
4 SUPPLEMENTARY ASSESSMENT FOR GAS FIELD COMPONENT

4.1 INTRODUCTION

The assessment of social impacts from the Gas Field Component of the Queensland Curtis LNG (QCLNG) Project was provided in the draft environmental impact statement (EIS) in *Volume 8, Chapter 4*. As a result of submissions received regarding the development of the Gas Field, QGC has reviewed this chapter of the draft EIS, and provides the following information regarding:

- changes to workforce and population forecasts as a result of detailed design
- changes to housing impacts and provisions, including construction camps as a result of finalising workforce estimates
- social constraints regarding field development planning
- responses to submissions to the draft EIS concerning social impacts related to the development of the Gas Field
- further assessment of social impacts and benefits
- a description of further mitigations which have been developed as a result of submissions received and detailed project design.

The main changes to the development of the Gas Field of relevance to social impacts include:

- a reduction in the number of Central Processing Plant (CPP) facilities from nine to four
- an increase in the life-of-project number of Field Compression Station (FCS) facilities from 27 to 53
- the need to incorporate maintenance and emergency flaring at wells
- changes to the Upstream Infrastructure Corridor
- finalisation of workforce numbers, including construction workforce requirements post 2014.

The possible provision of compressors at well sites may also affect rural amenity, in relation to noise impacts. Noise limit compliance and mitigation strategies are discussed in *Volume 3, Chapter 13* of this supplementary EIS.

Since the development of the draft EIS, QGC has further assessed a range of locations for the development of Gas Field infrastructure. Where this has occurred, this chapter now provides:

- a description of the social constraints methodology that has been used and will continue to be used to avoid, minimise and mitigate impacts from the location of Gas Field infrastructure components

- a social constraints profile that will be used for the tenement areas
- an understanding of the potential social impacts that could result from the construction and operation of CPPs and FCSs. As described in the draft EIS, up to 6,000 commercial production wells will be progressively established over the life of the Project. The exact location of these wells will not be known until exploration activities have been conducted in each tenement. This has caused concern, as expressed by submitters in relation to uncertainty about wells on their properties and potential effects on their amenity. Description of wells and gathering systems are described in *Volume 2, Chapters 7 and 11*. The impacts of wells and gathering systems are discussed in *Volume 3* of the draft and sEIS. The Project has developed a code of conduct to mitigate concerns about well drilling and operation on rural residential properties constraints (see *Appendix 8.3*)
- a description of possible social mitigation strategies that may be applied at each site, pending a detailed site investigation and/or land holder negotiations where QGC is not a landholder.

In summary, this chapter provides an outline of the submissions received and responses as part of the statutory consultation process, and an update on social implications resulting from further Project detailed design.

QGC has considered submissions in further defining the project, and in the development of social constraints and mitigation strategies to minimise impacts on communities in the Western Downs and Toowoomba regions.

4.2 SUBMISSION ISSUES AND RESPONSES

The QCLNG Project draft EIS received 11 submissions commenting on social and cultural impacts regarding the development gas field area. These are detailed below in *Table 8.4.1*.

Table 8.4.1 Issues and Responses to Submission Relating to the Gas Field Component

Issues Raised	Project Response	Submitter Number
Indigenous Issues		
Invisibility of indigenous people in the EIS, especially in the Social Impact Assessment. Need reference to indigenous people and their issues in all chapters in <i>Volume 8</i> . Lack of cross-referencing between 'whole of community programs' and those dedicated to the indigenous community.	QGC recognises the importance of indigenous people, and that projects need to be managed to avoid negative impacts and maximise project benefits for indigenous people. QGC is actively consulting with Traditional Owner groups and indigenous communities in the Gas Field area, including on employment and training strategies and social mitigation projects. <i>Volume 8</i> of the draft EIS includes references to indigenous people throughout the demography and service provision sections, and <i>Volume 8, Chapters 7 and 9</i> of the draft EIS specifically	8

Issues Raised	Project Response	Submitter Number
	<p>address social and cultural heritage impacts for Indigenous people.</p> <p>QGC is committed to ensuring that it includes indigenous people and their issues in all further assessment works and social mitigation policies, strategies and processes.</p> <p>QGC reiterates that those programs described as ‘whole of community programs’ equally apply to indigenous people, and where additional strategies have been discussed or identified, these have been developed and will continue to be developed as the Project progresses through detailed design and social mitigation and social investment strategies are finalised.</p>	
Indigenous social and economic impact – ‘closing the gap’ issues not addressed in the draft EIS.	<p>The ‘Closing the Gap’ Policy was an important milestone for the indigenous people of Australia in gaining the Government’s commitment and support in ensuring that equality is gained on a range of social, economic, education and employment indicators. QGC supports this. The social investment strategy being developed in consultation with indigenous community representatives provides for direct investment in indigenous programs relating to employment and training, affordable housing and cultural awareness.</p> <p>QGC looks forward to working with indigenous communities to ensure that QCLNG makes a positive contribution to ‘Closing the Gap’.</p>	8
Gangulu people are community members and landholders, and have some particular areas of need, such as ensuring the care of old people and young people in the education system.	<p>QGC in consultation with the Gangulu people and other indigenous community members is committed to improving opportunities, including training and employment opportunities for those who wish to develop skilling in this field through apprenticeships, and developing programs with indigenous people that reflect their cultural wishes, beliefs and health needs.</p>	8
How are Business Principles and Standards translated into action including outcomes for indigenous people? A primary principle should be that no indigenous person would be any worse off as a result of the Project.	<p>QGC is committed to working with indigenous people and other stakeholders to mitigate impacts on indigenous people’s wellbeing and to developing responses that address ‘Closing the Gap’ priorities. QGC’s social impact management plans and social investment strategies will have transparent and measurable targets that can be audited. The results of social performance audits are reported in BG Group’s Sustainability Report, which is presented to all shareholders as part of BG Group’s Annual General Meeting documentation. The QCLNG Project will need to demonstrate to the commonwealth and state government that it has met the commitments defined in this EIS and accompanying agreements, including Indigenous Land Use Agreements and Cultural Heritage Management Plans.</p>	8

Issues Raised	Project Response	Submitter Number
Indigenous Australians are the most disadvantaged people in Australian society. Limiting access to affordable housing or the ability to compete for private housing would place indigenous people in a greater disadvantage than before the start of the Project.	<p><i>Volume 8, Chapter 7</i> of the draft EIS details the social impact of the project on indigenous communities. Within this Chapter, QGC recognises that many indigenous people find it difficult to secure affordable housing, and that projects like the QCLNG Project can have an impact on this.</p> <p>QGC is developing an Integrated Housing Strategy (considering all Project areas, and including housing investment, management and affordable housing¹ initiatives). This includes the development of the QCLNG Housing Strategy as discussed in later sections. These strategies have included social investment mitigations strategies with measurable performance indicators to ensure that indigenous people in the Project area are not further disadvantaged in relation to housing as a result of the development of the QCLNG Project.</p>	8
QGC is wrongly attempting to use the Indigenous Land Use Agreement (ILUA) compensation payment to meet the mitigation and management strategy for the social impact on indigenous people and communities within the Project area.	<p>QGC has worked, and continues to work, with Traditional Owners in the Project area to develop ILUAs. In parallel, QGC is also developing a Social Performance Plan, which includes social impact management plans and social investment projects.</p> <p>The draft and supplementary EISs identify potential issues and impacts, and propose mitigation strategies to be further developed in consultation with Indigenous stakeholders to ensure that benefits are realised and reflected in the SIMPs. Both the ILUA and social performance plans provide a range of mechanisms and strategies to ensure that indigenous people and communities are respected and involved in the Project through social investment, skills development and employment. QGC will work and involve the traditional owners and indigenous people in a spirit of co-operation and participation.</p>	8
Information exchange and skills development to be applied to indigenous people in the implementation of the local content policy.	The Local Content Strategy includes specific references to indigenous employment and business development. Consultation with indigenous people will occur in 2010 as part of the implementation of the local content strategy.	8
Community Reference Groups – will there be one for Banana Shire (Pipeline area) and will there be any indigenous representation?	Consultative mechanisms for Banana Shire will be outlined in the Community Engagement Strategy, to be prepared before construction, and will include indigenous people.	8

¹ 'Affordable housing' refers here to housing that is affordable for people on low incomes. It includes affordable private rental dwellings, public housing and housing managed by churches and non-government organisations.

Issues Raised	Project Response	Submitter Number
<i>Health, Safety and Risk Issues</i>		
Treated CSG water may be provided to workers' camps as potable water, although environmental impacts are assessed, potential impacts of treated CSG water on human health are not assessed.	As discussed in the draft EIS in <i>Volume 3, Chapter 11</i> , Page 29, any CSG water provided for human consumption would require treatment to meet the Australian Drinking Water Guidelines.	10
Health and safety – stress and anxiety placed upon Tara Estate residents.	<p>Hazards and Risks in the Gas Field have been addressed in <i>Volume 3, Chapter 17</i> of the draft EIS. Further advice on health and safety has also been provided in the sEIS in <i>Volume 3, Chapter 17</i>.</p> <p>In <i>Volume 3, Chapter 19</i> of the sEIS, QGC has outlined a gas field and pipeline construction plan from 2010 to 2014 (the Plan), which includes the constraint mapping and other social and environmental mitigations as part of the supplementary EIS. The Plan identifies indicative locations of where and how major infrastructure is to be located. It provides a level of certainty for residents and accountability for QGC with regard to how it will position infrastructure.</p> <p>When locating infrastructure on land, safety procedures will be provided to all landholders and residents as part of the Landowner's agreement. Landholders will be able to deal directly with QGC regarding any concerns they have. QGC will have a 24 hour emergency response line for all members of the community to report incidents or issues relating to safety, health and environmental amenity or harm.</p> <p>QGC has also developed a Code of Conduct for operations in rural residential areas, in consultation with Tara residents, to assist in reducing anxiety and stress relating to Project impacts (see <i>Appendix 8.3</i>).</p>	13
Residents need to know the risks of these operations in rural residential areas.	<p><i>Volume 3, Chapter 17</i> of the draft EIS outlines risk assessment that was conducted for the Gas Field. QGC accepts that locating infrastructure such as wells and compressor stations requires a rigorous assessment of health and safety risks. To this end, QGC will work with individual landholders and residents to ensure that infrastructure is located and operated in a safe way and does not put residents at risk of injury.</p> <p>A Code of Conduct has been developed in consultation with rural residential area residents, to agree specific provisions for operations in rural residential areas (see <i>Appendix 8.3</i>). It should also be noted that there are a number of engineering standards, safety standards and health standards that QGC must meet in locating any infrastructure near residential premises. QGC will meet or exceed these standards.</p>	19

Issues Raised	Project Response	Submitter Number
<i>Workers Camps Issues</i>		
Workers camps should be classed as sensitive receptors for noise and air emissions.	QGC commits to taking measures to minimise disturbance to sleep of workers staying in camps that may arise as a result of plant noise. A variety of mitigation measures will be used, including site selection, mitigation of noise at source and the use of air conditioning in the habitable spaces of the camp. QGC believes the appropriate noise levels to apply are indoor noise levels as defined in AS2107.	10
The siting of workers camps should be discussed with Western Downs Regional Council (WDRC) before establishment of camps and any necessary approvals must be obtained before building workers camps.	QGC will consult with the Western Downs Regional Council on the intended location of camps, seek Council's input to camp siting considerations, and seek regulatory approvals as required.	36
<i>Local Content and Procurement Issues</i>		
Local procurement process to engage with local and regional businesses. WDRC keen to work collaboratively with QGC for local procurement.	The Project's intention is to engage with local and regional businesses as described in the Local Content Strategy in <i>Volume 8, Chapter 8</i> of the draft EIS. Furthermore, QGC is committed to 'buy local' where possible and to encourage QGC staff and contractors to 'buy local' as well. Local governments including the WDRC will be consulted to assist in implementation of the Project's Local Content Strategy.	36
<i>Workforce and Population Impacts Issues</i>		
It is not acceptable that the project is unable to quantify indirect population growth and growth from other CSG projects.	Cumulative impacts such a population growth from direct and indirect consequences of the QCLNG Project proceeding can only be determined from Environmental Impact Statements that are in the public domain. The draft EIS has considered all projects that were at this stage in planning and development.	36
It was proposed that the local labour market in Western Downs will be minimally affected. It was submitted that this was not accurate.	Unemployment levels in the Western Downs Region are approximately 2 per cent. This will limit the number of workers available for the QCLNG workforce. Priority will be given to local workers where possible. QGC understands that there may be some impacts from workers leaving existing employment within the Western Downs Region to work for QGC, and that this may affect businesses and local governments, and has committed to initiatives such as the Local Content Strategy, which will enhance local business growth.	36

