Australia Pacific LNG submission to the Senate Rural Affairs and Transport Committee: Inquiry into the management of the Murray-Darling Basin – impact on mining of coal seam gas

Submitted 6 September 2011

Executive Summary

Australia's natural gas industry is in a very strong position to:

- Assist in the transition of Australia to a lower carbon economy through greater use of gas for electricity generation purposes,
- Support expanded investment in intermittent renewable projects such as wind farms,
- Provide energy security, especially to East Coast Australia, and thus help meet rising energy demands from increased population and economic growth,
- Create a significant number of new employment opportunities - especially in regional areas,
- Contribute significantly to Australia's overall prosperity through increased LNG exports, and
- Play a major role in helping to reduce global emissions as increased LNG exports replace coal for electricity generating purposes in countries such as China.

Australia's well established Coal Seam Gas (CSG) industry and the associated development of a major new LNG export industry in Queensland will play a crucial role in delivering on these opportunities.

The CSG industry has been operating in Queensland for more than two decades and now provides around 90% of the State's gas supplies and fuels about 15% of the State's electricity generation. It is therefore already contributing to the daily lives of many people in Queensland and demonstrating that the CSG industry is integral to meeting East Coast Australia's future energy demand.

The Australia Pacific LNG Project is currently producing over 300Tj/d of CSG for the Australian East Coast domestic gas market, including Origin's 630MW power station at Darling Downs (approximately 40 km from Dalby). The Darling Downs Power Station, which commenced operations in 2010, is the largest gas fired combined cycle base load power station in Australia. At full load it supplies around 10% of Queensland's power, the equivalent of 400,000 Queensland homes.

Origin is the Upstream operator for the Australia Pacific LNG Project. It is well placed to deliver on the gas field development, bringing more than 30 years of gas production experience in Queensland to the operation. It has the longest track record of any major CSG company in Australia, having drilled its first CSG exploration well in Queensland in 1993. The Downstream operator for the Australia Pacific LNG Project, ConocoPhillips, is also the world's largest CSG operator, with 25 years of CSG production experience. The two companies therefore bring considerable expertise to the Australia Pacific LNG Project and the Queensland gas fields.

As Queensland's CSG industry has expanded over this period, the Queensland Government has also progressively expanded the regulatory regime applying to the industry. Queensland now has a well established suite of legislation, regulation, and reporting requirements that apply to the CSG industry. The main legislation that covers the industry includes:

- The Petroleum and Gas (Production and Safety) Act 2004, Petroleum Act 1923, Environmental Protection Act 1994, Water Act 2000, Water and Supply (Safety and

reliability) Act 2008, the Nature Conservation Act 1992, the Sustainable Planning Act 2009 and the State Development Public Works Organisation Act (1971).

The Queensland Water Act 2000 was recently amended to introduce a new regulatory framework to manage the cumulative impacts on water supply bores and springs from the extraction of the CSG industry. It also establishes the independent role of the Queensland Water Commission to oversee the management of the cumulative impacts of CSG operations on underground water.

At the Commonwealth level, the EPBC Act (1999) and the Commonwealth Water Act 2007 may also apply depending on the scope and area of operations of a particular project.

Each of these regulatory regimes require a rigorous, public assessment process for major projects against comprehensive terms of reference or other statutory requirements, which are underpinned by the principles of ecologically sustainable development. These assessment processes are open and transparent.

Project proposals are only allowed to proceed if appropriate environmental, social and economic outcomes are assessed as likely to be achieved. In the case of the Australia Pacific LNG Project (and the other major CSG to LNG Projects), the Queensland Coordinator-General and the Commonwealth Environment Minister have judged this to be the case, but have applied additional, strict environmental approval conditions to provide additional assurance.

The scope and scale of these conditions are unprecedented for any project proposal in Queensland to date.

For example, the Coordinator-General has, in addition to existing legislative requirements, imposed a set of conditions that have not been used to previously regulate project impacts in Queensland. The Coordinator-General's report on the Australia Pacific LNG Project EIS includes the following imposed conditions:

- 58 imposed conditions mainly related to environmental and water issues,
- 16 imposed conditions related to traffic and transport issues, and
- 5 imposed conditions (including many sub-components) related to social and economic impacts.

Conditions imposed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* for each of the three components of the Australia Pacific LNG Project (gas fields, pipeline and LNG facility) total 261.

As an example of the strict Commonwealth environmental approval conditions, Condition 50 applying to the Australia Pacific LNG Project (EPBC 2009/4974) requires the development of a Stage 1 CSG Water Monitoring and Management Plan. This Plan requires Australia Pacific LNG to address, amongst other things, groundwater monitoring and management.

The groundwater components of this Plan require:

- Groundwater drawdown limits for each potentially impacted aquifer,
- A program and schedule for aquifer connectivity studies and monitoring of relevant aquifers to determine hydraulic connectivity,
- A program and schedule for field piloting of aquifer reinjection of treated CSG water and other groundwater repressurisation techniques, and
- Early warning indicators where drawdown thresholds are being approached.

These extensive and rigorous CSG groundwater modelling, monitoring and reporting requirements will ensure that potential risks to aquifers in the areas Australia Pacific LNG operates in will be quickly identified at a very early stage, allowing sufficient time to respond with appropriate mitigation activities.

Despite the operation of this very rigorous regulatory regime and the significant employment benefits the CSG/LNG industry will deliver to Queensland regional areas and the Queensland and national economies, we have seen growing community concerns about certain aspects of the operation of the CSG industry – including whether the industry's expansion will have the effect of significantly reducing food production by "competing" for prime agricultural land or a negative impact on water supplies for farmers and local communities.

Regrettably many of these concerns have been fuelled by claims that either misrepresent the CSG industry's operating procedures, fail to recognise the strict regulatory regime the Queensland Government has progressively applied to the CSG industry or fail to acknowledge the genuine desire of CSG/LNG operators such as Australia Pacific LNG to consult with landowners and the communities it operates in, and to be open and transparent about our operations.

Australia Pacific LNG is demonstrating every day through its current activities that the CSG industry and Queensland farmers can genuinely co-exist.

For example, Australia Pacific LNG has undertaken considerable work to ensure that landowners are supportive of our activities before they commence. All current activities are performed with the agreement of the owner, based on an informed, transparent relationship built over time. Australia Pacific LNG currently has over 600 'active' compensation agreements. These agreements cover all CSG activities, from exploration to appraisal to development.

