F6 Construction Accommodation Facility

Santos | PETRONAS

Report

GLNG Supplement LNG Facility CAF Social

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Prepared for

Santos

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Abbreviations

ABS	Australian Bureau of Statistics
CAF	Curtis Island Construction Accommodation Facility
CRO	Community Relations Officer (Santos)
DIDO	Drive-in, drive-out
EIS	Environmental Impact Statement
FEED	Front End Engineering Design
FIFO	Fly-in, fly-out
GLNG	Gladstone Liquefied Natural Gas (project)
IAS	Initial Advice Statement
LNG	Liquefied Natural Gas
m	Meters
OESR	Office of Economic and Statistical Research
PIFU	Planning Information and Forecasting Unit
QAS	Queensland Ambulance Service
SIA	Social Impact Assessment
TAF	Temporary Accommodation Facility
TMG	The Maroon Group

Executive Summary

This social impact assessment supplement report has examined a change to the GLNG Project construction schedule and a new accommodation scenario. The schedule change focussed on the activities to be undertaken in the first six months of construction (preliminary construction phase) including:

- Construction of the mainland marine facilities;
- Construction of the CAF; and
- Clearing and initial development of the LNG Facility.

This resulted in a requirement to house all workers including the 72 assumed imported (see Table 3-5) in the Gladstone area until part of the CAF was complete by month 6 to start accommodating the LNG facility construction workforce. Full completion of the CAF was not anticipated until month 12. The majority of workers could be locally sourced due to workforce size and anticipated skills required for the preliminary construction phase, making the ratio of imported to locally sourced workers 80:20. For the rest of the construction of Train 1, the ratio was still assumed to be 65:35 as recorded in the EIS SIA. Only Train 1 was reassessed in the supplement because it was the only Train impacted by the schedule change.

The new accommodation scenario assumed that of the imported workforce, approximately 80% would be housed in the CAF within the State Development Area (SDA) on Curtis Island and the remaining 20% would be housed in the Gladstone area. This scenario was developed to provide key stakeholders with an understanding of what such a scenario could look like in terms of social impacts.

Potential social impacts associated with the Supplement identified some localised impacts however overall the wider impacts remain low. The following six social component areas were examined:

- Demographics and Community Profile;
- Accommodation;
- Health and Wellbeing;
- Education and Training Opportunities;
- Economic and Employment Opportunities; and
- Social Infrastructure.

Cumulative effects for these social components were addressed separately.

The social impacts remain low due to the project workforce requirements in relation to the community size and growth trend. Areas of concern include use of health and emergency services and accommodation. When the cumulative potential from other proposed projects is considered then many of the potential impacts increase in magnitude; however, determination of reasonable predictions is difficult due to the differing methods for presenting workforce data from project to project.

Impacts on demographics and community profile are anticipated to remain low. This is mainly due to the decision to accommodate the majority (80 %) of the imported workforce in the CAF on Curtis Island. The remaining 20 % of the imported workers are anticipated to require accommodation in the Gladstone area under the new accommodation scenario which equates to a population increase within the normal annual increase variations. Worker and dependent migration in the first year is estimated to be 429 and 346 in the second year totalling 775 by the end of year two. With peak occurring in Months 20 to 22, the following years will experience a decline in workforce numbers by 489 and 243 the following year. The workforce and their families are expected to integrate in the community given the industrial economy of the area and population demographics.

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Impacts on accommodation are anticipated to remain low though slightly increased from the EIS SIA due to the new accommodation scenario. There are currently over 200 homes for sale and over 200 rental properties available in the Gladstone area. There is also housing construction activity in the area though the number of approvals was down 45.6 % (389) in 2009 from the previous year (715). As discussed in the demographics and community profile impacts, the CAF accommodation ratio and location factor heavily in the low impact assessment.

Impacts on health and wellbeing are anticipated to remain low, though the new accommodation scenario found positive and negative impacts as a result. The levels are low because the population increase associated with the project is not anticipated to be unsustainable or unmanageable for the community, and the CAF accommodated workers will have limited impacts on the community. Demand on health and emergency services will occur at a higher level than other services primarily because emergencies will be routed to local service providers. Santos will coordinate efforts with local health and emergency services providers to manage these impacts.

Impacts on Education and Training remain low due to the requirement to import a large portion of the workforce (~65 %) and the location of the CAF on Curtis Island. In addition to the impacts assessed in the EIS SIA, the new accommodation scenario estimated a very low increase in children associated with the project (worker dependents). This was seen as a low level impact as the numbers per month are within the normal variation for annual attendance.

Impacts on economic and employment opportunities will remain low and mainly positive. The CAF servicing provides many opportunities as does the services for the imported workforce housed in the Gladstone area. Employment opportunities remain relatively unchanged from the EIS SIA since the anticipated imported to local ratio remained the same at 65:35.

Impacts on social infrastructure are anticipated to remain low, though the new accommodation scenario found positive and negative impacts as a result. The levels are low because the population increases associated with the project are low and the CAF accommodated workers will have facilities on-site for them. The relatively small population increases identified in the impacts on demographics and community profile and the accommodation impacts indicate that the project workers will have low level impacts on social infrastructure. Traffic impacts are assessed separately in Attachment C.

Cumulative effects from other projects have the potential to increase impacts, both positive and negative. The cumulative effect results in an increased potential for an impact to have the following:

- Occurrence/Likelihood – Higher probability of the impact to occur;
- Magnitude/Consequence – Greater effect from the impact;
- Duration – Longer timeframe for the impact to occur; and
- Degree of Confidence – Decreased confidence in the ability to predict and mitigate the impact.

The project in isolation will have low level social impacts across most components analysed, with impacts to accommodation, and health and emergency services being slightly elevated. With each additional project approval and construction, the pressures increase and are more dependent on the design strategies and implementation from other projects. Coordinated efforts at the local and State level to monitor and mitigate impact will be required. The CAF strategy and location are important variables in the cumulative effects on the community. By placing the majority of imported workers on Curtis Island away from the community, the cumulative effects are more predictable and manageable for Santos and the project contractors.

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Santos has committed to the development of a social management plan in order to effectively monitor and manage the project social impacts. This will be conducted in consultation with relevant key stakeholders and focus on specific social components individually. The framework for this plan is already being developed in consultation with DIP. Monitoring of changes in the community associated with the project and others will also be an important component as the area experiences the level of development projected. This will be included in the mitigation and management strategy.

1

Introduction

This EIS Supplement report addresses the key concerns and issues raised through the public comment component of the EIS for the social impacts assessment (SIA). In some cases clarification of the assessment is provided as well as additional studies conducted to address underlying concerns. The SIA provided an assessment of the potential impacts from the project on the community given the option of locating the Curtis Island Construction Accommodation Facility (CAF) in isolation from the community and restricting access. This supplement study will reiterate some key components of the SIA as well as assess a new accommodation scenario for the construction phase of the project. This supplement focuses entirely on the construction phase for Train 1. No further assessment of the operational phase of the project was conducted.

1.1 Methodology

The supplement for the CAF social assessment followed a similar methodology as was used for the Social Impact Assessment (SIA) in the environmental impact statement (EIS). The following assessment methodology was used:

1. Baseline assessment – used the baseline from the SIA with updates as required;
2. Imposed known project components on the baseline;
3. Assessed workforce;
4. Assessed impacts;
5. Developed mitigation and enhancement strategies;
6. Assessed residual impacts;
7. Assessed cumulative effects; and
8. Developed an executive summary.

Interviews with key stakeholders were carried out in order to provide additional information or close gaps in the data. Interpretation of potential impacts was also conducted in some cases to determine perceived impacts given certain scenarios.

There are additional documents available or under development since the submission of the SIA in the Gladstone Regional Council area including the Futureye Report: Gladstone Regional Vision 2028 (Final report) and the Social Infrastructure Strategic Plan (under development). These documents have been used to update and strengthen areas of the baseline and will be used to help inform future management plans.

This supplement is a revised accommodation assessment of the LNG facility construction phase and is based on an updated accommodation strategy. Focus is placed on the assessment of the Train 1 construction phase for the following reasons:

- Train 1 is the first construction phase;
- Train 1 will experience the largest construction workforce;
- Train 1 will require the most locally sourced accommodation dwellings which can be maintained for subsequent train constructions; and
- Predicting real estate and housing markets beyond the four year Train 1 construction period is unrealistic.

1.2 Revised Accommodation Scenario

Santos received feedback from certain stakeholders that further consideration be given to a workforce accommodation scenario that acknowledges a degree of growth and impact on the Gladstone resident population. To this end, Santos has reassessed the impacts by developing an accommodation scenario based on the experiences of Bechtel (Santos' FEED Contractor for LNG Facility) in the area. This scenario is detailed in Section 4.6 of this report.

In essence, this new scenario has a 65:35 (%) imported to local worker split. It is assumed that all of the local workers and 20% of the imported workers will reside in and around Gladstone. The remaining 80 % of the 65 % of imported workers will reside in a CAF on Curtis Island. This gives an overall estimated split of 52 % of the workers in a CAF on Curtis Island, and 48 % being based in and around Gladstone.

1.3 Original Workforce Accommodation Scenario

The EIS/SIA provided a scenario for the accommodation of 100 % of the LNG facility construction workforce in a CAF on Curtis Island. This option was selected for the following reasons:

- Significantly reduced potential for negative social impacts on the community;
- Reduced potential transportation impacts on the community;
- Reduced cost of transportation of workers to and from the site;
- Reduced health and safety risk to workers associated with transportation to and from the site; and
- Reduced impact on the accommodation market in the Gladstone area.

The rationale for this strategy is even more appropriate from a cumulative effects assessment perspective. There is likely to be a high demand on the Gladstone housing market based on the number of potential large scale industrial projects planned for the study area. Accurate information for most of these studies was not available as they are still in the data collection phases of their EIS studies; however, regardless of the exact details, the cumulative accommodation requirements for overlapping construction workforces will very likely put significant strain on the Gladstone housing market. Designing the GLNG Project construction phase to minimise the potential strain on the market was determined to be the most prudent approach.

Additional criteria for the selection of the 100% CAF scenario arose from concerns identified by key stakeholders including the inter-agency meeting in Gladstone and some council staff (pers. comm., Gladstone Regional Council, 2008). Real and perceived negative social impacts associated with past large scale construction operations in the Gladstone area are identified in the SIA. These included traffic issues, housing issues, inflow of individuals wanting to acquire work contracts with nowhere to live and impacts on local services. This was presented as anecdotal evidence as no statistical data was made available to Santos to further support the identified impacts.

There were also concerns related to the economic and employment uncertainty as a result of the global financial crisis still playing out during the drafting of the EIS/SIA reports and the likely cumulative effects of multiple large scale industrial projects requiring local accommodation during overlapping timeframes with the GLNG Project.

Santos assessed this scenario based on the following variables:

- CAF location isolated from the population on Curtis Island;
- Lack of direct land based transportation corridors onto Curtis Island;

1 Introduction

- Lack of direct land based transportation access to South End and other Curtis Island populated areas (track later identified through community consultation);
- Lack of private and public docking facilities for marine traffic at the LNG facility site;
- Santos policies regarding transport restrictions for workers on their work rotation;
- Santos policies regarding worker access to the community;
- Santos policies with regard to local hiring and definitions of locals; and
- The potential housing supply issues that could occur in Gladstone from other projects proposed or approved for development in the area, and the direct and indirect impact on the local housing markets.

The option of not having the CAF on Curtis Island was also considered but not assessed because the daily commute would impact the project as follows:

- Reduction in the amount of productive hours;
- Delayed schedules;
- Increased project costs;
- Increased marine and land traffic; and
- Increased potential for health and safety incidents due to fatigue.

Table 1-1 Social Components and the Impact Potential from the CAF Option in SIA – 100% of Construction Workers Housed in CAF

Social/Economic Component	Impact Potential from CAF Option	Brief Explanation
Community Demographics and Dynamics	Significantly reduced	Population increases would be minimal due to CAF isolation, no incentive to move to Gladstone and reduced economic opportunity increases associated with the project. Furthermore, the individuals and families likely to move to Gladstone as a result of the project are similar to the current population demographics.
Health and Wellbeing	Significantly reduced	Health services would be provided for workers in order to meet workplace health and safety requirements. Emergencies would require transport to local hospitals, but this is determined to be a low impact as past project experience suggests such emergencies are not frequent occurrences.
Education	Significantly reduced	Education facilities including schools would not experience a large increase in enrolments because of the lack of incentive to move to Gladstone by imported workers. The reduced level of potential spin-off economic opportunities would also reduce the potential for people providing services for the project moving to the area, since the CAF is isolated from the community.
Training Opportunities	Unchanged	The project would still offer training opportunities to locals seeking employment opportunities with the project.
Economic Opportunities	Significantly reduced	Due to the CAF location in isolation from the population and the restricted access to the mainland, local businesses would not experience the potential increase in sales associated with construction workers spending money in the community were the CAF situated on the mainland. The assessment did include the opportunities for local businesses to provide services to the project which would result in a low positive economic opportunity.

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Social/Economic Component	Impact Potential from CAF Option	Brief Explanation
Employment Opportunities	Unchanged, though potentially reduced by CAF restrictions	The project will maximise local hiring opportunities through construction contractors including through the development of education and training opportunities. However, some locals may be deterred from seeking employment due to the intended policy to house all workers in the CAF for their work rotation. There is a likely psychological issue associated with being so close to home but unable to return while staying at the CAF for the work rotation. This would be evident for both workers and their families. Note – The Supplement assesses the change in policy where locals are able to commute daily.
Social Services and Infrastructure	Significantly reduced	Impacts on social services and infrastructure would be significantly reduced as a result of the workforce being physically isolated from the community and fully catered for in the CAF. However there could be an increase in family counselling services as a result of the stresses associated with the local workforce being housed in CAF as well. This would likely be a minor impact.
Worker Health and Safety	Mixed	The reduced transport requirements of having to ferry workers to and from the island daily is a benefit, as it reduces the probability of an accident. The major side effect though is that due to the isolation from the mainland, emergency evacuations could take longer. The project would construct a helicopter pad in order to allow helicopter evacuations, (e.g. Medivacs) and would coordinate with local emergency services to develop emergency response plans once the project had been approved and the final investment decision (FID) made by the project.
Project costs	Reduced	It is less costly to house the workforce in CAF than to commute daily and source accommodation in the Gladstone area. The daily commute of all workers if the CAF was not on Curtis Island would result in: • Additional mainland and jobsite facilities for larger capacity and additional ferries; • Larger capacity and additional ferries; • Additional non-productive time for workers commuting and waiting to be transported; and • Additional costs associated with longer schedules due to more non-productive time.
Cumulative Effects	Reduced	There is a minimal attributable cumulative effect from the construction phase on the community if the imported workers are housed in CAF. By housing the local workforce in a CAF as well there is less marine traffic to and from the island daily; however, there is an increase in the potential family stresses associated with partners/spouses being so close by but unable to assist in family issues while in CAF. Cumulative effects would mainly be attributed to other projects due to the isolation of the workforce. Population influxes outside the norm for the area would be part of the cumulative effect of the project.

Source: Santos GLNG EIS SIA, 2009.

There is a high probability for the local to imported workforce ratio to shift from predominantly local to predominantly imported workers as the project progresses. This could occur for the following reasons:

- Local skill sets compliment the type of workers required for the initial stages of construction;

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- As workforce number requirements increase, there will be less potential local workers available to fill those roles due to the size of the population and the low unemployment rate. This was determined through Bechtel's assessment of local skills; and
- As other projects proposed for the area move from the EIS and approvals stage to construction, there will be increased competition for construction workers, both local and imported. However, as there is a finite number of locals to source from, a heavier reliance on imported workers will most likely become a reality.