Issues Raised	Project Response	Submitter Number
<i>Social Infrastructure Issues</i>		
<p>QGC Community Development Fund does not adequately address social infrastructure needs of an expanded population as a result of the development of the Gas Field and Pipeline.</p>	<p>QGC is working with local community organisations and local governments, including the Western Downs Regional Council, to identify priorities for social and health infrastructure development, and ensure that those programs are targeted best to the needs of the local community. The QGC Community Development Fund will also support the capacity of community organisation to increase services and improve facilities for all community members. This is outlined in the draft Social Impact Management Plans (see <i>Appendix 8.4</i>).</p>	36
<p>WDRC requires QGC to enter into an Infrastructure Agreement to provide sufficient contributions for the provision of affordable housing and community infrastructure in the region.</p>	<p>In developing SIMPs and the social investment strategy, QGC will consult with WDRC to ensure that investments in affordable housing, creation of housing stock and social infrastructure investment for building the capacity of services to meet changing needs is well targeted and leads to measurable outcomes that benefit the Western Downs community.</p>	36
<p>The demand on health infrastructure and health services is understated in the impact assessment. QGC's Community Development Fund does not adequately address increase in demand for these services by the introduction of the QCLNG Project in regional areas.</p>	<p>QGC will employ general practitioners, practice nurses and allied health services to care for its contractors and subcontractors. Thus, the impact on primary health care services should be minimal. However, QGC is aware that some of its employees or contractors might choose to see a non-Project doctor or that in cases of workplace injuries that require health services other than primary health care services, that regional hospitals and medical services may be required. This has been factored into the impact assessment.</p> <p>QGC is consulting with health and community stakeholders in the Western Downs to develop investments in rural health capacity, which will offset the demands due to population growth induced by QCLNG, and improve the long-term sustainability of rural health services. Target projects will be identified through QGC's Rural Health Partnership, which will be completed before Project construction.</p> <p>The aim of the Community Development Fund is to determine with the community how communities and community services will be affected by the Project, and how best these can be mitigated taking account of individual community needs. QGC will work with local government, community groups and medical staff to ensure that these services are not diminished as a result of the Project, and may be enhanced.</p>	36

Issues Raised	Project Response	Submitter Number
<i>Training and Skills Development Programs</i>		
QGC should improve and complement existing training programs in Western Downs when considering the provision of training for potential workers.	In developing training initiatives and training programs, QGC and its contractors will work with existing training providers and economic development groups to ensure that new training programs complement existing training initiatives and local training capacity where possible.	36
Engage with Waminda services for employment of people with disabilities.	QGC has consulted Waminda directly to refine the social infrastructure baseline and develop social infrastructure investments that ensure people with disabilities benefit from the Project.	15
<i>Housing</i>		
Housing impacts identified in the draft EIS for the Western Downs Region are understated.	<p>Revised workforce estimates and a revision of potential impacts on housing and mitigation strategies are detailed in the supplementary EIS in <i>Volume 8, Chapter 4 (Sections 4.3.2 and 4.3.4)</i>. This reassessment concluded that housing investment, camp management and affordable housing strategies as forecast in the draft EIS are a high priority in the Western Downs.</p> <p>Comprehensive mitigation strategies to address housing impacts are outlined in the draft EIS (<i>Volume 8, Chapters 4, 6 and 8</i>). Further detailed assessment has also identified the need for an integrated housing strategy that addresses all impacts across the Project area. The QCLNG Integrated Project Housing Strategy is being developed, and will include further consultation with WDRC, TRC and other stakeholders concerned with housing availability.</p>	36
Toowoomba may be an attractive location for workers in the Gas Field to live for various reasons – such as it is a regional centre with social infrastructure and services of a high standard, and housing stock that could meet the needs of families.	<p>QGC acknowledges that the Toowoomba area is attractive for QGC families of employees, contractors and subcontractors.</p> <p>Further consultation with Toowoomba Regional Council early in 2010 will include this as a consideration.</p>	14
Social, economic and transport and cumulative impacts need to be assessed in relation to Toowoomba as a regional city.	<p>Toowoomba will benefit economically from the Project, given the city's role as a regional business centre.</p> <p>It is acknowledged that QGC will contribute in a minor way to population growth in Toowoomba. Given Toowoomba's housing availability and social infrastructure, and the provision to accommodate all non-local workers in camps, it is unlikely that the number of QCLNG workers moving to Toowoomba in the short term (up to 2015) will cause a significant impost on social infrastructure or housing availability. Given housing stress in the Western Downs, it is likely that Toowoomba will continue as the home of</p>	14

Issues Raised	Project Response	Submitter Number
	<p>choice for some QGC workers.</p> <p>QGC, as a major stakeholder in the region for the next 30 years, looks forward to the development of functional and consultative relationships with Toowoomba Regional Council, Toowoomba businesses and residents. These relationships will ensure that the broader Project region, including Toowoomba, benefits from QCLNG.</p> <p>Traffic and transport impacts are discussed in <i>Volume 3, Chapter 14</i>, and <i>Volume 4, Chapter 13</i> of the sEIS.</p>	
Impacts on affordable and community housing and provision of affordable housing for pensioners and people with disability.	<p>The sEIS provides further information on both the impact of the Project on affordable housing and the provision of affordable housing.</p> <p>QGC is developing a Social Impact Management Plan (SIMP) and an Integrated Project Housing Strategy that will further detail housing impact mitigation measures in the Western Downs to ensure that the Project does not affect affordable housing for vulnerable groups. These documents will be the subject of stakeholder consultation and partnership development in 2010.</p>	20
Provide family accommodation by direct investment in housing stock to attract families to reduce impacts of single male workforce in small towns.	<p>Workers camps will be provided to reduce the impact of single male workforce on small towns.</p> <p><i>Volume 8, Chapter 8</i> of the draft EIS discusses QGC's approach to developing housing stock through the Project's Social Investment Strategy and SIMPs, and in particular through the Project's Integrated Housing Strategy. A working draft Social Impact Management Plan is provided as <i>Appendix 8.4</i>.</p>	20
Housing affordability for families with low income (provide housing subsidy).	<p>QGC is working with local Councils, community groups, non-government agencies and housing industry stakeholders to develop housing affordability strategies, as discussed above.</p>	20
MAC Services has housing stock available for rent in Gladstone, and is developing housing villages in Dalby.	<p>Noted for consideration in the Housing Strategy</p>	17
Impact Monitoring and Management		
A Social Impact Monitoring and Management program and process along with actions to manage impacts need to be put in place by the Project.	<p>Monitoring and reporting of social impacts are critical in determining the success or otherwise of mitigation strategies designed to minimise expected impacts. <i>Volume 8, Chapter 4</i> and <i>8</i> of the draft EIS discussed a number of mitigation strategies and how these will be reported.</p> <p>QGC has developed a draft Social Impact Management Plan, (SIMP) which will have measurable performance indicators and be audited and reported publicly through QGC and BG's social performance reporting requirements.</p>	36

Issues Raised	Project Response	Submitter Number
Location of Gas Field Infrastructure		
Lack of certainty and clarity in the draft EIS regarding the location of equipment, wells, pipeline, transport routes and general logistics.	<p>QGC accepts the lack of certainty on infrastructure locations, including wells, pipeline routes, transport routes and general logistics, has caused concern as identified in submissions and consultation on the draft EIS.</p> <p>Although the Project is still being refined, QGC has moved to a level of detail that will provide an improved level of understanding as to how the Gas Field will be developed, how infrastructure will be located and how mitigation measures will work and be monitored. <i>Volume 3, Chapter 19</i> of this supplementary EIS includes a gas field and pipeline construction plan from 2010 to 2014 to show:</p> <ul style="list-style-type: none"> • Facility locations. • How constraints mapping is being utilised to determine possible locations for infrastructure. • How agreements with landholders and communities will be applied in determining possible locations for infrastructure. 	8
Distance of wells in rural residential areas is variable.	Wells will be located approximately 750 metres apart as discussed in the draft EIS (<i>Volume 2, Chapter 7, Page 10</i>). Additional provisions regarding well locations in rural residential areas are outlined in <i>Section 4.4</i> of this chapter.	8
Bushfires in Gas Fields		
Bushfires could be caused by activities at the CSG wells, pipes and infrastructure. Local fire fighters need to be trained in fires from gas field infrastructure.	<p>Bushfires are a real risk in rural Queensland, and QGC accepts that the community may be concerned with regard to the QCLNG Project providing an additional risk regarding bushfires.</p> <p>The development of the Gas Field, pipelines and other infrastructure is governed by a range of safety and fire prevention standards (refer to <i>Volume 3, Chapter 17</i> of sEIS for details on bushfire management). These standards include:</p> <ul style="list-style-type: none"> • Buffer zones around flares. • Ability to shut flares down if required. • Ensuring safe welding practices are used. • Ensuring worker conduct does not lead to an accidental bushfire. • Rural fire fighting training. • Fire safety processes and procedures. <p>QGC is developing a Safety Plan that provides procedures for the prevention and control of bushfires. These plans will be developed in consultation with local fire and rescue services and state emergency services. QGC also has fire wardens at all of its sites and a 24 hour incident notification hotline for residents.</p>	7, 8 and 19

Issues Raised	Project Response	Submitter Number
	QGC works in co-operation with local and state emergency services, and supports requests or recommendations made to QGC by these groups to assist in prevention of bushfire risk.	
<i>Rural Residential Areas</i>		
There appears to be no code of conduct for gas field and pipeline works to be conducted in rural residential estates.	A Code of Conduct has been developed regarding QGC activities in rural residential areas (see <i>Appendix 8.3</i>). Consultation on the draft Code of Conduct included a mail-out to approximately 2,000 rural residential landholders in the area of the QGC tenements. A total of 21 responses were received from the invitation to provide input, of which nine opposed the development of QGC infrastructure in rural residential areas. The Rural Residential Code of Conduct provides specific measures to reduce amenity impacts from the locations of Gas Field and Pipeline infrastructure on residential, rural residential and rural land (as detailed in <i>Appendix 8.3</i>).	19
QGC has indicated that it is not fully prepared for conducting operations in rural residential areas.	<i>Volume 8, Chapter 4</i> and <i>Volume 12</i> of the draft EIS and the supplementary EIS have assessed the impacts of the Project activities on the rural residents in the Project area and have proposed various impact management strategies. The Project has also developed a Code of Conduct that addresses activities in rural residential areas (see <i>Appendix 8.3</i>).	7

4.3 REVIEW OF PROJECT IMPACTS

4.3.1 Refined Workforce Forecasts

4.3.1.1 Gas Field Construction Workforce

Detailed planning for the Gas Field construction (which includes field development, the collection header, CSG facility construction, water management facilities and drilling) has identified a larger optimal workforce for construction in the Gas Field than was forecast in the draft EIS. It should be noted that from a social impact perspective this section includes all Project-related workforce that will impact the Western Downs region.