Australia Pacific LNG is committed to providing detailed information on its operations to landowners, the communities we operate in and the wider community.

For example, we have been running regular technical sessions for our key stakeholders on the LNG process, groundwater impact issues, drilling and well integrity and fracture stimulation. Fact sheets on these issues including the chemicals used in fracture stimulation are available on our website.

Australia Pacific LNG is working to establish the optimal use of CSG produced water and to sustainably address the issue of produced salts.

Australia Pacific LNG has a proud record of community engagement and consultation, particularly with landowners in its Queensland gas fields.

Australia Pacific LNG and its shareholders genuinely believe that landowners and the local communities we operate in should be treated with respect. We demonstrate that daily in our operations, our on-going consultation with landowners and communities, and our openness in our operations.

We therefore believe we can work with local farmers and the communities we operate in to deliver, together, the substantial benefits available from both the Australia Pacific LNG Project and Queensland's farming sector.

6 September 2011

1. The Australia Pacific LNG Project

(a) Background

Australia Pacific LNG is the largest coal seam gas (CSG) operator in Australia and holds the country's largest CSG reserves position. Australia Pacific LNG is developing a multi-billion dollar, world-class CSG to LNG export project in Queensland.

The ownership of Australia Pacific LNG is as follows:

Origin	42.5% interest
ConocoPhillips	42.5% interest
Sinopec	15% interest

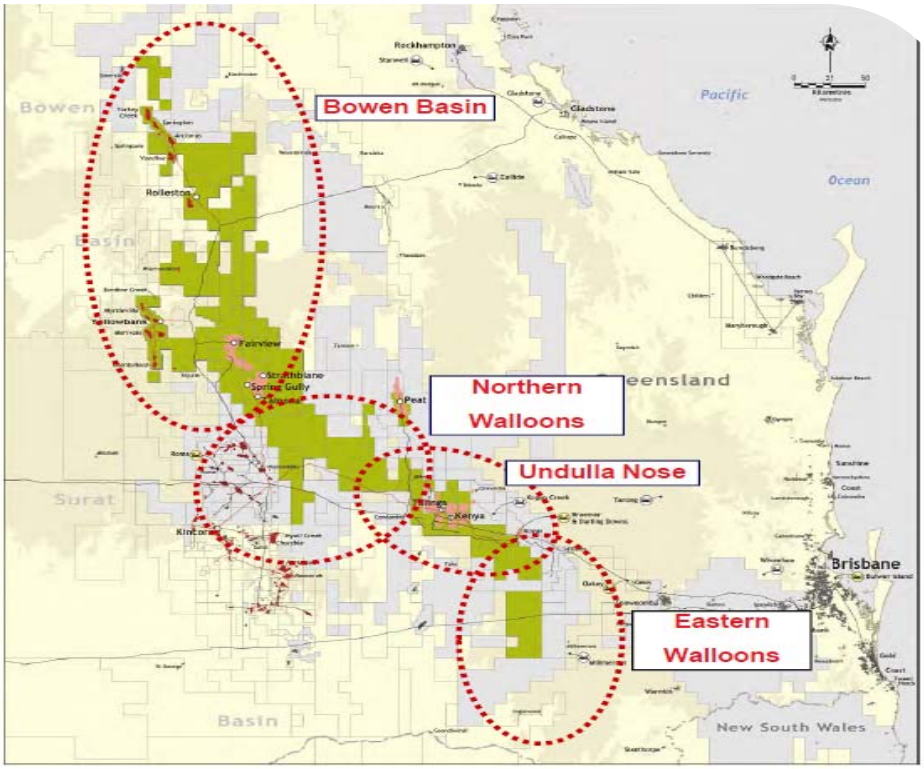
Origin is the Upstream operator for the joint venture and is responsible for the construction and operation of the gas fields and pipeline. Origin is well placed to deliver on the gas field development, bringing more than 18 years experience to the operation. It has the longest track record of any major CSG company in Australia, having drilled its first CSG exploration well in Queensland in 1993.

ConocoPhillips is the Downstream operator for the joint venture and is responsible for construction and operation of the LNG facility.

ConocoPhillips is an integrated energy company with interests around the world. The company has more than 40 years experience in operating and developing LNG facilities and 25 years of CSG production experience. ConocoPhillips is a pioneer and global leader in LNG technology and developed the Optimised Cascade LNG technology which will be used at the Australia Pacific LNG facility, and has been licensed for use by the other CSG to LNG Projects establishing LNG production facilities on Curtis Island (QCLNG and GLNG). ConocoPhillips is the operator of the Darwin LNG facility which commenced operation in 2006.

China Petrochemical Corporation (Sinopec Group) is an energy and chemical company with an integrated business value chain. Sinopec Group is China's second largest crude oil and natural gas producer, China's largest petroleum products and chemicals producer and supplier. It is the foundation customer for Australia Pacific LNG's first production plant (train) to be constructed at Gladstone.

Australia Pacific LNG is currently producing over 300Tj/d of coal seam gas for the Australian east coast domestic gas market. This is equivalent to around 40% of Queensland gas demand. Gas is supplied to large and small industrial customers, and households. Australia's largest gas fired combined cycle base load power station located south west of Dalby on the Darling Downs – the 630MW Darling Downs Power Station - runs on coal seam gas.



[1] Energy Quest 2010

Australia Pacific LNG CSG permits in Surat and Bowen Basins (Operated and Non-operated)

Current CSG producing areas are located at Peat near Wandoan (producing since 2001), Spring Gully north east of Roma (producing since 2005) and Talinga south east of Chinchilla (producing since 2009).

Australia Pacific LNG was formed in late 2008. Since then it has been progressing the development of a major CSG to LNG export project.