2

Baseline

Baseline data collected for the SIA has been incorporated into this supplement report. Some of the information presented in the SIA has been included here to assist in reading the report; however, more detailed information can be found in the SIA (Appendix Z of the EIS). Additional information has also been added where applicable to update information from the SIA baseline. The following additional sources were used to collect supplementary baseline data:

- Australian Bureau of Statistics (ABS);
- Futureye Report: Gladstone Regional Vision 2028 Final Project Report;
- Gladstone Social Infrastructure Strategic Plan Project Updates; and
- Planning Information and Forecasting Unit – Population and housing fact sheet for Gladstone Regional Council August 2009.

2.1 Gladstone Regional Council Statistics

The *Central Queensland – A New Millennium Regional Plan* (CQNMRP) recognises Gladstone as a regional centre. Gladstone has in the past been seen as a key centre for metals processing and as a major coal export centre. The centre is well serviced by rail, road and air transport links and is increasingly becoming a focus for the processing and export of energy related products and other material. Gladstone is one of the few areas for which the state government has defined and operates a special State Development Area for major industrial projects.

Gladstone is also recognised as a node for access to the Great Barrier Reef and as a key centre for leisure such as sailing and other marine-based activities, as well as a base for access to the hinterland. The region is serviced by the full range of tertiary, secondary and primary school facilities and also continues to be a place of choice for retirees according to CQNMRP.

2.1.1 Population

The Gladstone Region (and the city of Gladstone specifically) represents one of the key regional centres along the Queensland coast. Table 2-1 highlights the population centres in the Gladstone area. Gladstone City (population approximately 31,000) consists of a number of suburbs and is situated on the southern side of Port Curtis approximately 5 km from the LNG facility site.

Table 2-1 Estimated resident population by major urban centre/locality, Gladstone Regional Council, 2007

Urban centre/locality	Estimated resident population as at 30 June 2007	Area	Population density	State rank (population size)
	Number	**sq km**	**per sq km**	
Gladstone (C)	30,731	67.1	458.1	11
Tannum Sands (C)	4,388	4.8	920.6	45
Boyne Island (C)	3,910	6.8	573.5	48
Agnes Water (C)	1,707	45.6	37.4	100
Calliope (C)	1,646	4.1	398.4	103

2 Baseline

	Estimated resident population as at 30 June 2007	Area	Population density	
Benaraby (L)	630	3.5	180.7	223
Miriam Vale (L)	382	3.7	102.7	283
Mount Larcom (L)	267	1.6	162.9	331
Seventeen Seventy (L)	64	6.6	9.7	364
Gladstone Regional Council	**55,523**	**10,487.8**	**5.3**	**. .**
Queensland	4,091,546	1,734,174.0	2.4	. .

. . = not applicable; L = Locality; C = City. Note: Based on ASGC 2006.

Source: ABS, Regional Population Growth (Cat no. 3218.0) and unpublished data

The preliminary estimated resident population of the Gladstone Regional Council area at 30 June 2008 was 57,587 people, an increase of 1,871 people (or 3.4 %) over the year. This compares with an increase of 1,775 people (or 3.3 %) in the year to June 2007 (PIFU, 2009). Table 2-2 highlights the population trends in the council since 2001.

Table 2-2 Gladstone Regional Council Population Trends 2001 to 2008

Year at June 30	Estimated Resident Population
2001	46,369
2002	47,659
2003	49,075
2004	50,891
2005	52,186
2006	53,941
2007r	55,716
2008p	57,587

Note: p = preliminary r = revised

Source: PIFU 2009

In the year to June 2007 natural increase (births minus deaths) accounted for an increase of 512 people while assumed net migration resulted in a gain of 1,263 people (PIFU, 2009). This maintained the current trend from June 2006 to June 2008 where Gladstone Regional Council's annual population change averaged approximately 3.4% growth as seen in Table 2-3.

2 Baseline

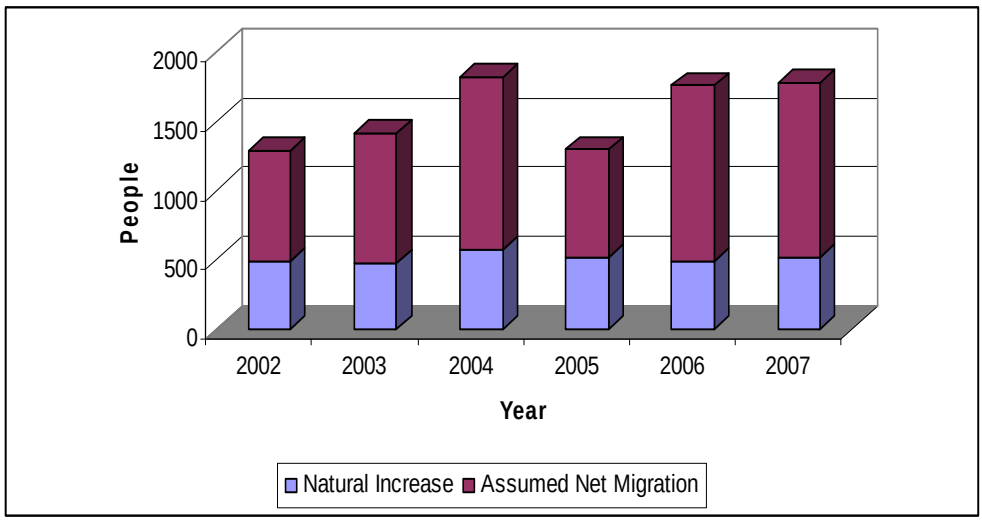
Table 2-3 Gladstone Regional Council Annual Population Change 2002 to 2008

Year to June 30	Natural Increase	Assumed Net Migration	Annual Change	
			Total	Percent
2002	493	797	1,290	2.8 %
2003	471	945	1,416	3.0 %
2004	572	1,244	1,816	3.7 %
2005	513	782	1,295	2.5 %
2006	490	1,265	1,755	3.4 %
2007	512	1,263	1,775	3.3 %
2008	n.a.	n.a.	1,871	3.4 %

Source: PIFU 2009

Components of the population change in the region indicate that both natural increases and assumed net migration have positive effects on population growth. Natural increases have been lower than assumed net migration since 2002 with the proportion ranging from approximately 2:3 respectively in 2005 to approximately 1:3 in 2006. Figure 2-1 highlights the components of population change in the area from 2002 to 2007. 2008 data has not yet been analysed by PIFU to distinguish between natural increases and assumed net migration.

Figure 2-1 Gladstone Regional Council Components of Population Change 2002 to 2007



Source: PIFU 2009

Projections prepared by the department indicate that by 2016 the expected population of Gladstone Regional Council will be between 68,470 and 75,430 people. By 2031 this is expected to change to between 90,060 and 114,530 people (low and high series) (PIFU, 2009).Table 3-4 highlights the population projections every five years from 2011 to 2031.

2 Baseline

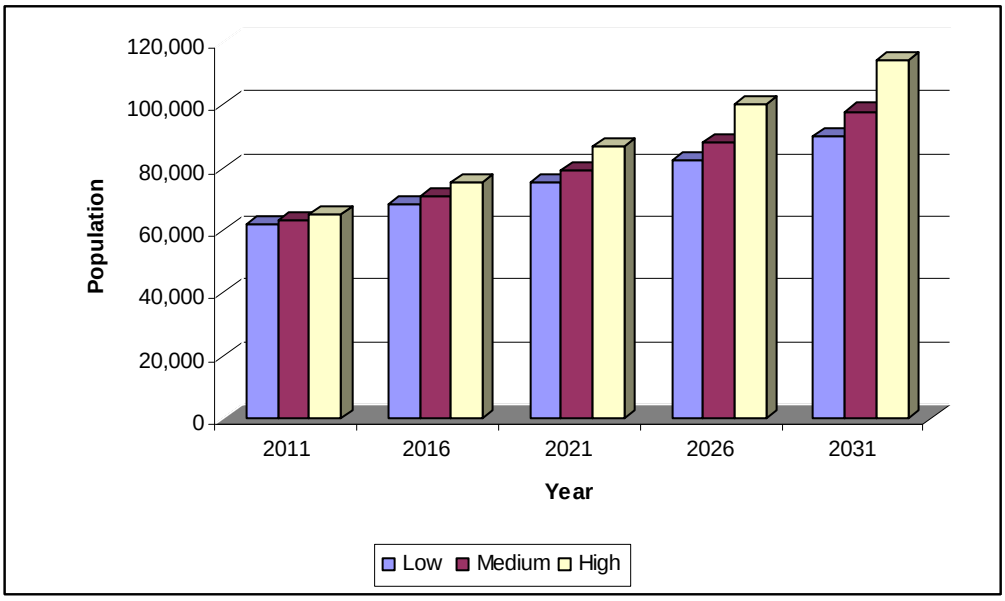
Table 2-4 Gladstone Regional Council Five Year Population Projections 2011 to 2031

Year	Projected Population		
	Low	Medium	High
2011	61,971	63,120	65,029
2016	68,472	70,927	75,427
2021	75,099	79,102	86,965
2026	82,478	88,265	100,137
2031	90,060	98,041	114,525

Source: PIFU 2009

Figure 2-2 illustrates the population projections for Gladstone Regional Council every five years from 2011 to 2031. All projections show continued steady growth in the region.

Figure 2-2 Gladstone Regional Council Population Projections 2011 to 2031



Source: PIFU 2009

2.1.2 Housing

Updated dwelling approval information from the Planning Information and Forecasting Unit (PIFU) is presented Table 3-5 for the last four quarters from August 2009 (PIFU, 2009).

2 Baseline

Table 2-5 New Dwelling Activity in Gladstone Regional Council for Previous Four Quarters from August 2009

Quarter	New Dwelling Approvals		
	Houses	Other	Total
September Quarter 2008	109	65	174
December Quarter 2008	72	76	108
March Quarter 2009	44	2	46
June Quarter 2009	59	2	61

Source: PIFU 2009

Dwelling activity decreased in the Gladstone Regional Council area in the year ending June 2009 with 389 approvals, 73.0 % of them for separate houses, compared to 715 approvals in the previous year. These figures represent a decrease of 45.6 % in dwelling activity (PIFU, 2009). Table 2-6 highlights new dwelling activity from June 2003 to June 2009.

Table 2-6 New Dwelling Activity in Gladstone Regional Council from June 2003 to June 2009

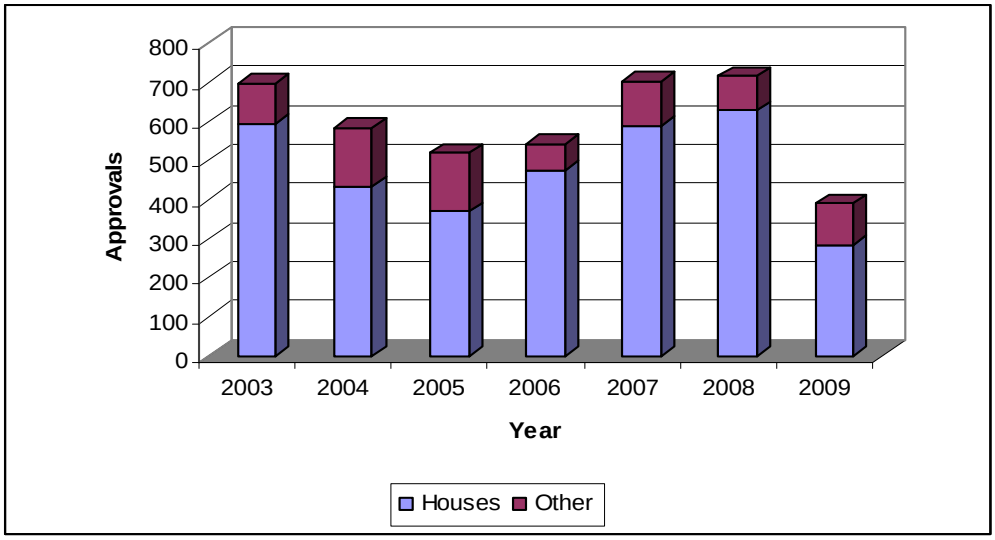
Year to June	New Dwelling Approvals		
	Houses	Other	Total
2003	595	104	699
2004	433	151	584
2005	370	148	518
2006	476	65	541
2007	589	113	702
2008	627	88	715
2009	284	105	389

Source: PIFU 2009

Figure 2-3 graphically illustrates the trends in approvals in the region from 2003 to 2009. There has been an increasing trend since 2005 to 2008. This comes on the tail of a downward trend from 2003 to 2005. 2009 experienced a decrease in dwelling approvals significantly below the other years recorded in the figure.

2 Baseline

Figure 2-3 Gladstone Regional Council Dwelling Approvals 2003 to 2009



Source: PIFU 2009

The following information was extracted from Appendix C of the SIA (refer Appendix Z of the GLNG EIS).

Existing residential detached housing (i.e. standalone houses) is concentrated in the suburbs of Clinton, New Auckland, South Gladstone and West Gladstone. Gladstone City includes higher density housing. The *Gladstone City Council Planning Scheme* – Plan 1 and Plan 3 show existing residential areas and planed urban expansion areas. The southern area of Gladstone has been designated for significant urban growth, including the Kirkwood Road precinct. The Kirkwood Road South Structure Plan sets out 2,600 lots for development.

Recently there has been increased interest in higher density development in Gladstone, with several large multi-unit developments currently under construction or being proposed. These include:

- 63 managed apartments on Bramstom Street (under construction);
- 40 unit apartment development in Lord Street, Gladstone (under construction);
- 34 units in Oaka Lane (under construction);
- 12 residential units and 48 serviced units in Auckland Street (Bluechip) (approved);
- 74 residential unit development in Glenlyon Road, Stokeston (approved);
- 48 residential unit development in Glenlyon Road;
- Grand Hotel – 96 unit residential tower (proposed); and
- 19 residential units and 46 motel units, corner Goondoon and Lord Streets (proposed).

The raw ownership data indicated that 29 % of properties within the Gladstone Regional Council area were rented.

New dwelling activity statistics prepared by PIFU show that the Gladstone Regional Council area had a total of 627 new house approvals and 88 other approvals (i.e. total of 715 new dwellings) in 2008 (PIFU, 2009). In 2007, there were a combined total of 702 new dwelling approvals issued for the Gladstone Region. The figures for 2007 and 2008 suggest that the region has the capacity to meet the required “approval rate” per annum to provide an adequate supply of dwellings to meet expected base demand over the next 25 years.

2 Baseline

The Gladstone region has an active residential construction sector. A survey (Property Research, 2008) of 16 local builders indicates that there is a current shortage of labour within the building industry. The shortage of building labour (particularly the skilled trades) has led to an increase in build times. Ultimately, ability to meet demand for construction of dwellings may be limited by the capacity of the local building industry. Increasing the capacity of the building industry could be achieved "*through the emergence of new building companies with their own tradespeople from other areas or an increase in local wages sufficient enough to attract subcontractors from other locations*" (Property Research, 2008).

Median House Prices and Sales

The following information was extracted from Appendix C of the SIA (Appendix Z of the GLNG EIS).

The price of all residential properties has risen steadily over the last 10 years, with a strong surge in median prices since 2002. For the 12 months to the end of March 2008, median house prices and median unit prices for the Gladstone Regional Council area have increased by 27 % and 48 %, respectively. In Calliope Shire, median house prices and unit prices have increased over the last 12 months by 19 % and 41 %, respectively.

Statistics released by REIQ for the June 2008 quarter show an increase in median house prices for population centres around Gladstone as follows:

- Gladstone – $394,000 (2.2 % growth);
- Calliope – $394,500 (8.2 % growth); and
- Boyne Island – $435,000 (0.5 % growth).

The median house price in Tannum Sands dropped 7.5 % over the June quarter, to $465,000. The strong growth in Gladstone is likely to have been a result of a number of major projects being approved for the area and a market realisation that an increase in demand can be expected, coupled with the positive geographic and lifestyle attributes that Gladstone continues to offer. Increasing prices have also been attributed by some to the escalating building costs, and strong investor activity spurring prices (Property Research, 2008). Previous price increases are also likely to have been a result of readily available credit (i.e. affordable interest rates) and growth in the employment sector, including in regional areas such as Gladstone and its surrounds.