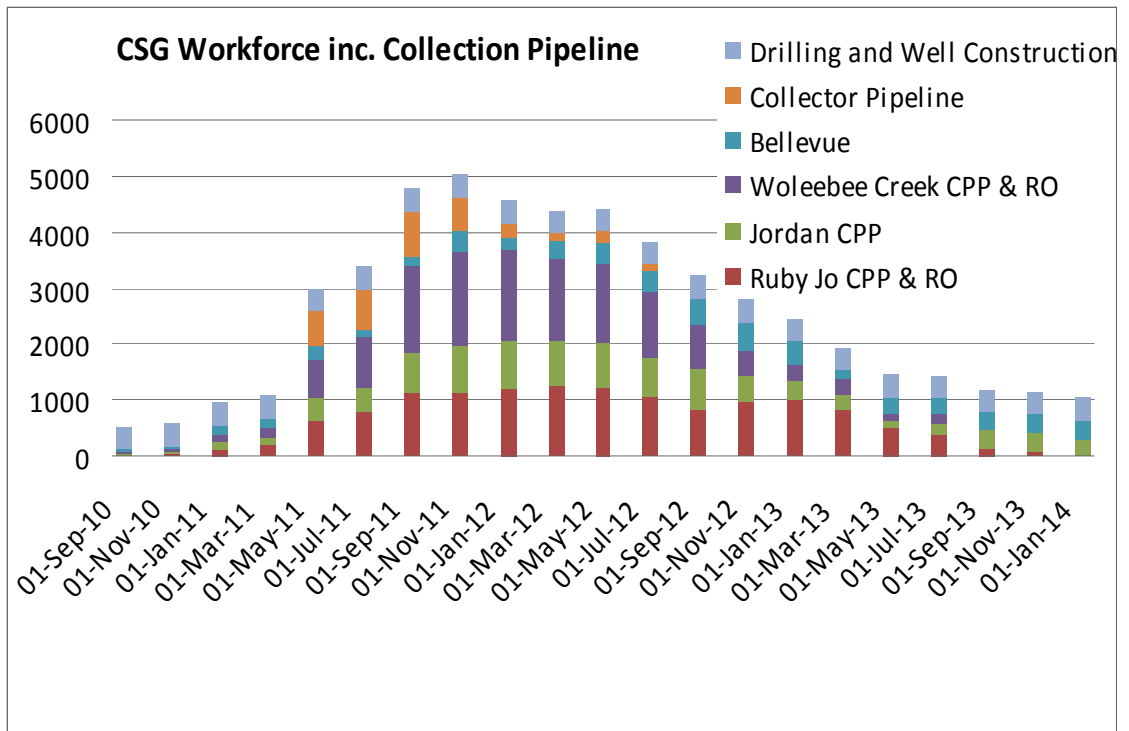
By January 2011, the Gas Field's workforce on site will include approximately 500 workers, and will peak at approximately 4,500 workers by December 2011, then steadily decline to less than 3,000 workers by November 2012, 1,500 workers in April 2013, and around 750 by late 2013.

In addition to this workforce, there will be approximately 400 contracted workers for well drilling and construction. The estimated total workforce peak

will be approximately 4,900 workers in the Gas Field, including the Collection Header pipeline.

The revised construction workforce forecast is represented in the histogram below in *Figure 8.4.1*, and includes the Collection Header pipeline, which will be constructed as part of the Gas Field infrastructure.

Figure 8.4.1 QCLNG Workforce in the Western Downs Regional Area 2010 – 2014



As per the draft EIS, QGC is committed to maximising local employment, with a particular focus on ensuring local employment in Gas Field operations in the long term. Unemployment in the Western Downs region in July 2009 was estimated to be 2.2 per cent. This is effectively full employment. Consultation with key stakeholders and local residents has confirmed that labour availability is limited. Thus, it is unlikely that many workers will be drawn from the local area during the first few years of construction.

QGC is undertaking a labour availability study to inform the development and implementation of recruitment and training programs to achieve a progressive increase in the percentage of local workers as discussed in *Volume 8, Chapter 4, Section 4.4.1.4* of the draft EIS.

As discussed in *Section 4.3.2* of this chapter, QGC will undertake local content strategies and involve local businesses where possible. Along with these strategies QGC’s employment and training initiatives outside of the CSG industry will assist to offset drawing of labour to the QCLNG Project. This is likely to include working with agricultural and services businesses in the Western Downs.

While manual and non-manual jobs will be promoted to appropriately qualified residents, the quantity and specialised nature of these employment opportunities mean that a large non-local workforce will be required to fill these positions. It is anticipated that approximately 2 per cent of the workforce required for the Gas Field Component development will be sourced locally.

The expected origin of the workforce during construction is as follows:

- approximately 100 workers (2 per cent, predominantly non-manual workers) sourced locally
- approximately 400 workers (8 per cent) sourced from the regional area, including the Maranoa and Toowoomba regions, on a drive-in, drive-out basis
- 4,400 workers (approx. 90 per cent) sourced from other parts of Queensland, Australia and possibly overseas, who may either fly-in and fly-out or relocate to the area.

The availability of housing may constrain the Project's capacity to employ locally, and this is discussed in *Section 4.3.4* of this Chapter.

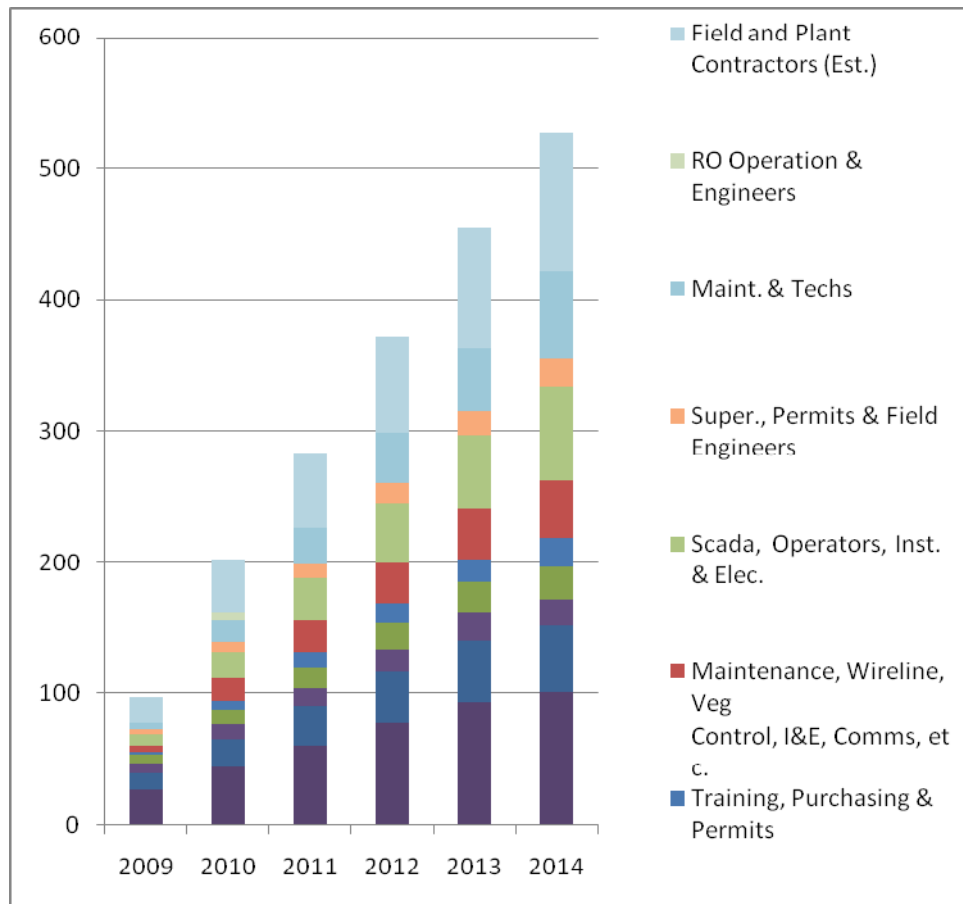
4.3.1.2

Gas Field Operations Workforce

As the Project progresses through detailed design, operations workforce numbers have been reviewed, and it is now estimated that approximately 530 workers will be required. This has been reduced from the draft EIS estimate of 800, as drilling and well construction contractors are now considered in the continuing construction phase of the Project for workforce assessment.

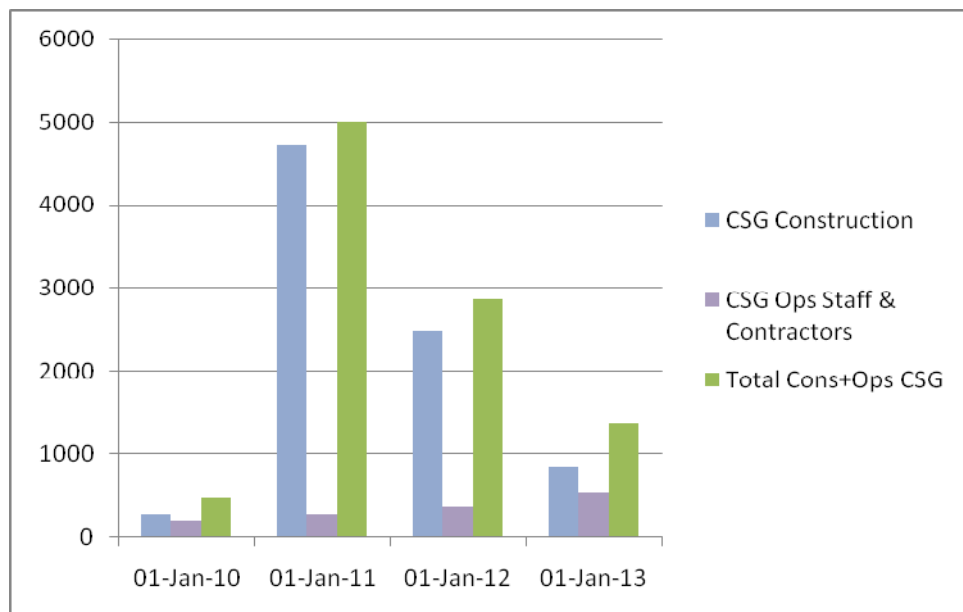
The operations workforce for the QCLNG Project will start in 2010, while construction is under way, with approximately 200 workers, and increase to a steady state of approximately 530 workers in 2014 (refer *Figure 8.4.2*). The workforce histogram below (see *Figure 8.4.3*) shows the expected workforce and skill sets required for both construction and operations, and the breakdown between these two phases of the Gas Field development.

Figure 8.4.2 Operational Workforce for the CSG Field Components 2010 – 2014



In combination, the on-site Gas Field operational and construction workforce will peak at around 5,200 workers in 2011. This will decline steadily by the end of 2013 as the construction phase is completed. See *Figure 8.4.3* below.

Figure 8.4.3 Total CSG (Construction and Operations) Workforce On-Site



4.3.1.3 *Forward Program Construction Employment*

Post 2014-15, construction of gathering systems and Field Compression Stations will continue until 2025. With respect to ongoing construction, the current forward schedule indicates a peak of approximately 1,000 construction workers is expected during 2015, some 2,000 workers during 2018-19 and approximately 1,000 workers during 2022-23. As such, QGC is committed to long-term partnerships with local stakeholders to address housing, social infrastructure availability and other social impacts, as forecast in the draft SIMP (refer to *Appendix 8.4*).

4.3.2 ***Impacts Related to Increased Workforce***

4.3.2.1 *Employment Security and Economic Benefits*

The creation of more than 5,000 jobs at peak construction coupled with approximately 530 jobs created for operations provides an opportunity for local residents to secure long-term employment. It is QGC's intention to maximise employment opportunities for local residents and the indigenous community.

These increased opportunities may, however, increase the labour draw from existing local businesses, services and other industry and may lead to a labour shortage in the area.

Benefits to local businesses may be enhanced beyond those stated in the draft EIS through the development of a Local Content Strategy and a Local Procurement Policy. These have been highlighted as key areas of partnership and growth by Western Downs Regional Council in their submission on the draft EIS.

Mitigation

The forecast workforce for CSG construction and operations has increased, due to consideration of all contractors and more detailed planning.

At peak, the total Gas Field workforce (including operations staff) for the QCLNG Project is likely to reach approximately 5,000 workers.

The Project aims to achieve a steady increase in the percentage of local workers as CSG and trade education, training and apprenticeship programs in the local area are developed by the Project and the LNG industry. QGC is participating in cross-industry training and skills analysis projects to facilitate this. A detailed labour availability study is being conducted to address both construction and operational workforce requirements in more detail, to support the development of pathways to operational employment, including training and career development programs.

