	Cert II Vocational. Education – Multi-Trades- General	31	24	7
2002	Cert II Vocational. Education – Multi-Trades- General	96	9	87
2003	Cert II Vocational. Education – Multi-Trades- General	18	7	11
2004	Cert II Vocational. Education – Multi-Trades- General	27	3	24
2004	Cert I Vocational. Education – Multi-Trades- Mech	8	0	8
Pre - vocation Numbers - Whyalla				
2000	Cert II Vocational. Education – Multi-Trades- General	26	11	15
2001	Cert II Vocational. Education – Multi-Trades- General	30	13	17
2002	Cert II Vocational. Education – Multi-Trades- General	32	19	13
2003	Cert II Vocational. Education – Multi-Trades- General	29	22	7
2003	Cert I Vocational. Education – Multi-Trades- Elec	14	1	13
2004	Cert II Vocational. Education – Multi-Trades- General	29	17	12
2004	Cert I Vocational. Education – Multi-Trades- Elec	15	7	8
2004	Cert I Vocational. Education – Multi-Trades- Auto	11	0	11
Pre - vocation Numbers - Roxby Downs				
2000	Cert II Vocational. Education – Multi-Trades- General	10	1	9
2001	Cert II Vocational. Education – Multi-Trades- General	10	0	10
2002	Cert II Vocational. Education – Multi-Trades- General	15	3	12
2003	Cert II Vocational. Education – Multi-Trades- General	8	0	8
2004	Cert II Vocational. Education – Multi-Trades- General	15	0	15

Note: ⁽¹⁾ The non- graduates count is high because many students leave, having gained employment before finishing the course.
Source: Spencer Institute of TAFE.

It is to be expected that there will be withdrawals (and some non-commencements) from any course. We would encourage effort to reduce the “failure to complete/withdrawal rate”, to back-fill all non-commencements and to more heavily promote pre-vocational courses as a pathway to employment, an apprenticeship and a career.

Employers should consider the role they might play in encouraging retention rates, including *inter alia*, higher starting salaries for graduates, demonstration of career pathways and through direct offers of employment.

Knowledge of pre-vocational courses was widespread amongst employers interviewed. During interviews with GMUSG members a number of issues were raised concerning pre-vocational courses.

A surprisingly large number of employers commented on the literacy and numeracy skills of their new apprentices, predominantly as they apply to the engineering trades. Although this problem is likely to have roots in the primary and secondary school sectors, suggestions by employers of a greater emphasis on engineering numeracy and literacy at the pre-vocational level were offered. We consider it would be advantageous to employers and the training providers if discussions were held to find ways to improve the level of familiarity with engineering knowledge and skills.

A smaller number of employers mentioned the difficulty some pre-vocationally trained apprentices found in adjusting to the ‘discipline’ of the work environment and the commitment of a 38-hour working week. Again solutions offered included a greater emphasis on the ‘work ethic and commitment’ within the course.

Finally, one employer preferred not to recruit apprentices from pre-vocational courses but instead to employ ‘raw’ apprentices so they can be trained as required without any pre-conceived ideas about the workplace. This would appear to be a personal choice of the employer and not widespread amongst the GMUSG members.

In this study we cannot hope to consider every issue related to training supply but it does appear that several topics warrant further examination:

- GMUSG employers and Tier 1 companies in the current environment will recruit all pre-vocational graduates in the relevant fields of study;
- greater efforts need to be made to fill all available places, to retain students and raise the completion rate;
- “staying in and completing courses” is a pathway to paid employment and a career, and employers have a supportive role to communicate this and then ensure that the young person is rewarded;
- there was a view that “we cannot get enough kids to enrol”. Employers can assist by helping to advertise employment where young applicants are interviewed and first directed to the relevant pre-vocational course. Perhaps joint advertising by employers and TAFESA could be investigated;
- the region has a high youth unemployment rate;
- after completing a pre-vocational course and commencing a trade, once employed, the apprentice will leave the trade and become an operator/machinist where the pay is above what a tradesperson (often working 12 hour shifts or overtime) will earn;
- employer commitment to employ graduates from pre-vocational courses and programs such as the Whyalla Youth Futures Alliance could assist to increase retention rates;
- wage rates for apprentices are not competitive with wage rates in other sectors of the economy; and
- graduation or completion rates can vary between 50 to 80 per cent and we encourage a review of this situation.

In general, industry opinion of pre-vocational courses was positive with most employers preferring a pre-vocational qualification when recruiting apprentices. A number of employers said they would be willing to take a wider interest in the content and design of pre-vocational courses should they be asked. This invitation needs to be acted upon.

Again, we restate that to do the following:

- fill all commencements, increase retention and completion rates provides an additional 24 apprentices a year or approximately 100²⁹ over 5 years;
- one more course per year of 15 students via recruitment through the Whyalla Youth Futures program (and its equivalent in Port Augusta and Port Pirie) provides 40 additional apprentices a year or 200 over 5 years; and
- one more “regular” pre-vocational course in each of Whyalla, Port Augusta and Port Pirie per year provides 40 additional apprentices a year or 200 over 5 years;³⁰

and this would approximate employer requirements (see later discussion).

4.4 Whyalla Youth Futures Alliance Program (WYFAP)

In 2004, approximately 10 per cent of apprentices and traineeships in the USG region came from the Whyalla Youth Futures Alliance Program. This is a year-long program run by the Whyalla Economic Development Board, the Spencer Institute of TAFE the Edward John Eyre High School (EJEHS), OneSteel and number of local Whyalla based companies. It is targeted at unemployed youth and involves a semester of education and personal development at the EJEHS and a semester at Spencer TAFE completing the equivalent of the first year of an apprenticeship (in either the Mechanical or Electrical stream). The program includes a ‘phased-in’ transition approach to TAFE from EJEHS, as well as work experience, career mentoring and work preparation elements (including interview preparation) which ensures participants are prepared for the workforce as apprentices and trainees upon completion.

Table 4.6 indicates the program has so far been relatively successful with over 80 per cent of the thirty previously unemployed participants securing employment, or electing to continue with their studies. As well, with over 90 per cent of mechanical and electrical tradespersons in the USG region being male, it is encouraging that the program has a number of females enrolled.

Based on the success of the program in the mechanical and electrical streams, the Whyalla Economic Development Board has secured funding for another 30 places in the community services industry which will help to ease industry shortages in aged care, nursing, child care and early childhood teaching.

Table 4.6
Outcomes: Whyalla Youth Futures Alliance Program: 2003 and 2004

Year	Participants (Number)	Employment Outcomes (Per cent)	Further Study (Per cent)
2003	30	63	23
2004	30	53	23

Source: Whyalla Economic Development Board.

²⁹ We should allow some withdrawal rate for any course (and also in the discussion of the next two dot points).

³⁰ The location could be Roxby Downs – we are indicating an additional 3 courses of 15 students each.

Approximately half of the companies interviewed were familiar with this program. A large percentage approved of the structure of the program and were willing to consider employing a graduate from this program.

4.5 Mature Age Apprenticeships

Estimates are that between 5 and 10 per cent of engineering apprentices in the USG region come from mature age apprentices. Mature age apprentices are undertaken by persons 21 years and over on commencement of their apprentice. Given the difficulty in attracting school leavers to the industry this type of apprenticeship is highly valued by employers as a partial solution to the problem of skill shortages.

Amongst the GMUSG companies interviewed there was a growing recognition of the advantages of mature age apprentices in terms of applicants already having industry experience and commitment. A small number of companies have taken on mature age apprentices.³¹ The majority of companies, however, including those who have employed mature apprentices, have a poor knowledge of the ability to reduce the contract of training for a mature apprentice from 4 years to 3 years as a consequence of previous industry experience or training undertaken.

It should be investigated whether there is scope to reduce still further the period of training, accompanied by the opportunity to build skills through enrolling in additional modules.

4.6 Apprenticeships and Traineeships – Upper Spencer Gulf Region

Table 4.7 shows the total number of contracts of training (apprentices and traineeships) commenced in the Upper Spencer Gulf Region and South Australia each year between 2000 and 2004. While there was a slight dip in 2003 there has been an upward trend in the number of contracts of training commenced since 2001, with strong growth in 2004.

Table 4.7
Contracts of Training Commenced During Year, All Training
Upper Spencer Gulf and South Australia, 2000-2004

	Upper Spencer Gulf Region (Number)	South Australia (Number)	USG as per cent of SA
2000	330	24,479	1.3
2001	757	18,242	4.1
2002	766	20,301	3.8
2003	730	21,603	3.3
2004	1,097	21,031	5.2

Source: Department of Further Education, Employment, Science and Technology, unpublished data.

Only in 2004 did the contracts of training exceed the region's share of total State employment.

³¹ Includes Engineering, Business, Retail, Health and Beauty etc. sectors.

Our principal concern is with contracts of training that are relevant to the GMUSG (Tier 2) companies and the Tier 1 companies. Table 4.8 shows selected relevant vocations for the engineering sector in which contracts of training were commenced in the USG region in the period 2000 to 2004.

Table 4.8
Contracts of Training Commenced, by Selected Heavy Industry Vocations,
Upper Spencer Gulf – Number, 2000-2004

Vocation -Number	2000	2001	2002	2003	2004	Total
Asset Maintenance	10	27	56	11	24	128
Automotive Tradesperson (Auto Electrician)	0	0	2	9	12	23
Carpentry	8	4	9	2	2	25
Civil Construction And Maintenance Worker	0	2	6	11	13	32
Construction Worker Grade 1	0	1	0	3	10	14
Electrical Tradesperson (Electrician)	0	15	14	18	24	71
Electrical Tradesperson (Refrigeration)	1	2	5	6	5	19
Electrical/Electronics Trades Assistant	0	4	4	1	4	13
Engineering Production Employee Level III	4	13	15	21	26	79
Engineering Tradesperson (Electrical/Electronic)	1	2	1	1	1	6
Engineering Tradesperson (Fabrication)	0	19	5	17	25	66
Engineering Tradesperson (Mechanical)	1	19	14	16	27	77
Information Technology	1	6	8	10	7	32
'Instrumentation Tradesperson (Electrical/Electronics)	2	9	4	5	6	26
Motor Mechanics	1	8	21	9	8	47
Motor Mechanics (Diesel)	0	8	9	9	8	34
Laboratory (Technical Assistant)	0	0	0	5	7	12
Painting & Decorating	0	0	0	2	5	7
Television/Radio/Electronics Tradesperson	0	0	0	0	1	1
Total	29	139	173	156	215	712

Source: SACES based on Department of Further Education, Employment, Science and Technology and NCVET unpublished data.

It is pleasing to note that contracts of training have grown strongly from a very low base in 2000 for those trades traditionally associated with the heavy engineering sector namely mechanical tradespersons; electrical tradespersons; and fabrication tradespersons. However, in some other trade skill/occupations with the potential for skills shortages such as electronic tradespersons and instrument technicians, there have only been moderate gains in numbers.

The number of commencements of training undertaken in any year has a direct effect on “in-training” levels in the following years.³² Table 4.9 shows the large increase in contracts of training have flowed through to correspondingly increase the total number of engineering, electro-technology, construction and automotive apprentices/trainees in training, particularly in the years 2003 and 2004.