Residential property activity has been high in the Gladstone area over the last few years, with high demand for property from residents and investors. However, Heron Todd White (2008b) believes that Gladstone has passed the peak of the residential property cycle and is now in the declining market stage, with reduced new house construction and demand, declining house sales, and a significant number of listings. The volume of sales has reduced dramatically in the June 2008 quarter, with 135 total sales, down seven sales from the same time last year (Heron Todd White 2008(a)). Over 200 house and land properties were listed as "for sale" in the Gladstone Area (Realestate.com.au, 2008) and again in October 2009 ((Realestate.com.au, 2009).

Subdivision of Land

The following information was extracted from Appendix C of the SIA (Appendix Z of the GLNG EIS).

The supply of land for residential development has fluctuated over time. PIFU residential land monitoring figures for the previous Calliope and Gladstone local government areas show that a total of

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319 residential lots were sealed (i.e. approved with title plans prepared) for the two areas combined in 2007, with 416 sealed in 2006. In 2003, 1152 were approved.

The Gladstone Market Report (Property Research, 2008) and the GEIDB presentation (GEIDB, 2007) note from real estate anecdotes that fewer than 30 blocks of serviced residential land are for sale. *"[A] total of 29 vacant land sites and 218 house and land properties were listed as 'for sale' on Realestate.com.au* [assumed survey carried out prior to April 2008]*".* In October 2009 there were over 200 houses listed as 'for sale' as well as 28 town houses and 76 units/apartments listed in the Gladstone and surrounds area (Realestate.com.au, 2009).

A Broad hectare Residential Land Analysis for the Gladstone region prepared by PIFU indicates that there is at least 2,316 hectares of residential land available over the next 10 years. Of this, 1,329 hectares is urban residential land. A further 987 hectares is allocated for rural residential development purposes (which is likely to yield a significantly lower number of lots per hectare – approximately 0.5 to 2 lots per hectare).

There is significant lead-in time for lot development. The typical residential subdivision takes approximately 12 months for approvals and 12 months for civil works, plan registration and sale (GEIDB, 2007).

Forecast Land and Housing Requirements

The following information was extracted from Appendix C of the SIA (Appendix Z of the GLNG EIS).

The Medium Estimated Resident Population Growth projection published by PIFU in 2008 shows that the Gladstone Regional Council area is expected to grow from 53,941 persons in 2006 to 98,041 persons in 2031. The projected population growth represents strong growth and will provide significant challenges for local and regional planning authorities.

As part of this study, a housing needs model was developed to assist in identifying likely housing needs for the population growth expected in Gladstone over the next 25 years. The model uses PIFU growth scenarios and basic assumptions regarding housing density, dwelling occupancy rates and distributions of people in multi-unit development and single dwelling houses. Appendix A provides overall summarised figures for the Medium growth scenario provided by PIFU for the Gladstone Region.

The most significant aspect of an analysis of Gladstone's future housing needs is the ongoing requirement for significant amounts of land to cater for the expected growth. Based on the Medium Growth Scenario, Gladstone is expected to require a total of approximately 1,633 hectares of residential land (not taking into consideration land requirements from the GLNG Project). This is based on present development patterns which include:

- A propensity towards single dwelling house development and limited, low-rise multi-unit development (based on past ABS data showing approximately 90 % of the population are housed in single dwelling houses vs. 10 % of the population in multi unit dwellings); and
- Dwelling density of 10 single dwelling houses per hectare or 15 multi unit dwellings per hectare.

This equates to an average demand of 65.3 hectares per annum over the next 25 years for 590 single dwelling houses and 98 multi-units per year.

Based on the broad hectare residential land analysis projections up until 2027, the existing land supply is likely to adequately meet the region's needs in the period covered by the projection.

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Rental Accommodation

The following information was extracted from Appendix C of the SIA (Appendix Z of the GLNG EIS) and a Bechtel study undertaken in August 2009. Only paragraphs sourced from the Bechtel study are identified as such. All other selections are from the SIA.

A survey of the local real estate agents in August 2009 showed the best availability of housing in the Gladstone town centre, with three and four bedroom houses and two bedroom apartments most widely offered (Bechtel, 2009).

Private Rental and Public Housing

2006 census data shows that there are around 4,800 rented dwellings recorded. Discussions with property managers and council indicate that rental properties are in short supply, with the vacancy rate reportedly less than one percent (agent pers. comm., 2008; GEIDB, 2007). A search of Realestate.com.au showed around 110 advertised 'for rent' (Realestate.com.au, 2008). A re-search of Realestate.com.au showed over 200 advertised 'for rent' (Realestate.com.au, 2009).

Gladstone has not experienced as sharp an increase in median rent prices for a three-bedroom house as other areas in the region. Given that Gladstone is well-situated on the coast and is a well-serviced town, it is likely that there is still scope for significant rent rises, based on figures for other centres of a comparable size and the rental housing market in Queensland overall.

The median rental price for a three-bedroom flat in Gladstone ($320 per week in 2008) is greater than that for a three-bedroom house. This may be because of proximity advantages that exist with flats usually being located closer to CBD services, jobs and other services than some houses, which may be located on the outskirts of urban areas, and a resultant premium that some people may be prepared to pay for such benefits. In October 2009 the rental price per week ranged from $165 to $750 for a large three bedroom penthouse apartment (Realestate.com.au, 2009).

A key indicator of housing affordability is the proportion of income spent on accommodation. Appendix B.1 and B.2 of the stand alone accommodation study for the GLNG EIS (Appendix C of the SIA) showed the percentage of households in Gladstone and Calliope Shires where accommodation accounts for 30 % or more of gross income. This is considered a threshold level for high housing costs.

Gladstone Regional Council, the Department of Housing (now Department of Communities) and community groups noted that vulnerable groups within the community have difficulty in finding appropriate accommodation due to limited vacancies and high costs; however, the situation isn't as bad as it has previously been (pers. comm., B. O'Rourke, 2008; V. Laverick, 2008).

There are five crisis houses and a men's and women's shelter in the community. The Department of Housing (now Department of Communities) has approximately 750 units in the Gladstone area. Demand for housing assistance is high, with around 25–30 applicants a month. Currently there are 167 people on a waiting list for 28 low income housing units managed by Roseberry Management (pers. comm., B. O'Rourke, 2008; V. Laverick, 2008) (URS, 2006).

Gladstone Regional Council, the Department of Housing (now Department of Communities) and community groups noted that previous large construction projects in the area had a significant impact on housing availability and pricing in the region. The CAR 1 construction phase resulted in a jump in rents and house prices and decreased availability, which forced some low income households out of the area to lower cost areas (pers. comm., B. O'Rourke, 2008; V. Laverick, 2008).

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Vacancy Rates

The Real Estate Institute of Queensland (REIQ) produces a quarterly report on vacancy rates for houses and apartments across Queensland. The most recent data shows that the Gladstone regional area had a vacancy rate of 6.1 % in March 2009. Further data is available for purchase from the REIQ publication 'Queensland Market Monitor'. The data includes trend data over the last one to five years in the Gladstone area (Bechtel, 2009).

A sample study by the Queensland Office of Economic and Statistical Research in July 2009 showed that twice as many managers of residential rental accommodation across Queensland believed that the demand for residential rental accommodation in their area had decreased over the past 12 months as opposed to a perceived increase (48.4 % versus 24.3 %). The remainder believed demand had remained the same (23.3 %) or did not proffer an opinion (4.1 %). In contrast the 'Rest of Queensland' regional which excludes Brisbane and the Gold Coast areas said that 31.6 % of real estate agencies in this area experienced and increase in demand for residential accommodation (Bechtel, 2009).

Hotel and Motel Accommodation

A range of hotel and motel accommodation is available in the Gladstone/Calliope region, catering to tourist and business travellers and providing a further residential option for those working temporarily in the region. Table 2-7 highlights the hotel and motel accommodation available in the Gladstone area.

Table 2-7 Hotel/Motel Accommodation in Gladstone Region – June Quarter 2008

Area	Number of Businesses	Rooms	Bed Spaces	Room Occupancy Rate	Average length stay (nights)
Calliope Shire	9	227	751	52 %	2.7
Gladstone Shire	23	598	1633	70.6 %	1.8
Total	**32**	**825**	**2384**	**NA**	**NA**

Source: ABS, 2008 – 8635.3.55.001 – Tourist Accommodation, Small Area Data, Queensland, Jun 2008

Based on ABS data for tourist accommodation, there are currently 32 establishments (with five or more rooms) within the Gladstone Region (June, 2008). The combined number of rooms in these establishments is 825 rooms. Gladstone shire by itself has 598 rooms available, with a relatively high room occupancy rate of 71 %, or approximately 425 rooms occupied on any single night. The 227 rooms available in Calliope Shire by itself have a lower occupancy rate, with around 120 rooms occupied on any given night (ABS, 2008). Occupancy rates are understood to be lower in the summer period, which is outside of the main tourist season. The average length of stay is almost two (1.8) days in Gladstone and almost three (2.7) in Calliope (see Table 2-7).

Table 2-8 provides a selection of hotels and motels in the Gladstone area and key information.

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Table 2-8 Selection of Gladstone Area Hotels and Motels August 2009

Property Name	Type	Rooms
Quest Serviced Apartments	Studio, 1, 2 & 3 Bedrooms	82
The Pines	2 Bedroom Apartments	71
Harbour City Motel	Standard rooms	28
Rydges	Standard rooms	73
Xenia Central Studio Accommodation	Studio & 1 Bedroom	12
Harbour Sails Motor Inn	Suites & Units	32
Best Western Camelot Motel	Suites & Units	26
Gladstone Palms Motor Inn	Standard rooms	36
Metro Hotel and Apartments Gladstone	Standard rooms	49
Gladstone Motel	Standard rooms	22
Mawarra Motel	Standard rooms	30
Amber Lodge	Standard rooms	15
Siesta Villa	Standard rooms	11

Source: Bechtel

A number of motel and hotel developments are being constructed or have been lodged as development applications with council. These developments, if approved and constructed, would increase the pool of short term accommodation.

Caravan Parks

There are 12 caravan parks listed in the greater Gladstone area (GAPDL, 2008); however, the ABS data indicates that there are only seven. ABS data for the June 2008 quarter shows a total combined capacity of 800 sites. Gladstone recorded a high occupancy rate (79 %) during the June 2008 quarter (see Table 2-9). Demand for caravan park style accommodation is seasonal, with the winter months being the period of highest demand. During the summer months, occupancy is much lower. The parks contain a large number of long term residents, which reduces the capacity of all the parks to operate as temporary accommodation for workers and the seasonal tourist influx (URS, 2006).

Table 2-9 Caravan and Mobile Home Parks in Gladstone Region – June Quarter 2008

Area	Number of Businesses	On-site vans	Cabins, flats units and villas	Other powered/ unpowered Sites	Total capacity	Site Occupancy Rate
Calliope	4	35	68	450	553	49.6%
Gladstone	3	45	65	137	247	79.0%
Total	**7**	**80**	**133**	**587**	**800**	**NA**

TAFs/CAFs

Currently there are no operational temporary accommodation facilities (TAFs) in the area. TAFs for previous projects such as the CAR1 project have been decommissioned. There have been several

applications with Council for TAFs recently and one development has recently been approved (see Table 2-10).

Table 2-10 Recent TAF Approvals and Applications for Gladstone Regional Council

Project	Details	Notes
101 Calliope River Road Accommodation Units	Development approval issued for 240 accommodation units 6/10/2008 on a 33ha site (Stage 1). Operational works application to be lodged shortly.	Primary issue is water availability. Approval limited to 240 units based on existing capacity.
101 Calliope River Road Accommodation (continued)	Preliminary approval for remaining 2,025 units. Application to be submitted at a later stage.	As discussed above, issues for further unit development dependent on sourcing water.
Stowe Road – Lot 13 RP616937	300 units. Operational works application lodged.	
(BSL) Dahl Road	Application for 450 units submitted 17/4/2008. **Withdrawn**	Will connect to sewer on Dahl Rd. and water on Old Tannum Sands Rd.
Awonga Dam Road – Lot 2 RP615267	Application for 140 unit development recently submitted in November 2008.	

Source: Gladstone Regional Council representative 2/12/2008

Gladstone Regional Council approved a TAF development in Calliope Shire in October 2008 for 240 units, and an operational works application for the development was submitted to council in December 2008. This is the first stage of the development run by The Maroon Group (TMG), which plans a 3,000 unit complex on the site at 101 Calliope Road (TMG, 28/11/2008). Council has granted preliminary approval for 2,025 units on the site. Council concerns about capacity of potable water and disposal of effluent prevented it from giving complete approval for the project (ABC 10/10/2008). TMG anticipates an approval decision on the full 2,265 unit site in November/December 2009 based on the updated information they compiled for council (pers. comm., TMG, 2009).

There are a number of other applications with council for TAF-style accommodation, as detailed in Table 2-10. Combined, these applications amount to almost 600 proposed units of accommodation. MAC Services Group had a contract with Rio Tinto Alcan to construct a 300 room TAF near Calliope for the Yarwun 2 project; however, the development has been cancelled. The first rooms were due to be completed by January 2009 (Mining News, 2008).

An issue for TAFs is the provision of infrastructure and services. Potential sites are often located a significant distance from services or the existing services do not have capacity to cater for such increased use, meaning that TAFs have to provide independent infrastructure to service the site.

Housing Summary

The following information was extracted from Appendix C of the SIA (Appendix Z of the GLNG EIS).

A summary of the existing housing characteristics of the Gladstone region is as follows:

- The predominant housing type within the study area is the detached house. Semi-detached dwellings and apartments or units only represent a minor proportion of dwelling type; however, there are a number of higher density developments being constructed or proposed within the Gladstone CBD;

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- Approximately 70 % of dwellings are owned by the occupier / being purchased versus 30 % rented in Gladstone region;
- Gladstone region has had a strong property market for the last five years, characterised by high sales rates, high demand for housing stock and a strong increase in median house and land prices. Rental vacancy rates are understood to have been less than one percent and median rent prices have been steadily increasing over the last five years. There is scope for significant further increases in rent;
- The property market slowed in 2008 with a reduction in sales and increased listings. Median house and land prices have steadied or in some areas have dropped. In the longer term, the property market is expected to remain buoyant due to steady population growth that is expected to take up most available new and existing accommodation (sale and rent) in the local housing market;
- Based on the medium population growth scenario, Gladstone is expected to require a total of approximately 1,633 hectares of residential land over the next 25 years, which equates to a demand of 65.3 hectares per annum for 590 single dwelling houses and 98 multi-units per year. Calculations are based on present development patterns favouring single dwelling development. Based on the broad hectare residential land analysis projections until 2027, the existing land supply is likely to adequately meet the region's needs during the projected period;
- Approval rate figures for 2007 and 2008 suggest that the region has the capacity to meet the required approvals per annum to provide an adequate supply of dwellings to meet expected base demand over the next 25 years. There is an acknowledged shortage of skilled workers in the local building industry that may limit capacity to meet demand. Limited supply could also increase build times and costs;
- Lower income groups within the community have experienced difficulty in finding appropriate accommodation due to limited vacancies and high costs. Previous large construction projects in the area have had a significant impact on housing availability and pricing in the region, with some moving out of the area to more affordable locations;
- Demand for housing assistance is high;
- Hotel/motels and caravan parks are frequently booked out; and
- There are currently no TAFs in the area; however, there have been a number of approvals and applications made for TAFs in the former Calliope Shire. The main issues for TAFs are the provision of infrastructure and services.

For additional information on housing in Gladstone refer to the SIA (Appendix Z of the GLNG EIS) as well as Appendix C of the SIA.