The Project intends to develop QCLNG as an employer of choice for local residents, and to assist in the development of a skilled local workforce for the Project's operational phase.

As part of its social investment initiatives, QGC is participating in the Queensland Mineral and Energy Academy (QMEA) cross-industry training initiative, and assessing strategies proposed by the National Resources Sector Employment Taskforce.

The Local Content Strategy developed by QGC aims to maximise local economic benefits. The Local Content Strategy provides measurable strategies to ensure economic benefits for local businesses, and includes:

- a focus on recruitment strategies and contract conditions that will attract local labour
- maximising employment and economic development for indigenous people through direct employment and training, and support for business development
- working with local suppliers to increase their capacity to supply QCLNG and similar projects
- providing capable suppliers with full, fair and reasonable opportunity to supply equipment, materials and services to the Project
- Facilitating Suppliers to competitively replace imports and global supply chains to ensure that where possible local goods and services are utilised.

QGC will shortly establish an office in the Gas Field area, which will improve local residents' and businesses' access to the Project.

4.3.3 Population Impacts

The draft EIS estimated that the population of the Western Downs could increase by an additional 225 people relocating to the region by 2014.

However, with the changes outlined in the workforce requirements for the construction and operation of the Gas Field, including longer-term construction employment, it is now expected that approximately 5 per cent of the non-local workforce would move to the Western Downs Region by 2014. These would be predominantly workers with partners or families, and would result in around 230 families moving to the region. At an average household size of three persons, this would mean an increase in the population by approximately 700 people, of whom some 230 would be children.

Workers attracted by jobs in the operational phase of the QCLNG Project and the amenity of the Western Downs may also move to the area. If one-quarter of the 530 operational workers forecast for 2014 settle in the area by 2014, this would mean a population increase due to the operations component of the Gas Field of approximately 130 households or 400 people.

Theoretically, the total population increase due to the QCLNG Project by 2014 could be approximately 360 families, or more than 1,000 people, with around 360 of those being dependent children and students. This increase in permanent residents in the area is likely to increase the vitality and population

stability of the area, by providing permanent jobs with higher than average incomes. Some indirect increase in the population growth is also likely. Indirect population increase and cumulative impacts in the region are discussed in *Volume 8, Chapter 4* of the draft EIS.

The Western Downs LGA population is expected to increase from 30,118 people in 2006 to some 32,500 by 2014². As such, families drawn to the area by employment in the QCLNG Project would be equivalent to more than half the forecast population growth by 2014. This growth is contemplated in population forecasts for the area. It will be necessary though for QGC to maintain regular consultation with the Department of Education and Queensland Health to ensure they are aware of hiring trends and any implications for service planning.

Toowoomba is also likely to experience a small population increase as a result of the Project, due to the availability of housing and the attractiveness of its amenity. This is conducive to its role as a regional centre, however consultation with Council regarding settlement of QGC families may be required if numbers are appreciable.

Population increases due to the Project may be limited by housing availability. QGC is committed to increasing its local workforce while mitigating impacts on housing affordability. Revised impacts on housing and social infrastructure are discussed below.

4.3.4 Housing

The Project intends that all of the construction workforce from outside the region will be housed in camps. Locations will be subject to social constraints profiling, and an examination of opportunities for local towns to benefit from camps in the area will be undertaken. However, a gradual, long-term in-migration for QCLNG Project employment is expected, as described in the draft EIS.

QGC has committed in its draft EIS to mitigating impacts on general housing affordability (i.e. managing demand so as to mitigate general housing cost increases) and to investing in affordable housing (i.e. housing for people on very low incomes). The draft EIS described a range of strategies, with housing stock creation and affordable housing partnerships key to mitigations.

Submissions to the draft EIS have indicated that the impacts on housing in the Western Downs were understated. These impacts have been reassessed, based on these concerns, data provided by members of the community, and the revised workforce numbers developed a result of detailed design.

² Based on projections of 31,620 people by 2011 and 33,037 by 2016, in Queensland Department of Infrastructure and Planning (2008)

Based on the revised assessment of potential population increase due to the QCLNG Project, it can be estimated that 360 dwellings may be required in the Western Downs region by 2014.

Rental dwelling availability (vacancy rate) in the Western Downs LGA in 2008-2009 was approximately 1.9 per cent³, equivalent to about 56 dwellings available (of around 2,900 rental dwellings available in the Western Downs LGA). Availability in the previous year was approximately 6.9 per cent, with about 205 dwellings available. This fluctuation in availability is due to the construction of various projects in the region. Demand is unlikely to decrease in the foreseeable future due to the number of projects being developed in the Western Downs.

Building approvals in the Western Downs LGA totalled 267 between June 2006 and June 2008, with 83 approvals in 2008-09⁴. If the 2008-09 rate of domestic building activity is sustained in the five years to June 2014, this would produce a total of 415 dwellings. A large proportion of these would be available for rental. This would assist to provide housing for families with QCLNG Project workers, however demands for housing for growing businesses and other projects will also be required, and it is unlikely that this production rate will be sufficient to prevent housing impacts from QCLNG and other projects planned for this region in the short to medium term. Further as part of understanding the cumulative impacts, it is clear that existing and proposed energy and minerals projects in the region are already affecting the cost and availability of housing. A co-ordinated strategy will be required to address cumulative impacts on housing affordability in the Western Downs.

Mitigations

The development of affordable housing initiatives started with consultation in November 2009 to identify potential partners and affordable housing opportunities. QGC's housing strategy will include a component designed to address the specific vulnerabilities faced by indigenous communities, pensioners and low income households in respect to housing security.

As discussed in *Chapter 6, Volume 8* of the draft EIS, the Project is developing a detailed housing strategy involving key stakeholders from the government and the industry. The QCLNG Integrated Housing Strategy will address the whole project footprint, and include:

- workers camps to house all non-local workers for construction and operation of the Project, to reduce housing demand
- the development of partnerships for housing stock construction, to provide dwellings for QCLNG Project workers and offset demands on local housing stock

³ Unpublished data provided by the Office for Economic and Statistical Research, Queensland Government, 1 December 2009.

⁴ www.wdrc.qld.gov.au/council/documents/Annual%20Report/PRINT%20VERSION%20Adopted%20WDRC%2008%2009%20Annual%20Report.pdf, accessed on 7 December, 2009.

- management of worker in-flow through advice on housing supply, and provision of quality camp accommodation
- development of partnerships for investment in affordable housing for very low income households
- to address cumulative impacts on housing in addition to its Integrated Project Housing Strategy, QGC will also participate in joint industry-Council initiatives.

Furthermore, QGC will provide a range of support options for workers to settle their families in Toowoomba, which has a good supply of housing and residential land planned for development. Workers would be housed in camps during the shift week, and could return to Toowoomba outside these times. This mitigation has been considered based on Toowoomba Regional Council's submission and further consultations with Council by QGC.

Consultation with councils, community and housing industry stakeholders on the QCLNG Housing Strategy will start in February 2010, for implementation in the second half of 2010.

4.3.5 Health, Safety and Social Infrastructure

4.3.5.1 Health

As forecast in the draft EIS, the Project will provide health care services to support on-site operations for workers and contractors, to minimise demand on local primary health services.

However, the increase in construction workers and in population will affect demand for local health and community services over time. In addition to QGC's provision of medical practitioners for the workforce, and social investments through the Community Development Fund, QGC has committed to working with Queensland Health, Regional Health Advisory Boards and health providers to plan co-operatively for service expansions as required.

Submitters noted that uncertainty regarding the location of major Gas Field facilities was causing anxiety that could affect health. The need for certainty is acknowledged, and has been addressed through:

- provision of the Gas Field and Pipeline Construction Plan from 2010 to 2014 (*Volume 3, Chapter 19*)
- consideration of social constraints for major facility locations, as discussed in *Section 4.4* of this supplementary EIS
- development of the rural residential Code of Conduct discussed in following sections, including consultation on the draft Code of Conduct (attached as *Appendix 8.3*).

Submissions also indicated a concern regarding the potential for coal seam water to enter the local water supply. This is examined in more detail in

Volume 3, Chapter 11. There was also concern about the noise impacts on people's lifestyle and health. These are examined in detail in *Section 4.3.6.1* below and in *Volume 3, Chapter 13* of the sEIS.

Mitigations

QGC has recently requested for tenders for the provision of primary health care services including general practitioners, practice nurses, allied health professionals and ambulance services. A protocol for medical evacuation arrangements with Queensland Health will be developed as part of occupational health and safety obligations.

QGC has launched a Rural Health Initiative. This has so far included consultations with social and health organisations, identification of priority action areas for rural health capacity building, and canvassing of partnerships and programs.

Although in early stages, the rural health initiative has identified a range of opportunities for partnerships to address local health issues. QGC's Rural Health Initiative will target deficits and inequities in access to health services within the region, engage the community in all steps of the initiative, and work to build capacity from the existing strengths in the region. Where possible existing partnerships will be utilised, and these may include the Western Downs Healthy Communities Network and the Toowoomba and Darling Downs Primary Care Partnership.

QGC will also provide social investments through the Community Development Fund to ensure that health and safety services benefit from the development of the QCLNG Project.

4.3.5.2 *Safety*

QGC is aware the community is concerned about personal safety as a result of the implementation of Gas Field infrastructure on private land. QGC has a 'safety first' policy in respect to all construction and operational matters, and this includes community safety. QGC will work with landholders and residents to ensure that QGC's activities and infrastructure do not cause risks to personal health and safety.

Submissions noted concerns in relation to unintended gas releases and methane migration. A quantitative risk assessment was undertaken for the unplanned release of gas from Gas Field Component infrastructure (refer *Volume 3, Chapter 17* of the draft EIS). A number of scenarios were considered, relating to the type of equipment and the size of the hole from which gas was released, and these were assessed as having negligible risk of fatality. Moderate injury risk criteria are highly unlikely to be exceeded at distances greater than 16 metres from the release point used in the model. Comprehensive emergency management plans, including establishment and maintenance of adequate safety zones for each infrastructure type, will ensure that the risk to human health is as low as reasonably practical (the risk

assessment results are based on Australian industry standards). This is further discussed in *Volume 3, Chapter 17* of the sEIS.

Other potential hazards were identified and assessed using a qualitative risk assessment process. For hazards assessed qualitatively, those with the greatest residual risk are related to transport incidents. Further control measures are proposed to minimise transport risks.

Traffic safety is a primary concern for QGC and the Project. QGC has initiated engagement with Western Downs Regional Council and the Department of Transport and Main Roads to develop a traffic impact mitigation strategy, including a focus on road network safety. Consultation on this began in November 2009, and will produce an agreed Traffic Infrastructure Mitigation Plan to enhance road network safety in the Western Downs region.

Submissions also reinforced the need for community education and support to community groups involved in emergency responses, and a detailed bushfire and emergency response plan. These plans will be provided to all emergency services located in or near the Gas Field to ensure there is quick, clear and timely communication and decision-making if a fire or an emergency event occurs. QGC will also co-operate with other key stakeholders to address community education and support needs regarding emergency responses.

As discussed in the draft EIS (*Volume 8, Chapter 4*) large increases in workers in rural areas can have a negative impact on the social culture of townships if they are not well managed and their participation in local community life enabled. As discussed in the draft EIS, QGC will expect a 'Workers Code of Conduct' to be incorporated in contractual discussions with all contractors. QGC is also providing camp accommodation located and managed to limit any behavioural impacts on local communities. Social investments to address community integration and community resilience to change are discussed in the following section.

4.3.5.3 *Changes to Impacts on Social Infrastructure*

Changes to the workforce and population impacts as detailed in *Sections 4.3.1* and *4.3.2*, indicate that by 2014 the population increase due to the QCLNG Project would be approximately 1,000 people. This would include approximately 360 families, with approximately 360 of new residents being dependent children and students.

The workforce during construction is likely to constitute around 98 per cent of non-local workers as against 95 per cent as estimated in the draft EIS. This indicates that the Project will have a slightly larger Fly-in/fly-out (FIFO) workforce than anticipated in the draft EIS.