³² In theory, the number of training commencements in one year should directly boost the number of apprentices and trainees in training the next year. However, due to the way the NCVET reports data, in that for “confidentiality purposes”, where commencements range between 1 and 10 for a particular qualification, an (a) instead of the actual number of commencements, has been allocated, this is likely to understate the number of commencements of training in any one year relative to those in training, making direct comparisons between commencements in one year and in training in the next difficult.

Table 4.9
Contact of Training – Total Numbers in Training by Qualification, Selected Heavy Engineering Vocations, Upper Spencer Gulf Region: 2000 to 2004

Training Package Qualification - Number	2000	2001	2002	2003	2004	Total
Certificate II in Engineering - Production	20	70	50	60	90	290
Certificate III in Engineering - Mechanical Trade	20	80	140	180	190	610
Certificate III in Engineering - Fabrication Trade	30	70	110	130	160	500
Certificate III in Electrotechnology - Electrician	20	60	110	170	190	550
Certificate III in Electrotechnology Refrigeration	10	20	30	40	50	150
Certificate III in Electrotechnology Instrumentation	10	20	40	40	50	160
Certificate III in General Construction (Carpentry)	30	80	90	120	150	470
Certificate III in Automotive (Light Vehicle)	20	30	50	80	100	280
Certificate III in Automotive (Heavy Vehicle)	10	10	20	40	30	110
Certificate III in Automotive (Diesel Fitter)	0	0	10	10	10	30
Certificate III in Engineering - Electronic	10	10	10	10	0	40
Total	180	450	660	880	1020	3190

Source: SACES based on Department of Further Education, Employment, Science and Technology and NCVER unpublished data.

Table 4.10 shows the proportion of heavy engineering apprentices in training as a percentage of all persons in training (including Business, Retail, Information Technology etc.), in the region have substantially increased for most trades, particularly the mechanical, fabrication and electro-technology trades between 2001 and 2004.

Table 4.10
Contract of Training by Qualification, Selected Heavy Engineering Vocations, Upper Spencer Gulf Region: 2000 to 2004, (Per cent)

Training Package Qualification - Percent	2000	2001	2002	2003	2004
Certificate II in Engineering - Production	0.7	2.4	1.6	1.8	2.4
Certificate III in Engineering - Mechanical Trade	0.7	2.8	4.6	5.3	5.1
Certificate III in Engineering - Fabrication Trade	1.1	2.4	3.6	3.8	4.3
Certificate III in Electrotechnology - Electrician	0.7	2.1	3.6	5.0	5.1
Certificate III in Electrotechnology Refrigeration	0.4	0.7	1.0	1.2	1.3
Certificate III in Electrotechnology Instrumentation	0.4	0.7	1.3	1.2	1.3
Certificate III in General Construction (Carpentry)	1.1	2.8	2.9	3.5	4.0
Certificate III in Automotive (Light Vehicle)	0.7	1.0	1.6	2.3	2.7
Certificate III in Automotive (Heavy Vehicle)	0.4	0.3	0.7	1.2	0.8
Certificate III in Automotive (Diesel Fitter)	0.0	0.0	0.3	0.3	0.3
Certificate III in Engineering - Electronic	0.4	0.3	0.3	0.3	0.0

Source: SACES based on Department of Further Education, Employment, Science and Technology and NCVER unpublished data.

Intake of Apprenticeships and Trainees– GMUSG Companies

Table 4.11 shows the number of apprentices currently in training with GMUSG companies in the Upper Spencer Gulf region. It is not the total number of all apprentices, as several companies did not complete the survey questions. However, amongst respondents the largest intake of apprentices/trainees occurs in the trades of boilermaker, fitter and electrician, which are among the skills most in demand in the region. Nearly one third of the companies surveyed indicated that they intended to slightly increase or substantially increase their take-up of apprentices over the next 5 years.

Table 4.11
Apprenticeships by Trade, GMUSG Companies – Number and Percentage

Apprenticeship by Trade	Number	Per cent
Fitters	18	33
Boilermakers	18	33
Electrician	5	9
Boilermakers/Welders	4	7
Instrument Technician	4	7
Mechanics	4	7
Riggers	2	4
Total	55	100

Source: SACES calculations based on survey data.

Training and GMUSG Companies

On going skill shortages in the region and difficulties associated with recruiting employees with the required skills levels has resulted in a mindset amongst most of the employers surveyed of the need to train employees not only for productivity and workplace performance, but also to improve workplace morale and prevent the migration of workers to other companies. In this context, there was acceptance by most firms of training costs as a component of normal business operating costs. Some firms were also willing to employ persons whose skills did not match exactly the job requirements and then accept the cost of providing the required training.

There was, however, also a recognition amongst employers surveyed that once an employee is trained they become a more valuable asset to all companies in the region. In effect, training and skills development increases the potential for and reality of labour mobility. Some employers have had the experience of supporting training only then to lose the individual to another employer in the region. For these employers, this has had a negative impact on future levels of training provided.

For the GMUSG companies 90 per cent of those surveyed indicated that they undertook some form of internal training. This fell to 82 per cent for external training. Table 4.12 shows the percentage of GMUSG companies who undertake training by category of training.

Table 4.12
GMUSG Firms who Undertake Training - by Category of Training

Training Category	Per cent
New technologies and equipment	55
Health and safety issues	64
Equal employment issues	18
Environmental issues	55
Quality issues	64
Improved work skills	82

Source: SACES.

Almost all firms surveyed indicated they conducted some form of internal training to improve work skills. Training for health and safety issues and quality issues were the next highest categories. Training for equal opportunity and employment issues was only provided by 18 per cent of companies.

Amongst the firms surveyed there was an expectation of a continuing demand for courses that provided leadership and other skills in the areas of Front Line Management, Supervision and Business Management Skills. As well, courses (especially basic – entry level training courses) in the areas of laboratory Operations, Scaffolding and Rigging and Heavy Equipment Operation were expected to remain in high demand.

With such a high percentage of GMUSG companies surveyed undertaking either internal, external or supporting both forms of training, Table 4.13 indicates the category of major training provider preferred. From the table, it can be seen that 45 per cent of firms surveyed chose TAFE as their major training provider. This was followed by 22 per cent for private training providers.

Table 4.13
GMUSG Firms Supporting Training by Provider Category (Per cent)

Category of Training Provider	Per cent
TAFE	45
Private Trainers	22
University	13
Industry Associations	13
Smartlink	7
Total	100

Source: SACES.

In general, the level of satisfaction with training providers was quite high amongst GMUSG companies. In the survey some firms did indicate concerns associated with location of courses and frequency of courses offered. However, much of this can be associated with the economics of providing courses in a region where the number of trainees may be small and widely dispersed. Other concerns however relating to skills content and relevance of courses were raised. Specifically these related to a belief that training providers function in isolation to industry and present training that only match a companies requirements to a limited degree.

4.7 Apprentices and Traineeships –Employer Comments

This section summarises comments by GMUSG companies as they relate to other organisations involved in the recruitment and management of apprentices and trainees in the USG region.

New Apprentices Centres (NAC)

New Apprenticeships Centres provide a free service to employers to help with the sign-up and administration of an apprenticeship. In the Upper Spencer Gulf Region NACs are the Career Employment Group, Business SA and MAS National Apprenticeship Services.

Whilst there was a widespread understanding amongst employers interviewed as to the role of these centres in the registration of apprenticeship and contracts of training, the role of NAC in providing information on apprentice options to employers, particularly options for mature age apprentices was less well understood. Few employers knew there was a degree of flexibility on offer to them when employing and training apprentices.

There was a feeling amongst a number of GMUSG member companies interviewed of the need for more liaison between the NACs, and current and potential employers in order to better understand the full range of training and employment options available to employers when employing apprentices.

Group Training Providers (GTO)

Group Training is an employment and training arrangement whereby an organisation employs apprentices and trainees under an Apprenticeship/Traineeship Training Contract and places them with host employers. A GTO undertakes the employer responsibilities for the quality and continuity of the apprentices' and trainees' employment and training.

The majority of companies interviewed did not use a GTO, instead preferring to directly employ apprentices. One company was opposed to GTOs as it saw them simply as 'middlemen' who increased the cost of employing an apprentice. Another company had reservations about the quality of apprentices taken on by GTOs as the company played no role in selecting and recruiting these apprentices. Of the small number of companies who did use a GTO the general level of satisfaction regarding the apprentices they received and how these apprentices were managed was high.

While two companies felt that they would not consider using a GTO due to the time needed to build a 'team environment' amongst their workforce, a number of mainly smaller companies, stated that they would consider using a GTO in periods where labour was in high demand, but felt they could not justify employing an apprentice or trainee on a full-time basis due to the cyclical nature of their work. Many of these companies were generally favourable to the idea of establishing a GTO within the GMUSG member companies similar to that run by HunterNet, a group of manufacturing, engineering and hire firms located in the Hunter Valley region of New South Wales. We consider there is merit in exploring this concept for the GMUSG group.

HunterNet has established a Group Training Company to support member companies who lack the resources to provide structured “on-the-job” training programs. Trainees and apprentices are employed by the HunterNet Group Training Company on behalf of companies who will guarantee their positions for the duration of their training. During their apprenticeships, students are placed in several different member companies so as to broaden their skills-base and their understanding of operations across a number of industries and work-places. A manager is employed by HunterNet Group Training Company to co-ordinate the skills development as required by each member.

Should a GTO within the GMUSG be considered, it should also be noted that the Federal Government offers a Targeted Initiatives Programme (TIP) is to enable Group Training Organisations to generate Apprenticeship opportunities in priority areas. The Programme funds projects which contribute to the establishment of a sustainable apprenticeships market in critical, under-serviced or challenging areas.

4.8 Australian Technical College (ATC)

With recognition of the difficulty that exists in attracting secondary students in the region towards apprenticeships, and the continued support for industry and training organisations to enter schools to promote apprenticeships, there was considerable interest expressed in the concept of an Australian Technical College in the region (see Box 4.1).

Box 4.1

Australian Technical Colleges in the Upper Spencer Gulf Region

The Commonwealth have recently proposed the concept of an Australian Technical College (ATC) for Whyalla/Port Augusta — colleges to be located in regions suffering skill shortages, with high rates of youth unemployment and which are supported by a significant industry base. Both Whyalla and Port Augusta submitted an expression of interest to locate such a college. The proposed college will be required to offer a trade from four industries (out of five), four of which are considered relevant to labour demand in heavy engineering, maintenance, mineral processing and mining, including *inter alia*:

- Metal and engineering (e.g., machinists, fabricators, toolmakers, welders, sheet metal workers);
- Automotive (mechanics, auto electricians, panel beaters, vehicle painters);
- Building and construction (bricklayers, plumbers, carpenters);
- Electro-technology (including refrigeration, air conditioning, electricians); and
- Commercial cookery.

It is proposed that courses will link to School Based New Apprenticeships (SBNA) at the Certificate II or III level.

There was a feeling amongst some GMUSG firms surveyed that the entry of the Commonwealth Government into the apprenticeship training debate highlighted the disjuncture that currently exists between the training system and the requirements of the mining and heavy engineering sector in the region. Most did not want to see the ATC duplicate what TAFESA currently does; rather they felt the intervention of the Commonwealth should help to expand the number of courses, improve retention rates and improve the quality of courses.

4.9 Industry Training and Employer Comments

In this section we briefly consider training undertaken by the GMUSG companies and other companies in the region to up-grade skills of their existing employees.