2.1.3 Health and Wellbeing

The 2028 Gladstone Region Vision Statement from the Futureye report states:

The Gladstone region will be recognised, nationally and internationally, as a sustainable 'region of choice' for achieving the best integration of large industry and commerce, environmental protection and community wellbeing. *We will be renowned for balance: a friendly, clean and vibrant place in which to work, live and raise a family.*

We will achieve this vision by:

- *Providing the opportunity for everyone in our urban and rural communities to participate fully in the life of the region;*

- *Acknowledging the Indigenous caretakers of our region and their continued custodianship and spiritual connection to our land;*
- *Valuing our diversity: celebrating our cultural and natural diversity, and protecting them so they can be enjoyed by residents and tourists; and*
- *Aspiring to be a region that retains, develops and provides safe environments for its people across all generations (young and old), creates and manages a sustainable economy, and maintains its unique lifestyle (such as good fishing and crabbing) by ensuring we grow in a smart way.*

We recognise this will involve:

- *Maintaining our natural assets, "small town" feel, green belts, employment opportunities, "can do" attitude, university and wide range of recreational options; and*
- *Planning, managing and reducing the environmental impact of our industries while building a community where everyone takes responsibility for, and is helped in, living sustainably.*

We want our new regional council and other levels of Government to work in partnership, with each other, and with us, so we can have the predominant say over how and where Government resources are allocated within the wider region to meet local and regional needs. Our regional voice will be prominently established (Futureye, 2008).

However the report also identified some concerns in the following areas:

- A crucial new period in the region's history has begun;
- Community involvement in decision-making;
- Prosperity is unevenly shared;
- Community division over environmental management/issues; and
- Contribution of industry and all governments to the region.

For more details on the report and its findings refer to the report itself which is available on the Gladstone Regional Council website (http://www.gladstonerc.qld.gov.au).

2.1.4 Social Infrastructure

The SIA (Appendix Z of the GLNG EIS) conducted a survey of social infrastructure in the Gladstone area (Section 5.3 and Appendix B of the SIA). Social infrastructure is generally attributed to 'built' community facilities; however, it can also include services provided for the community. These include schools, churches, hospitals, libraries, sports and recreational facilities, police, fire, ambulance and other emergency services. Transportation was assessed in the Traffic and Transport study in the EIS (Appendix J). Social services were included in Section 4 and Section 5 of the SIA including health services, multicultural services, housing and counselling services, child care, education and training. In addition, clubs and teams as well as other various community groups and organisations make up part of the social infrastructure.

The Gladstone Regional Council, Gladstone Economic and Industry Development Board (GEIDB) and DIP are currently developing a Social Infrastructure Strategic Plan for the Gladstone Regional Council area. There are two updates available on the Gladstone Regional Council website as well as a Stage 1 background report. It is too early to extract relevant information from this plan as it is in Stage 2 of 6 at present; however the information within it will provide a more comprehensive

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assessment of the social infrastructure in the area. Therefore this supplement considered the information provided in the SIA.

3

Relevant Project Details and Assumptions

This section identifies the changes to the project that have resulted in the need to reassess some of the social impacts from the SIA section (Appendix Z) of the GLNG EIS. New assumptions or changes to assumptions made in the SIA are also presented in this section.

3.1 Design

The project has a preference for a modular design of the proposed LNG facility. However, the stick build option is assessed again in the Supplement in terms of construction workforce numbers.

There are differing workforce requirements for the two options but they are similar in scale and effect.

3.2 Definition of Local and Imported Worker for Hiring Purposes

The LNG facility FEED contractor (Bechtel) applies a standard definition of "non-local" for hiring purposes as defined below. Once categorised, a worker cannot change designations to become a local even if they relocate to Gladstone on their own.

Non-Local (Imported) Employee

- Usual Place of Residence is the address stipulated by the employee in the Registration of Interest (ROI) Form. This will determine their classification as a non-local (imported) or local employee.
- Candidates for employment will be required**,** upon registration**,** to make a declaration of their Usual Place of Residence on their ROI form. The Employer will use the declaration to determine if their employee is a Non-Local (Imported) Employee.
- For the purpose of geographically defining a Non-Local Employee engaged under the terms of the Agreement, it includes any employee whose usual place of residence is outside of a 60 km radius of the nearest Post Office to the Project. In the case of Gladstone Projects, the centre point of the radius is the Gladstone DC Post Office.

Local Employee

A local employee is therefore an individual who resides within 60 km of the Gladstone DC Post Office at the time of their application.

3.3 Policy Regarding Local Workers Transport To and From Worksite

The SIA indicated that all workers would be housed in the CAF for the duration of their work rotation including the local hires. This strategy has now been modified in light of further clarification of the project details and experience from Bechtel. All local workers will now be transported to and from the worksite daily via ferry. For more information on the logistics of this process see the Traffic Assessment in Attachment C.

3.4 Worker Sourcing – Imported vs. Local

The number of workers imported or sourced locally will remain the same as the SIA (65:35), with 65% being imported from outside the area for the construction phase and 35 % being sourced from the Gladstone area as defined in Section 3.2. No changes to the operational workforce scenario presented in the SIA have been made so an additional assessment for this supplement was not

conducted. Santos still prefers to hire locally first including through contractors; however, the 65:35 scenario was determined to be a more realistic assumption based on the following:

- Provides a worst case scenario to consider; and
- Better reflects the initial skills assessments and other project considerations for the area.

From a social impact assessment perspective, if more workers can be sourced locally then there will be lower social impacts, with the exception of the potential for locally skilled workers to choose to leave their current employment to work for GLNG. It is a stated goal for key parties to promote local hiring for the project wherever possible. Recent industry layoffs in the area indicate that for some phases of the Train 1 construction period there may be more local labour supply available than the 35% assessed as worst case, especially in the initial months.

3.5 Worker Schedule – Preliminary Construction and Train 1 Construction

The project schedule has been updated to include a preliminary construction period from July 2010 to June 2011. This period will see the construction of some of the mainland facilities required for the project, some initial site clearing and development, and the CAF – see Project Description changes. The CAF is not expected to be completed until month 12; however, at month 6 there will be spaces to accommodate 50 workers, and that will increase to a peak capacity of 1,600 by month 12. Table 3-1 details the workforce for the preliminary construction phase (first six months) and up to month 12.

Table 3-1 Preliminary and Train 1 Construction Workforce July 2010 to July 2011

Worker Source	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Local	40	88	136	184	184	232	235	272	356	392	416	470
Local Nightshift					56	56	56	68	89	98	104	118
Imported	10	22	34	46	46	58	436	504	660	728	772	874
Imported Nightshift					14	14	14	126	165	182	193	218
Total	**50**	**110**	**170**	**230**	**300**	**360**	**670**	**970**	**1,270**	**1,400**	**1,484**	**1,680**

Source: Santos

Santos conducted initial assessments of the skills required and local availability of labour to inform these assumptions. In addition to the dayshift, there is also a nightshift that begins in month 5 with 70 people and is maintained at that level into month 7. After month 7 the nightshift is assumed to be approximately 20 % of the workforce which coincides with when the ability to recruit locally starts to drop off, and carries on until the completion of Train 1 in month 48 as indicated in the SIA. The changes in numbers in the supplement for months 1 to 9 reflect new information available regarding the preliminary construction phase on Curtis Island and the mainland marine facilities. Site clearing and other construction tasks will occur concurrently on the LNG facility site in order to maintain the construction schedule. At month 10 the anticipated 65:35 split between imported and locally sourced workers occurs. This is based on Santos' assumption that more locals will be available during the early stages of the project when the worker demand is low and primarily semi-skilled and unskilled labourers are required. Table 3-2 details the remainder of the Train 1 construction worker requirements in 6 month intervals from month 12 assuming the 65:35 ratio remains throughout.

3 Relevant Project Details and Assumptions

Table 3-2 Construction Workforce to Completion of Train 1 Months 18 to 48 (6 Month Intervals)

Worker Source	Month					
	18	24	30	36	42	48
Local	823	823	721	314	188	47
Local Nightshift	206	206	180	78	47	12
Imported	1,529	1,529	1,340	582	349	87
Imported Nightshift	382	382	335	146	87	22
Total	**2,940**	**2,940**	**2,576**	**1,120**	**672**	**168**

Source: Santos

Table 3-3 illustrates the construction requirements if the modular construction option was used. This is provided as an indication of the differences in the two options. This assessment examines the stick build option because it would create the biggest potential disturbance, and therefore result in a higher potential for social impacts. Both stick build and modular options are anticipated to require 48 months to complete; however stick build peak is in month 20 to 22 (3,080 workers) while modular peak is in month 30 to 36 (2,200 workers). The modular option requires fewer workers, which means lower numbers housed in Gladstone and lower numbers housed in the CAF. Table 3-3 examines the first year of construction. No further assessment of the modular workforce was conducted.

Table 3-3 Modular Workforce Requirements

Worker Source	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Dayshift Workers	50	110	170	230	230	290	370	448	528	608	688	768
Nightshift Workers					70	70	90	112	132	152	172	192
Total	**50**	**110**	**170**	**230**	**300**	**360**	**460**	**560**	**660**	**760**	**860**	**960**

Source: Santos

3.6 Imported Workforce Accommodation

For the first six months of construction all workers will need to be accommodated in the Gladstone area while the CAF is being constructed. It is assumed a 80:20 (imported to local) ratio will occur at this phase since the majority of the work matches skills identified as prevalent in the local area (Bechtel, 2009). The rest of the construction workforce is still presumed to be roughly split 65:35 between imported workers and locals, as presented in the SIA and described above (see Section 3.5).

Updated information from Bechtel indicates that approximately 20 % of the construction workforce could be housed in the local market after the preliminary construction phase. Local accommodation would generally be considered for long-term workers on the project in order to:

- Reduce the potential for constantly changing who is accommodated in each place; and
- Reduce the impact on the neighbours and neighbourhoods where imported workers (and occasionally their dependants) are housed.

This Supplement has assessed the implications of the 20 % requiring local accommodation. The remaining 80 % of imported workers would be housed in the CAF.

3 Relevant Project Details and Assumptions

Table 3-4 breaks the Train 1 construction workforce down into imported and local workers as well as further breaking down the imported workforce between Gladstone (20 %) accommodated and CAF (80 %) accommodated.

Table 3-4 Train 1Construction Workforce Breakdown Month 8 to 12 and Every 6 Months After

Month	Imported (CAF)	Imported (Gladstone)	Total Imported	Local	Total
1	-	10	**10**	40	**50**
2	-	22	**22**	88	**110**
3	-	34	**34**	136	**170**
4	-	46	**46**	184	**230**
5	-	60	**60**	240	**300**
6	-	72	**72**	288	**360**
7	303	76	**379**	291	**670**
8	504	126	**630**	340	**970**
9	660	165	**825**	445	**1,270**
10	728	182	**910**	490	**1,400**
11	771	193	**964**	520	**1,484**
12	874	218	**1,092**	588	**1,680**
18	1,529	382	**1,911**	1,029	**2,940**
24	1,529	382	**1,911**	1,029	**2,940**
30	1,340	335	**1,675**	901	**2,576**
36	582	146	**728**	392	**1,120**
42	350	87	**437**	235	**672**
48	87	22	**109**	59	**168**

Source: Santos

The breakdown indicates that by the end of month 6 the CAF needs to have a capacity of at least 300 in order to accommodate the anticipated imported workers (see Section 4.2 “Impact on Accommodation” for more details).

It is anticipated that for the first 6 months of construction the project will require approximately 12 imported workers per month to reside in the Gladstone area, likely within the Gladstone city limits. After month 6 the rate increases before peaking between month 18 and month 24 (actual peak as identified in the SIA is month 20). The actual peak is not captured in Table 3-4 but will require 390 imported workers to be locally accommodated from month 20 to month 22. It is important to note that the numbers are cumulative.

Subsequent sections will explore the breakdown of the imported workers to be housed in Gladstone by family status (Section 3.7) and their housing requirements (Section 3.8).

3.7 Imported Workers Family Status

The same assumption for the breakdown of imported construction workers' family status used in the EIS SIA will be used in this supplement as follows (based on estimates used in the DIP model modified in the EIS SIA and explained in Appendix D of the EIS SIA):

- Single status – 17 % (counted as 1.0);
- Couple status – 57 % (counted as 2.0); and
- Family status – 26 % (counted as 2.6).

It is important to differentiate between family statuses for two reasons:

- Determining population increases (as discussed in this section); and
- Determining accommodation requirements (discussed on Section 3.8).

These percentages for family status are not a reflection of the overall workforce but rather those anticipated to relocate to the Gladstone area. Generally the majority of the imported workforce tends to be classified as single status and is accommodated as such regardless of their family status because their families are not accompanying them. These workers are generally accommodated in the CAF. However, this assessment examines the imported workers assumed to relocate to the area for the construction phase, which is assumed to be approximately 20 % of the imported workers. The family status was therefore calculated based on the traditional breakdown of construction workers relocating to the Gladstone area as indicated in the DIP model.

Table 3-5 lists the breakdown for the imported workers not housed in CAF for Train 1.

Table 3-5 Imported Workers to be Housed in Gladstone by Family Status

Month	Imported Workers Housed in Gladstone			Total
	Single (1)	Couple (2)	Family (2.6)	
1	2	6	3	**10**
	2	11	7	**20**
2	4	12	6	**22**
	4	25	15	**43**
3	6	19	9	**34**
	6	38	23	**67**
4	8	26	12	**46**
	8	52	31	**90**
5	10	34	16	**59**
	10	67	41	**118**
6	12	40	19	**71**
	12	81	49	**142**
7	13	43	20	**75**
	13	85	51	**149**
8	21	71	33	**125**
	21	141	85	**248**
9	28	92	43	**163**
	28	185	112	**324**

Month	Imported Workers Housed in Gladstone			Total
	Single (1)	Couple (2)	Family (2.6)	
10	31	102	47	**180**
	31	204	123	**358**
11	33	108	50	**191**
	33	216	130	**379**
12	37	122	57	**216**
	37	245	148	**429**
18	65	214	99	**378**
	65	428	258	**751**
24	65	214	99	**378**
	65	428	258	**751**
30	57	188	87	**332**
	57	375	226	**659**
36	25	82	38	**144**
	25	163	98	**286**
42	15	49	23	**87**
	15	98	59	**172**
48	4	12	6	**22**
	4	24	15	**43**

Note: Values were rounded to the nearest whole number which resulted in rounding errors and some values not adding up to the total. The total was calculated by adding the unrounded values and then rounding the total to the nearest whole number.

Source: Santos

When the calculated value was not a whole number the value was rounded to the next whole number. This rounding results in different values in some cases than in previous tables. The top number in each cell is the number of workers per selected month and the bottom number is the total number of people including dependants anticipated to accompany them plus the worker (total people). The values were not adjusted to match previous tables since this assessment is based on an anticipated scenario and not necessarily the exact scheduling.

3.8 Workforce Accommodation Requirements

The following assumptions were used in order to determine housing demand by dwelling type based on similar requirements for past projects and likely requirements/preferences:

- Single workers can be accommodated:
  - Individually in one bedroom units (10 %);
  - With another single in two bedroom units (45 %); and
  - With another single in two bedroom houses (45 %).
- Couples can be accommodated in:
  - One bedroom units (10 %);

  - Two bedroom houses (40 %);
  - Two bedroom units (10 %); and
  - Three or more bedroom houses (40 %).

- Families can be accommodated in:
  - Two bedroom houses (50 %); and
  - Three of more bedroom houses (50 %).

These assumptions are based on what could occur, and use ratios that are easy to convert to different project scenarios should they materialise.

3.8.1 Locally Sourced Workers

The locally sourced workers will be allowed to commute daily, thus reducing the impact on the worker and their family from being required to stay in the CAF for the duration of their work rotation. This is assessed as a positive impact from the policy indicated in the SIA. No further social assessment was conducted as the workforce is locally sourced and does not differ from that assessed in the EIS SIA. The marine traffic movements are assessed in the Traffic Assessment (Attachment C of the GLNG EIS Supplement Report) for all worker traffic.