Spring Gully Accommodation Facility

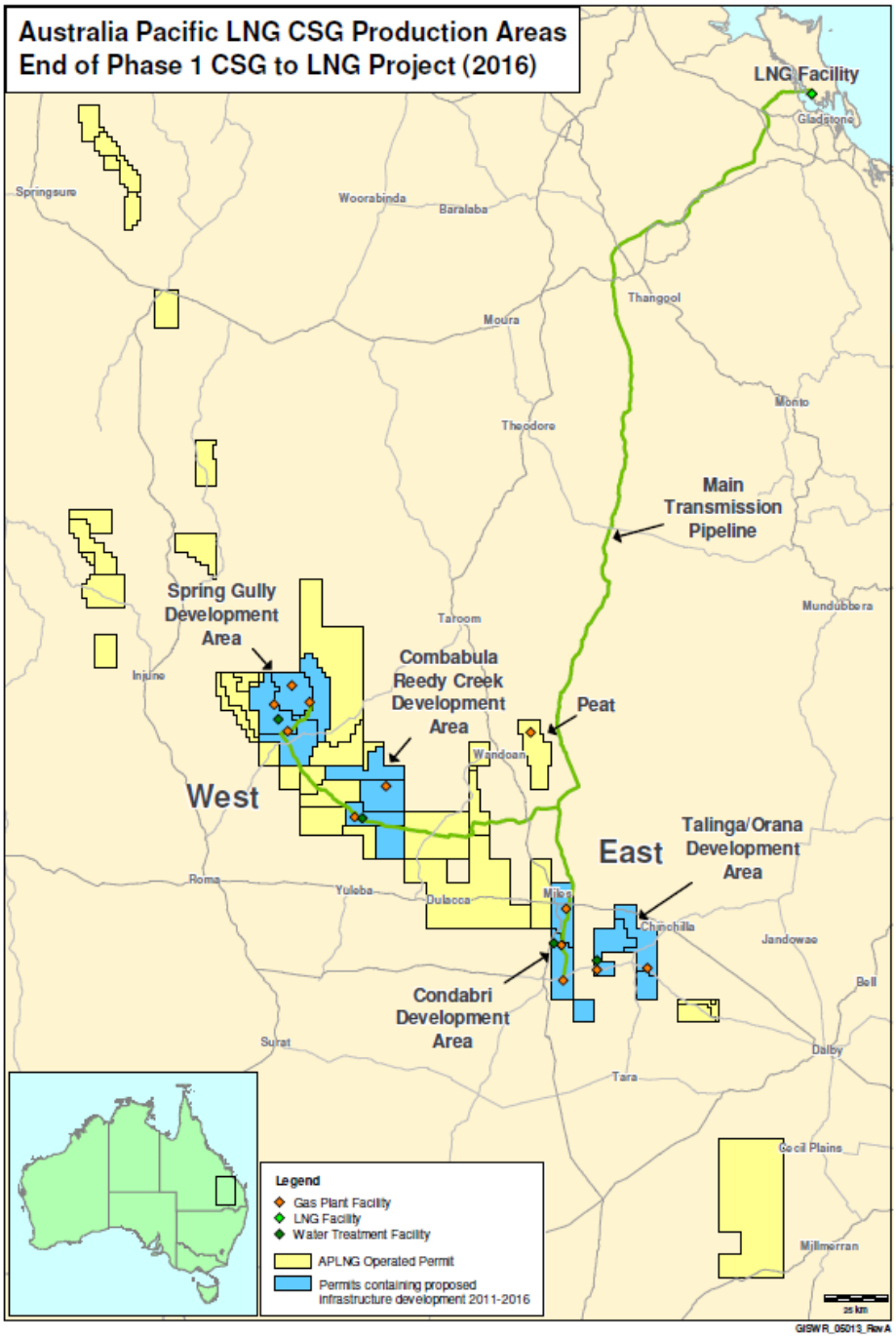
The Australia Pacific LNG Project consists of:

1. The further development of Australia Pacific LNG's gas fields in the Surat and Bowen basins in south western and central Queensland. The Project will drill around 300 wells per year over the next 5 years.

2. A gas pipeline from the gas fields to a LNG facility in Gladstone.

3. A LNG facility on Curtis Island at Gladstone. The first two production lines (trains) will have a processing capacity of up to 9 million tonnes per annum.

From the LNG facility, Australia Pacific LNG's cargoes will be shipped to the energy markets of Asia. Australia Pacific LNG's first cargo is expected to be exported in 2015.



An Environmental Impact Statement (EIS) was developed for the Project based on a comprehensive Terms of Reference which was finalised after receipt of public submissions. The EIS built on existing research and regional studies and included a wide range of additional technical studies which took over 10,000 field hours to complete using recognised experts and consultants. Technical studies were undertaken in all key potential impact areas including groundwater, surface water, aquatic ecology, terrestrial ecology, air quality and noise, greenhouse gas emissions, soils and land, traffic and transport, cultural heritage and social and economic. The technical studies to support the preparation of the EIS cost over $20 million to complete.

The EIS was submitted to the Queensland Coordinator General in late January 2010 and was subject to public review and comment and also underwent thorough review by the Queensland and Commonwealth Government regulators and their supporting technical experts.

On the 9 November 2010, the Queensland Co-ordinator General approved the EIS for the Project. This was followed on 22 February 2011 by Federal Government Approval for the Project under the EPBC Act.

It was announced on 28 July 2011 that the Board of Australia Pacific LNG had approved a Final Investment Decision ("FID") on the first phase of a two train CSG to LNG Project.

This approval will result in investment in the first phase of the Project of US$14 billion to service the sale and purchase agreement executed with China Petroleum & Chemical Corporation (Sinopec Corp.) for 4.3 million tonnes per annum – the largest single LNG sales agreement by annual volume ever signed for delivery in Australia.

(b) Project Benefits

Based on Australia's largest 2P CSG reserves, the Australia Pacific LNG Project will become a supplier of low emissions fuel to growing international energy markets.

The Australia Pacific LNG Project will generate significant benefits at regional, State and national levels. The Project will create approximately 6,000 direct jobs during the peak construction phase which includes the gas fields, gas pipeline and LNG facility. It will also create 1,000 jobs during the operation of the Project.

With significant employment needs, Australia Pacific LNG will be working to increase local skills capacity via apprenticeships, scholarships and vocational training.

The Project also expects to make a considerable contribution to regional economies through the purchase and use of local goods and services, where practicable, for the construction and operation of the infrastructure.

Australia Pacific LNG will pursue the highest environmental, community consultation and regional development standards not only during the construction period, but also throughout the ongoing operational life of this Project. Australia Pacific LNG values a constructive relationship with local communities, landowners and all levels of government.