As NCVER points out,³³ in industries that experience a significant boom/bust culture it can be argued that skill shortages are a direct result of the special difficulties associated with training employees in such industries. In boom times when productivity and output is paramount employees are often working at close to full capacity to maximise output. During this time employers may be reluctant to take on apprentices or trainees. Rather an employer may hire labour from a labour hire company at a premium wage, which an employer is willing to accept as a consequence of boom conditions. During the bust cycle of these industries, employers are forced to reduce their workforce to cut expenses. With training an expensive option for an employer quite often they may be reluctant to take on new trainees or apprentices.

This suggests that where industries are susceptible to boom/bust cycles, greater effort needs to be taken to ensure that the focus on recruiting, employing and maintaining a skilled workforce is long term, rather than short term.

In interviews with companies in the region it was evident that two main ‘schools of thought’ existed towards training. In the first, there was recognition by employers of the value of training and an acceptance of training costs as a component of the cost of doing business. In the second, while there was also an acceptance of the need to train the workforce there was a reluctance to go beyond basic training requirements as the experience of the employer was that the costs of training had not been recouped as employees had left for employment in other companies in the region.

Training Levels in the Upper Spencer Gulf Region

Table 4.14 shows the number of contracts of training by industry sector in the USG region between 2001 and 2005. It indicates that within the region the private sector is the largest trainer and has increased its share of training contracts since 2001. In contrast to this, both group training schemes and local Government have decreased their share of training in the region. The Commonwealth Government who until the mid 1990s was a major employer in the region has seen its training share increase in recent years, however its share still remains at approximately 10 per cent of all training.

Table 4.14
Contracts of Training Commenced by Industry Sector, 2001 to 2005,
Upper Spencer Gulf Region (Per cent)

Sector	2001	2002	2003	2004	2005
Private Sector	49	63	71	69	72
Group Training Scheme	37	25	24	27	23
Commonwealth Government	0	0	0	1	10
Local Government	13	10	4	3	3
State Government	2	2	1	1	1
Total	100	100	100	100	100

Source: NCVER.

³³ NCVER, *Prospecting for Skills: The Current and Future Skills Needs in the Mineral Sector*, May 2005.

Table 4.15
Spencer Institute of TAFE, Course Enrolments: 2000-2004

Campus	Program	Activity	2000	2001	2002	2003	2004	CAGR⁽¹⁾
Port Augusta	Business, Finance, Retail and Property Services	Clerical Administration	296	446	179	121	196	(9.79)
Port Augusta	Business, Finance, Retail and Property Services	Management	118	85	22	34	23	(33.56)
Port Augusta	Business, Finance, Retail and Property Services	Small Business	0	3	14	15	6	0.00
Port Augusta	Design, Arts, Information Technology	Information Technology	201	156	86	84	58	(26.71)
Port Augusta	Manufacturing, Engineering and Transport	Airconditioning and Refrigeration	35	24	18	22	30	(3.78)
Port Augusta	Manufacturing, Engineering and Transport	Automotive Mechanical and Electrical	122	100	66	70	104	(3.91)
Port Augusta	Manufacturing, Engineering and Transport	Electrical	105	108	59	78	71	(9.32)
Port Augusta	Manufacturing, Engineering and Transport	Fabrication and Welding	48	50	22	23	40	(4.46)
Port Augusta	Manufacturing, Engineering and Transport	Mechanical	33	15	14	23	66	18.92
Port Augusta	Manufacturing, Engineering and Transport	Mining Industry	0	3	0	0	11	0.00
Total (Manu)			343	300	179	216	322	(1.57)
Total			958	990	480	470	605	(10.85)
Port Pirie	Business, Finance, Retail and Property Services	Clerical Administration	828	263	309	225	208	(29.20)
Port Pirie	Business, Finance, Retail and Property Services	Management	43	23	0	0	0	(100.00)
Port Pirie	Business, Finance, Retail and Property Services	Small Business	0	17	36	27	0	0.00
Port Pirie	Design, Arts, Information Technology	Information Technology	166	144	157	77	121	(7.60)
Port Pirie	Manufacturing, Engineering and Transport	Automotive Mechanical and Electrical	30	36	38	30	16	(14.54)
Port Pirie	Manufacturing, Engineering and Transport	Electrical	36	58	47	38	91	26.09
Port Pirie	Manufacturing, Engineering and Transport	Fabrication and Welding	125	151	212	158	100	(5.43)
Port Pirie	Manufacturing, Engineering and Transport	Mechanical	38	52	104	32	67	15.23
Total (Manu)			229	297	401	258	274	4.59
Total			1,266	744	903	587	603	(16.92)

Table 4.15 (continued)
Spencer Institute of TAFE, Course Enrolments: 2000-2004

Roxby Downs	Business, Finance, Retail and Property Services	Clerical Administration	147	95	112	39	40	(27.78)
Roxby Downs	Business, Finance, Retail and Property Services	Management	30	123	64	25	78	26.98
Roxby Downs	Business, Finance, Retail and Property Services	Small Business	0	0	0	0	6	0.00
Roxby Downs	Design, Arts, Information Technology	Information Technology	26	0	14	0	0	(100.00)
Roxby Downs	Manufacturing, Engineering and Transport	Airconditioning and Refrigeration	0	0	5	0	12	0.00
Roxby Downs	Manufacturing, Engineering and Transport	Automotive Mechanical and Electrical	8	10	28	10	17	20.74
Roxby Downs	Manufacturing, Engineering and Transport	Electrical	33	39	21	46	35	1.48
Roxby Downs	Manufacturing, Engineering and Transport	Fabrication and Welding	26	25	24	21	23	(3.02)
Roxby Downs	Manufacturing, Engineering and Transport	Mechanical	6	0	0	0	0	(100.00)
Roxby Downs	Manufacturing, Engineering and Transport	Mining Industry	170	76	58	71	86	(15.66)
Total (Manu)			243	150	136	148	173	(8.14)
Total			446	368	326	212	297	(9.67)
Whyalla	Business, Finance, Retail and Property Services	Clerical Administration	411	262	209	111	104	(29.08)
Whyalla	Business, Finance, Retail and Property Services	Management	105	153	219	140	76	(7.76)
Whyalla	Business, Finance, Retail and Property Services	Small Business	127	115	125	60	100	(5.80)
Whyalla	Design, Arts, Information Technology	Information Technology	172	84	52	34	70	(20.13)
Whyalla	Manufacturing, Engineering and Transport	Automotive Mechanical and Electrical	19	30	31	29	34	15.66
Whyalla	Manufacturing, Engineering and Transport	Electrical	104	107	87	131	144	8.48
Whyalla	Manufacturing, Engineering and Transport	Fabrication and Welding	107	63	74	133	146	8.08
Whyalla	Manufacturing, Engineering and Transport	Mechanical	141	99	122	126	85	(11.88)
Whyalla	Manufacturing, Engineering and Transport	Mining Industry	104	153	125	126	116	2.77
Total (Manu)			475	452	439	545	525	2.53
Total			1,290	1,066	1,044	890	875	(9.25)

Table 4.15 (continued)
Spencer Institute of TAFE, Course Enrolments: 2000-2004

USG Region ⁽²⁾	Business, Finance, Retail and Property Services	Clerical Administration	1,682	1,066	809	496	548	(24.45)
USG Region	Business, Finance, Retail and Property Services	Management	296	384	305	199	177	(12.06)
USG Region	Business, Finance, Retail and Property Services	Small Business	127	135	175	102	112	(3.09)
USG Region	Design, Arts, Information Technology	Information Technology	565	384	309	195	249	(18.52)
USG Region	Manufacturing, Engineering and Transport	Airconditioning and Refrigeration	35	24	23	22	42	4.66
USG Region	Manufacturing, Engineering and Transport	Automotive Mechanical and Electrical	179	176	163	139	171	(1.14)
USG Region	Manufacturing, Engineering and Transport	Electrical	278	312	214	293	341	5.24
USG Region	Manufacturing, Engineering and Transport	Fabrication and Welding	306	289	332	335	309	0.24
USG Region	Manufacturing, Engineering and Transport	Mechanical	218	166	240	181	218	0.00
USG Region	Manufacturing, Engineering and Transport	Mining Industry	274	232	183	197	213	(6.10)
Total (Manu)			1,290	1,199	1,155	1,167	1,294	0.08
Total			3,960	3,168	2,753	2,159	2,380	(11.95)
Proportional Share of Manufacturing (Per cent)			32.6	37.8	42.0	54.1	54.4	

Notes: ⁽¹⁾ CAGR = Compound or Annual Average Growth Rate.

⁽²⁾ Includes Roxby Downs.

Source: Department of Further Education, Employment, Science and Technology, unpublished data.

With Private sector firms conducting most of the training in the Upper Spencer Gulf region, Table 4.15 displays the number of enrolments between 2001 and 2004 for industry training courses, prevocational courses and more “general” study courses at the Port Augusta, Port Pirie, Whyalla and Roxby Downs Campuses of the Spencer Institute of TAFE.

It can be seen that for the USG region, (which includes Roxby Downs) for all the selected courses there has been a decline in the number of enrolments by 1,580 students with the largest falls being in Clerical Administration, Business Management and Information Technology.

However, for the six “heavy industry/manufacturing” courses provided by TAFESA shown for the USG region at the end of Table 4.15, the total number of course enrolments was relatively stable over the period 2000 to 2004 at 1,290 course enrolments. As a result of the stability of enrolments in the selected courses and the decline in clerical/administration courses then the 6 “manufacturing, engineering and transport” courses represented 32.6 per cent of course enrolments in 2000, rising to 54.4 per cent in 2004. This change in the relative proportion of course enrolments will need to continue if the region is to meet the demand for skilled labour as the mining sector expands.

4.10 Conclusions: Analysis of Current Training Requirements

Table 4.16 draws together school numbers, training commencements, those in training, SBNA, pre-vocational intakes, and training rates in the training of apprentices and trainees in the USG region between 2000 and 2004.

Table 4.16
Apprentice and Trainee Intakes: Upper Spencer Gulf Region, 2000 – 2004

Year	2000	2001	2002	2003	2004
School Numbers	2,053	2,066	2,040	2,084	2,066
Training Commencements	330	757	766	730	1,097
In Training	180	450	660	880	1,020
SBNA	15	31	58	82	91
Pre-vocational Intakes	109	116	165	109	129
TAFE Training Places	3,960	3,168	2,753	2,159	2,380
WHYFA	0	0	0	30	30

Source: SACES.

Table 4.16 shows that apprentice/trainee commencements and those in training over the five years shown here have increased. Most notably, the increase has occurred in 2001 and again in 2004, although there has been what appears to be a decline in training places in the TAFE sector since 2000. The very positive employment outcomes for pre-vocational courses and the Whyalla Youth Futures Alliance program suggests there is considerable scope to expand these programs.

5. Estimation of Demand: Upper Spencer Gulf region

Terms of Reference

- Identify the projected skills/occupation shortages over the next 5 years and examine projected training needs to address the shortages described above;
- Identify training programs and potential providers (within and outside the region) available to address the proposed training needs;
- Provide estimates of skills in demand in the USG for 2006-2010; and
- Highlight any potential implications from the qualitative and quantitative data obtained.