3.8.2 Preliminary Construction and Train 1 Construction Phases

During this phase 80 % of workers will be presumed locally sourced. These workers will remain in their homes and commute daily to their respective work sites. Therefore there are no workforce accommodation requirements for these workers.

The remaining 20 % will need to be imported, likely to perform specific tasks or skills not available in the area including management and other non-manual field roles. These workers will require local accommodation, likely in the form of units and houses depending on their duration of stay and personal/family needs.

Imported workers refer to those workers who are sourced outside the 60km buffer area around the Gladstone Post Office. For the duration of the Train 1 construction phase it was assumed that 65 % of the workforce would need to be sourced externally. This is because, as the workforce demand increases, the locally available worker pool remains constant, and thus is not likely to accommodate the project demand. This assessment is based on experience with other large construction projects in the Gladstone area and reasonable assumptions made to consider the specifics of the GLNG Project.

This is presumed to be the worst case scenario, as Santos assumes more local hires are possible, particularly in the earlier phases of construction. Table 4-6 highlights the potential accommodation requirements for the preliminary construction workforce based on the assumptions above. Rounding errors result in significant changes from values calculated in Table 3-1 through to Table 3-6; however, they are indicative of the dwelling requirements overall.

3 Relevant Project Details and Assumptions

Table 3-6 Potential Accommodation Requirements in Gladstone by Dwelling Type for the Train 1 Construction Phase

Month	Units		Houses		Total Dwellings Required
	One Bedroom	Two Bedrooms	Two Bedrooms	Three Plus Bedrooms	
1	1	1	4	4	10
2	1	2	9	8	20
3	2	3	13	12	31
4	3	4	18	16	42
5	3	6	24	22	55
6	4	7	28	26	64
7	4	7	30	27	69
8	7	12	50	45	113
9	9	16	65	58	148
10	10	17	71	64	163
11	11	18	76	68	173
12	12	21	86	77	196
18	21	36	150	135	342
24	21	36	150	135	342
30	19	32	132	119	301
36	8	14	57	52	131
42	5	8	34	31	79
48	1	2	9	8	20

Note: Singles are calculated in two bedroom dwellings by adding two singles for every one dwelling. Rounding errors are present though this table provides an indicative requirement for accommodation per month by dwelling type.

Source: Santos

Train 1 construction peak in month 20 could see a scenario similar to combining month 1 and month 18 values. This would see a total dwelling requirement of 352 as follows:

- 22 one bedroom units;
- 37 two bedroom units;
- 154 two bedroom houses; and
- 140 three plus bedroom houses.

In can be assumed in the absence of availability of specific dwelling types, that workers would be accommodated in the next dwelling type up (right on Table 3-6). If there were significant shortages of certain dwelling types some workers would be required to temporarily be accommodated in hotels or motels, or moved to the CAF. This would apply to singles first as they do not have dependants to consider as well.

4

Impact Assessment

The following impact assessment examined the potential impacts associated with the housing of 20 % of the imported construction workforce in Gladstone. The same methodology used in the SIA has been used in this report. This supplement assesses the Train 1 construction workforce based on selected project description changes and the new accommodation strategy.

The following is an overview of the assessment process:

- Assess baseline;
- Determine workforce details;
- Apply workforce details to baseline;
- Assess potential impacts;
- Mitigate potential negative impacts and enhance potential positive impacts;
- Assess residual impacts; and
- Assess cumulative effects.

Impacts are assessed by looking at key social components of the study area similar to those assessed in the SIA. These social components are:

- Demographics and Community Profile;
- Accommodation;
- Health and Wellbeing;
- Education and Training Opportunities;
- Economic and Employment Opportunities; and
- Social Infrastructure.

Potential impacts within these social components are then assessed as follows:

- Background information relevant to the potential impact;
- Impact Assessment;
- Monitoring and Mitigation; and
- Residual Impact.

Impact Assessment

This assessment considers the impacts of the locally accommodated imported workforce anticipated only. As was presented in the original workforce accommodation scenario (Section 1.3) and in the GLNG EIS and SIA, the imported workers accommodated in the CAF will have very little to no impact on the community due to their isolation from the population. The only noticeable impact will be during the start and end of work rotations when large numbers of workers are moving on and off Curtis Island respectively. This is addressed in the traffic assessment in more detail (see Attachment C).

The SIA concluded that there was a need to find alternative accommodation for the imported workforce for the following reasons:

- Workforce too large for local market;
- Inconveniences of past large industrial construction projects in area as indicated by council and social service providers;
- Potential to negatively impact local housing market;
- No locations available on mainland with more favourable outcomes;
- Strategy by QGC Gladstone LNG to use some local accommodation and CAF as well;
- Strategy by Fisherman's Landing LNG to use local housing market exclusively; and
- Cumulative effect potential from other projects not assessable by GLNG (have not submitted EIS).

4 Impact Assessment

The impact assessment from the SIA is still relevant for this supplement report; however, specific changes in the accommodation strategy have been identified in this report.

Monitoring and Mitigation

The monitoring and mitigation section examines mitigation for negative impacts and enhancement of positive impacts. Management strategies also formulate part of the mitigation strategy.

Santos will develop a Social Management Plan in consultation with key stakeholders, including developing key performance indicators, project or cumulative impact tracking and monitoring strategies, and program enhancement opportunities.

Santos is committed to managing social impacts associated with the project. Throughout the various mitigation sections reference will be made to the Social Management Plan. Santos will incorporate the findings from the Gladstone Social Infrastructure Strategic Plan as appropriate, as this is anticipated to be a comprehensive assessment of local infrastructure beyond the scope of EIS baseline data collection and analysis.

Santos will also consult with the Planning and Infrastructure Forecasting Unit (PIFU) within the Office of Economic and Statistical Research (OESR) at the Queensland Treasury to advise of construction workforce numbers since PIFU projections are the main data sources used by state and local government agencies in planning for future service demands.

Residual Impacts

The residual impacts section examines the level of anticipated impact after the mitigation measures and management strategies have been implemented. Positive impacts are not assessed and residual impacts that are assessed as low are not reassessed.

Santos will continue to liaise with relevant state government agencies and councils including Department of Communities and Department of Infrastructure and Planning, Gladstone Regional Council, in order to maintain a proactive management approach to residual impacts. Changing project conditions as well as external circumstances will continue to influence project impacts throughout the construction phase of the project. Santos believes that maintaining open lines of communication throughout the project will enable all parties to plan and react to changing conditions more effectively.

4.1 Impact on Demographics and Community Profile

4.1.1 Background

Gladstone Regional Council as a whole has been growing by approximately 3.2 % annually over the past 7 years. The most current population statistic is 57,587 (2008) and the population is projected to grow to between 61,971 and 65,029 by 2011 (PIFU, 2009). Assumed migration from 2002 to 2007 (values estimated by PIFU for 2008 are not yet available) averages at 1,049 people per annum.

Table 4-1 highlights the total population increases associated with the 20 % of the imported workforce being accommodated in the Gladstone area.

4 Impact Assessment

Table 4-1 Potential Population Increase from Housing 20% of Imported Workforce and Their Dependants in Gladstone

Month	Total	Change[1]	Month	Total	Change[1]	Month	Total	Change[1]
1	**20**	-	7	**149**	7	18	**751**	322
2	**43**	23	8	**248**	99	24	**751**	0
3	**67**	24	9	**324**	76	30	**659**	-92
4	**90**	23	10	**358**	34	36	**286**	-373
5	**118**	28	11	**379**	21	42	**172**	-114
6	**142**	24	12	**429**	50	48	**43**	-129

Note: 1 Change from previous month

It is important to note that these values are cumulative from the previous month up to peak as shown in the change column. After peak the workforce declines so there could be a decrease in net migration for this period as workers and their dependants leave the area. The cumulative impacts assessment examines the potential for other projects in the area to help retain these workers and their families in the community as described previously (see the Cumulative Impacts Assessment in Section 5 for more details). Assumed net migration for the 7 year trend (1,049) in the area if calculated evenly over a year is approximately 87 people per month. In higher level years like 2006 where 1,265 people increase in population was from assumed net migration (PIFU, 2009), the monthly average would be approximately 105 people per month.

In order to align with PIFU population data the following breakdown by year will be referenced:

- Year 1: July 2010 to June 2011;
- Year 2: July 2011 to June 2012;
- Year 3: July 2012 to June 2013; and
- Year 4: June 2013 to July 2014.

4.1.2 Impact Assessment

The Year 1 population increase associated with the project will be 429 (or 40.9 % of the annual assumed net migration) when averaged from 2002 to 2007. By March 2012 an additional 346 people will have moved to the area marking the peak of Train 1 construction for the GLNG Project (not shown in Table 4-1 but estimated to be approximately 775 people). This increase is within the current annual range of assumed net migration.

Month 8 and month 9 would see the largest increase in imported workers and dependants moving to the area to be accommodated locally (see Table 4-1). Assuming a relatively constant increase from month 12 to month 18 there could be approximately 54 more people each month residing in the area from the project alone. As discussed in the background to this impact (Section 4.1.1) above, this is within the normal parameters of the communities 7 year trend population growth. This would likely be a cumulative effect on the population growth not attributed to the project as oppose to part of the assumed growth. The difference is that this increase for the project is short-term to medium-term. After peak this number will decline.

For the period where the population is increasing up to March 2012, an annual increase from 3.2 % (7 year average) to ~3.9 % up to June 30 2011 and ~3.7 % up to June 2012 would be experienced before decreasing to ~2.5 % up to June 2013 and ~2.8 % up to June 30 2014 (if assumed net

migration remained constant and the project was an addition to that). Potential positive impacts could include:

- Increase in housing values (for homeowners and investment properties);
- Increase in community growth and investment (more rate payers); and
- Increase in employment and business opportunities (services for new arrivals).

Potential negative impacts could include:

- Increase in housing values (for renters, people wanting to enter the housing market or upgrade their property and people in the lower echelons of the socioeconomic profile);
- Increases in demand on social infrastructure (schools, hospitals, community facilities, recreational facilities, etc.); and/or
- Disruption to daily activities (from increased activities of imported workers and their dependents on neighbours and commuters).

All of these potential positive and negative impacts are anticipated to be low as the Gladstone area has been experiencing a similar impact over the past recordable 7 year trend (PIFU, 2009). Table 4-2 is an indicative model of what sustained growth in Gladstone matching the 7 year trend from the PIFU Population and Housing Fact Sheet (PIFU, 2009) would look like (see table notes for more details). Based on this model, the population increases experienced by the housing of 20 % of the imported construction workforce in the Gladstone area would be 0.7 % in 2011 and 0.5 % in 2012. After peak in March 2012 there would actually be a decrease in workforce numbers which in turn would reduce net migration. This is recorded in the GLNG attributed change cell to maintain the assumed net migration as a reflection of the non-project attributed trend based on the PIFU 7 year trend.

Table 4-2 Estimated Population Increases in Gladstone Regional Council with Anticipated Project Contribution From 20% of Imported Workers Housed in Area

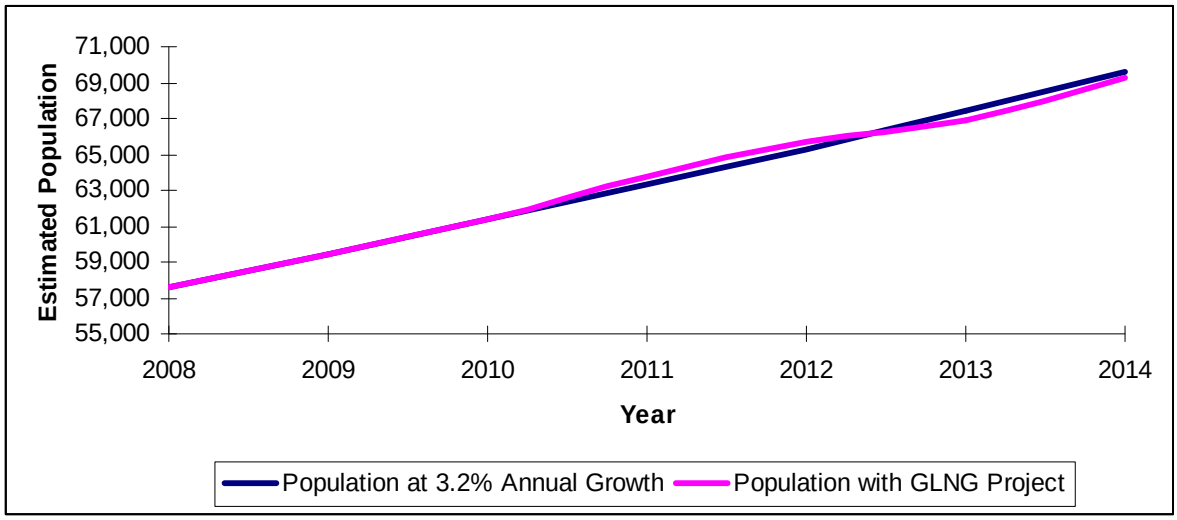
Parameter	Estimated at 30 June for Each Year						
	2008	2009	2010	2011	2012	2013	2014
Assumed net migration	n.a.	1,230	1,270	1,311	1,352	1,396	1,440
Assumed annual percent change	3.4%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Assumed population	**57,587**	**59,430**	**61,332**	**63,294**	**65,320**	**67,410**	**69,567**
GLNG attributed change	-	-	-	429	346	-489	-243
New total	**57,587**	**59,430**	**61,332**	**63,723**	**65,666**	**66,921**	**69,324**

Note: This table is based on assumptions from the PIFU projections and an annual population increase of 3.2% as is the 7 year trend. Assumed net migration was calculated by averaging the 7 year trend in proportion to the natural increase. This was determined to be 66.7% of the annual percentage change. This table is designed to give an indication of what a maintained 7 year average would look like with the project projected onto the results. Projected populations therefore do not exactly reflect those from PIFU. 2008 data is taken directly from the PIFU projections and therefore does not match the rest of the calculation methodology (PIFU, 2009). 2013 and 2014 are represented as negatives because they are post peak and the decrease in Santos workers would be reflected as a decrease in net migration.

Figure 4-1 illustrates the level of impact anticipated by direct project migration to the area during the Train 1 construction period. This helps to identify the annual changes determined in Table 4-2 between the projected annual increase at 3.2 % and the inclusion of the GLNG project imported workforce to be accommodated in the Gladstone area. It is evident that the project will initially result in an increase in population up to peak in month 20 before resulting in a reduction in the annual increase

from 3.2 % as the project workforce requirements decrease. This is based on the assumptions that the annual rate will remain constant throughout the year from 2008 to 2014 as well as that the project is assessed on its own. Cumulative effects are assessed separately in Section 5.

Figure 4-1 Population Projections for Gladstone Regional Council Based on 3.2% Annual Growth With and Without the GLNG Project



Source: Santos

Based on the calculations presented in Table 4-2, the anticipated impact of the project workforce on the Gladstone area is still assessed as a low impact.

The imported workers will mainly be males between the ages of 25 to 55 based on similar construction projects. This will have some effect on the male to female ratio; however based on the size of the increase this too is anticipated to have a minimal impact. In addition, the construction workforce is a short to medium-term impact in terms of duration. There are also potential impacts associated with workers rotating in and out as they are required for the project. Santos will focus its locally housed imported worker strategy on longer term workers (see Monitoring and Mitigation Section 5.2.3). This has the intended purpose of reducing impacts to the community character.

The GLNG Project on its own will likely experience a shift from predominantly locally sourced and housed workers to predominantly imported and CAF housed workers as the Train 1 construction phase evolves. The inclusion of other projects in the study area during this time will likely result in an increase in the rate of this shift as well as a possible housing situation that requires more imported workers to be accommodated in the CAF (see Cumulative Effects Section 5).

4.1.3 Monitoring and Mitigation

Monitoring and mitigation of the imported workforce impacts housed in the Gladstone area is primarily focussed around including provisions in GLNG's Social Management Plan to inform relevant service providers of workforce numbers and any anticipated changes.