The scope of impacts on social infrastructure remains the same as detailed in the draft EIS (*Volume 8, Section, 4.4.4*), and these are summarised below:

- pressure on health and medical services provided by general practitioners and community health centres and hospitals as discussed in *Section 4.3.5* of this chapter
- potential for an increase in demand for local emergency services, including Fire and Rescue, Ambulance and Police services
- an increased demand for local school enrolments
- increased demand on child care, family support and youth support services
- incremental increased demand on community and cultural facilities, such as libraries, parks, community centres and sporting grounds
- increased membership pool for community, cultural and sporting associations.

As indicated in the Toowoomba Regional Council's submission to the draft EIS, Toowoomba is a regional centre for social infrastructure provision, providing access to higher-order services (such as medical specialists, tertiary education, senior education, and crisis intervention and child safety services). It will therefore be important for QGC to maintain regular consultation with Toowoomba Regional Council and major service providers in Toowoomba, and consider the need for investment in regionally based services.

Mitigations

As outlined in the draft EIS (*Volume 8, Chapter 8*), QGC has committed to developing a Community Development Fund, to ensure community health and social services are improved, and community members benefit from the development of the QCLNG Project.

Based on submissions received, further mitigation strategies have been developed as part of the sEIS process, to ensure that impacts on social infrastructure are minimised as far as practicable. These include the Social Infrastructure Partnership initiative, which began in November 2009, to update the needs assessment and identify partners and potential projects for implementation from early 2010.

Consultation as part of the Social Infrastructure Partnership Initiative has identified the following priority action areas for exploration with partners in the Gas Field region:

- developing combined community centres' strategic and business plans, to plan for growth
- working with indigenous communities to increase the availability and accessibility of community services for indigenous people, particularly care options for young people and elders
- enhancement of community child care services, including for children with disability

- crisis housing and long-term community housing, with Western Downs and Toowoomba stakeholders
- community transport
- programs to integrate newcomers (including QCLNG Project families) in local communities
- introducing and supporting existing education initiatives, including youth and indigenous training and job readiness initiatives
- QGC's social investment includes developing initiatives in CSG vocational education in schools, and participation in cross-industry skills training targeted at the CSG industry.

The QGC Community Development Fund process has also been developed to include:

- consulting through local Community Reference Groups to identify local priorities throughout the course of the construction period
- developing partnerships and programs that support existing valued initiatives in keys areas identified by community members
- using this knowledge and existing services to implement targeted programs to address community needs.

In respect to integration of non-local workers in the local community, QGC will:

- provide support for local sporting clubs and facilities to integrate QCLNG Project workers in clubs and social sporting programs
- provide support for programs that strengthen young people's resilience to changing activity levels in towns and the increased number of non-local workers
- facilitate an employee participation project that involves QCLNG Project workers in community projects and activities.

QGC has also committed to consultation with Department of Communities and Queensland Health regarding Project schedules, impacts and co-operative solutions to increased needs for social infrastructure including schools, childcare and family support.

Co-operative efforts between Government and industry stakeholders will also be required to monitor and address cumulative impacts on social infrastructure, and QGC is willing to participate in this process.

4.3.6 **Changes to Impacts on Lifestyle and Amenity Values**

4.3.6.1 *Quiet Rural Character (Noise Impacts and Well Locations)*

Issues were raised in submissions regarding the impact of the Project on the quiet rural character of the Western Downs region, particularly relating to increased noise from Gas Field infrastructure.

Since the draft EIS, further noise modeling for the Gas Field and the impact of noise from infrastructure may have on residents and other noise-sensitive places has been conducted. This is detailed and discussed in *Volume 3, Chapter 13* of this sEIS.

It is expected that QGC will be able to meet the proposed noise limits. However, to ensure this character is protected, QGC has developed and is committed to implementing the following mitigations in addition to those described in *Volume 3, Chapter 13*.

Mitigations

QGC will ensure that the QCLNG Project meets the proposed noise limits. To assist in mitigating potential noise impacts from Gas Field infrastructure and road traffic in rural residential areas, QGC has committed to the following additional noise mitigations for rural residential areas, as outlined in the draft Code of Conduct for work near or on rural residential land (detailed technical noise mitigations are in *Volume 3, Chapter 13* and the Code of Conduct as *Appendix 8.3*):

- QGC will not locate wells on properties with an area less than 12 ha without the agreement of the property's owner.
- QGC will not carry out drilling operations, install above-ground infrastructure or construct access tracks within 200 m of an occupied dwelling, except with the consent of the dwelling occupiers.
- QGC will consult the occupiers of all dwellings within 400 m of proposed wells, access roads and other infrastructure to avoid or mitigate impacts.
- Construction work will not be undertaken between the hours of 6 pm and 6 am unless written agreement is received from each household within 200 m of the work. Drilling work may be required on a 24 hour schedule, and QGC will meet noise requirements in respect to sensitive receptors, or provide mitigation as agreed with affected property occupiers.
- Vehicle speeds on rural residential properties will not exceed 10 km/h within 200 m of dwellings, and will not exceed 40 km/h elsewhere on rural residential properties. Vehicle movements on rural residential properties will be avoided where possible between 6 pm and 6 am.
- QGC will incorporate a 24 hour complaints hotline to ensure that any noise impacts can be recorded, investigated and managed effectively.

4.3.6.2 *Community Cohesion*

QGC notes the need for investment in indigenous employment, to ensure Indigenous community members benefit from increased incomes, and the increased opportunity for community interaction that employment brings.

As discussed in the draft EIS (*Volume 8, Chapter 4, Sections 4.4.2.2, 4.4.4 and 4.4.6.3*) community cohesion may be affected due to the increased number of single male non-local or FIFO workers. Initiatives to address this are described in *Section 4.3.5.3*.

In addition to the camp and worker codes of conduct, and social performance requirements for camp management as described in the draft EIS, QGC has further considered locational issues as a result of the public consultation process, which indicated both negative and positive perceptions towards camps.

The majority of camps in the Gas Field will be located at the proposed Central Processing Plant (CPP) construction sites known as Ruby Jo, Jordan, Woleebee Creek and Bellevue. These locations are a minimum of 2.4 km from town boundaries.

Mitigations

Locating the proposed workers' camps on construction sites and provision of recreation facilities within camps will minimise daily interactions between non-local workers and the local community members. The camps will be controlled wet camps, meaning alcohol will be available at camps within limits, which will minimise the need to visit local hotels. Workers will be required to meet zero alcohol and drug levels to enter a work or drilling site.

The Project's consultative processes, social infrastructure investments and ongoing partnerships with community groups and other stakeholders will also assist to ensure workers are integrated and community capacity (e.g. sporting club capacity) to absorb workers is increased. Family support services will be an important inclusion from a cultural diversity and cohesion point of view.

QGC is also developing strategies that will ensure QGC workers can access housing in the Western Downs and Toowoomba regions, to settle their families and integrate with local communities.

4.4 SOCIAL CONSTRAINTS FOR GAS FIELD INFRASTRUCTURE LOCATIONS

One of the most significant changes since the draft EIS has been the development and finalisation of the social and environmental constraints that will be used to locate Gas Field infrastructure. 'Constraints mapping' is the technical term to describe factors that limit where infrastructure can be located, based on the impact a piece of infrastructure will have on the environment and people. The constraints used in the location of the Gas Field infrastructure are described in this section.

4.4.1 **Infrastructure Locations**

As stated in *Volume 2, Chapter 7* of sEIS the final location and design specification is not completed for the supplementary EIS, hence this assessment is carried out on the basis of proposed sites. *Volume 3, Chapter 19* of the sEIS proposes a gas field and pipeline construction plan from 2010 to 2014, the infrastructure description used in this section is passed on the proposed plan. Two existing QGC CPPs are located at Berwyndale South and Kenya. Four new CPPs are proposed for the QCLNG Project, to be distributed across the Gas Field tenements. The proposed CPP sites comprise two freehold properties owned by QGC and two locations to be negotiated. The locations of the four proposed sites are described in *Table 8.4.2*.

Table 8.4.2 Proposed CPP Sites

Tenement/ Block	Property Name	Address	Tenure and Ownership	Existing Land Use
Northern				
Woleebee Creek	Delga Park	Gadsby Road, Woleebee	Freehold (QGC)	Grazing
Central				
Bellevue	Property to be negotiated			
Southern				
Jordan	Property to be negotiated			
RubyJo	Kumbarilla Park	Daandine Kumbarilla Road, Kumbarilla	Freehold (QGC)	Grazing

As stated in *Volume 3, Chapter 19* of sEIS, approximately 20 Field compression stations (FCSs) will be developed in the first 5 years of the project.

Wells will be located approximately 750 m apart to optimise production. Construction of the well sites will require a firm and level area of approximately 1 ha (i.e. 100 m x 100 m) for the drilling rig (refer to *Volume 2, Chapter 7* of the draft EIS) and may include placement of site offices, stored pipes and other associated temporary infrastructure, a sufficient distance away from the drill rig.

Well drilling is undertaken over 24 hours, and takes approximately one week to complete. Within the well pad area is a gas well, a separator, one or two sumps for temporary containment of associated water, and a flare pit. Following establishment of wellhead infrastructure, the pad will be progressively rehabilitated and will eventually occupy an area of approximately 5,000m².

Up to 6,000 commercial production wells will be progressively established over the life of the Project. The exact location of these wells will not be known until exploration activities have been conducted in each tenement. The design life of a wellhead is 25 years, with the typical well production life 15 to 20 years. Surface production facilities will typically consist of a fenced site pad fitted out with the wellhead(s), wellhead hydraulic drive unit(s), miscellaneous pipework, valves and fittings, gas / water separator, flare stack and instrumentation.

A complex gas gathering system constructed out of high-density polyethylene (HDPE), fibreglass and steel pipe will be installed to connect:

- the completed wells to the FCSs (HDPE or fibreglass)
- the FCSs to the CPPs (steel trunk lines).

During extraction of the gas, the hydrostatic pressures within the coal seam are reduced, resulting in the release of water contained within the cavities of the coal. The water gathering system is constructed of HDPE pipe, and will be installed to transfer water from:

- wells to water treatment facilities and/or water balancing ponds
- FCSs and CPPs to water ponds
- between water treatment facilities and/or existing evaporation ponds.

Volume 2, Chapter 7 and 11 of the draft and sEIS outlines the general engineering requirements for each of these ponds. QGC understands that there will be many communities and industry groups that may be interested in using this water. QGC is working in partnership with these groups and the Queensland Government to determine the most appropriate use of this water, based on social, environmental and economic constraints of all parties.

Salt is a by-product of the treatment of this water. QGC will seek to dispose of salt to third parties through commercial arrangements, and is working in partnership with a leading Australian organisation with specialist technical expertise and economic interests in acquiring this by-product. Disposal of salt to purpose-built, engineered and secure landfills will be considered by QGC if other options are not available in time.

4.4.2 ***Social Constraints Methodology***

Social constraints considered by the Project in locating Gas Field infrastructure include:

- locations of noise sensitive receptors
- locations of towns and their immediate surrounds
- rural residential areas and land zoned for future residential purposes
- land used for economic activity
- locations of community facilities
- cultural heritage sites and places of community importance
- existing movement patterns, such as local and district roads, and relationship to social uses and townships.

The identified social constraints and corresponding levels of sensitivity were mapped, to identify areas within the study area that are suitable or not suitable for the siting of Gas Field infrastructure, and the level of likely mitigation required to minimise or avoid impacts on the social environment. Social constraints maps are being continually updated with the results of consultation and site-specific research as infrastructure locations are confirmed.

An analysis was undertaken of the Gas Field tenements to identify areas where:

- Gas Field facilities should be avoided, due to very high levels of social constraints
- Gas Field facilities may be developed, subject to the implementation of a moderate or high level of mitigation measures to minimise or avoid impacts of the facility on local residents and communities
- facilities may be developed, subject to the implementation of standard QGC mitigation measures to minimise or avoid impacts of the facility on local residents and communities.

This was based on the identification of potential social constraints relating to such things as community facilities, noise-sensitive receptors (houses), land use and zoning, including rural residential uses, cultural heritage sites and other social uses.