5.1 Introduction

This chapter considers the estimated demand for skilled labour and projected training needs in the Upper Spencer Gulf region over the period 2006 to 2010. It estimates the employment and education and training requirements that are likely to emerge as a consequence of economic and sectoral growth in the region, as well as employment to meet replacement demand due to retirement and wastage, particularly from the trades. We have already indicated that calculations of future demand for labour and potential training effort are based on data supplied by Tier 1 and Tier 2 (GMUSG) companies and information supplied by Tier 3 or labour hire firms. The estimates of future employment for the entire USG region **do not** include the impact of the Olympic Dam expansion, the planned mining development at Prominent Hill by Oxiana or other proposed mining developments in the Upper Spencer Gulf region. They are considered separately. The results or baseline estimates are reported for Tier 1 and Tier 2 (GMUSG) companies together, and then extrapolated out to the region as whole with some minor adjustment to the methodology.

The estimation methodology involved the use of a labour-demand model developed by the Centre which takes into account current employment levels, current estimates of skill shortages, changes in future skills needs and replacement rates in the workforce. The sources of data relied upon include the Australian Bureau of Statistics (ABS), the Department of Employment and Workplace Relations (DEWR), the structured questionnaire sent to 22 GMUSG companies, and Tier 1 companies within the region such as OneSteel and Zinifex, labour hire companies, follow-up interviews conducted by staff of the Centre and interviews with group training providers.

5.2 Estimation Methodology

For the baseline estimates of the expected demand for labour in the USG region over the period 2006-2010, employment by occupation for the Tier 2 GMUSG group of companies and the larger Tier 1 employers in the region was used. Data obtained from survey responses indicated that companies had a total combined employment of approximately 4,800 persons in 2005, which represents approximately 69 per cent all employment in the manufacturing, construction, mining and electricity, gas and water sectors in the Upper Spencer Gulf region. Table 5.1 shows the total labour force for the surveyed companies, by occupational category and further broken down by four major trade groups.

Table 5.1
Tier 1 and Tier 2: Current Employment by Occupation and Selected Trade, 2005

Occupation	Employee Numbers	Occupation Share (Per cent)
Managers & Administrators	138	3
Professionals	482	10
Tradespersons & Related Workers	1,258	26
Clerical & Service Workers	224	5
Labourers & Related Workers	2,662	56
Total Labour Force	4,763	100
Trades	Trade Numbers	Trade Share (Percentage)
Electrical/Instrumentation	377	30
Mechanical	340	27
Construction ⁽¹⁾	302	24
Automotive (diesel and petrol)	239	19
Total Trades	1,258	100

Note: ⁽¹⁾ includes metal fabrication and building trades.

Source: SACES. Based on returned surveys.

For the estimation model used it was necessary to document total employment in the companies under study, then to estimate total employment in the relevant industries for the region as whole for the current period and for the period 2006 to 2010, and finally to separate out:

- the demand from employers for skilled workers; and
- the demand for education and training into the future.

There are several elements to the **demand from employers** for new skilled employees graduating from the VET system. Firstly, employers need to recruit new employees to meet any increase in the demand for their output, and new business setting up also need to recruit employees; hence economic growth (and its sectoral distribution) is a significant driver of demand. Secondly, employers need to replace skilled workers who leave the region or the occupations; therefore labour turnover (including wastage) retirement rates and migration out of the region are all significant drivers of employer demand. Finally, to the extent that the ‘skill-intensity’ of job tasks is changing, employers need to recruit more highly skilled workers. Offsetting these drivers of demand for locally trained skilled workers is any migration into the region of persons with VET qualifications.

In regard to the requirement for **education and training** to prepare a skilled workforce, there are three key sources of demand for Vocational Education and Training courses (or at least that proportion of it that is linked to the labour market):

- demand from those leaving school whose chosen profession requires a vocational qualification (including apprenticeships);
- those who are changing professions to one that requires a vocational qualification; and
- those who undertake training relevant to their current employment, either to maintain their skill level, or to advance within their occupation.

Although the paths that persons in the first two groups are following into VET are often very different, the types of VET courses they demand are very similar, as for both groups these courses provide the required education to enter an occupation. This means that in general the course demanded will be of Diploma or Advanced Diploma Level where the occupation of interest is an Associate Professional, or a Certificate III or IV for a less education intensive occupation group such as a Trade. This is not always the case, however, as lower level courses sometimes act as a pathway into the course required for the occupation. For example, some apprentices initially enrol in a Certificate I pre-vocational course, with the student progressively completing the requirements for lower-level courses as they progress towards the qualification required for the occupation. Similarly, Certificate I to III level VET courses can often act as a pathway into higher-level courses for those who don't have the necessary academic prerequisites for entry into a Certificate IV or Diploma.

In the case of the latter group, as the focus is on maintaining or upgrading skills sometimes the demand may be for an individual subject, or for relatively low-level courses such as a Certificate I. The flexibility of access to courses is often a significant factor for this group.

In terms of future demand for education and training the driving factors also vary between the three pathways into VET. Demand from those leaving school is obviously driven by the share of the school population currently completing Year 12 (or intending to leave at Year 10 or 11), and by expectations amongst these students as to the employment prospects in, and desirability of, the occupations linked to VET courses. Demand from those shifting from other occupations is driven by the occupation profile of the regional economy (as labour turnover varies between occupations), by changes in the employment mix in the region, and by expectations of those changing occupations. Finally, demand for VET education relevant to a persons current employment depends on the 'VET intensity' of employment in the USG region (i.e. the extent to which occupations require a VET qualification), and on the extent to which the expected education level of employees is increasing.

The first estimation of the demand for labour derives from employment and sectoral growth and is summarised in Table 5.2. Based on survey data, company interviews and employer expectations about future employment growth, then the Centre has estimated an employment growth rate of 2 per cent per year out to 2010 for the Tier 1 and Tier 2 (GMUSG) group of companies. This represents a sustainable, but nevertheless strong growth in demand for labour for the region when compared against the long-term State average. In Table 5.2 we show the gain in employment by occupational groups out to 2010 from economic growth and sectoral growth.

Table 5.2
Employment Growth: Economic and Sectoral Contribution 2005-2010

	2005	2010	Difference 2010-2005
Managers and Administrators	138	152	14
Professional	482	532	50
Tradespersons & Related Workers	1258	1389	131
Clerical & Service Workers	224	247	23
Labourers & Related Workers	2,662	2,939	277
Total	4,764	5,260	496

Source: SACES. Data supplied by companies.

The skilled trades and semi-skilled labourers and related workers are the two principal groups in demand by the companies in this study.

Included in the estimated employment growth rate is the increase in on-going operations employment arising from Project Magnet. The project is currently being undertaken by OneSteel and is due for completion in late 2007.

Interviews by the Centre with OneSteel and contracting companies indicates that at the peak of the project the number of contractor employees will be approximately 300 workers with 50 per cent of these coming from within the USG region. During the construction phase, existing workers in the region can be expected to absorb much of this extra demand by contractors. At the completion of the project direct employment is estimated to increase by between 100 to 150 employees out to 2010 with the majority possessing a trade qualifications (75 persons) and a further 70 employed as semi-skilled labourers and related workers.

The demand from employers for new skilled employees graduating from the VET system (and universities) also derives from the need to replace skilled workers who may leave the region or the occupation: replacement demand arises from retirement rates, turnover and wastage and migration out of the region; the last of which may be offset by inward migration. In estimating demand from employers we included an estimate for the projected retirement and wastage rate from occupations. We have assumed zero net migration due to strong competition elsewhere in the Australian economy, and particularly the mining sector, for skilled trades, skilled operators and trades assistants. However, we are aware of concerted efforts to attract employees from outside the region, particularly those with professional qualifications and the government's effort to attract skilled labour to South Australia and to regional centres.

In relation to managers and professionals we provide some comment based on survey returns, discussions and interviews about those occupations for which it has been difficult to recruit.

Retirement of workers – Evidence from the surveys and the employment by age profile of several companies provided to the Centre at the time of interview, indicates an age structure skewed towards older workers when compared against the State average. This was especially the case for the largest employers in the region. However, to some degree, a younger workforce for several mining companies included in this study offset the ageing workforce of the larger employer. As well, when forecasting retirement rates the Centre took into account incentives currently being offered to retain skilled workers at or near retirement age.

Wastage – ‘wastage’ occurs when an employee leaves an occupation or employer to take up employment in an industry or occupation in which their skills are non-essential, or only a minor, requirement. Alternatively an employee may remain with an employer but transfer to a new occupation. In the heavy engineering, maintenance and mining sectors we found some evidence of wastage. Frequently this involves a skilled employee assuming a position as a machine operator, or being promoted to a more highly skilled/managerial position. Promotion is usually due to an individuals ability to combine maintenance skills with operational skills of complex plant and machinery. This trend is reinforced by higher rates of pay for operators/managers. Therefore, wastage is not necessarily a “negative outcome” and can refer to career progression from trades positions to related positions that benefit the industry and the individual. However, “true wastage” was also observed where the employee leaves the industry.

The two most important variables to exert an influence on the future growth in employment are the expansion of industries in the region, (sectoral component) and the age structure of the workforce and hence retirement/replacement issues. Table 5.3 summarises the additional demand for labour from economic growth (drawn from Table 4.2 and shown in column 1), the replacement of retiring workers for Tier 1 and Tier 2 companies (shown in column 2) the addition of these two (shown in column 3) and in the final column, total demand for the sector for the USG region out to 2010.

Table 5.3
Growth in Demand for Labour: USG Region 2010

	Economic Growth	Replacement Demand	Total Demand: Tier 1 and Tier 2	USG Economy
Managers and Administrators	14	22	36	53
Professionals	50	77	127	184
Tradespersons & Related Workers	131	200	331	480
Clerical & Service Workers	23	36	59	85
Labourers & Related Workers	277	424	701	1,016
Total	496	759	1,255	1,818

Not all occupations require a VET qualification. Suffice to say, the majority of managers, administrators and professionals will have other qualifications. This is not to say that those in these occupations may not have VET as their highest qualification, but rather the VET proportions vary by occupation. For example, for most trades VET as the highest qualification is between 70 and 100 per cent; for general managers it is 30 per cent, for medical practitioners or pharmacists it is zero.

In Table 5.3 the 53 management positions and 184 professionals will be partly filled by immigration.

For example, graduates with mining and metallurgical experience, environmental professionals and engineers are required to manage and operate the Zinifex plant at Port Pirie and OneSteel at Whyalla. The company has sought to recruit these professionals “overseas in places like South Africa due to the decline in mining and metallurgical education around Australia”. Other qualifications in current demand where future skill shortages are predicted include electrical and electronic engineers, chemical engineers and mechanical engineers. NRG Flinders recently advertised for a Maintenance Manager where the “successful applicant will possess a degree in Engineering, or Associate Diploma, and extensive experience with large, coal fired steam turbine generating plant”.

For tradespersons and related workers, Tier 1 and GMUSG Tier 2 companies are anticipated to recruit an additional 66 tradespersons per year (2006-2010) or 330 tradespersons over 5 years to meet economic growth and the need to replace an increasing number of retiring workers. This can be thought of as approximating:

- 24-26 more apprentices per year to meet economic growth; and
- 40 more apprentices to replace retiring workers,

in addition to current intake. For the sectors of manufacturing, construction, utilities and mining (subject to previous caveats) the total additional demand is 90-95 tradespersons per year or 480 over 5 years across the USG regional economy.