Santos will develop mechanisms to consult with relevant service providers in the community as part of the Social Management Plan. In addition, a list of service providers in the plan will allow Santos to inform them of unforeseen project changes that may impact them or require their assistance. Santos is

dedicated to becoming a respected member of the Gladstone community and will continue to work closely with key stakeholders as the project progresses. Santos believes utilising the skills and services already established in the community is the most effective approach to addressing positive and negative changes to the community.

4.1.4 Residual Impacts

The residual impact of the population increase on the demographics and community profile is anticipated to remain low. The population increases associated with the strategy presented in this supplement are neither avoidable nor desirable to lower. Increasing the local population, though temporarily for construction, at the level proposed will not cause significant impacts to the community. The increase is a benefit to area businesses and citizens seeking employment due to the increased economic and employment opportunities as opposed to isolating the entire workforce in the CAF on Curtis Island. The CAF is still required to accommodate the majority of the imported workforce. The additional monitoring and mitigation plans therefore focus on maintaining a low impact rating.

4.2 Impact on Accommodation

4.2.1 Background

The preliminary construction period from Month 1 to Month 6 will require 100 % local accommodation for the workforce while the CAF is being constructed. During this phase of the project more local workers are anticipated to be hired due to the skill requirements. This will see an imported to local worker ratio of 20:80. As a result approximately 75 imported workers will need to be accommodated in the Gladstone area by month 6. After month 6 it is anticipated that the ratio will moving towards the EIS SIA estimate of 65:35 as more workers and specific skills workers are required. This estimate is based on what is likely not what is desired. Santos and the community would prefer more locally sourced workers if possible.

The updated accommodation scenario for imported workers after Month 6 will begin to experience ~ 80 % housed in the CAF and ~20 % housed in locally sourced accommodation as imported workers are transitioned into the CAF as it increases in capacity. All locally sourced workers will be able to commute daily to Curtis Island, as will locally accommodated imported workers. The anticipated split between imported workers and locally sourced workers will remain at 65:35 as was presented in the SIA. However, based on the new accommodation strategy of the total workforce 52 % will be in CAF and 48 % will commute daily from the mainland. This is calculated from breaking the 65 % imported into 80 % (52 %) CAF housed and 20 % (13 %) locally housed. The 13 % is then added to the 35 % already housed locally to come up with the 52:48 split. The accommodation assessment therefore examines the 13 % as the other 35 % already have accommodation in the area in order to be classified as local.

Updated dwelling approval information from PIFU is presented in Table 4-3 for the last four quarters from August 2009 (PIFU, 2009).

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Table 4-3 New Dwelling Activity in Gladstone Regional Council for Previous Four Quarters from August 2009

Quarter	New Dwelling Approvals		
	Houses	Other	Total
September Quarter 2008	109	65	**174**
December Quarter 2008	72	76	**108**
March Quarter 2009	44	2	**46**
June Quarter 2009	59	2	**61**

Source: PIFU 2009

Dwelling activity decreased in Gladstone Regional Council in the year ending June 2009 with 389 approvals, 73.0 % of them for separate houses, compared to 715 approvals in the previous year. These figures represent a decrease of 45.6 % in dwelling activity (PIFU, 2009). Table 4-4 highlights new dwelling activity from June 2003 to June 2009.

Table 4-4 New Dwelling Activity in Gladstone Regional Council from June 2003 to June 2009

Year to 30 June	New Dwelling Approvals		
	Houses	Other	Total
2003	595	104	**699**
2004	433	151	**584**
2005	370	148	**518**
2006	476	65	**541**
2007	589	113	**702**
2008	627	88	**715**
2009	284	105	**389**

Source: PIFU 2009

Figure 4-2 illustrates the trends in approvals in the region up to June 30 from 2003 to 2009. There has been an increasing trend since 2005 to 2008. This comes on the tail of a downward trend from 2003 to 2005. 2009 experienced a decrease in dwelling approvals below the other years recorded in the figure. New dwelling approvals in 2009 were 54.4 % of approvals the previous year (2008). This was mainly the case for house approvals which were 45.3 % as opposed to other approvals which saw a 19.3 % increase from 2008.

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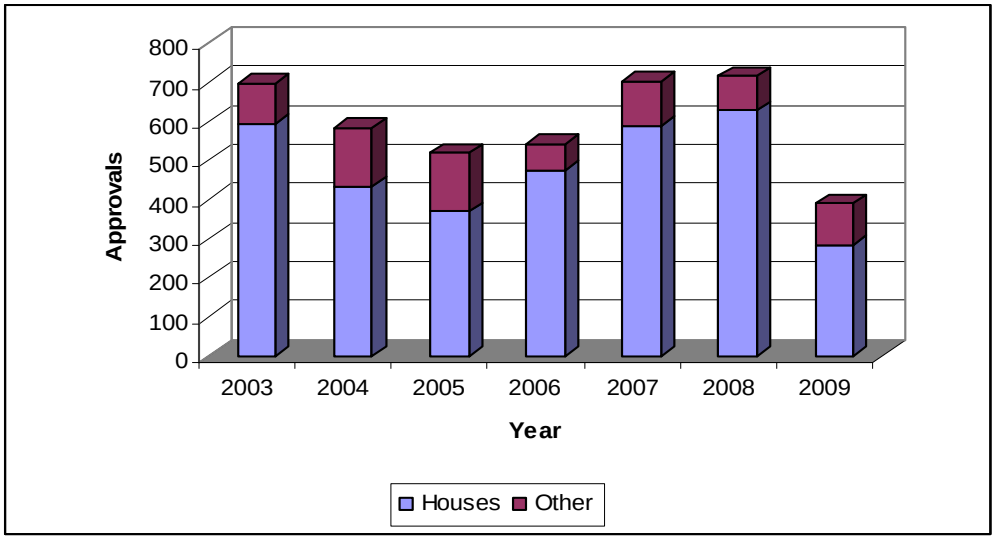
Figure 4-2 Gladstone Regional Council Dwelling Approvals 2003 to 2009



Source: PIFU 2009

The level of approvals in 2007 and 2008 is more conducive to the potential levels required to accommodate the natural assumed net migration increases and the project requirements combined (see Section 4.1 for information on the potential population increases in more detail).

CAF Site Selection

The CAF was assessed on Curtis Island due to the practicality of accommodating imported workers in close proximity to the work site. It was determined to be unfeasible to have the entire workforce commuting daily via the mainland for the following reasons:

- Occupational health and safety concerns;
- Fatigue management;
- Worker attraction/retention;
- Project costs;
- Scheduling delays; and
- Logistical issues.

The prospect of the CAF accommodated workers having to potentially commute daily for an hour by bus to a ferry terminal to then commute by ferry for 45 to 60 minutes was not feasible. This would need to occur twice daily for workers travelling to work and then returning to the CAF at the end of their shift. For locally accommodated workers the ability to return home is seen as the added incentive for the commute as well as the likely reduced land commute due to closer proximity to the Auckland Point terminal. In addition, this workforce is anticipated to be smaller than the CAF accommodated workforce. If all workers were to commute daily from the mainland the effects would compound as is the case with the cumulative effects assessment.

4.2.2 Impact Assessment

Accommodation impacts begin slowly from month 1 due to the anticipated number of locally sourced workers available for this phase (~80 %). As discussed, all of the imported workers will need to be

accommodated locally as the CAF is constructed. CAF construction is anticipated to take 12 months to fully complete but units are anticipated to be available after 6 months.

There are enough dwelling types available for sale in Gladstone and surrounds to accommodate the project needs for the first year of construction based on the number of houses, townhouses and unit/apartments listed on Realestate.com.au (see Section 2.1.2). There are also enough dwelling types available for rent to accommodate the first year's imported workforce on its own, indicating that the current 'for sale' and rental market have over 200 dwellings each. Not all the dwellings are suitable to accommodate the workforce demand but when combined they provide sufficient opportunities to accommodate the imported workforce demands for this scenario. The preferred option would include a combination or utilisation of the existing housing and rental markets as well as the new homes construction industry.

The breakdown in workforce numbers from Table 3-4 indicates that by the end of month 6 the CAF needs to have a capacity of at least 300 spaces in order to accommodate the anticipated imported workers (see Section 3.6 for more details). There is leeway to acquire local accommodation up to peak level due to a requirement to have those available for peak; however, this is not preferred as it could result in a rapid increase in housing demand attributed to the project which has the potential to increase the cost of houses as well as increases in rent.

There are potential positive and negative impacts associated with housing a portion of the imported workforce in the Gladstone area. There is the potential for low to medium impacts as a result of an increase in property value in the area from the increase in housing demand associated with the project. This would be positive impacts if people:

- Own their property;
- Own investment property;
- Have property to sell;
- Are looking to sell their property and move out of the area;
- Work in the home construction industry; or
- Own a home construction business.

These would be negative impacts if people are:

- Renting;
- Looking to buy; or
- Looking to sell their property and upgrade in the area.

People in the lower socioeconomic echelon of society are more susceptible to the negative effects of the cumulative accommodation impacts; however, the increased employment opportunities have some positive effects as well.

During some phases of construction there may be a requirement to have some specialised imported workers in the area for brief periods of time. These workers may be placed in local hotels or motels depending on other accommodation availability. This could result in some hotels and motels being full for extended periods of time. This is not a preferred option and steps will be taken to provide owners warning in advance. Consideration will be made to scheduled community events as well, to reduce the likelihood of a shortage of local accommodation during those events.

The construction phases for Train 2 and Train 3 have the potential to prolong the impact of housing being secured for the project. It is important to realise that additional housing is not anticipated at the

same rate since many dwellings will have already been secured for Train 1 construction. The peak workforce is 66.7 % more in Train 1 (3,080) than each of the other two trains (1,848) as well, which indicates that fewer secured dwellings may be required. However, there is likely to be some instances where new dwellings are required, particularly for family status workers relocating their family to the community. As a result there is anticipated to be sustained housing activity into the Train 2 and Train 3 construction phases but at a significantly reduced level to that of Train 1.

After the peak for Train 1 construction there could be a release of dwellings back into the local real estate and rental markets. This could potentially result in increases in housing supply, though it is probably more likely that this will reduce the strain on the markets caused by the ramp up to peak. Predicted population growth not associated with the project would likely absorb the release of dwellings since Gladstone Regional Council has an anticipated population increase up to 2011 of approximately 3.2 % annually. This would reduce the likelihood of the markets dropping (prices and activity) as project housing demand drops.

4.2.3 Monitoring and Mitigation

The numbers of new dwelling approvals for the area would need to return back to the 2007/2008 levels (see Table 4-4 and Figure 4-2 in Section 4.2.1) in order to mitigate against potential reductions in housing supply coinciding with increases in housing demand. New dwelling approvals and construction would likely need to increase from the 2009 levels regardless of whether the project used previously built or newly built homes/units in the new accommodation strategy. This is because the population is anticipated to still be increasing naturally at the time and would therefore require more housing options to accommodate the increase in population. Use of the available housing and rental markets in combination with new dwelling construction is anticipated to provide enough supply to meet project accommodation demands. Should demand pressures due to various circumstances start to negatively impact the community Santos may consider additional options including commissioning new dwelling construction specifically for the project or expanding the CAF capacity to accommodate workers originally scheduled to be accommodated locally on the mainland. The reasons for the increase in pressure will help inform the strategies for dealing with the issues.

There are increased economic and employment opportunities in the residential construction industry due to the demand of the project for local accommodation. This mitigation is not within Santos' control, so communication of the accommodation strategy to local businesses and development boards is the best recourse.

Santos is aware that the anticipation of employment opportunities and the cumulative effect of other large scale industrial projects proposed and approved in the area may result in stresses to the local housing market if large numbers of people move to the area. Santos has developed policies to limit this including defining locals for construction and not permitting imported workers to change their status to local; however, the choice to move is a personal decision outside the control of Santos.

As part of the Social Management Plan, Santos will develop a section specifically to address local housing impacts. Santos will work with local and State housing services to track changes in the community housing pressures. These groups were identified through consultation with key stakeholders and Gladstone Regional Council as vulnerable groups in the Gladstone area; however, the definition of vulnerable groups for the area is not limited to these groups.

Santos does not anticipate their workforce will directly impact services designed to assist in accommodation stresses but is cognisant of the potential for increases in the demand on local housing and rental markets could impact vulnerable groups in the community. Santos will maintain an open line of communication with housing service providers active in the area as part of the social management plan.

Local and State housing services providers will be invited to participate in the design and implementation of the accommodation section of the Social Management Plan. The plan will also tie into recent initiatives developed by Gladstone Regional Council including the Gladstone Regional Vision 2028 Report and the Social Infrastructure Strategic Plan currently being developed by Gladstone Regional Council, Gladstone Economic and Industry Development Board (GEIDB) and DIP where appropriate. Santos recognises the programs and services available in the community and sees the social management plan as a means for contributing to the strengthening of these programs and services.

4.2.4 Residual Impacts

The residual impacts will remain low to medium. Although there are some difficulties in accurately predicting accommodation impacts, Santos will maintain ongoing dialogue with key stakeholders throughout the construction phase in order to address concerns as they arise and work together to reduce potential negative impacts attributable to the Santos GLNG Project. Santos anticipates many positive impacts in the Gladstone area associated with the GLNG Project and recognises the benefits of utilising existing community skills and services to help mitigate the negative social impacts.

4.3 Impact on Health and Wellbeing

4.3.1 Background

There have been several reports and articles published assessing the status of the Queensland Health system. As identified in the SIA there is concern among many in Gladstone that the current level of service does not meet the needs of the community. This by definition would mean that any increase in the demand on the local services would be a negative impact. The project is not anticipated to have a significant direct effect on population based on the findings presented in Section 4.1 (Impacts on Demographics and Community Profile).

The CAF will also house the majority (80 %) of the imported workforce for the construction phase of the project. This will require Santos to have qualified first aiders and emergency responders on site as part of their workforce health and safety requirements.

4.3.2 Impact Assessment

The locally accommodated imported workforce will increase the demand on local health services; however, this level is anticipated to be low due to the size of the anticipated population increase (see Table 4-1 and Table 4-2 in Section 4.1). The potential positive impacts are:

- Increased business for private service providers;
- Increased business opportunities for private health care providers; and
- Potential to attract health care providers from outside the area to set up businesses in the area or seek employment at established businesses and hospitals in the area.

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The potential negative impacts are:

- Increase in demand on already stretched hospitals;
- Increase in stress on some residents due to:
    - Project construction activities interfering with daily routine (like traffic); and
    - Locally housed imported workers real and perceived negative impact on the area.
- Increased financial and emotional pressures on people unable to seek employment or from a lower socioeconomic echelon of the community (likely from accommodation strains and increased community affluence from various industrial projects with higher wages than other industries).

All of these potential impacts are assessed as low due to the relatively small population increases in the context of the 7 year trend in the population increase for Gladstone Regional Council.

There will be an additional impact on local health and emergency services by the CAF accommodated workforce even though they are housed remote from the community. This is because emergencies requiring offsite medical treatment would use the local services. Emergencies outside the capabilities of Santos' onsite responders could occur during the construction phase. Santos will have provisions and policies in place to reduce the likelihood of workplace accidents; however from a due diligence perspective a level of emergency preparedness will be required. In addition, there is also the potential for incidences involving Santos first responders to also require external assistance. This could include minor cuts and breaks as well as other medical emergencies. The number of incidences requiring external emergency services and health facilities is anticipated to be low due to the implementation of onsite workplace health and safety policies; however Santos will track worker use of local services and liaise with the appropriate State and local authorities to address the increase in demand associated with the project.

The location of the LNG facility plays a part in the impact on community health and wellbeing. The impacts are greatly reduced by the project's isolation from the population. This reduces the real, tangible impacts. The impacts associated with the perceived risks are not likely to manifest during construction as there will not be any direct gas supplies until operations commence. Risks have been assessed in Section 10 of the EIS and ongoing consultation has presented real and perceived risks to the community throughout the EIS process.