(c) Operating more sustainably

Australia Pacific LNG is committed to exploring innovative and more sustainable solutions to reduce the impact of its CSG to LNG operations on the environment and community, for example:

- First in CSG to LNG industry to use reverse osmosis plants,
- Use of energy efficient compressors,
- Lower impact seismic surveys, and
- Use of hybrid drill rigs.

Australia Pacific LNG is using latest technology coiled tubing drilling rigs which will allow a significant reduction of drilling 'footprint' in agricultural areas

2. Co-Existence of CSG Developments and Farming

(a) Our approach and expected impacts

A major concern that has been raised with the Committee is the potential for what is seen as conflict of land use for energy resource development purposes versus land use for food production purposes. Australia Pacific LNG and its shareholders recognise the genuine concern about this fundamental issue in the communities we operate in, as well as the broader community. However experience with the development of the CSG industry over the past decade and arrangements being put in place in consultation with farmer representative groups demonstrate that CSG and farming interests can genuinely co-exist.

The predominant land use over the Australia Pacific LNG gas fields' development area is cattle grazing. Various forms of cropping are found in areas of more fertile soil, as well as where the use of machinery is not constrained. Other land uses include forestry, nature conservation, resource extraction and urban activities.

The majority of Australia Pacific LNG's tenement areas lie outside of the two areas of strategic cropping land - Strategic Cropping Protection and Management Areas - identified by the Queensland Government.

Strategic Cropping Land represents the State's best cropping land. The next category is "good quality agricultural land" (GQAL) which is defined as 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 and includes crop land, limited crop land and pasture land.

Of the 335,000ha of good quality agricultural land (GQAL) identified in the gas fields area in the Project EIS (comprising of gas tenements and connecting pipeline areas), only 7% (23,726ha) is expected to be disturbed during construction of the Australia Pacific LNG Project.

It is noted that this 7% number is a gross number across the 30 year project life. However, due to the progressive nature of the development and the progressive nature of rehabilitation, it is anticipated that, in fact, only a maximum of 2-3% of GQAL will be affected at any point in time in the life of the Project.

Additionally, only 1.3% (4,319ha) of this GQAL is estimated to be removed from agricultural production for the life of the Project because of significant land rehabilitation activities (generally within 1-2 years). However this 1.3% figure is also considered to be a potential maximum impact as a result of the progressive development/rehabilitation that will occur across the Project area. The 1.3% then reduces to a very low number once final rehabilitation occurs at the end of the Project.

Further, it is expected that the combination of our activities (improved infrastructure, beneficial use of water and spending by farmers from initial and on-going compensation payments) will result in increased capacity/productivity on existing farms, leading to an overall (net) increase in productivity and capacity.

The impact on GQAL associated with pipelines in the gas fields and the main transmission gas pipeline will be mainly temporary; i.e., confined to the construction phase. The pipelines will be constructed in a manner that ensures that agricultural activities can be resumed following burial of the pipes and reinstatement of the land.

Example of initial rehabilitation along a pipeline route

Under the operating procedures established for the Australia Pacific LNG Project, every effort is taken to minimise disruption to the current usage of relevant properties. For example, a number of “scouting teams” have been established to work with farmers to ensure than, where practical, infrastructure is located in such a manner as to avoid GQAL and Strategic Cropping Land; e.g., along existing fences, tracks, roads.

On site scouting for well sites and other infrastructure is conducted in close consultation with the landowner. Site suitability is determined based on:

- Current land use,
- Future planned land use,
- Terrain on the land,
- Location of existing access tracks and roads,
- Location of property infrastructure,
- Vegetation coverage,
- Location of sensitive vegetation that needs to be retained, and
- Potential cultural heritage issues.

Under these arrangements, property-specific plans are also prepared with landholders to manage the impact of project activities around their businesses and residences.

On properties used for dry land or irrigated cropping, Australia Pacific LNG will endeavour to place infrastructure in a way which minimises the impact on these activities.

These are practical examples of how Australia Pacific LNG is determined to work with landowners to ensure the coal seam gas operations can productively co-exist with grazing, agriculture and other farming activities.

In addition, proposed rehabilitation measures in GQAL areas, moving from construction to operation phases, and following decommissioning of operational areas, will include reinstatement of the original landform and soil profile to minimise productivity losses and maintain cropping efficiency. At the end of its economic life, a CSG well is decommissioned by pumping cement plugs into the well to provide permanent isolation of the productive zones and the surface equipment is removed and remaining lease area rehabilitated. The well casing strings are cut off at a sufficient depth below the ground surface so as not to impact on future agricultural activities. During the decommissioning phase of the Project there are likely to be some structures associated with the gas fields that will be retained for use by landholders or the community after their use for the Project ceases; e.g., access roads and some water storage facilities.

In summary, **the economic impact associated with the change in land use is anticipated to be minimal** given that:

- Much of the land impacted by the gas fields' and pipeline infrastructure will revert mostly to its original use once operational.
- In many grazing areas (which is the predominant land use in the Australia Pacific LNG gas fields), it is anticipated that stock carrying capacity should not be significantly affected after the installation of coal seam gas infrastructure on a property is complete, and
- Aspects of the Australia Pacific LNG operations such as beneficial use of water will lead to an increase in productivity and capacity of a number of existing farming operations.

CSG well integrated with existing agricultural activity

(b) Properties owned by Australia Pacific LNG

Where major infrastructure such as gas plants and water treatment plants and containment ponds needs to be installed, Australia Pacific LNG will normally purchase properties for this purpose. Australia Pacific LNG has also acquired properties to undertake pilot programs involving the use of some of its produced water for irrigation purposes. For example, in 2003 Australia Pacific LNG purchased the 4500ha Spring Gully grazing property which had a carrying capacity of 1000 head of cattle. This property became the focus of Australia's largest CSG development at that time. In the past 8 years, 32 wells, associated water and gas gathering systems and access roads, a 12ML/d Water Treatment Facility and 72ha of treatment and storage ponds plus field offices and a 50 man camp were installed on the property. A 300ha Pongamia bio-fuel plantation has also been established on this property utilising RO treated CSG water. Even though the property is now the centre of a significant CSG development, the carrying capacity of the property has only been reduced to 700 head of cattle. Once the processing of Pongamia seeds commences and a feed meal by-product is available, it is expected that the carrying capacity will increase well above 1000 head again, highlighting the ability of CSG operations and farming to co-exist.