Allocated across the 4 broad trade classification group as shown in Table 5.1 the estimated additional demand in the number of trades and related workers required each year and then for the five year period is shown below:

- Electrical Instrumentation 30 per year (150 over 5 years);
- Mechanical 27 per year (135);
- Construction 24 per year (120); and
- Automotive 19 per year (95).

This is likely to be the upper bound, because all companies will endeavour to retain retiring workers or provide encouragement to defer retirement, and as well, we have assumed zero net inward migration. To the extent Australia and South Australia is successful in securing skilled overseas migrants and regional programs encourage their location to the Upper Spencer Gulf then the demand for VET trainees will be reduced.

For GMUSG group and Tier 1 companies some 700 “labourers and related workers” will be required over the 5 years or 120 persons per year. For the entire region it is estimated approximately 1,000 workers or 200 persons per year. There is obviously some training effort required for this group.

5.3 Supply Growth

Chapter 4 discussed the current training effort in the USG region. With estimates of the additional demand for labour required in the region between 2006 and 2010 indicating the need to train between 90 to 95 extra tradespersons per year, the question remains as to how this figure compares to the current training effort.

Table 4.8 indicated that Contracts of Training commenced per year by selected vocations increased from a very low base of 29 in 2000 to 215 in 2005. With a four-year time lag for any increase to flow through to the pool of labour in the region, the effects of low intakes of apprentices in 2000 and 2001 are currently being felt through the emergence of skills shortages. Future implications of the larger intakes of 2003 and 2004 will not be fully felt until 2007-08.

We have provided an upper bound for an increase in training out to 2010. There is always some uncertainty about the “longevity of a mining boom” – and in any case, much of the boom is in iron ore exports from Western Australia and Queensland to China, whereas the “boom” in South Australia is of a different nature – so a conservative training response might involve discounting demand by 15 to 20 per cent. However, we advise that this adjustment is best made around 2008-09 and that an increase in pre-vocational training approximate to the upper-bound (90 pre-vocational places) should commence in 2006. The reasons for this are:

- a) the expected expansion at Olympic Dam, where there is greater certainty of further employment;
- b) that Project Magnet is already underway;
- c) that Prominent Hill will require a “total” operations workforce; and
- d) the Air Warfare Project will also seek to recruit these with engineer (albeit defence engineering) skills.

That is to say, there is confidence going forward that 90 additional pre-vocational places should be offered.

Further, with the model estimating the growth in demand for machine operators, process and transport workers in the USG at over 200 per year, recent trends indicate that a significant percentage of these will be sourced from the stock of those with trade qualifications as employers strive to build an efficient workforce that can manage, operate and maintain plant and machinery.

Further support for the need to increase apprentice numbers over the period 2006-2010 can be found in an analysis of the trends in course enrolments at TAFE for the region between 2000 and 2004. Enrolment in those courses classified as being in the engineering sector (electrical, mechanical, automotive, construction) have remained relatively constant over this period (see Table 4.15). Whilst this may have to do with the emergence of the region from recession, there is no doubt that it has contributed to the dearth of skills found in the region today.

5.4 Expected Shortages by Occupation

Based on those trades in short supply and the current recruitment difficulties of employers surveyed and supported by interviews conducted by the Centre, employer assessments of future skill requirements, and information provided by labour hire firms and Group Training Organisations, the estimated demand for tradespersons is summarised in Table 5.4. The number of trades required for Tier 1 and Tier 2 (GMUSG) companies is shown in column one and for the USG region in column 2 for the five years to 2010.

Table 5.4
Estimated Growth in demand by Trades, Numbers Required per Year, 2006-2010

Occupations	Tier 1 & 2	Region
Electrical/Refrigeration	13	19
Boilermakers/ welders	10	14
Instrument Technician/Fitter	6	8
Fitters	12	17
Riggers	4	6
Machinists	4	6
Mechanics (petrol and diesel)	5	7
Plumber	3	5
Carpenters	2	3
Toolmakers	3	4
Electronic/ radio technician	2	3
Sheet metal workers	2	3
Crane Driver/Operator	1	2
	67	98

Source: SACES estimated based on survey data.

Electrical fitters, boilermakers, instrument technicians and fitters were the trades assessed to be in greatest demand over the next five years. Riggers and then all trades (reading down Table 5.4) to toolmakers were expected to be in “high demand”, with electronic technicians and crane drives/heavy machine operators experiencing moderate demand.

6. Addressing Skills Training: The Future

Terms of Reference

- Present options for retaining/integrating the skills of the ageing/retired workforce and opportunities to recruit new entrants to the workforce;
- Identify training programs and potential providers (within and outside the region) available to address the proposed training needs; and
- Report all findings and provide conclusions and recommendations.

6.1 The Future

The USG is well positioned for strong economic and employment growth into the medium term – 2006 to 2010 – supported by an expansion (or now guaranteed continuation where once there may have been some uncertainty) of the major employers in each of the Provincial Cities, the support industries and more gradual diversification of the economic base of the region. The region is now characterised by inward migration, population growth, a rapidly expanding mining sector and stronger export performance. There is a feeling of confidence and optimism compared to the situation in the mid to late 1990s. It would appear that this renewed optimism is well placed.

There is a wonderful opportunity to advance and promote the region as a “Centre of Excellence” in education and training for the mining sector, for mineral processing, professional support to the mining sector, education and training for heavy engineering, manufacturing and maintenance operations. One important benefit of this would be to target even lower unemployment rates, and higher levels of local employment.

Table 6.1 highlights the change in unemployment in the year to June 2005. There was a decline of 650 persons in the unemployed ranks in a single year. If all 650 persons went to employment³⁴ then this would equate to an employment growth rate of 3.1 per cent.

Table 6.1
USG: Unemployment, Unemployment Rate and Labour Force: 2004 and 2005

	Unemployed (Number)		Unemployment Rate (Per cent)		Labour Force
	June 2004	June 2005	June 2004	June 2005	
Whyalla	1,242	820	11.8	7.9	10,444
Port Augusta	636	467	9.9	7.3	6,388
Port Pirie	140	86	8.4	5.2	1,655
Roxby Downs	17	12	0.8	0.5	2,220

Source: DEWR, *Small Area Labour Markets: Australia*, June 2005.

³⁴ It is likely that some unemployed left the region, returned to education/training, became involved in programs that did not classify them as unemployed or not in the labour force.

Further, the comparative unemployment rates in 2001 and 2005 were:

- Whyalla: 13.1 to 7.9;
- Port Augusta: 10.3 to 7.3;
- Port Pirie:³⁵ 13.8 to 5.1;
- Roxby Downs: 2.9 to 0.5.

In summary, even leaving aside the planned expansion at Roxby Downs by BHP Billiton and at Prominent Hill by Oxiana for which we have not modelled in this report, the USG region faces the following challenges:

- continued growth in demand for labour;
- expansion of industries in the region
- an ageing workforce
- a need to increase apprentice intakes and to retain more students in existing course in order to achieve higher graduation rates; and
- limited in-migration of tradespersons from other regions as demand is high elsewhere and therefore regional migration programs will be important.

There is a recognition that the previous system of recruitment and training of apprentices has gone forever, whereby larger companies did the majority of training on the job, within the company training facilities and provided a pool of apprentices to be recruited by the medium and smaller companies. Group training schemes have been developed to assist the medium and smaller sized company but not all members of GMUSG are in favour of group training schemes. Notwithstanding, there is some interest in GMUSG conducting its own group training scheme modelled along the lines of HunterNet in the Hunter Valley, New South Wales.

The importance of skills training, pre-vocational courses and intake of apprentices for GMUSG members is illustrated in the employment and occupational profile of Tier 1 and Tier 2 (GMUSG) companies. We note that the aggregate number of tradespersons is highest in the Tier 1 companies, but that the proportion of those with a trade qualification to total employment is highest in the GMUSG group at 43 per cent of all employees. This reflects the high degree of specialisation in the GMUSG group of companies.

There is strong support for the pre-vocational courses although some members of GMUSG would like to see marginal changes to the courses including *inter alia*:

- students to have greater familiarity with the “language of engineering”;
- improvements in the literacy and numeracy of graduates; and
- students to have a greater appreciation of the work environment (e.g., work ethic, punctuality, team ethos).

In the current environment there is a very active recruitment of pre-vocational students by the larger companies, members of GMUSG and group training providers.

³⁵ Port Pirie city. A contribution to the lower unemployment would have been some out-migration up to mid-2002.

6.2 Estimates of Training Demand: Supply-Side

Estimates of **training demand** include the demand from those leaving school whose chosen profession requires a vocational qualification, those who are changing professions and those currently in employment but who are seeking to upgrade skills and/or qualifications. The **growth in demand** for labour from employers derives from economic and sectoral growth, the need to replace retiring workers or those lost to an employer, through turnover, etc., and changes in the skill intensity of job tasks.

The growth in demand for labour over the period 2006 to 2010 for the GMUSG group and Tier 1 companies is estimated at 1,255 persons (subject to the caveats noted in the report) and for the USG region at 1,800 persons. We have modelled for zero net migration to the region. These estimates should be considered as an upper-bound as there is likely to be intense effort to “soften” or defer retirement rates, encourage inward migration and up-skill or multi-skill existing employees.

Notwithstanding, the combination of economic growth and rising retirement rates indicates a requirement for the following:

- 330 additional tradespersons for Tier 1 and Tier 2 companies and 480 for the region (i.e., 60 to 90 per year for each of the next 5 years); and
- 700 labourers and related workers for Tier 1 and Tier 2 companies or 1,000 for the USG region (i.e., 140 to 200 per year for each of the next 5 years).

This can be achieved through a combination of actions:

- for existing pre-vocational courses, fill all commencement places and seek to increase retention and completion rates. This would provide an average of 20-24 additional graduates (and apprentices we estimate) a year or approximately 100 over 5 years;
- conduct one more “regular” pre-vocational course in three locations would provide 40 additional apprentices a year or 200 over 5 years; and
- to target those currently unemployed, provide through the Whyalla Youth Futures program (and its equivalent in Port Augusta and Port Pirie) an additional intake which would provide 40 apprentices a year or 200 over 5 years.

We anticipate there will be withdrawals (and some non-commencements) from any course but we believe greater effort is required to reduce the “failure to complete/withdrawal rate”, to back-fill all non-commencements and to promote pre-vocational courses as a pathway to employment, an apprenticeship and a career.

Employer should consider the role they could play in encouraging retention rates, including *inter alia*, higher starting salaries for graduates and through direct offers of employment.

A Centre of Excellence for Mineral Resources and Heavy Engineering?

Towards the conclusion of this study we were made aware of preliminary investigations into such a centre. There is considerable merit in such a proposal; it would be likely to draw industry support; it may potentially draw in overseas students³⁶ and create pathways from schools to pre-vocational courses, apprenticeship training and links into university courses. One of the most important attractions of such a proposal is that it would raise the profile of education, training and skills development in the region. It may extend to the delivery of tertiary degrees in engineering at the University of South Australia, Whyalla Campus.

At the tertiary level, there is a shortage of graduates with mining and metallurgical experience, environmental professionals and engineers. It is likely that courses in these areas could only be sustained in a regional centre such as Whyalla, with overseas student enrolments.