4.3.3 Monitoring and Mitigation

Santos will provide health services for the CAF and work site. This will include:

- Accredited first aiders and first responders including access to paramedics and nurses as well as an onsite doctor around peak construction;
- Medical facilities and aid stations providing health support services;
- An onsite ambulance;
- A helipad for emergency evacuations;
- Coordinated plans with local emergency services; and
- An onsite health and safety manager.

Santos will also have sports, recreation and entertainment facilities in the CAF for CAF accommodated workers, as well as private quarters with possible amenities including cable TV, air conditioning, and a refrigerator.

Santos is aware that the project can have a direct impact on local health service providers, particularly local emergency services and the local hospitals in the case of an emergency requiring site evacuation (e.g. Medivac). In order to coordinate efforts, Santos will consult with these organisations in the development of an emergency response plan for the project. Santos will offer site tours with the organisations to develop an understanding of the project details and specific issues relating to emergency responses to Curtis Island from the mainland. Santos will track worker use of local services and liaise with the appropriate State and local authorities to address the increase in demand associated with the project.

Santos is currently investigating a number of mitigation measures to minimise potential impacts on the Queensland Emergency Service network. This may include the procurement of a dedicated resource to transport critically injured personnel and the provision of emergency medical assistance. Santos is committed to working closely, and consulting with the appropriate emergency response organizations to ensure that through cooperation the best possible outcomes are achieved.

As part of the Social Management Plan development, Santos will consult with the Central Queensland Health Service District and the Gladstone Hospital for identifying direct potential impacts from the project. For indirect impacts Santos will consult with Central Queensland Health Service District and area health service providers where practicable to monitor changes in community health and wellbeing associated with the project. Correlations between health and wellbeing and other factors including stresses due to changes in the community may be considered in the design.

4.3.4 Residual Impacts

There will always be a residual impact associated with the potential demand on local health and emergency services. As discussed, planning can never fully eliminate the potential; however, the mitigation strategies and coordination with those services can have a positive effect as well. This can be achieved through enhanced trained and response capabilities.

The residual impacts associated with community wellbeing are anticipated to remain low with monitoring and mitigation. The impacts associated with the increase in population associated with the project (Train 1 construction) are not likely to be medium to high level impacts due to the following reasons:

- Size of the population increase;
- Timeframe of the increase of 20 months; and
- Duration of the impact.

Monitoring and mitigation through the Social Management Plan will be the primary vehicle for effectively manage the anticipated low level impacts.

4.4 Impact on Education and Training Opportunities

There has been no change from the SIA with regard to baseline data collection. Training opportunities are unchanged from the EIS SIA and will not be assessed further in this supplementary report. Focus instead will be on the increase in school aged child dependants anticipated to be relocating to the area throughout the Train 1 construction phase.

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4.4.1 Background

At peak there could be as many as 65 children requiring schooling in the area, based on the assumptions provided in Section 3 and assuming 100 % of children are of school age. Table 4-5 highlights the anticipated number of school aged children accompanying imported workers to be housed in Gladstone under the 20 % assumption for the Train 1 construction.

Table 4-5 Potential School Aged Children Migrating to Gladstone Area by Project Month

Factor	Per Month												Per 6 Months					
	1	2	3	4	5	6	7	8	9	10	11	12	18	24	30	36	42	48
Number of Children	2	3	5	7	9	11	12	20	26	28	30	34	60	60	52	23	14	3
Change[1]	-	1	2	2	2	2	1	8	6	2	2	4	26	0	-8	-29	-9	-11

Source: Santos

Note: Rounding errors have occurred in some cells reflective of the actual numbers generated for workforce breakdown to two decimal places. These were then rounded to make whole numbers signifying people. 1 - Change from previous month.

These values are indicative of what could be expected if 20 % of the imported workforce is housed in Gladstone during construction of Train 1.

4.4.2 Impact Assessment

Demand on Education Facilities and Schools

There is a potential for increases in the number of children in the area associated with the project as seen in Table 4-5. Since the breakdown for anticipated construction workers is different for general migration, the number of children anticipated to accompany workers is a lot lower than if a population increase occurred of the same size naturally. This is because of the family status breakdown of the workforce as discussed in Section 3.7. For most months the increase in the number of children is small, ranging from 1 to 8 for the first 12 months and averaging 2.8 per month. This could be disruptive to some children and classes but at a very low level given the number of schools in the area and the number of children anticipated to be moving to the area.

4.4.3 Monitoring and Mitigation

There is a low level potential impact attributed to the direct impacts of imported workers relocating to Gladstone for the project, and the subsequent influx of children to the area.

Santos will continue to liaise with local schools and the Department of Education throughout the construction phase. Information on worker children moving to the area, timing and school requirements will be communicated when possible to allow schools to plan for changes and potentially additional resourcing. A section of the Social Management Plan will focus on education and training, with protocols for communication with local schools and education officials about schooling needs of worker dependants. A provision for special needs children may also be included to assist in the placement of such children in schools capable of meeting their specific needs.

4.4.4 Residual Impacts

The residual impacts for the anticipated demand on local schools will remain low with the monitoring and mitigation provisions.

Santos will continue to liaise with local schools and the Department of Education throughout the construction phase. Information on workers' children moving to the area, timing and school requirements will be communicated when possible to allow schools to plan for changes and potentially plan for additional resourcing.

4.5 Impact on Economic and Employment Opportunities

There are two components assessed in this section:

- Economic opportunities; and
- Employment opportunities.

4.5.1 Background

Background details have not changed significantly from the EIS SIA other than the preliminary construction phase that will see more people active in the community while the CAF is being constructed. Data on the numbers of workers and their anticipated number of dependants can be found in Table 3-5 in Section 3.7.

4.5.2 Impact Assessment

There will be an increase in the economic and employment opportunities from those assessed in the EIS SIA based on the new accommodation scenario. This is anticipated to be a positive impact for the following reasons:

- Increase in business opportunities for:
    - Established businesses; and
    - New businesses.
- Increase in employment opportunities as a result of increased business opportunities; and
- Increased revenue for local and State government through rates payments and taxes.

The population increase is being managed through a split between locally accommodated imported workers (~20 %) and CAF accommodated imported workers (~80 %). This strategy will result in a reasonable level of activity in the community without crossing the threshold into significant impacts that could occur if the entire imported workforce was housed locally. That scenario would increase the potential economic and employment opportunities but the consequences would likely be significant negative impacts for all other social components. In order to balance the potential positive and negative impacts the 80:20 scenario was assessed.

Economic Opportunity Impact

The economic opportunities associated with the project are increased from the EIS SIA scenario by:

- Allowing locally employed workers to commute daily to/from Curtis Island; and
- Accommodating 20 % of imported workers in the Gladstone area.

These changes from the EIS SIA will likely result in an increase in spending in the Gladstone area which will benefit local businesses. There will still be opportunities for local businesses to win contracts associated with the construction and operation of the CAF. These would include food supply, newspapers and magazines, and vending machines to name a few. There are also opportunities associated with the imported workforce housed in the Gladstone area including charters, rentals and tours as well as retail trade.

Employment Opportunity Impact

Santos pursues a mix of recruitment strategies that includes the local community. This is consistent with the policy detailed in the EIS SIA. The assessment of the imported to local worker ratio is based on an estimation of the likely available local workforce for the project. There are many variables that can affect this ration including local area lay-offs from other industries or the cumulative effects of other projects requiring similar workforces.

Santos has assessed local employment opportunities as a high positive for the community for direct (Santos employees) and indirect (Santos contractors) employment opportunities. There is also a high induced (support and services as a result of all aspects of the project) employment opportunity with the change in policy to allow locally sourced workers to commute daily, and the housing of 20 % of the imported workers locally.

There is still the potential for negative impacts to occur in relation to the project attracting workers from businesses in the area; however this is unavoidable and a matter of personal choice.

Monitoring and Mitigation

Santos will monitor economic and employment opportunities associated with the project throughout the Train 1 construction phase with the focus of benefiting the community. A grievance and complaints registry will be developed as part of the Social Management Plan in order to track issues associated with the project that negatively affect people or organisations in the community.

4.5.3 Residual Impacts

Santos' monitoring and mitigation strategy is anticipated to keep the impacts positive and manageable.

4.6 Impact on Social Infrastructure

4.6.1 Background

Social infrastructure is generally attributed to 'built' community facilities; however, it can also include services provided for the community. Community facilities were outlined in Section 5 of the EIS SIA as well as Appendix B of the EIS SIA. These include schools, churches, hospitals, libraries, sports and recreational facilities, police, fire, ambulance and other emergency services, etc. Transportation was assessed in the Traffic and Transport study in the EIS (Appendix J). Social services were included in Section 4 and Section 5 of the EIS SIA including health services, multicultural services, housing and counselling services, child care, education and training, etc. In addition, clubs and teams as well as other various community groups and organisations make up part of the social infrastructure.

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A study is currently underway in the Gladstone Regional Council area to assess the current social infrastructure presenting Gladstone Regional Council, identify areas for improvement and gaps in services, and develop a Social Infrastructure Strategic Plan. This plan will be able to enhance the assessment of local infrastructure from the EIS SIA due to its expanded scope from that of the EIS. This information can help inform the GLNG social management plan as part of the monitoring and mitigation strategy for the project.

4.6.2 Impact Assessment

The information presented in Section 4.1 provides insight into the anticipated number of imported workers and dependants that could relocate to the area for the Train 1 construction phase. This is within the natural increases experienced in the area over the last 7 years, although as a cumulative effect of the natural increase (3.2 %) that could increase to 3.9 % in 2011 and 3.7 % in 2012 (see Section 4.1.2). There will likely be a low level impact on social infrastructure as a result, though this will be short to medium-term in duration due to the length of the construction phase for Train 1. When Trains 2 and 3 are considered the impact is low but extended over a longer period of time.

The increase in demand is both potentially a low positive impact and a low negative impact. Potential low positive impacts include:

- Increases in use of infrastructure with fees will generate more income;
- Increases in demand can result in increases in funds available for some infrastructure; and
- Increases in use can result in some under used facilities becoming more used.

Potential low negative impacts include:

- Increases in demand can result in decreases in availability;
- Increases in demand can result in increases in wear; and
- Overuse can result in deterring people from use.

As discussed, the CAF accommodated workforce will have onsite amenities including recreation and entertainment provisions. They will also be isolated from the community and unable to access local social infrastructure (e.g. at South End) while residing in the CAF. As a result, only the 20 % accommodated in Gladstone have been assessed as having an impact on local social infrastructure.

4.6.3 Monitoring and Mitigation

The Social Management Plan will include a section to monitor and mitigate increases in demand on social infrastructure associated with the project. Santos will consult with Gladstone Regional Council on the status of the Social Infrastructure Strategic Plan and identify areas for improvement of Gladstone area social infrastructure.

Santos will also monitor the use of social infrastructure by CAF accommodated workers in the event that they use such infrastructure. Although this is not anticipated, there could be instances where such use may be required or occur and Santos will monitor this use and consult with the affected services as to the resultant impacts.

4.6.4 Residual Impacts

The project associated population increases and the level of impact on social infrastructure was assessed as low positive and negative. The monitoring and mitigation will likely maintain the low level

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assessment; however, overall anticipated increases in demand from population growth not attributed to the project could add further pressure to social infrastructure.

5

Cumulative Effects

The cumulative effects assessment is based on published Environmental Impact Statements (EIS) and Initial Advice Statements (IAS).

The workforce numbers have been displayed in Table 5-1 as peak time construction workforce numbers. With the information available at this time, the workforce numbers were given for the various project reports as a single high peak value, rather than estimating the workforce numbers over the duration of the construction phase as was completed for GLNG. Therefore a workforce numbers over time graph presented in the GLNG EIS SIA report would not accurately reflect the conditions, due to having to estimate the increase and decrease in workforce numbers before and after peak construction periods.

Table 5-1 Peak Workforces of Projects in the Gladstone Regional Council Area

Project	Document Submitted	Construction Period	Construction Workforce (peak numbers)
Wiggins Island Coal Terminal	EIS	2010 - 2013	650
Queensland Curtis LNG	EIS	2010 - 2013	4,175
Fisherman's Landing Port Expansion	EIS	start 2010	150
Gladstone LNG Project - Fisherman's Landing	EIS	2010 - 2012	120
Gladstone Pacific Nickel	EIS	2008 - 2011	2,600
Boyne Island Aluminium Smelter	EIS	2008 - 2011	650
Yarwun (2) Alumina Refinery	EIS	2007 - 2012	2,800
Sun LNG Project	IAS	2011 - 2013	400
Australia Pacific LNG Project	IAS	Late 2010 - 2014	4,000 - 5,000
Shell Australia LNG	IAS	2010 - 2014	2,500 - 3,000
Boulders Steel Limited (Gladstone Steel)	IAS	2009 - 2012	2,100
GLNG	EIS	2010-2014	3,080

Note: As of November 2009, Yarwun 2 peak is estimated at 1,500 with the current workforce approximately 1,350. Boyne Island Smelter and Gladstone Pacific Nickel projects have not yet commenced. GLNG modular peak workforce is anticipated to be approximately 2,200 workers.

Source: EIS and IAS collected from proponent websites or Queensland Coordinator-General website.

In addition, without further details about when the peak workforce will occur during the construction phase of the projects, it would require Santos to make assumptions on other projects workforces over time, thus further reducing the accuracy and practicality of the outcomes. As a result, an indicative cumulative effects assessment was undertaken assuming several large-scale industrial construction projects could be occurring in the community at the same time. In addition, due to the number of projects and the potential time frames for development, project effects would be experienced over a longer period of time than the project itself as a result of the impacts by other projects. Therefore, the cumulative effect results in an increased potential for an impact to have the following:

- Occurrence/Likelihood – Higher probability of the impact to occur;
- Magnitude/Consequence – Greater effect from the impact;
- Duration – Longer timeframe for the impact to occur; and
- Degree of Confidence – Decreased confidence in the ability to predict and mitigate the impact.

5 Cumulative Effects

The workforce numbers have remained constant since the EIS SIA report except for those listed in Table 5-2. A similar graph to the one portrayed in the EIS SIA was not developed for the supplement's cumulative effects assessment because the format is not compatible with the information available from other projects over the timeframe being considered in the GLNG EIS SIA.

Table 5-2 Project Workforce Number Changes since the GLNG SIA Submission

Project	Workforce Numbers (at peak time)	
	SIA Report	EIS Report
Central Queensland Gas Pipeline	300	250
Wiggins Island Coal Terminal	520	650

Note: Observed changes from values presented in the GLNG EIS SIA based on numbers available at the time.

The purpose of the cumulative effects assessment is to identify the issues arising from other project construction periods occurring at the same time as GLNG and present what impacts that creates. The lack of consistency in the information presented by the various projects limits the cumulative effects assessment to identifying issues and commitments to monitor the changes in consultation with key stakeholders and State and local government agencies as appropriate.

As more information becomes available from other projects EISs and IASs the rationale behind accommodating a large proportion of the imported workers in CAFs becomes prudent. This is due to a combination of increased housing demand and the desire to reduce the transient workforce movements in the community. The cumulative effects of several projects' transient workforces accommodated in the community can result in relatively low and manageable impacts becoming high level impacts that are difficult to manage or differentiate between the projects. The result could be all projects being perceived as the cause regardless of the effectiveness of their individual programs and strategies.

A sliding scale may need to be employed where more workers are housed in Gladstone at the start of construction, and more in the CAF as the construction phase advances and CAF construction is completed as this is likely to coincide with other projects' activities. There will be less local accommodation options available as other projects begin construction. Some projects are planning on housing all or most of their workers locally which could further compound the potential impacts by effectively limiting future projects options to CAF style accommodation only. The number of local workers will also remain relatively constant as more projects commence construction. Although there will be training opportunities developed for most or all of the projects, the local labour supply is relatively finite. This means that the imported worker to locally sourced worker ratio will shift toward the imported worker as the project advances.