Overall, this analysis identified that:

- The northern tenements were generally subject to lower levels of social constraints in relation to the siting of upstream infrastructure due to the presence of larger grazing properties and lower numbers and density of noise-sensitive receptors.
- The siting of Gas Field infrastructure in the central tenements is

constrained by a larger number of noise-sensitive receptors concentrated around towns and rural localities such as Condamine and Brigalow and small rural residential subdivisions located south of Brigalow. The central tenements also include a number of major land uses, including power stations and aerodromes and non-indigenous cultural heritage sites, which also offer constraints to the siting of upstream infrastructure.

- The southern tenements are generally subject to the highest level of social constraint, particularly due to the location of sensitive receptors clustered around rural residential subdivisions north and east of Tara and adjacent to the Surat Developmental Road south-west of Dalby.

This has made a more detailed examination of the scope of impacts relating to Gas Field construction and operation possible, as discussed below.

4.4.3 Scope of Impacts of Gas Field Infrastructure

Four CPPs and approximately 20 FCSs will be required for the first phase of operations. The CPPs will be located at Woleebee Creek, Bellevue, Ruby and Jordan blocks. All CPP sites, except for Jordan, will have an FCS located within the same sites, with additional FCSs distributed as outlined in the Gas Field and Pipeline construction plan from 2010 to 2014 in *Volume 3, Chapter 19* of the sEIS.

Generally, impacts for residents and local communities associated with the construction and operation of FCSs and CPPs may include:

- amenity impacts due to noise and dust generated from construction activities and construction traffic
- impacts on road safety, including for school bus routes, due to increases in construction traffic on local and district roads
- impacts on visual amenity, including visual impacts from surrounding properties and roads
- impacts for residents associated with the acquisition of properties, including relocation and loss of social and support networks
- loss or further fragmentation of cropping and Good Quality Agricultural Land (GQAL), particularly in the central tenements. Impacts of this on the livelihood of the property owners or occupiers will be addressed in the land access and compensation agreements
- noise impacts from the operation of facilities for surrounding residents, particularly during evening and night-time, potentially resulting in sleep disturbance and subsequent impacts on health and wellbeing, and impacts on residential amenity, including use and enjoyment of outdoor areas.

Consultations undertaken for the Project, including key stakeholders such as local councils, local residents and industry groups, were also used to inform this assessment.

Volume 3, Chapter 19 of this supplementary EIS described the Gas Field and Pipeline construction plan from 2010 to 2014. It shows how these constraints, both social and environmental, are applied in determining where major infrastructure is to be located. The location of the facilities will be influenced based on the constraints discussed below, and as the locations are finalised, detailed social impact assessment will be undertaken.

The following section provides an overview of social constraint factors for the various land uses found in the Gas Field area. The scope of impacts and mitigations are discussed in detail for Northern, Central and Southern Tenement areas in *Section 4.4.5*.

Acquisition of properties may be required in order to locate infrastructure facilities to minimise impacts on social values and more densely settled areas. This will be undertaken in accordance with QGC land access and acquisition processes.

4.4.4 Social Constraints and Mitigations for Social Uses

4.4.4.1 Social Urban Centres and Towns

Urban centres and towns located across the gas fields include Wandoan, Miles, Chinchilla, Condamine, Kogan, Dalby and Tara. Smaller rural localities generally comprising a small residential community and, in some instances, limited community services located within or close to the Gas Field tenements include:

- Kowguran and Guluguba in the vicinity of the northern tenements
- Brigalow, Boonarga, Hopeland, Goombi and Boortkoi in the vicinity of the central tenements
- Ducklo, Kumbarilla, Weranga and Daandine in the vicinity of the southern tenements.

Location of major infrastructure facilities within or adjacent to towns and urban centres will be avoided. CPPs and FCSs will generally not be located within 2.4 km of town boundaries to avoid or minimise impacts on the character and amenity of the towns due to operation noise, the visual impact of facilities and safety for motorists.

However, consideration could be given to siting these facilities closer to some rural localities, provided they achieve requirements relating to noise-sensitive receptors and other constraints such as visual amenity.

4.4.4.2 Rural Residential Land Uses and Land Access

Minimising impacts on existing and future rural residential premises and businesses is important. Rural residential areas are generally located within the central and southern Gas Field tenements, and particularly within the

former Tara Shire local government area, north and north east of the Tara township.

Access to rural residential properties for location of facilities or infrastructure in the Gas Fields where required was a key issue identified in submissions received during the consultation process. Major facilities (CPPs, FCSs and water treatment) will not be constructed within 500 m of land zoned for rural residential uses, and will be sited to ensure that QGC can meet proposed noise criteria at sensitive receptors including community facilities.

Wells and pipelines will be located with consideration to the location of dwellings, domestic and agricultural water sources, and property improvements, minimise impacts on residents' amenity, privacy and enjoyment of their property.

Rural residential landholders were consulted regarding QGC's proposed Code of Conduct in rural residential areas, and the following agreements have been developed in consultation with Tara rural residents, to ensure their amenity and privacy is maintained:

- The QGC Land Access team will follow communication procedures as agreed with each individual landholder/occupier during land access negotiations.
- QGC will negotiate access rules for each property where land access is required, including access provisions specific to the property developed over time in consultation with the landholder.
- Construction work will not be undertaken between the hours of 6 pm and 6 am unless written agreement is received from each household within 200 m of the work.
- Construction activities and operating wells in rural residential areas will be fenced to ensure residents' and animals' safety.
- QGC will not locate wells on properties with an area less than 12 ha without the agreement of the landholder.
- QGC will not carry out drilling operations, install above-ground infrastructure or construct access tracks within 200 m of an occupied dwelling, except with the consent of the dwelling occupiers.
- QGC will consult the occupiers of all dwellings within 400 m of proposed wells, access roads and other infrastructure to avoid or mitigate impacts.
- QGC's site supervisor will ensure that wells and lines are placed in positions as indicated to the landholder, and consult the landholder and resident about significant changes to the program of works, before implementation.
- Vehicle speeds on rural residential properties will not exceed 10 km/h within 200 m of dwellings, and will not exceed 40 km/h elsewhere on rural residential properties. Vehicle movements on rural residential properties will be avoided where possible between 6 pm and 6 am.

- QGC will negotiate and finalise repairs, corrective actions and rehabilitation work with the minimum of delay, and will invite the landholder to inspect the work area when the program of works is finished so that any problems can be discussed.

QGC will implement a community feedback procedure. Stakeholders can provide feedback to a QGC employee, or to a toll free number. Complaints will be acknowledged, feedback provided within 24 hours and stakeholders advised regularly of progress in addressing their complaint.

Consultation with landholders potentially affected by Gas Field infrastructure and the collection header is ongoing. QGC has acquired some properties where needed to allow construction and operation without undue impact on landholders. QGC is progressively determining specific lots that would need to be fully or partially acquired for major facility locations. These will be managed through QGC's land acquisition process, including the provision of fair market value and consideration of expenses.

More detailed assessment of relocation, land use change or severance issues may be required before construction, and mitigation for impacts experienced will be developed in consultation with stakeholders including landholders and councils.

Other land use and land access-related issues and mitigations, including compensation issues, are also discussed in the draft EIS in *Volume 3, Chapter 5* and *Volume 8, Chapter 4*.

4.4.4.3 *Noise-Sensitive Receptors and Community Facilities*

Overall, the southern tenements have a higher number of sensitive receptors (dwellings and community facilities) due to the higher levels of urban development and rural residential development within this area. The gas fields contain a large number of community facilities, including those serving local and district communities. A description of existing community facilities in the Gas Field is provided in *Volume 8, Chapter 4* of the draft EIS, with detailed information provided in *Appendix 8.2*.

More detailed noise modelling for the Gas Field and the impact noise may have on residents and other noise-sensitive places has been conducted and is detailed in *Volume 3, Chapter 13* of the sEIS. It is expected that QGC will be able to meet proposed noise criteria.

Community facilities are considered as noise-sensitive receptors along with residential dwellings and other accommodation, schools, childcare and kindergartens, churches, community halls and health and medical facilities, including aged care. Most community facilities are located within townships, where gathering and processing infrastructure will be avoided. Facilities located on the outskirts of towns will also be considered as a constraint in locating Gas Field and Pipeline infrastructure.

Of particular relevance to the siting of Gas Field infrastructure are:

- Grosmont State School, located at Grosmont Road north-west of Wandoan, in the vicinity of the northern tenements.
- Brigalow State School, located on the Warrego Highway, approximately 1.5 km west of the Brigalow township.
- Columboola Environmental Education Centre, in the McNulty tenement located off the Warrego Highway at Columboola, approximately 18 km east of Miles (Boort-koi Road), which provides day visits, overnight camps and off-site visits to schools in the region.
- Gulugaba State School, located off the Leichardt Highway at Fosters Road, Gulugaba.
- Community facilities at Condamine, including a golf club, cemetery and school, situated in the Grace tenement.
- Lake Broadwater Conservation Park, located immediately east of the Harry tenement, which supports recreational activities including camping and picnicking.

CPPs and FCSs will be located at the required distance to meet the specified noise criteria for sensitive receptors, including community facilities such as education facilities, childcare, health and aged care facilities, formal recreational facilities, community halls and cemeteries. Mitigation at source (design and/or buffering of the facility) will ensure noise impacts of facility operations are minimised (for detailed technical mitigation strategies refer to *Volume 3, Chapter 13* of the draft and sEIS). Consultation and communication with occupiers of sensitive receptors about construction activities, likely impacts and mitigation measures will also be incorporated in construction planning.

Other mitigations which will be considered after further consultation and with advice from QGC's nominated noise expert as required include:

- implementation of noise mitigation works at the sensitive receptor (such as air-conditioning, glazing, insulation) to ensure evening and night-time noise goals are achieved
- purchase of noise-sensitive receptors located within 1 km of facilities
- implementation of community grievance policy to identify and respond to noise complaints.

The location of community facilities offers less constraint to the location of wells and pipelines, although it is desirable that wells and pipelines are also situated further than 500 m from education facilities, childcare, health and aged care facilities and formal recreational facilities.

4.4.4.4 *Cultural Heritage Sites*

The Gas Field study area includes a number of cultural heritage sites, including indigenous and non-indigenous sites that constrain the location of facilities, wells and pipelines.

Information on the location of indigenous cultural heritage sites has been obtained through consultation, research of local, state and National Heritage Registers and DERM's Aboriginal Cultural Heritage Coordination Unit (ACHCU) database. The known sites are mapped in *Chapter 7* of this Volume.

Non-indigenous cultural heritage sites situated within or close to the Gas Field tenements are described in *Volume 8, Chapter 9* of the draft EIS, and *Volume 8, Chapter 7* describes the methodology of further assessment of non-indigenous cultural heritage sites, which will be carried out during site inspection before the start of construction. In addition, there are a number of potential heritage sites within the Gas Field area that have the potential to be affected by infrastructure. These are listed in *Volume 8, Chapter 9, Table 8.9.19* of the draft EIS.

QGC will avoid locating facilities, wells and pipelines within a reasonable distance of cultural heritage sites. Consultation with the relevant authority or community group will be conducted with respect to the potential need for mitigation for facilities located up to 500 m from heritage sites. Where this is not possible the impacts on heritage will be mitigated as outlined in *Volume 8, Chapter 9* of the draft EIS and *Volume 8, Chapter 7, Section 7.4* of the sEIS.

Provisions for protection of indigenous cultural heritage sites, such as survey and monitoring procedures and buffer distances for indigenous heritage sites, are being determined in consultation with local indigenous groups, and have been identified in the Cultural Heritage Management Plans (CHMPs).

4.4.4.5 *Agricultural Land*

The Gas Field include areas of land classified as Good Quality Agricultural Land (GQAL) in accordance with the *State Planning Policy 1/92*.

GQAL is "land which is capable of sustainable use for agriculture, with a reasonable level of inputs, and without causing degradation of land or other natural resources" (DPI and DHLGP, 1993). Four classes of agricultural land have been identified for Queensland, ranging from Class A (land suitable for current and potential crops with limitations to production which range from none to moderate levels) to Class D (land not suitable for agriculture due to extreme limitations).