Australia Pacific LNG now owns approximately 65,000ha of land for these purposes in the Western Downs and Maranoa Regional Council areas. We expect to run 5,000 head of beef cattle in joint ventures with rural producers on this land and to grow more than 2,000 hectares of irrigated crops, such as wheat, sorghum and chickpeas.

Australia Pacific LNG will carry out improvements on many of these properties including regrowth control, pasture improvement and upgrades to fencing, roads, water supplies and cattle yards, thus increasing the productive capacity of the properties.

It is estimated that through these activities, these properties will produce around 12,000 tonnes of grain each year for some 25 years. This beef and grain production is enough to feed a population of more than 60,000 each year.

Australia Pacific LNG is committed to maintaining the agricultural productivity of the land it needs to purchase for the efficient development of its CSG resources and to being a responsible and responsive neighbour in the rural communities in which it operates.

As part of this commitment, Australia Pacific LNG seeks to ensure that local managers operate the properties to help maintain existing local communities.

Australia Pacific LNG will use some treated produced water to irrigate broad acre crops

(c) CSG Essentials Program: Partnering with Landowners

The CSG-LNG industry is aware that as we move to larger developments, the potential for day to day impacts on landowners' activities and their lifestyle will increase.

Australia Pacific LNG recognises the need to genuinely – and pro-actively – address the legitimate concerns of landowners as to the potential adverse impacts of an expanding CSG-LNG industry.

Australia Pacific LNG is therefore developing a program to partner with landowners to directly involve them in some maintenance and operational activities with a view to improving the management of CSG activities on their properties. We are exploring the options to integrate, where possible, the gas production activities on a property with the existing day to day farming skills base and work practices. These gas activities include operation and maintenance of CSG infrastructure on a property, inspection and rehabilitation activities. It is anticipated that this program will create the opportunity for landowners to provide an operations support service direct or through their (accredited) contract provider on a fee for service basis. This would allow Australia Pacific LNG to work with an embedded service provider (the landowner) whose skills are directly linked to the task at hand.

We are currently developing a trial program. This will include the development of a three tiered job scope which is underpinned by training to meet the required competency standards, together with a defined safety training package to support the role. It is envisaged that:

- The first tier will focus on farm related skills, land management and land rehabilitation,
- The second tier would consist of a mix of farming related skills and basic gas activities, and
- The third tier would provide more detailed gas related skills.

In addition to the landowners, our partners and stakeholders for this program include:

- Other CSG/LNG proponents (Santos, QGC and Arrow),
- Queensland Farmers Federation (who have agreed to support the development of the job roles and associated training requirements),
- AgForce (potential training delivery and landowner support),
- Skills Qld (training funding support), and
- DEEDI (Government lead agency).

Australia Pacific LNG is developing pilot programs to give landholders the opportunity to provide operating and maintenance services on CSG wells

3. Land Access

Another major concern raised with the Committee is the issue of Land Access.

Australia Pacific LNG recognises the genuine concerns in this area and the legitimate desire of land owners and their families to be treated with respect.

Successful land access, management and compensation outcomes are not just determined by Government regulations and conditions. They are also guided as much by landowner relations, community expectations and ecological value as regulations. It therefore requires CSG companies to plan and deliver a process to meet landowner commitments and expectations.

Over the years, Australia Pacific LNG has developed an approach to engagement based on genuine consultation and open communication with landowners and local communities.

Australia Pacific LNG places significant value on developing constructive relationships with landowners and local communities, as well as with local councils and with Government.

Our approach is based on:

- Engaging with each landowner within the project area prior to any project activity on their land,
- Working towards outcomes that, wherever possible, benefit both parties,
- Assigning a dedicated liaison officer to each landowner in the project area, and
- Locating and scheduling project activities to reduce the impacts on landowner activities.

In addition, we are committed to ensuring that all of our field staff and contractors act with common sense, courtesy, honesty and transparency in carrying out our activities.

Under the Petroleum and Gas (Production and Safety) Act 2004, CSG operators have specific notification obligations and are required to abide by the Queensland Government's Land Access Code in gaining access to and carrying out operations on any property. The Code builds on many of the land access arrangements that Australia Pacific LNG had already put in place for co-operative access outcomes.

Successful land access requires the building of trust and understanding of both sides

In meeting these regulatory obligations and in line with our stated commitments, this includes:

- Notification before entry or any activity commences on landowner property,
- Minimising disturbance to livestock and crops,
- Ensuring our vehicles travel at safe speeds suitable for weather conditions,
- Promptly rectifying any damage we may cause to land or infrastructure,
- Where possible, installing gates and grids to minimize stock disturbance,
- With prior notice, carry out routine visits to complete operational, environmental and safety audits after our work on a property is finished,
- Designing our infrastructure to blend with the landscape and reduce visual impact as much as possible, and
- Rehabilitation of the land progressively throughout our operations and at the completion of our activities.

We have a range of facts sheets and published materials that explain our approach to our project, including land access and compensation. These can also be found on the website http://origintogether.com

4. Compensation Payments to Landowners

(a) Government regulatory requirements

The Queensland Government requires CSG operators to pay fair and reasonable compensation to landowners under the Petroleum and Gas (Production and Safety) Act 2004. Under this legislation, Australia Pacific LNG is liable to compensate each owner or occupier of land in the area of the resource authority for any 'compensatable effect' the landowner suffers as a result of Australia Pacific LNG's activities. 'Compensatable effects' include:

- Deprivation of the land's surface,
- Diminution of value,
- Diminution of the use made of the land,
- Severance of any part of the land from other parts, and
- Any cost/damage/loss arising from the activities.

Compensation paid varies depending on, for example, the scope of activities being undertaken, the expected impact on existing (and future) business activities and the time between disturbance and rehabilitation. While compensation for similar activities on similar land should be consistent, each property has unique factors that will affect the overall compensation paid.

(b) Our approach

Australia Pacific LNG uses a 'whole of business' and a full project life cycle approach when negotiating with landowners to ensure that the landowner is, as a minimum, no worse off as a result of our activities.

For the CSG to LNG Project, Australia Pacific LNG will also carry out regular audits to ensure the compensation paid, based on planned activities, matches the impacts of the development activities actually undertaken.