These potential cumulative issues are considered throughout the assessment. The social components are discussed separately as was performed in the impact assessment section above.

5.1 Cumulative Effects on Demographics and Community Profile

There are potential positive and negative impacts arising from the cumulative effects of several large-scale industrial developments occurring in the Gladstone area in the next 5 years.

Some of the potential positive impacts are:

5 Cumulative Effects

- Prolonged increases in the population resulting in:
    - Continued growth in the area;
    - Increased revenue for State and local government (see Section 5.5 on Economic and Employment Opportunities);
    - Gladstone being viewed as an area of economic and employment opportunity; and
    - Increased cultural diversity.

Some of the potential negative impacts are:

- Unsustainable increases in the population resulting in:
    - Unsustainable increases in real estate and rental property demand (see Section 5.2 on Accommodation);
    - Strains on health services and community wellbeing (see Section 5.3 on Health and Wellbeing);
    - Large numbers of school aged children straining the school system (see Section 5.4 on Education and Training); and
    - Unsustainable demand on social infrastructure (see Section 5.6 on Social Infrastructure).

The GLNG Project on its own will likely experience a shift from predominantly locally sourced and housed workers to predominantly imported and CAF housed workers as the Train 1 construction phase evolves. The inclusion of other projects in the Gladstone area during this time will likely result in an increase in the rate of this shift as well as a possible housing situation that requires more imported workers to be accommodated in CAF style accommodation (see Section 5.2). From a demographics and community profile perspective this could result in a (n):

- Increase in the number of imported workers in the area;
- Increase in the length of time these workers are in the area;
- Increased potential for imported workers to move to the area;
- Increased potential for other people to move to the area;
- Increase in pressure on disadvantaged groups through increases in the cost of living including housing costs;
- Change in the community dynamics as the construction timeframe continues from project to project and there is no perceived end is in sight;
- Increase in the male to female ratio;
- Potential increase in the cost of living; and
- Perceived change in the character of Gladstone to a more high-paced city.

The fact that these projects will be starting and stopping at different times and will eventually become indistinguishable from the next is likely the most important variable in the study of the cumulative effects. As a result, the construction phase could have a real and perceived extension. Real extension due to lack of labour supply and perceived because the release of workers from one project at completion would likely result in another project acquiring them for their project. From the perspective of a member of the community could be perceived as a never-ending construction phase in the community. This provides both potential positive and negative impacts depending on the:

- Level of personal interaction with the projects; and
- How the projects affect their lives.

5.2 Cumulative Effects on Accommodation

There are potential positive and negative impacts associated with housing a portion of the imported workforce in the Gladstone area. These can increase from low to medium level impacts to high or significant as a result of the cumulative effect of numerous projects being constructed in the area at the same time. There is the potential for significant positive impacts as a result of an increase in property value in the area if you:

- Own your property;
- Own investment property;
- Have property to sell; and/or
- Are looking to sell and move out of the area.

There are potentially significant negative impacts if you are:

- Renting;
- Looking to buy; and/or
- Looking to sell your property and upgrade in the area.

People in the lower socioeconomic echelon of society are more susceptible to the negative effects of the cumulative accommodation impacts; however, the increased employment opportunities have some positive effects as well. The negative effects are more likely to affect people that are not easily employed, under skilled (relevant to the various project requirements), and the elderly.

There is a very real potential that the demand on the local housing market (real and perceived) from all the projects identified in Table 5-1 could result in unsustainable increases in real estate and rental properties. Markets are driven by supply and demand; however, the people generally affected the most by such circumstances are generally not directly affected by the project but rather the vulnerable groups in society most susceptible to changes. This impact could be compounded by the duration of the combined construction phases which could see sustained high prices for housing and rental properties.

As discussed, if the increases in housing pressures are having unsustainable negative impacts on the community then alternative accommodation options might be required. This could be either shifting more workers to CAF style accommodation and deterring family relocation or contracting the construction of additional housing options in the area. Based on the number of potential projects it is likely that an increase in building approvals will be required to accommodate all the workforce demands. Projects starting later may benefit from the decreasing workforce from projects nearing completion but if the multi-train projects run continuous construction phases as described in their EISs and IASs then there will be increasing pressures on the housing market. In the absence of other pressures markets would be expected to equalise. Significant impacts to the cost of housing could occur in combination with other pressures, which could have subsequent spin off effects on other components like demographics, community profile, disadvantaged groups, economic and employment opportunities and social infrastructure. It is important to note that the more projects constructing at the same time, the higher the probability of increased impacts on accommodation.

5.3 Cumulative Effects on Health and Wellbeing

The strains on health services and community wellbeing from the cumulative effects of several projects could be an issue for the community. Such concerns were certainly raised during community consultation sessions for the Public Review phase of the Project. The major concern for health and

emergency services is that large portions of the workforce may not be considered local due to their placement in CAF style accommodation., Although they reside within the service area of these services while on their at work rotation they are not counted in the official population statistics. This has the potential to create an impact whereby workers requiring emergency assistance will rely on the local services. Local services may have difficulty factoring these workers into their budgeting and planning from year to year. Coordinated efforts to strengthen these services by various projects could be more beneficial because it could distribute the assistance to more areas more efficiently.

Cumulative effects on wellbeing will generally revolve around increases in stress attributed to changes in daily routine. A few examples include increased waits for services, increased traffic volume, and changes to the neighbourhood from imported workers accommodation.

Cumulative effects on wellbeing are more likely to be individual issues though there is a potential for negative issues to create ripple effects in society. Community development programs and sponsorship programs can help in uniting the community as the reality of several concurrent construction projects eventuates. Programs and strategies through existing agencies and organisations can help mitigate the cumulative effect, Cumulative effects generally require cumulative responses, and projects can utilise the existing local services to coordinate their efforts. This can occur through (but not limited to):

- Gladstone Regional Council strategic plans;
- Gladstone Economic and Industrial Development Board;
- Development of Regional Consultative Committees; and
- Gladstone Inter-Agency Group.

The various projects have the potential to increase health and wellbeing through new initiatives, additional funding and programs, attracting new skills to the community, diversification and maintaining the feeling that Gladstone is moving forward. Conversely, there is the potential for negative effects like uncontrollable changes to the community, increases in unfamiliar faces, changes to the community character, and increased pressure on local health services. Health and wellbeing cumulative effects can be managed by taking a proactive approach through various committees and programs.

5.4 Cumulative Effects on Education and Training Opportunities

There is a potential for the increase in population to result in an increase in the number of school aged children. This could result in a strain on the school system including early childhood education and day care facilities. Schools base their planning on enrolment numbers; however, a coordinated response from project proponents with local schools and State and local agencies may be required as projects become approved. Pre-empting such impacts is difficult to achieve since many projects have accommodation strategies to limit migration to the area; however, the choice to migrate is largely an individual/family decision.

Increases in training opportunities associated with the various projects will place the Gladstone area in higher standing as a post-secondary education and training centre. This will likely have a prolonged effect since many programs will be driven by, or coordinated through, TAFE and university campuses, thus enhancing their capabilities. Long-term employment opportunities directly linked to the training programs offered will also increase the profile of these institutions in Australia.

5.5 Cumulative Effects on Economic and Employment Opportunities

There is a potential for the cumulative economic and employment opportunities from the various other projects in the Gladstone area to result in an influx of people to the area. This is addressed throughout the Cumulative Effects section for each social component. The Gladstone Regional Council area could be perceived as both a strong investment area and a strong labour market. This has the potential to create an economic boom as multi-billion dollar LNG projects come on-line. This can be seen as both a significant positive impact and a significant negative impact. The potential positive impacts from the prolonged construction period from cumulative projects are:

- Increases in economic opportunities:
    - For established businesses in the area; and
    - For new businesses to establish themselves in the area.
- Increases in employment opportunities:
    - Working for various construction projects; and
    - Servicing the community and projects.

The potential negative impacts are:

- Unsustainable increases in the population (see Section on Demographics and Community Profile) resulting in:
    - Unsustainable increases in real estate and rental properties (see Section 5.2 on Accommodation);
    - Strains on health services and community wellbeing (see Section 5.3 on Health and Wellbeing);
    - Large numbers of school aged children straining the school system (see Section 5.4 on Education and Training); and
    - Unsustainable demand on social infrastructure (see Section 5.6 on Social Infrastructure).
- Potential for an economic bust after all the construction activity ends.

The various projects will contribute significantly to State and local government revenue from royalties and taxes which can result in additional local development projects and infrastructure upgrades.

The cumulative effects will also result in Gladstone being viewed as an area of economic and employment opportunity. This can help spur potential population growth which can again increase economic and employment opportunities from direct and indirect employment working for the projects or induced opportunities. Potential negative population growth can result from unsustainable growth or growth at a rate exceeding the capabilities of social services and infrastructure as well as government to manage.

There is also the potential for an economic bust to accompany an economic boom. Although the prolonged construction period and the 20 to 40 year anticipated operational life of many projects will reduce this likelihood, there is a potential that markets could become so over inflated through speculation and real pressures that a breaking point is reached and value drops. Additionally there are numerous external variables that could affect the development including changing commodity prices, another global financial crisis, wars, etc. In terms of the cumulative effects of the various projects and

the likelihood of more in the future, the more probable potential negative impact is growth at a rate that exceeds the capabilities of key services and infrastructure to keep up.

5.6 Cumulative Effects on Social Infrastructure

There could be an unsustainable increase in demand on social infrastructure in the area. This is more likely with increases in workers being housed in the area. The main advantages of CAF style accommodation is that it reduces pressures on social infrastructure by removing large portions of the workforce from accessing such infrastructure. On an individual project level this may not seem ideal from a community perspective, but in consideration of the other potential projects proposed, the potential impact on social infrastructure becomes more evident. Mixed accommodation strategies attempt to address this concern; however, with each new project there is a likely need to decrease local accommodation to reduce the negative potential impacts.

The various projects are likely to strengthen local infrastructure through various programs and initiatives. The role of State and local government would be to coordinate these programs to ensure social infrastructure improvements are more evenly distributed. The development of the Gladstone Social Infrastructure Strategic Plan should assist in focussing community investment programs toward common areas of need.

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Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 15 July 2009.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between August and October 2009 and is based on the project description changes and updated accommodation scenario by Santos at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

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Appendix A Gladstone Housing Model from EIS SIA

HOUSING DEVELOPMENT NEEDS MODEL - GLADSTONE			Year																					
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Base Population Estimates																												
	Low Growth Scenario		**53941**	55459.11	57019.945	58624.709	60274.637	**61971**	63219.842	64493.851	65793.533	67119.407	**68472**	69748.881	71049.573	72374.52	73724.178	**75099**	76519.998	77967.883	79443.164	80946.361	**82478**	83941.531	85431.031	86946.962	88489.793	**90060**
						2.81%					2.02%					1.86%					1.89%					1.77%		
	Medium Growth Scenario		**53941**	55663.254	57440.497	59274.485	61167.03	**63120**	64609.43	66134.006	67694.557	69291.932	**70927**	72491.446	74090.4	75724.622	77394.89	**79102**	80855.148	82647.151	84478.871	86351.187	**88265**	90138.923	92052.632	94006.969	96002.798	**98041**
						3.19%					2.36%					2.21%					2.22%					2.12%		
PIFU Estimates	High Growth Scenario		**53941**	55995.949	58129.184	60343.687	62642.554	**65029**	66987.077	69004.113	71081.884	73222.218	**75427**	77605.119	79846.135	82151.866	84524.18	**86965**	89452.919	92012.019	94644.318	97351.929	**100137**	102862.18	105661.52	108537.05	111490.83	**114525**
						3.81%					3.01%					2.89%					2.86%					2.72%		
	Chosen Scenario Pop. Projections		53941	55663.254	57440.497	59274.485	61167.03	63120	64609.43	66134.006	67694.557	69291.932	70927	72491.446	74090.4	75724.622	77394.89	79102	80855.148	82647.151	84478.871	86351.187	88265	90138.923	92052.632	94006.969	96002.798	98041
	Chosen Scenario:	**Medium**																										
GLNG Workforce																												
Total Estimated Resident Pop.			53941	55663	57440	59423	61475	63414	64775	66277	67933	69522	71081	72670	74365	75991	77585	79228	80981	82773	84605	86477	88391	90265	92179	94133	96129	98167
Estimated Household Occupancy		**2.7**																										
Estimated Household Occupancy		**1.8**																										
Housing Dwelling Demand																												
Rqr. Expected to Require Multi-Unit		**10%**																										
Rqr. Expected to Require Single		**90%**																										
Pop. Expected to Reside in Multi-Unit Development	Base Pop.		5394	5566	5744	5927	6117	6312	6461	6613	6769	6929	7093	7249	7409	7572	7739	7910	8088	8265	8448	8635	8827	9014	9205	9401	9600	9804
	Change on Previous Yr.			172	178	183	189	195	149	152	156	160	164	156	160	163	167	171	175	179	183	187	191	187	191	195	200	204
Pop. Expected to Reside in Single Dwelling Houses	Base Pop.		48547	50097	51696	53347	55050	56808	58148	59521	60925	62363	63834	65242	66681	68152	69655	71192	72778	74382	76031	77716	79436	81125	82847	84606	86403	88237
	Change on Previous Yr.			1550	1600	1651	1703	1758	1340	1372	1404	1438	1472	1408	1439	1471	1503	1536	1578	1613	1649	1685	1722	1687	1722	1759	1796	1834
Housing Land Demand																												
Assumed Dwelling Density (dwellings per hectare)	Multi - Unit Development	**15**																										
	Single Dwelling Development	**10**																										
Assumed Population Density (persons per hectare)	Multi - Unit Development	**27**																										
	Single Dwelling Development	**27**																										
Land Required for Multi-Unit Development	Base Pop. Land Requirement (Hta.) - includes existing stock		199.8	206.2	212.7	219.5	226.5	233.8	239.3	244.9	250.7	256.6	262.7	268.5	274.4	280.5	286.6	293.0	299.5	306.1	312.9	319.8	326.9	333.8	340.9	348.2	355.6	363.1
	Base Change on Previous Yr.			6.38	6.58	6.79	7.01	7.23	5.52	5.65	5.78	5.92	6.06	5.79	5.92	6.05	6.19	6.32	6.49	6.64	6.78	6.93	7.09	6.94	7.09	7.24	7.39	7.55
	Base Cumulative Land Amount (Hta.)			6.38	12.96	19.75	26.76	34.00	39.51	45.16	50.94	56.86	62.91	68.71	74.63	80.68	86.87	93.19	99.68	106.32	113.10	120.04	127.13	134.07	141.15	148.39	155.78	163.33
Land Required for Single Dwelling Houses	Base Pop. Land Requirement (Hta.) - includes existing stock		1798.0	1855.4	1914.7	1975.8	2038.9	2104.0	2153.6	2204.5	2256.5	2309.7	2364.2	2416.4	2469.7	2524.2	2579.8	2636.7	2695.2	2754.9	2816.0	2878.4	2942.2	3004.6	3068.4	3133.6	3200.1	3268.0
	Base Change on Previous Yr.			57.4	59.2	61.1	63.1	65.1	49.6	50.8	52.0	53.2	54.5	52.1	53.3	54.5	55.7	56.9	58.4	59.7	61.1	62.4	63.8	62.5	63.8	65.1	66.5	67.9
	Base Cumulative Land Amount (Hta.)			57.4	116.6	177.8	240.9	306.0	355.6	406.4	458.5	511.7	566.2	618.3	671.6	726.1	781.8	838.7	897.1	956.9	1017.9	1080.3	1144.1	1206.6	1270.4	1335.5	1402.1	1470.0
Total Cumulative Land Required by				64	130	198	268	340	395	452	509	569	629	687	746	807	869	932	997	1063	1131	1200	1271	1341	1412	1484	1558	1633
Total Residential Land Required		**1633**																										
Average No. Dwellings Required Annually	**Single Dwelling Houses:**	**590**																										
	Units:	**98**																										
GLNG Residential Land		**0.79%**																										

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