Areas of land used for cropping are generally located within the central tenements, although pockets of existing cropping land also occur within Broadwater and Isabella in the south and tenements in the north. These areas provide a high level of constraint for the siting of Gas Field infrastructure, including facilities and wells and pipelines.

Areas of land classified as GQAL (Classes A and B) provide a medium level of constraint for the siting of infrastructure. These areas comprise a large portion of land in the northern tenements.

The siting of infrastructure on land constrained by existing cropping or GQAL (Classes A and B) will attempt to minimise potential impacts on this land, including further fragmentation of this land and disruption to farming operations (such as Geographic Information Systems (GIS) siting of furrows and drainage patterns). This may include the siting of facilities adjacent to fence lines or property boundaries or on land on the site considered to be of lower agricultural quality.

For more details on land use and land access-related issues and mitigations, refer to the *Volume 3, Chapter 5* of the draft EIS.

4.4.4.6 Major Land Uses

The Project area includes a number of existing major land uses that provide constraints on the location of various Gas Field infrastructure. These include:

- Aerodromes/ airstrips, including the:
 - Wandoan landing ground and Lucky Downs air strip, within or near to the northern tenements.
 - Dalby-Wambo Aerodrome, at Aerodrome Road north of Dalby (adjacent to the Dalby-Jandowae Road).
 - Two landing grounds at Miles, adjacent to the Leichhardt Highway south of Miles, approximately halfway between Miles and Condamine.
 - Chinchilla Aerodrome, south of Chinchilla on the Chinchilla-Tara Road.
 - Tara Aerodrome, north of Tara on the Chinchilla Tara Road.
- Power stations, including:
 - Condamine Power Station, 8 km east of Miles on the southern side of the Warrego Highway.
 - Kogan Creek Power Station, at Banana Bridge Road and Healy's Crossing Road, south of Brigalow.
 - Braemar Power Station, adjacent to Grahams Road and with access from the Kogan Condamine Road.
 - proposed QGC power station at Kumbarilla Park.
- Mining lease areas.

Consultation with the managers of major uses regarding access and co-location of facilities is in progress.

4.4.4.7 Access and Connectivity

The study area comprises national/state, district and local roads.

The Warrego Highway (National Highway A2) is part of the national highway system linking Brisbane and Darwin. The highway extends approximately 750 km from Ipswich in South-East Queensland to Charleville in the Queensland outback via Toowoomba, Dalby, Chinchilla and Roma. In addition to being an important part of Southern Queensland's freight transport network, the highway is an important tourist route, and provides access to numerous tourist destinations and attractions.

The Leichhardt Highway (National Highway A5) is part of the strategic road network. It links the Central Queensland coastal centres of Rockhampton and Yeppoon to the Western Queensland towns of Taroom, Miles and Goondiwindi, and then on to Melbourne via the Newell Highway. The highway is a major transport route and important tourist route, providing access to a wide range of tourist attractions.

The Moonie Highway is part of the regional road network, and forms part of the Adventure Way tourist route, linking Brisbane to Adelaide via Dalby, St George, Cunnamulla and outback NSW.

At district level, important roads include:

- Jackson-Wandoan Road, linking Wandoan to the Warrego Highway at Jackson.
- Dalby-Kogan Road / Kogan-Condamine Road/ Condamine-Roma Road;
- Chinchilla-Tara Road.
- Condamine-Meandarra Road.
- Kogan-Tara Road.
- Surat Developmental Road, connecting via Dalby and Tara.

A number of local roads located across the study area provide access for residents. The roads are generally either unsealed or comprise a single sealed lane. The condition of the local roads varies across the study area, with some comprising little more than a single-lane track.

A number of regional, state and local roads within the Gas Field study area also provide access for school buses.

The location of facilities will consider the potential impacts on local, state and national roads.

A comprehensive assessment of potential impacts of logistics and transport routes has been conducted (refer to *Volume 3, Chapter 14* of the draft and sEIS), and specific mitigation strategies were being developed in consultation with Western Downs Regional Council and other stakeholders.

4.4.5 Area-based Social Constraints, Impacts and Mitigations

4.4.5.1 Northern Tenements

There are approximately seven FCSs and one CPP proposed for the northern tenements as part of the first phase of operation. The CPP will be within the block of Woleebee Creek co-located with a FCS. The seven FCSs are expected to be located within the blocks of Polaris, Cam, Ross, Woleebee Creek, Mamdal, Paradise Downs and Carla.

Land use Impacts

Development within the northern tenements generally comprises large cattle grazing properties, with the density of dwellings relatively sparse compared with the central and southern tenements.

A CPP facility at Woleebee Creek is proposed on land owned by QGC at Delga Park. Delga Park covers an area of approximately 1,870 ha and comprises three separate parcels. The CPP is proposed to be co-located with the Woleebee Creek FCS, within the smallest of the three land parcels. The property is used for cattle grazing by the previous owner under lease from QGC.

Delga Park, and properties within the surrounding area, generally comprise areas of good quality agricultural land (GQAL), Classes A and B. Class A comprises land suitable for current or potential crops, with limitations to production that range from none to moderate levels, while Class B comprises land that is marginal for current or potential crops due to severe limitations, and suitable for pastures. The property is used for cattle grazing, and consultation for this assessment indicated that the property is generally considered marginal in relation to cropping.

Criteria for the selection of FCS locations will meet the objective of minimising impact on available GQAL.

Mitigation

In addition to mitigations mentioned in the constraints section, where possible the Project will also reduce the construction and design footprint of the facilities to minimise loss and fragmentation of GQAL and cropping land.

Facilities on the property will be sited within areas of lesser quality land or adjacent to roads to minimise further fragmentation of GQAL.

Facilities will be located to meet proposed noise limits at dwellings. Where this does not provide a satisfactory outcome for residents, additional mitigations either at source or at the receptor will be considered. This is discussed in more detail in *Volume 3, Chapter 13* of the draft and sEIS.

Noise and Dust Impacts

Impacts on the amenity of residents in the northern tenements are likely to be low given the relatively sparse level of residential development in this area and distance from the proposed CPP and FCS sites to houses or other noise-sensitive receptors. However, there is potential for some impacts on residential amenity where dwellings on adjoining properties are located close to other construction works associated with the FCSs (such as construction of access roads).

During construction, impacts on amenity may occur for residences nearest to the proposed facilities, due to construction noise, dust and traffic. However, given the distance of construction works from surrounding houses, it is not expected that residential amenity will be significantly affected by construction noise and dust. This will be monitored by the Project, and corrective action taken if required, as discussed in *Volume 9* of the draft EIS.

During construction, impacts on residential amenity may occur for residents close to haulage routes and access roads as a result of increased traffic noise or dust generated by construction vehicles and heavy vehicles on unsealed roads. There are sensitive receptors on surrounding properties within about 5 km of proposed FCS sites in the northern tenements. Other mitigation measures may be required for FCSs and the CPP.

Mitigation

In addition to relevant mitigations mentioned in the constraints section above, the Project will also give consideration to topography in the siting of the CPP on the property and maximising the distance of the facilities to sensitive receptors, and incorporating noise attenuation measures into the design of the CPP and FCS will result in QGC complying with operational noise limits at sensitive receptors.

Traffic Safety Impacts

The Jackson-Wandoan Road provides an important link for landholders, primary producers and industry between the Leichhardt and Warrego highways. The road provides direct property access for a number of rural properties, as well as indirect access through connections to local roads. The road is sealed and extends for approximately 80 km. It is generally undulating with some creek crossings and sections of steep road. The Jackson-Wandoan Road also provides access for school buses. An increase in construction traffic on the Jackson-Wandoan Road, including heavy vehicles, may affect the safety for local residents and other road users, including for school buses.

An increase in construction vehicles, including trucks, using Gadsby Road or adjacent roads may affect amenity for local residents through increased traffic noise and dust and changes to local access and road safety as a result of increased heavy vehicle use. However, upgrading of access roads will provide

improved amenity for surrounding residents through improvements in local access and road safety.

There are no community facilities in the vicinity of proposed FCS sites in the northern tenements. However, a number of community facilities are located within the Wandoan township, and a school is located at Fosters Road, Guluguba. Use of this road for construction vehicles, including trucks, may affect the safety of students using Fosters Road and the amenity of the school due to increased traffic noise.

Mitigation

A Traffic Management Plan will be established, in consultation with communities, council and other industries with facilities in the area. QGC is consulting with the Western Downs Regional Council, Toowoomba Regional Council and DTMR to develop a Traffic Mitigation Implementation Plan.

Traffic management measures will be put in place to ensure safety for other road users and local communities, including school students. This may include avoiding or limiting the haulage of construction materials and equipment during school bus hours. Haulage route selections will include limiting movement of heavy equipment during school bus hours. Traffic management related impacts and mitigations are also considered in *Volume 3, Chapter 14* in the draft EIS and this sEIS.

Heritage Impacts

There are no non-indigenous heritage places in the vicinity of proposed FCS sites in this location, although a number of sites are located at Gurulmundi.

Visual Impacts

The CPP may be visible from Gadsby Road and from some properties surrounding Delga Park. However, the topography of the property will assist in reducing visual impacts from adjoining properties.

FCS sites will, where practicable, be situated away from local roads and highways, and are unlikely to affect the visual amenity from these roads. However, the facilities may affect visual amenity from surrounding houses and properties, if these are located close to property boundaries.

Mitigation

Where possible, the retention of existing vegetation as a landscape buffer will be maintained to reduce the visual impact of facilities from surrounding properties. The planting of a landscape buffer in those areas where existing vegetation has been cleared or is not present, may also be considered to reduce the visual impacts of the facilities for surrounding residents. Maximising the distance between the facilities and surrounding houses, will also assist in reducing the visual impacts of the facility. Also refer to *Volume 3*,

Chapter 15 of the draft and supplementary EISs for detailed mitigations to visual impacts.

4.4.5.2 Central Tenements

There are two additional FCSs and one CPP proposed for the central tenements as part of the first phase of operation. The CPP will be located at Bellevue block and additional FCSs located at Bellevue (co-located with the CPP), Berwyndale, Berwyndale South (existing) and Kenya (existing) blocks.

Land Use Impacts

Development within the central tenements generally comprises rural properties, used for cattle grazing or cropping, and a number of rural residential developments, particularly in the vicinity of Kenya East, north of the Tara township. The central tenement generally has a higher density of development compared with the northern tenements, with approximately 120 sensitive receptors located within approximately 5 km of the proposed FCS locations.

One property intended for facility construction, Kenya East, is owned by QGC. This property was previously used for cattle grazing, but is currently vacant. The other properties in this tenement are used for cattle grazing, cropping and rural residential.

Noise and Dust Impacts

Potential impacts on amenity may occur as a result of noise and dust generated by construction of associated FCS infrastructure (such as access roads), where these works are located close to houses.

Impacts on amenity may also occur for residents located close to haulage routes and access roads due to increased traffic noise and dust generated by construction vehicles. This is particularly relevant for those roads that provide access to a number of sites, such as Weitzels Road, which is likely to provide construction access for both the Kenya East and Jammatt FCS sites. An increase in construction traffic accessing local roads may affect amenity at residences located close to these roads, due to increases in traffic noise. At some locations, dwellings are situated approximately 150 m from the roadway. An increase in construction vehicles using these roads may also affect safety for other road users.

In the longer term, noise from the operation of the FCSs and the CPP, will be mitigated to minimise impacts on amenity for residents nearest to the facility.

Community facilities in the vicinity of the proposed FCS and CPP sites in the central tenements include the Columboola Environmental Education Centre north of the Warrego Highway at Columboola and a number of facilities in Miles and Condamine. It is not expected that construction or operation of the FCS sites will affect these facilities.

Mitigation

Maximising the distance of the facility to sensitive receptors and incorporating noise attenuation measures into the design of the FCS and the CPP will help to reduce operational noise impacts for near neighbours. (Also refer to *Volume 3, Chapter 13* of the draft and sEIS for detailed mitigations to noise impacts).