A considerable amount of work is undertaken to ensure landowners are supportive of our activities before they commence. All current activities are performed with the agreement of the owner, based on an informed, transparent relationship built over time.

Australia Pacific LNG currently has over 600 'active' compensation agreements. These agreements cover all CSG activities from exploration to appraisal to development.

Successful negotiations with landowners require considerable time to allow the building of trust and understanding on both sides. Whilst the legislation that governs our activities, the Petroleum and Gas (Production and Safety) Act 2004, provides Australia Pacific LNG with certain rights and obligations to carry out authorised activities without interference or obstruction, it is equally important to work together constructively with landowners and treat the properties we work on with care and respect.

5. Groundwater Extraction and Potential Impact on Aquifers

(a) Strict regulatory environment

The CSG industry in Queensland is regulated by a significant volume of legislation and specific project approval conditions. This legislation includes the Petroleum and Gas (Production and safety) Act 2004, Petroleum Act 1923, Environmental Protection Act 1994, Water Act 2000, Water and Supply (Safety and reliability) Act 2008, the Nature Conservation Act 1992, the Sustainable Planning Act 2009 and the State Development Public Works Organisation Act (1971).

The Queensland Water Act 2000 was recently amended to introduce a new regulatory framework to manage the cumulative impacts on water supply bores and springs from the extraction of groundwater by petroleum tenure holders, including the CSG industry. It also establishes the independent role of the Queensland Water Commission to oversee the management of the cumulative impacts of CSG operations on underground water. Australia Pacific LNG and other major CSG to LNG Projects are working closely with the QWC to help develop a cumulative CSG water impact model.

At the Commonwealth level, the EPBC Act (1999) and the Commonwealth Water Act 2007 may also apply.

As an example of the strict Commonwealth environmental approval conditions, Condition 50 applying to the Australia Pacific LNG Project (EPBC 2009/4974) requires the development of a Stage 1 CSG Water Monitoring and Management Plan. This Plan requires Australia Pacific LNG to address 3 main components:

- Groundwater monitoring and management,
- Hydraulic fracturing (i.e., fracture stimulation), and
- Surface water monitoring and management.

Specifically relating to the groundwater component of this Plan, the requirements of this Condition 50 are:

- Groundwater drawdown limits for each potentially impacted aquifer,
- A program and schedule for aquifer connectivity studies and monitoring of relevant aquifers to determine hydraulic connectivity,
- A program and schedule for field piloting of aquifer reinjection of treated CSG water and other groundwater repressurisation techniques, and
- Early warning indicators where drawdown thresholds are being approached.

(b) Will coal seam gas production drain the Great Artesian Basin?

The Great Artesian Basin (GAB) is one of the largest artesian groundwater basins in the world. It lies under more than 1.7 million square kilometres of Queensland, northern New South Wales, Northern Territory and South Australia. This area is equivalent to approximately 22% of Australia's land mass.

Great Artesian Basin

The Surat Basin and Bowen Basins are sub-basins of the GAB.

The GAB comprises many different geological layers including sandstone, mudstone and siltstone, one on top of the other. Some of the layers, such as sandstones, are permeable and allow water to flow through them; these are called aquifers. The other layers, including mudstones and siltstones, are relatively impermeable and do not allow water to pass through them freely; these are called aquitards.

Groundwater from the GAB is generally suitable for livestock or industrial uses, and less commonly of a quality suitable for human consumption or irrigation due to its high salt content.

It is estimated that the GAB has a total storage capacity of 64,900 million mega litres. This is a massive amount of water - equivalent to 130,000 Sydney Harbours in volume. Each year it is naturally recharged by 912,120 ML and there is an estimated natural spring discharge of 47,450 ML and a natural diffuse discharge of between 160,000 ML/year and 456,250 ML/year

Current modelling estimates show the combined average water production for the total CSG to LNG industry at around 75,000 ML per year (or equivalent to 0.15 Sydney Harbours), with a peak of less than 140,000 ML per year. However industry experience operating in the

Bowen and Surat Basins for the last ten years indicates that water production rates are likely to be less than predicted by what is highly conservative modelling of groundwater impacts.

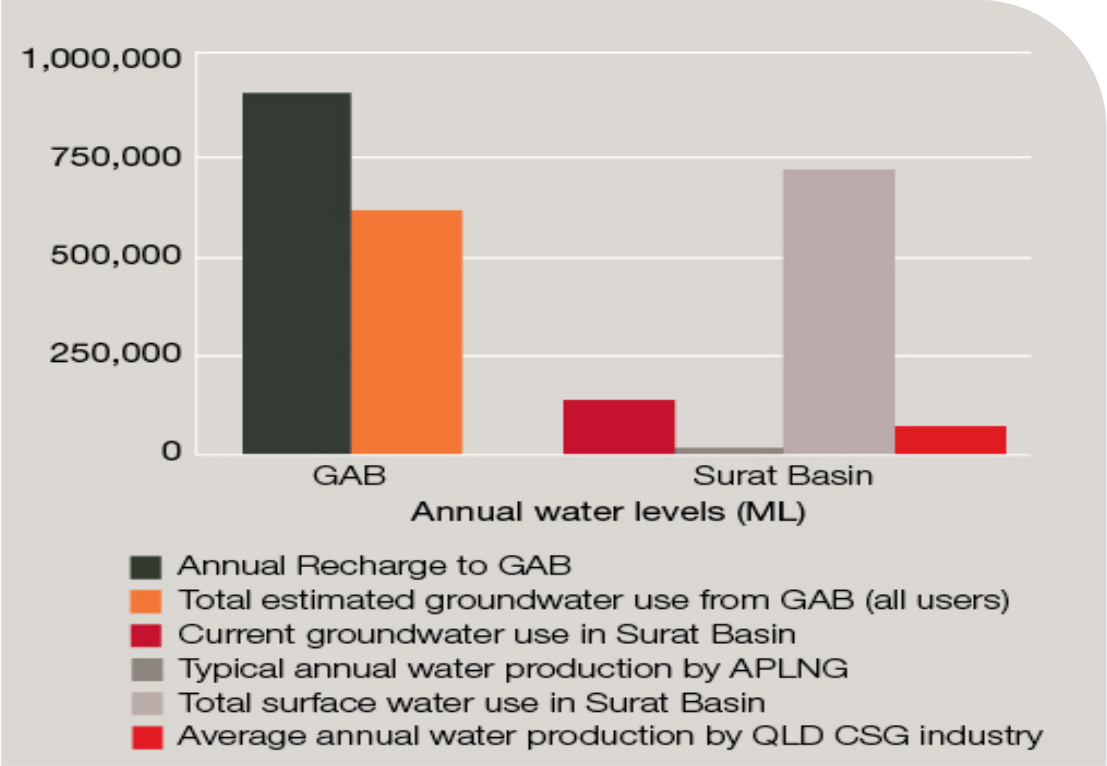
The industry is also investigating the feasibility of injecting large volumes of treated produced water back into the GAB. If this proves feasible, the net extraction by the CSG to LNG industry may be substantially less than these volumes.