6.3 Demand-Side Responses

Employers are aware of the need to replace retiring workers and the potential loss of skills this could involve. There is support for mature age apprenticeships and employers clearly do encourage existing employees to upgrade skills. However, it appears that many employers and employees are not aware of the potential reduction in the term of an apprenticeship for mature aged workers. While this is likely to vary on a case-by-case basis, we consider there is merit in TAFESA working more closely with employers to publicise the benefits of mature age apprenticeships.

SBNA are not so readily accepted by employers in the heavy industries, engineering and manufacturing sectors. The work environment is often team based and not amenable to part-time attendance; it is also more hazardous requiring greater supervision. While a commitment from industry is important, it may be more worthwhile that this was in the form of promotion and marketing of career opportunities, greater support for pre-vocational courses and incentives to undertake apprenticeship training.

³⁶ There is a proposal for overseas students to acquire an “apprenticeship visa”. University courses at the Whyalla University of SA campus could also be attractive.

Appendix 1

Population Employment and Industry Profile: Upper Spencer Gulf Region

A1.1 Introduction

Background information is provided on selected characteristics of the Upper Spencer Gulf Region including demography, labour force, employment, industry structure and qualifications. Most of the data is drawn from the 2001 Census (now somewhat dated) but is presented as a baseline for the region.

A1.2 Employment Profile of the Upper Spencer Gulf Region

The resident population in the Northern Statistical District (SD) at June 2003 was 78,184 with 64 per cent of this population concentrated in the local government areas (LGA) of Whyalla (21,604), Port Pirie City and District (17,490) and Port Augusta (13,795).

Tables A1.1 to A1.11 below contain selected comparisons of demographic characteristics between the Upper Spencer Gulf cities of Port Augusta, Port Pirie and Whyalla and in some cases, Roxby Downs. Roxby Downs has been included in this comparison as the Olympic Dam project and its possible expansion has important implications for the demand for skilled labour in the Northern Region.

Population

Table A1.1 shows that while Port Augusta, Port Pirie and Whyalla have all experienced declining population levels to 2001 or thereabouts. Roxby Downs in contrast has achieved positive population growth and this is expected to continue over the next decade.

Table A1.1
Population Growth, Selected Areas – 1991 to 2003

	Estimated Resident Population				Compound Annual Average Growth Rate		
	1991	1996	2001	2003	1991 to 1996	1996 to 2001	1991 to 2001
Port Augusta	15,234	14,318	13,756	13,795	-1.2	-0.7	-1.0
Port Pirie – City	15,011	14,373	14,118	14,490	-0.9	-0.4	-0.6
Whyalla	26,382	24,371	22,209	21,604	-1.6	-1.8	-1.7
Roxby Downs	-	-	3,633	3,732	-	1.8	-
Adelaide SD (000s)	1,057	1,078	1,111	1,119	0.4	0.6	0.5

Source: ABS, *Regional Population Growth, Aust and NZ, 1991 to 2001*, Cat. No. 3218.0.

For both Port Augusta and Port Pirie the decline in population numbers stabilised in 2003, while Whyalla continued to experience a declining population to 2003.

Table A1.2 indicates that Port Augusta, Port Pirie and Whyalla have similar populations by age category whereas Roxby Downs has a much younger population. All centres have a higher proportion of 0-14 years than the State average but a lower proportion of 15-24 years

indicating a movement of potential skilled workers away from these regions or a confirmation of the trend that young people leave for education/training and are reluctant to return.

Table A1.2
Population by Age – Provincial Cities: 2002
(Per cent)

	0-14	15-24	25-44	45-64	65+	Total
Port Augusta	22.4	12.9	28.9	23.9	11.9	100.0
Port Pirie	22.6	9.1	34.3	25.7	8.3	100.0
Whyalla	22.2	12.6	29.1	23.3	12.8	100.0
Roxby Downs	30.7	11.5	44.1	13.0	0.7	100.0
South Australia	19.3	13.1	28.6	24.3	14.8	100.0

Source: DFEEST, Regional Employment and Skills Formation 2004.

Table A1.3 indicates that Port Augusta has the largest indigenous population of the comparative regional cities. All four centres have a higher proportion of indigenous population than the State average and given the long-standing challenge of indigenous employment this cohort represents an important source of skilled labour, especially because the indigenous population is much younger. The rate of employment for the indigenous population is shown in Table A1.5.

Table A1.3
Indigenous Population Selected Areas: 2001

	Number	Per Cent
Port Augusta	2,041	15.1
Port Pirie	319	2.3
Whyalla	632	2.9
Roxby Downs	75	2.0
South Australia	23,425	1.6

Source: ABS, Unpublished data.

Employment and the Labour Force

Table A1.4 shows that unemployment levels have declined in all centres between 1991 and 2005 while the labour force in each area has increased.

Table A1.4
Unemployment and Participation Rates, Selected Areas: 2001 and 2005

	Unemployment Rate 2001 (per cent)	Labour Force 2001	Unemployment Rate June 2005 (per cent)	Labour Force June 2005
Whyalla	13.1	9,276	7.9	10,444
Port Pirie	13.8	5,429	7.3	6,388
Port Augusta	10.3	5,681	5.2	1,655
Roxby Downs	2.9	2,223	0.5	2,220

Source: ABS, Unpublished data and DEWR Small labour Market Review.

Table A1.5 shows that the youth unemployment rate is lowest in Roxby Downs and highest in Port Pirie. Both Port Pirie and Whyalla have a youth unemployment rate higher than the state average of 19.1 percent. Port Pirie, Whyalla, and Port Augusta all have a mature age unemployment rate higher than the State average (4.5 per cent). Indigenous unemployment rates are higher than non-indigenous rates for all cities. The youth unemployment level for the Northern and Western regions of South Australia was 22.5 per cent in 2005, which was equal with the State average.

Table A1.5
Unemployment Rates by Age, Selected Areas: 2001
(Per cent)

	15-19	20-24	25-44	45+	Indigenous
Port Augusta	15.0	16.2	10.6	7.2	28.0
Port Pirie	27.0	21.5	12.4	10.5	37.5
Whyalla	26.9	22.6	12.4	8.3	34.6
Roxby Downs	10.9	-	-	1.4	16.7

Source: ABS, Unpublished data.

Table A1.6 indicates that the average wage in Roxby Downs is much higher than in the three Provincial Cities and the State average.

Table A1.6
Wage and Salary Earners: Average Income Selected Areas,
South Australia and Australia: 1996-97 to 2001

SLA Area	1996-1997	1997-1998	1998-1999	2001 ¹
Port Augusta	26,875	27,679	29,041	32,108
Port Pirie – City	27,096	28,142	28,820	32,062
Whyalla	31,362	33,073	33,746	36,093
Roxby Downs	-	-	-	52,111
South Australia	27,725	28,851	29,790	35,245
Australia	29,768	30,985	32,271	-

Note: ¹ DFEEST, Regional Employment and Skills Formation 2004.

Source: ABS, *Regional Wage and Salary Earner Statistics, Australia (Experimental Estimates)*, Cat. No. 5673.0.

Employment and Industry Structure

Table A1.7 indicates that in the inter-Census period there was a large decline in State and Commonwealth Government employment in Port Augusta and Port Pirie and a large decline in private sector employment in Whyalla following the restructuring of OneSteel. However, since 2001 (and the Census data is now somewhat dated) the fortunes of the Cities have dramatically improved. Project Magnet at OneSteel is a prime example of this turnaround.

Table A1.7
Employment by Sector of Employment, Selected Areas: 1996 to 2001

	Federal Government	State Government	Local Government	Private Sector	CDEP	Not Stated
Port Augusta	-348	-189	8	499	36	-25
Port Pirie	-113	-96	-6	133	7	-35
Whyalla	5	-158	-19	-886	28	-48

Source: ABS, Unpublished data.

Table A1.8 outlines employment by industry in the three Provincial Cities. It shows that the largest industry sectors by employment in Port Augusta are Retail Trade, Health and Community Services and Education. In both Whyalla and Port Pirie the largest industries by employment are Manufacturing, the Retail Trade and Health and Community Services.

Table A1.8
Employment by Industry, Selected Areas: 2001
(Number & Per cent)

	Port Augusta		Port Pirie		Whyalla	
	Number	Per cent	Number	Per cent	Number	Per cent
Agriculture, Forestry & Fish	59	1.2	72	1.6	56	0.7
Mining	27	0.5	40	0.9	112	1.4
Manufacturing	228	4.6	910	19.7	2,002	25.3
Elec, Gas & Water Supply	249	5.0	28	0.6	33	0.4
Construction	341	6.8	292	6.3	489	6.2
Wholesale Trade	157	3.2	196	4.2	255	3.2
Retail Trade	948	19.0	889	19.3	1,280	16.1
Accom, Cafes & Restaurant	311	6.2	215	4.7	323	4.1
Transport and Storage	320	6.4	175	3.8	292	3.7
Communication Serv	53	1.1	56	1.2	67	0.8
Finance and Insurance	85	1.7	76	1.6	133	1.7
Property and Business Ser	331	6.6	288	6.2	676	8.5
Gov Admin & Defence	322	6.5	143	3.1	235	3.0
Education	441	8.9	334	7.2	650	8.2
Health and Community Serv	724	14.5	602	13.0	884	11.2
Cultural & Rec Serv	66	1.3	93	2.0	123	1.6
Personal and Other Serv	302	6.1	192	4.2	271	3.4
Total	4,980	100.0	4,618	100.0	7,927	100.0

Source: ABS, Unpublished data

Table A1.9 shows the change in employment numbers between the years 1996-2001. The biggest change in employment numbers has been in Transport and Storage for Port Augusta, Manufacturing and Communications Services for Port Pirie and Manufacturing and Construction for Whyalla.

Table A1.9
Change in Employment by Industry, Selected Areas: 1996 to 2001
(Number & Per cent)

	Port Augusta		Port Pirie		Whyalla	
	Number	Per cent	Number	Per cent	Number	Per cent
Agriculture, Forestry & Fish	7	13.5	12	20.0	7	14.3
Mining	8	42.1	17	73.9	-17	-13.2
Manufacturing	84	58.3	-59	-6.1	-649	-24.5
Elec, Gas & Water Supply	13	5.5	-14	-33.3	4	13.8
Construction	65	23.6	46	18.7	-111	-18.5
Wholesale Trade	-4	-2.5	56	40.0	-38	-13.0
Retail Trade	99	11.7	50	6.0	75	6.2
Accom, Cafes & Restaurant	11	3.7	-17	-7.3	-16	-4.7
Transport and Storage	-328	-50.6	-27	-13.4	10	3.5
Communication Serv	-11	-17.2	-59	-51.3	-27	-28.7
Finance and Insurance	-15	-15.0	-30	-28.3	-26	-16.4
Property and Business Ser	80	31.9	18	6.7	-90	-11.7
Gov Admin & Defence	117	57.1	-5	-3.4	37	18.7
Education	-43	-8.9	-17	-4.8	-50	-7.1
Health and Community Serv	-26	-3.5	50	9.1	-43	-4.6
Cultural & Rec Serv	-36	-35.3	-27	-22.5	16	15.0
Personal and Other Serv	47	18.4	-16	-7.7	2	0.7
Non-classifiable eco units	-14	-46.7	-25	-59.5	-60	-56.6
Total	54	1.1	-47	-1.0	-976	-11.0

Source: ABS, Unpublished data.