Traffic Safety Impacts

The area has experienced a number of traffic accidents in recent years, and a number of community concerns exist in relation to the safety of the road. Community concerns may arise about impacts on the safety of road users due to increases in construction vehicles using the Warrego Highway and construction traffic accessing the highway at Brownlies Road. The Kogan-Condamine Road/Dalby-Kogan Road would also be used by construction traffic. This road provides important east-west access for local and regional communities between Dalby and Roma. The road also provides direct access to a number of rural properties, and indirect access through connection to local roads.

Traffic management planning will need a focus on increased traffic and heavy vehicle movement on the local roads which may affect the safety of local residents and other road users, including school buses.

Mitigation

Traffic management measures will be implemented to ensure the safety of road users and local communities, including school students. This may include avoiding or limiting the haulage of construction materials and equipment during school bus hours. Traffic management-related impacts and mitigations are detailed in *Volume 3, Chapter 14* of the draft and sEIS.

Heritage Impacts

Known heritage places are located within the central tenements, including at Kogan-Chinchilla Road, Kogan-Condamine Road and Weitzels and Montrose roads.

Two heritage sites are located in the vicinity of the proposed Berwyndale FCS site. These include two Leichhardt 1844 expedition L Trees – October 1844 at Tieryboob and Nangram stations. A number of known heritage places are located on Weitzels and Montrose roads, including a house at Lot 12 Montrose Road and woolshed and yards, Boondoola Homestead and Old Topwater Homestead at Weitzels Road.

Mitigation

Impacts on heritage will be minimised and mitigated as outlined in *Volume 8, Chapter 9* of the draft EIS and *Volume 8, Chapter 7* of the sEIS.

Visual Impacts

The FCSs may affect visual amenity from adjoining properties and roadways, given that the topography of the central tenements is relatively flat, and large areas of land have previously been cleared for farming.

Mitigation

Where possible, existing vegetation will be retained to provide a landscape buffer between the facility and adjoining properties or roadways to reduce the visual impact of the facilities. Where there is no existing vegetation, landscape screening will be undertaken to minimise the visual impact of the facilities from surrounding properties and roadways. Also refer to *Volume 3, Chapter 15* of the draft and sEIS for detailed mitigations to visual impacts.

4.4.5.3 Southern Tenements

There are two CPPs and approximately 11 FCSs proposed for the southern tenements as part of the first phase of operation. The CPPs will be located at Jordan and RubyJo blocks, and the FCSs are expected to be located at RubyJo, Sean, David, Celeste, Poppy, Isabella, Will, Clunie, Kenya East, Jammatt and Harry blocks.

Land use Impacts

Land use within the southern tenements generally comprises rural uses, including cattle grazing or cropping uses, rural residential uses situated east and north-east of Tara. As such, population density within the southern tenements is relatively high, compared with other rural areas across the Western Downs LGA. The southern tenements also include large areas of state forest, including the Braemar State Forest, Kumbarilla State Forest, Dalby State Forest, Vickery State Forest, Weranga State Forest and Daandine State Forest, as well as conservation areas and mining and industry uses.

The CPP facility at Ruby is proposed to be located on land owned by QGC at Kumbarilla Park. Kumbarilla Park covers an area of approximately 430 ha. The site was previously used for grazing before being purchased by QGC, and a house is situated on the southern portion of the property. Both the house and property are vacant.

Locations for FCSs in the southern tenements include QGC-owned properties, state forest, leasehold land and some privately owned freehold properties.

Noise and Dust Impacts

The southern tenements have a higher residential density. While construction of the FCSs is unlikely to have a direct impact on the amenity of adjacent properties, potential impacts may occur at some properties as a result of noise and dust generated by construction activities and other FCS infrastructure (such as access roads).

Impacts on amenity may also occur for residents located close to haulage routes and access roads due to increased traffic noise and dust generated by construction vehicles. This is particularly relevant for Kerrs Road and Kumbarilla Lane. In the longer term, noise from the operation of the FCSs and CPPs may affect amenity for residents nearest to the facility, particularly during the evening and night-time, when existing background noise levels are relatively low.

Mitigation

Maximising the distance of the facility to sensitive receptors and noise attenuation measures will be included in the design of the FCSs and CPPs to manage operational noise impacts for sensitive receptors. Also refer to *Volume 3, Chapter 13* of the draft and supplementary EISs for detailed mitigations of noise impacts.

Traffic Safety Impacts

The Kogan-Tara Road provides access for local residents and communities between Kogan and Tara. The Surat Developmental Road extends for approximately 190 km between the Moonie Highway at Kumbarilla to the Carnarvon Highway at Surat. The road connects eastwards to Dalby via the Moonie Highway. The Kogan-Condamine Road/Dalby-Kogan Road provide important east-west access for local and regional communities between Dalby and Roma. Each of these roads also provides direct access to a number of rural properties, and indirect access through connection to local roads.

An increase in construction traffic using the Kogan-Condamine Road/ Dalby-Kogan Road, Surat Developmental Road and Kogan-Tara Road, including heavy vehicles, may affect safety for local residents and other road users, including for school buses.

Mitigation

The traffic management measures will be put in place to ensure safety for other road users and local communities, including school students. This may include avoiding or limiting the haulage of construction materials and equipment during school bus hours. Traffic management-related impacts and mitigations are also considered in *Volume 3, Chapter 14* in the draft and supplementary EISs.

Visual Impacts

The FCSs and the CPPs may affect visual amenity from adjoining properties and roadways, given that the topography of the southern tenements is relatively flat and large areas of land have previously been cleared for farming.

Mitigation

Where possible, existing vegetation will be retained and a landscape buffer will be provided between the facility and adjoining properties or roadways to reduce the visual impact of facilities. Where existing vegetation does not exist, landscape screening may be undertaken to minimise the visual impact of the facilities from surrounding properties.

Generally vegetation within the road reserves and the distance from the road to the CPP facility (greater than 1 km) will assist in reducing the visual impacts of the facility from the road (assessed as “low impact” in *Volume 3, Chapter 15*), provision of a landscape buffer between the facility and the road will be considered to assist in reducing the visual impacts of the facility. (Also refer to *Volume 3, Chapter 15* of the draft and sEIS for detailed mitigations to visual impacts).

Heritage Impacts

A number of known heritage places are located in the southern tenements that may be affected by the location of facilities. These include heritage places located at the Kogan-Condamine Road, Montrose and Weitzels roads, Steinerhts Road, Weranga North Road and within the Braemar State Forest.

Mitigation

Strategies to avoid or minimise impacts on heritage are detailed in *Volume 8, Chapter 9* of the draft EIS and *Chapter 7* of this sEIS. In terms of indigenous heritage, consultations with Traditional Owner groups and relevant heritage authorities about distance to receptors and potential impacts will be required. This is further detailed in *Chapter 7* of this volume.

4.4.5.4 *Summary of Mitigations*

A number of mitigation measures are identified to manage or avoid impacts of the construction and operation of facilities on residents and local communities. These include:

- consideration of the purchase of noise-sensitive receptors within 1 km of facilities or implementation of noise mitigation works at the sensitive receptor (such as air-conditioning, glazing, insulation) to ensure evening and night-time noise goals are achieved
- inclusion of noise mitigation measures into the design of the facility, including establishment of acoustic enclosures or consideration of noise emissions in purchasing compressors
- minimise the amount of vegetation clearing in the vicinity of facilities, and where necessary, establish appropriate screening and landscape buffers, to minimise impacts on visual amenity
- reduce the construction and design footprint of facilities in areas identified as cropping land or GQAL, and ensure facilities are located to minimise or

avoid further loss or fragmentation of GQAL (such as on areas of property with lower quality agricultural land, adjacent to existing access tracks or property boundaries, etc)

- implement traffic management measures, including communication and education and awareness about changes to local access and road safety and potential impacts for school bus routes.

In addition, a communication and consultation program will be established for the Project to provide information about the Project, construction activities, including time and duration, and likely impacts and mitigation measures. This will also include a community complaints process outlining procedures for receiving and responding to community concerns.

4.5 SUMMARY OF CHANGED IMPACTS

This section summarises the key social impacts and changes to mitigations as a result of submissions, developments in workforce forecasts, and field development planning.

4.5.1 Changes in Impacts

In summary, changes to positive impacts include:

- an increased peak workforce for Gas Field construction of more than 5,000 people, with enhanced employment and skills development opportunities for local and regional residents
- an increase in permanent residents, and increased stimulation of indirect employment
- steady long-term employment and growth opportunities for the region
- increased business development (economic stimulation) opportunities through the Local Content Strategy and Local Procurement Policy of the Project and indirect business development
- increased targeting of rural health and social infrastructure initiatives.

Changes in negative impacts include:

- increased demand on housing, and a potential for stress on local and affordable housing access
- increased attention required for community cohesion and social infrastructure due to increase in local population
- increased attention required to community safety and amenity related to increased single male non-local workforce.

The scope of impacts related to the location of CPPs and FCSs that will need to be managed through the location and construction management of facilities, includes:

- potential for amenity impacts due to noise and dust generated from construction activities and construction traffic
- impacts on road use, including for school bus routes, due to increases in construction traffic on local and district roads
- impacts on visual amenity, including visual impacts from surrounding properties and roads
- a small loss of cropping and grazing land
- potential for noise impacts from the operation of facilities for surrounding residents, particularly during evening and night-time.

4.5.2 Mitigation Refinements

Changed mitigations developed on the basis of the EIS submissions, EIS consultations and assessments in the supplementary EIS are summarised as follows, and detailed in the draft Social Impact Management Plan (see *Appendix 8.4*).

- A labour availability study will be conducted to address both construction and operational workforce requirements in more detail to support the development of pathways to operational employment, including training and career development programs.
- QGC has initiated engagement with Western Downs Regional Council, Toowoomba Regional Council and DTMR to develop a detailed traffic mitigation implementation plan.
- Changes to housing mitigations include:
 - preferred locations of workers camps in the Gas Field area at the four CPP sites
 - commitment to develop an Integrated Project Housing Strategy, including investment in affordable housing and partnerships for housing stock creation, with stakeholder engagement to identify appropriate investment areas
 - support for workers' families to settle in Western Downs and in Toowoomba, with Toowoomba-based workers given the option of staying in camps during the shift week.
- Impacts on the rural residential areas caused by the generation of construction and operation noise from project infrastructure will be mitigated with the implementation of a rural Code of Conduct developed in consultation with the rural residential communities in addition to other noise impact management measures that will be put in place (see *Appendix 8.3*).
- Community issues such as cohesion, security and cultural diversity, related to the nature of workforce (FIFO, single male and increase in permanent residents) will be minimised with the strategic location of workers camps at the CPP construction sites and appropriate camp management and workers behavior management strategies.

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- Health impacts will be managed with the provision of project health services, and development of a rural health strategy that is identifying key stakeholders and areas of investment, and will develop implementation partnership and programs.
 - Impacts on the social infrastructure will be managed with the development of a social infrastructure strategy that is identifying key stakeholders and areas of investment and will develop implementation partnerships to improve, extend or establish programs with emphasis in the areas of:
 - community facility and networks – community, cultural and recreation
 - family support and mental health programs
 - education initiatives, youth training and job readiness initiatives
 - supporting positive behaviour initiatives associated with the high incidence of single males, such as personal safety and resilience programs for young women
 - skills and training support or upgrade of local fire fighting services.

Impact mitigation and management strategies will be detailed and programmed in the Social Impact Management Plan (SIMP). The SIMP will be based on the impacts and mitigations developed in the EIS and subsequent consultation with key stakeholders, and will provide a framework and detailed strategies for managing social impacts (as detailed *Appendix 8.4*).

The SIMP will include objectives, performance criteria, detailed mitigation and management activities and accountabilities, community engagement and monitoring and auditing protocols. QGC will consult with key stakeholders on the draft SIMP from February to April 2010, with the SIMP finalised prior to approval of the EIS.

In conclusion, QGC has addressed the concerns of stakeholders who made submissions regarding the draft EIS. This Volume has endeavoured to provide more certainty around the Gas Field development, and provide an overview of the key strategies, management plans and planning constraints that will be used to minimise social impacts and maximise project benefits for communities within the Gas Field project area.