Compared to the total storage capacity of the GAB, the amount of water projected to be extracted during CSG production is very small. At the peak of water production, the annual water extraction is likely to be less than 0.0002% of total storage. This is the equivalent of taking approximately 5 litres out of an Olympic sized swimming pool. It is therefore submitted that the CSG industry will have negligible impact on total storage volumes.

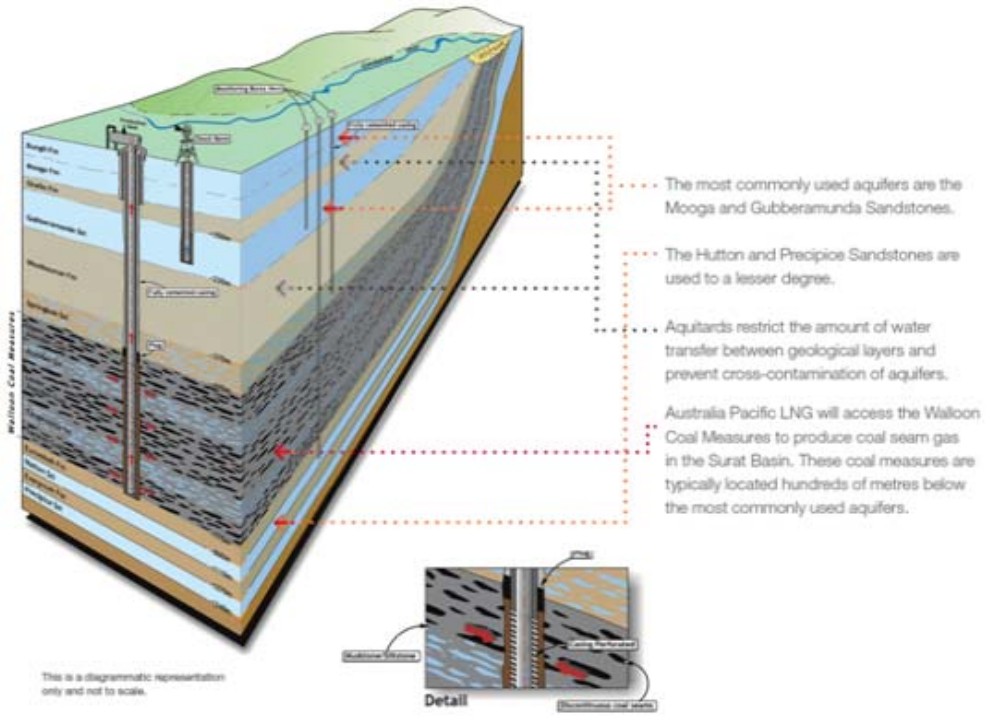
(c) Comparison of water removal from the Great Artesian Basin

European settlers first discovered the groundwater potential of the GAB in 1878. It is estimated that the total amount of water extracted from the GAB since that time is 57,125,000 ML, less than 0.1% of the total storage capacity.

It is estimated that 616,166 ML of water (less than 0.001% of total storage capacity) is currently extracted from the GAB by landholders, farmers, agriculturalists, industry and for urban use each year. The current usage figure for the Queensland portion of the Surat Basin is estimated to be 140,000 ML per year. The Australia Pacific LNG Project will typically produce water at the annual rate of 25,000 ML per year, with a peak of 57,000ML per year. ***This water is extracted from the coal formations and not the commonly used water supply aquifers***.



Projected post 2015 Great Artesian Basin and Surat Basin water figures



A schematic cross section of the Surat Basin

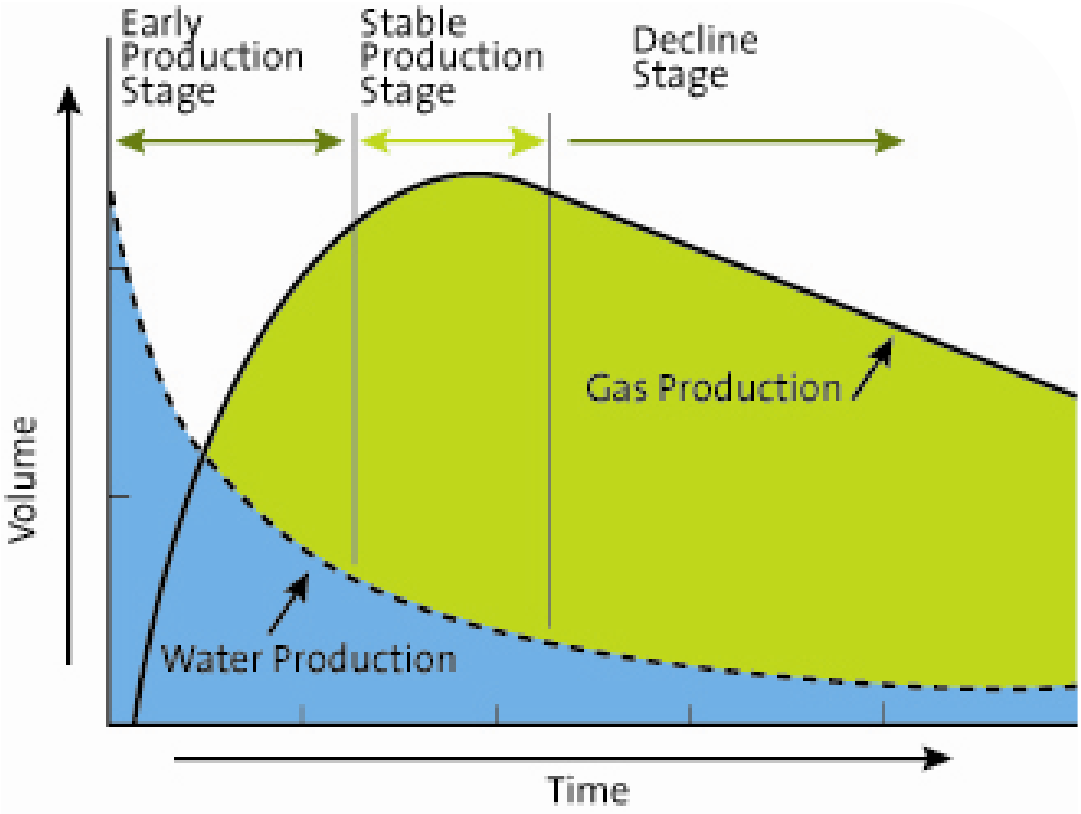
(d) Coal Seam Gas Production and Groundwater