Employment and Occupation

Table A1.10 summarises employment by occupation which tends to mirror the industry sectors of employment so that Intermediate Clerical, Sales, & Service Workers in both Port Pirie and Port Augusta are significant and Tradespersons & Related Workers in all three cities reflect the industrial, heavy engineering construction, and manufacturing basis of the local economies.

Table A1.10
Employment by Occupation, Selected Areas: 2001
(Per cent)

	Port Augusta	Port Pirie	Whyalla
Managers & Administrators	4.3	4.8	5.2
Professionals	13.4	12.1	13.3
Associate Professionals	12.8	11.6	11.2
Tradespersons & Related Workers	14.6	14.4	15.8
Advanced Clerical & Service Workers	2.0	2.5	2.4
Intermediate Clerical, Sales, & Service Workers	19.8	15.4	14.5
Intermediate Production & Transport Workers	8.9	13.7	13.5
Elementary Clerical, Sales & Service Workers	10.6	12.3	10.1
Labourers & Related Workers	11.2	11.2	11.1
Total	100.0	100.0	100.0

Source: ABS, Unpublished data.

Table A1.11 presents data on the age structure of the workforce in each industry sector in 2001. The low prevalence of younger workers applies to most industry sectors in the region except for the retail services sector and manufacturing both of which have a higher share than the State average.

The low prevalence of younger people in some industries suggests that these industries may face additional recruitment challenges in terms of being able to hire younger workers and thus maintain the skill and age profile of their industry workforce. This will particularly be the case where industries have a relatively older workforce such as manufacturing and thus face the prospect of a significant number of employees retiring in the short to medium term.

Table A1.11
Persons Employed in Region by Industry of Employment and Age Group
Upper Spencer Gulf Region and South Australia, Working Population: 2001
(Per cent)

	Port Pirie				Port Augusta				Whyalla				South Australia			
	15-24	25-44	45-64	65+	15-24	25-44	45-64	65+	15-24	25-44	45-64	65+	15-24	25-44	45-64	65+
Agriculture, Forestry & Fishing	1	2	1	13	0	1	2	10	1	1	1	0	4	5	7	24
Mining	1	1	1	0	0	1	0	0	1	1	1	0	0	1	1	0
Manufacturing	12	22	20	9	5	5	4	0	13	27	27	17	12	17	14	9
Electricity, Gas & Water	0	1	1	0	4	5	6	0	1	0	0	0	0	1	1	0
Construction	6	6	7	9	4	7	7	5	4	6	7	10	5	6	6	5
Wholesale Trade	5	5	3	0	5	3	3	5	4	3	3	0	4	5	5	4
Retail Trade	43	17	12	13	40	15	14	15	39	13	10	11	32	12	10	9
Accomm'n, Cafes & Restaurants	5	4	5	0	7	6	6	10	6	4	3	8	10	4	3	3
Transport & Storage	1	4	5	0	3	6	8	7	1	3	5	10	2	4	4	3
Communication Services	0	1	1	0	1	1	1	0	1	1	1	0	1	2	2	0
Finance & Insurance	2	2	1	5	2	2	1	10	1	2	1	3	2	4	3	2
Property & Business Services	6	6	6	0	5	6	8	0	7	9	9	10	7	10	10	10
Government Admin & Defence	2	3	4	5	6	6	7	0	2	3	3	3	2	4	5	2
Education	4	8	8	5	5	9	10	10	5	8	10	3	3	6	10	5
Health & Community Services	9	13	16	5	7	16	15	5	5	12	11	7	6	12	13	8
Cultural & Recreational Services	1	2	2	11	1	1	1	5	4	1	1	0	3	2	2	2
Personal & Other Services	2	4	5	5	4	6	6	5	4	3	3	3	3	4	4	3
Total ^a	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Note: ^a Includes non-classifiable economic units and not stated.

Source: ABS, Census of Population and Housing, unpublished data.

Education and Qualifications Profile

Table A1.12 shows the ‘level of education’ profile of those workers in the USG region and South Australia with a non-school qualification and the higher representation of certificate level qualifications. The USG workforce tends to be under-represented among higher-level qualifications.

Table A1.12
Persons by Non-school Qualification, Selected Areas: 2001
(Per cent)

	Port Augusta	Port Pirie	Whyalla	South Australia
Postgraduate Degree Level	0.9	0.9	1.3	3.1
Doctoral Degree Level	0.2	0.2	0.3	1.1
Master Degree Level	0.7	0.7	1.0	2.0
Graduate Diploma and Graduate Certificate Level	1.7	1.5	1.9	2.9
Graduate Diploma Level	1.5	1.3	1.8	2.6
Graduate Certificate Level	0.3	0.2	0.1	0.3
Bachelor Degree Level	11.8	12.8	12.4	19.5
Advanced Diploma and Diploma Level	8.6	8.3	7.9	12.9
Advanced Diploma and Diploma Level, nfd	0.2	0.1	0.1	0.2
Advanced Diploma and Associate Degree Level	4.7	4.7	3.9	7.2
Diploma Level	3.7	3.5	3.9	5.5
Certificate Level	44.0	48.6	52.1	37.8
Certificate Level, nfd	1.0	1.3	1.1	1.2
Certificate III & IV Level	38.2	42.7	46.6	31.6
Certificate I & II Level	4.8	4.5	4.4	5.0
Level of education not stated	30.3	25.2	21.6	20.7
Level of education inadequately described	2.7	2.7	2.8	3.1
Total	100.0	100.0	100.0	100.0

Source: ABS, Working Population Profiles, Census of Population and Housing, 2001.

The major fields of study in which employees in the USG region and South Australia held their non-school qualifications in 2001 is shown by Table A1.13. The pattern by fields study shows one main difference; a higher proportion of persons in Engineering and related technologies in the USG region, particularly for Whyalla.

The region experienced a loss of both private and public sector employment between 1991 and 2001 and severe adjustment in the rail, mineral processing, steel manufacturing industries which resulted in a loss of skilled workers from the Provincial Cities, some of whom accepted employment at Roxby Downs. Others who remained in the region took up different occupations or re-trained. There was significant out-migration of people principally in search of employment.³⁷

Tradespersons are not only essential to perform current skilled work practices but are responsible for training the next generation of tradespersons.

³⁷ The age profile of outward-migration was analysed in SACES report prepared for the Provincial Cities in 2002 and 2003.

Table A1.13
Employed Persons With Non-School Qualifications
Field of Study Upper Spencer Gulf and South Australia: 2001
(Per cent)

Field of Study	Port Pirie	Port Augusta	Whyalla	South Australia
Natural and Physical Sciences	1	1	2	3
Information Technology	1	1	1	2
Engineering and Related Technologies	27	24	42	23
Architecture and Building	7	6	6	6
Agriculture, Environmental and Related Studies	1	2	1	3
Health	9	9	11	12
Education	7	7	9	9
Management and Commerce	9	8	10	16
Society and Culture	5	6	7	10
Creative Arts	1	1	1	3
Food, Hospitality and Personal Services	6	4	4	6
Mixed Field Programmes	0	0	1	0
Field of study not stated	1	1	6	6
Field of study inadequately described	25	30	2	1
Total persons with non-school qualifications	100	100	100	100

Source: ABS, *Census of Population and Housing*, unpublished data.

Appendix 2

Terms of Reference

The Skills and HR Audit will provide baseline data and recommendations allowing for workforce development across the region through the completion of a skills audit of member companies and major customers. A review of HR practices/policies of members of Global Maintenance USG Inc (GMUSG) the Upper Spencer Gulf's maintenance services Cluster will be incorporated and best practice disseminated. Through the Cluster quarterly customer-supplier forums (hosted by GMUSG) it is evident that members of the Cluster and associated Regional Development Boards require a strong understanding of:

- where skills gap exist;
- how these can be addressed; and
- through which mechanisms.

These tasks represent the core objectives of the skills audit.

From within the membership base commonly faced issues that compliment the skills audit include staff retention and turnover, staff absenteeism, conflict management within the workplace, succession planning, Workforce planning and scheduling across member companies to meet major customer requirements and integrated workforce development between member companies. It is these issues that will be addressed through the HR policy and procedures review, through the use of company based surveys and interviews.

To the extent possible, the Skills and HR Audit will also encompass the employee's perspective of skills deficiencies, future skill development and HR practices to provide a holistic outcome for the audit. This component of the audit will be undertaken on an individual company basis.³⁸ Assisting existing employees to access training and up-skilling will also be considered as an outcome of the study with a focus 4 group training outcomes for non-management employees.

The project will identify the current skills gaps that exist and develop strategies for overcoming these. The project will review the HR policies and procedures of member companies such that best practice can be ascertained and disseminated across the membership base. Through completion of the skills audit and adoption of best practice in HR management it is viewed that employee's will be the main beneficiaries, providing opportunities for up-skilling, skill diversification and employee workplace satisfaction.

The project seeks to develop strategies to encourage collaboration between member companies along with improving business processes and other initiatives to strengthen organisational capability. Through the Skills Audit, use of Workforce Development Funding and the Enterprise Zone status of the region it is intended that the various projects will result in an increase in apprentice and trainee intakes across the region, with strategies to align with the current South Australia Works programs being implemented through the three Upper Spencer Gulf Regional Development Boards. A clear example of this integration is the alignment of the Whyalla Economic Development Board's Youth Employment Program (Whyalla Youth Futures Alliance) participants who were channelled through local GMUSG

³⁸ This research activity involving site interviews supplemented by data on workforce profile could only be undertaken on those companies that returned the employment profile survey.

Member's businesses for work experience and industry awareness opportunities. This initiative will allow a whole of region approach to new employee and workforce development.

The specific terms of reference include the following:

- Describe the population of the Heavy Industry sector (including resource processing, fabrication, labour hire, construction and heavy industry support organisations);
- Identify why there is a skills shortage in these industry sectors in the Upper Spencer Gulf region;
- Identify the existing skills base of the audit population;
- Describe the current skills/occupation shortages;
- Identify the projected skills/occupation shortages over the next 5 years;
- Categorise the age profile of the existing workforce;
- Present options for retaining/integrating the skills of the ageing/retired workforce and opportunities to recruit new entrants to the workforce;
- Identify existing and projected training needs to address the shortages described above;
- Identify training programs and potential providers (within and outside the region) available to address the proposed training needs;
- Assess the current HR practices within GMUSG member companies and disseminate best practice;
- Highlight any potential implications from the qualitative and quantitative data obtained; and
- Report all findings and provide conclusions and recommendations

On the Centre's initiative and supported by the WEDB the study received additional funding from the SA Government to extend the data collection process (and interviews) specifically to include OneSteel, NRG Flinders, Zinifex, Santos and WMC as these companies compete in the same labour market for skilled workers. Integrated workforce development for mining, processing and the heavy engineering sector was effectively elevated in importance as an outcome of the study.

Appendix 3

A Skills Audit of the Whyalla Heavy Industry Sector

The Whyalla Economic Development Board (WEDB) in mid-2003 commissioned a review of skills in demand by heavy engineering and maintenance firms based in Whyalla³⁹. At that time the Skills Audit, which was limited to the Whyalla Heavy Industry Sector identified the industry “as grappling with skill shortages in a cyclical work environment”. It was stated:

“The Skills Audit undertaken of the heavy industry sector at Whyalla has revealed an industry that is grappling with skill shortages in a cyclical work environment. The major client for this sector in Whyalla is the steel industry and simply due to the cyclical nature of the demand for steel products there is a similar impact on the support industries that results in an ebb and flow of the work available. This unstable work environment has provided the labour hire sector a worthwhile section of the labour provision market. The labour hire sector has had an impact on the number of permanent employees taken on by organisations within the heavy industry sector. With the availability, usually at short notice to obtain skilled staff for short periods the contract labour force is attractive to a cyclical industry. However this is at a dollar cost and a cost to future training in the various skills for the future.

The negative impacts of labour hire are the reduction in new entrants such as apprentices and trainees to the heavy industry sector. It has been suggested that the wages paid by labour hire companies has led to an exit from the permanent workforce with workers seeking better remuneration and forgoing the security of holidays and sick leave. This in turn has meant that those organisations seeking to retain or attract permanent employees have to compete against these wages. The labour hire organisations are currently used to provide the specialised skills and skill shortages that are not required all the time. They have available to them a large database of qualified people through an extensive network of state and national offices. The labour hire companies therefore have an important role within the industry sector and do play a vital part in keeping it operational

Other reasons for the decline in the skills base can be attributed to the significant resizing of the operations and workforce at the largest employer OneSteel. OneSteel have reacted to the downturn in business opportunities and increased global competition for its products by re-engineering its processes and people. They have engaged several organisations to manage specific aspects of their operations that allows them to concentrate on other strategic aspects of the whole operation.

OneSteel as the major employer in Whyalla has a looming problem with approximately one third of its 150 senior management and administrative team due to retire over the next five years or so.

The skills audit has identified that there are many contributing factors to the skills shortages within the heavy industry sector at Whyalla. It is clear there is no one quick fix to this situation and there needs to be a holistic approach taken that encompasses economic stimulation, education and learning, skills development programs, collaboration and commitment.”

It was thought that a similar situation existed throughout the Upper Spencer Gulf region in both Port Augusta and Port Pirie. The major employers of the heavy industry and maintenance sector in Whyalla is OneSteel, in Port Augusta it is EDI Rail and NRG Flinders with Zinifex the major employer at Port Pirie. The industry is also contracted by the mining sector to support construction, operations and mining maintenance.

³⁹ Skills Audit - Heavy Industry Sector of Whyalla, INDEC Consulting 2003.

In summary, the reasons for the existing skill shortage were stated as:

- a decade of neglect of apprenticeship recruitment due to economic conditions and downturn in the steel industry;
- retrenchments and natural attrition reduced the skills base;
- on the demand side, cost of apprenticeship training acted as a disincentive including the cost of funding block release training;
- on the supply side, apprenticeships were seen to be less attractive for young people, the training wages were low and group schemes did not offer/guarantee a job on completion; and
- the school system was not seen to be supportive of apprenticeships or to prepare students for the workforce, while the efficient delivery of TAFE courses was sometimes questioned.

Specific skilled trades identified were the metal and electrical trades – skills in pressure welding, automated electronic systems (programming and maintenance) and programmable logic controllers, electricians, instrumentation, boilermakers, fitters – see Table 1.4 for a summary of the projected skill shortages for the heavy industry sector in Whyalla as at March 2003. Non-trade areas included a demand for scaffolders and riggers.

The review of skills in demand in Whyalla included a survey population of 660 employees,⁴⁰ comprising 266 qualified trade based employees, non trade and management/design staff. Only 22 apprentices were identified as “in-training”. The estimated current shortage of staff was 42 positions or 6.4 per cent of the total surveyed workforce of which 20 positions (or 50 per cent of positions) were in the non-trades and 11 positions (25 per cent) in trade organisations. In addition, the age distribution of the firms surveyed demonstrated the following (see Table A3.1).

Table A3.1
Age Distribution of Firms Surveyed

Population Age	Per cent of Workforce
16-25	12
25-50	57
50-55	17
> 55	13

Source: Skills Audit – Heavy Industry Sector of Whyalla, INDEC Consulting, 2003.

That is to say, some 30 per cent of the heavy industry workforce surveyed was aged 50 years or over. Approximately 12 per cent of the workforce was aged between 16 and 25 years, a reflection of less attention to apprenticeship recruitment over recent years, the high cost of training apprentices and the difficulty of attracting young entrants to the workforce.

A frustration for industry in Whyalla was the concern that trained and qualified staff were lured to other locations by higher wages, better conditions and regular employment (e.g., Roxby Downs, mining sector, N-W Shelf). Relocation by students to undertake courses not

⁴⁰ On-going permanent staff represented 71 per cent of all employees; casual staff represented 29 per cent, most as labourers, trades assistants, scaffolders and riggers as 75 per cent of all casual positions.

offered in Whyalla “invariable meant they were lost to Whyalla”. This is a concern shared by a number of regional centres.

The report presented to the WEDB estimated current and future skill shortages (over next 5 years), as set out in Table A3.2, noting the potential for serious skills shortages with the now completed blast furnace reline project to be undertaken by OneSteel. Since that time OneSteel has announced further investment, WMC announced a very significant expansion at Roxby Downs and the Warfare Destroyer Contract at Osborne possess even further potential to compete for skilled labour. The construction/blast furnace reline project for OneSteel was projected to require 350 personnel: 50 refractory/civil workers, 50 pipe fitters, 20 welders, 80 boilermakers, 70 riggers/scaffolders, 10 crane drivers/dogman and 70 trade assistant labourers.⁴¹

Table A3.2
WEDB Estimate Current and Future Skill Shortages: 2005-2010

Current Skills Shortages	Future Skills Shortages
Electricians	Electricians
Instrumentation Specialists	Instrumentation Specialists
Pneumatics, Hydraulics	Pneumatics, Hydraulics
Boilermakers/Welders	Boilermakers/Welders
Fitters – Maintenance, Diesel/Mechanical	Fitters (all types)
Machinists	Machinists
Riggers	Riggers
Scaffolders	Scaffolders
Engineers (all types)	Engineers (all types)
	Admin – Office Managers
	Technical Officers
	Licensed Asbestos Workers
	Machining, tooling
	Radio Technicians
	IT Technicians

Source: Skills Audit – Heavy Industry Sector of Whyalla, INDEC Consulting, 2003.

A collaborative program⁴² “The Whyalla Youth Employment Future’s Alliance” was established to promote opportunities and careers in the heavy industry sector and was recognised as particularly successful pathway to achieving an apprenticeship. This initiative was designed to address the decline in apprenticeship intakes.

The report put forward 20 recommendations to address skill requirements in the short-term and to encourage more systematic responses by the heavy industry and maintenance sector to develop and maintain a skilled workforce in the future. The various recommendations can be summarised as follows:

- collaboration and partnership – involving industry, education sector and government – with industry driving change to affect the skilled workforce it demands. This philosophy underpins the Commonwealth’s intervention in trade training through the proposed ATC concept;

⁴¹ Estimated by OneSteel, reported by Indec Consulting (2003), p.4.

⁴² Involving OneSteel, TAFE, Education and Whyalla Economic Development Board.

- regional collaboration (rather than “beggar-thy-neighbour”) is required across the northern and upper Spencer Gulf;
- develop training responses that are structural in nature, because the pathways to training have altered;
- explore training responses to reduce cost to employers and employees including apprentice training, short-term, skill specific courses, multi-skilling, that address the needs of new entrants and training/re-training of older age employees; and
- industry initiative, support, funding and collaboration will be a critical driver of success.

Appendix 4

Prospecting for Skills: Skill Shortages in the Australian Mining Industry

A recent report from the National Centre for Vocational Education Research (NCVER)⁴³ has highlighted the skill shortages that currently exist in the Australian Mining Industry and the anticipated impact on output and expansion of the industry that this might have. The report highlights the recent growth in the demand for skilled labour of over 50 per cent between 2002 and 2004, particularly for the mechanical trades (heavy diesel mechanics, fitters, welders, mechanics, and technicians) and electrical trades (technicians). This growth has been a consequence of 74 new mineral projects (\$22.6 billion) across Australia that are either committed or under construction since 2002.

The study found that skill shortages were equally prevalent in both the construction and operational phases of the mining industry. Evidence of skill gaps in these areas included rising vacancy rates, difficulty in recruiting, as well as growth in relative wage rates. The report noted that employers were seeking to improve the retention rate of their workforce through improved terms and conditions.

The presence of a labour shortage in the mining sector and related industries is highlighted by the emergence of a skills gap; to overcome recruitment difficulties firms are effectively lowering their expectations and hence lowering the quality of new hires. “Quality” here refers to things such as prior experience in the workforce, experience in the mining sector rather than a reflection on the qualifications of the applicant. The report acknowledges evidence of a skills gap emerging in the mining industry but does not attempt to measure the size of these gaps due to the difficulty in quantifying them.

Technical or highly specialised skills take time to acquire. In the short-term, the response to a skills shortage may come from companies ‘poaching’ from other companies or hiring contract workers sourced from labour hire firms. Increased competition for labour may result in bidding wars pushing up wages in an industry experiencing skill shortages.⁴⁴

The report notes that the recent and sustained economic growth in China, potential emergence of India, along with high world commodity prices and strong domestic demand, all indicate a sustained continuation of the mining boom. This, coupled with the planned expansion of mining and exploration activities in Australia, points to sustained employment growth in the industry including the mining services sector which is likely to remain strong over the next decade.⁴⁵

The future demand for labour in the mining sector will be influenced by not only the cyclical nature of the industry but other important factors such as: the ageing demographic profile of the workforce;⁴⁶ the retirement rate of existing workers; the high level of skills attrition from qualified persons leaving the industry; and the increasing use of contract labour which has an affect on apprentice intakes and commitments to training.⁴⁷

⁴³ NCVER (2005), *Prospecting for Skills: Current and Future Skill Needs for the Minerals Sector*.

⁴⁴ Currently many mining companies do not have a salary cap for recruiting skilled employees and are often willing to offer whatever salary and benefits are required.

⁴⁵ Firms involved in providing services to mining have grown by over 70 per cent between 2001 and 2004.

⁴⁶ The age structure of the mining industry in Australia is older than the age structure of the general Australian workforce.

⁴⁷ Labour hire companies play a large role in attracting skilled workers into contract work due to their ability to offer higher wages as a consequence of having lower overheads.

In response to the predicted continued strong employment growth in the mining and mining services sectors, the report offers three initiatives to avoid the emergence of a skill shortage:

- aim to improve retention rates of employees within the industry through remuneration packages, flexible rostering (5 days on, 5 days off, etc.), fly-in, fly-out working arrangements, career pathways etc;
- widen the labour pool through migration, improved gender mix, Indigenous recruitment, school leavers, etc;⁴⁸ and
- enhance the capability of the workforce by up-skilling of existing workers through training and the introduction of multi-skilling.

Finally, the report highlights concerns within the mining industry relating to the quality of vocational educational training (VET). TAFE, in particular, was seen as not meeting the needs of industry due to the organisation being supply rather than demand driven. There was recognition of the need for a more coordinated approach between the industry and vocational training institutions to better deliver courses that meet industry needs. Examples include on-site and less campus based training which in the past has not always been viable due to the ‘thin’ nature of the training market.

⁴⁸ Measures for attracting employees, especially younger employees have revolved around informing school leavers of the prospects and employment opportunities in the industry through trade fairs, advertisements in regional schools/regional television, and scholarships in universities.