CSG is a naturally occurring gas, mostly methane, found in the coal measures deep underground. These coal measures are geological layers that consist predominantly of impermeable mudstone and siltstone that have thin seams of coal running through them. These coal seams are discrete and not continuous over large distances; they generally form only 10% of the total thickness of the coal measures. Small amounts of gas collect in the many gaps, called cleats, within the coal deposits. The gas is bonded to the coal and held in place by water pressure. CSG is extracted by removing some of the water and reducing the pressure holding the gas to the coal allowing the gas to flow.

CSG production only extracts water from the coal measures. It does not directly extract water from aquifers commonly used for local user's water supply.

The rate at which each individual gas well produces water varies based on the geology at each well site. In addition, the rate at which water is removed from a CSG well drastically reduces over time as gas production increases.

CSG production only removes enough water from the coal formations to depressurise the coal seams, it does not dewater (remove all of the water from) them.



Typical gas and water production curves for a CSG well

The required level of depressurisation reduces the water level in a CSG well to approximately 30 metres above gas producing coal seams.

In the Surat Basin, Australia Pacific LNG will be extracting CSG from the Walloon Coal Measures. These formations are generally located between 200 and 1000 metres underground in the project areas. There are many low permeability aquitards of significant thicknesses that separate the coal measures from the most commonly used groundwater supply aquifers. One aquitard example is the Westbourne Formation which is up to 250 metres thick in some places.

These aquitards create a high level of natural isolation between the coal measures and the commonly used aquifers. This means that there is limited potential for activity in one layer to directly impact the other and removing large amounts of water from the coal measures will not result in large reductions in water levels in aquifers.

However, there is some limited interconnectivity between layers and, as a result, there is the potential for a drop in pressure in some aquifers as water slowly makes its way through aquitards towards the Walloon Coal Measures. Although permeable, the water flow in aquifers is very slow and generally travels at a rate of between 1 and 5 m per year under natural conditions. This would mean that any potential impacts would be slow to develop and should be identified by the project groundwater monitoring program with sufficient time to implement mitigation measures. As part of groundwater monitoring and aquifer injection investigations, Australia Pacific LNG has recently completed 3 deep drill holes through the entire Great Artesian Basin sequence in the Surat Basin CSG areas. In what is believed to be a first, the GAB strata deeper than the coal measures have been fully cored which, in

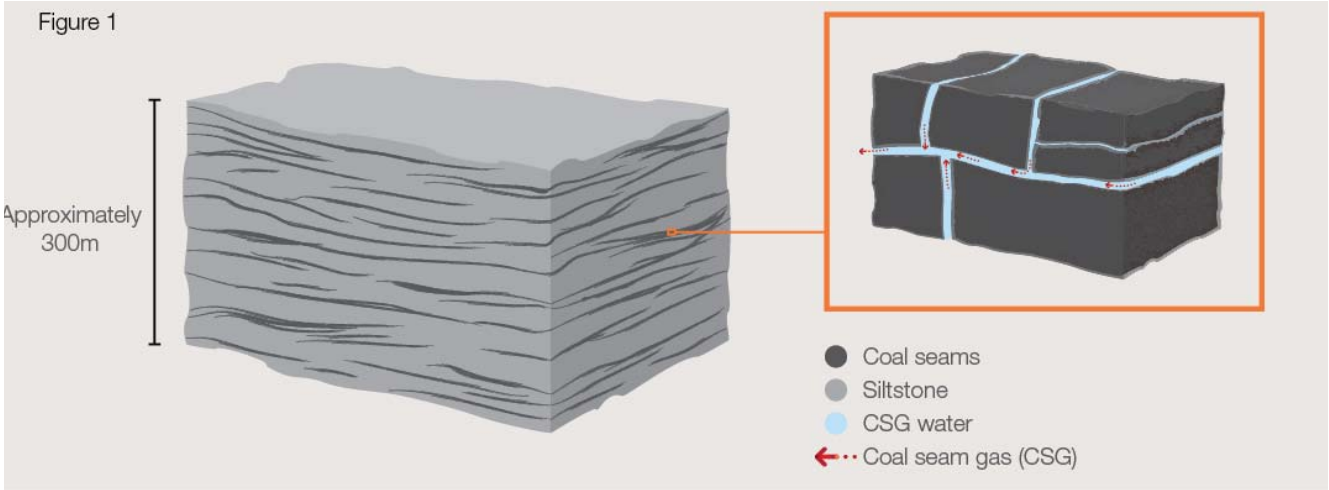
combination with core recently retrieved from groundwater monitoring bores above and into the coal measures, has allowed physical examination and laboratory analysis of in-situ aquifer and aquitard characteristics.

Preliminary assessment of the rock cores has demonstrated that the Springbok Sandstone (the aquifer closest to the CSG coal measures which has historically been considered as an aquifer) commonly displays aquitard properties in the central CSG producing areas and, therefore, provides an additional level of protection for the most commonly used shallow groundwater supply aquifers. As a result, extensive laboratory and geophysical analyses have been initiated to further delineate Springbok Sandstone hydro geological properties across the CSG fields.

The core also revealed a general lack of vertical structures (faults or fractures which could act as a conduit between CSG operations and aquifers), despite being drilled in close proximity to the largest mapped fault in the Surat basin.

Australia Pacific LNG provided open access to the GAB core for over a week, and received over 100 representatives from State and Federal Government regulators, universities, government geosciences and research organisations, all major CSG proponents, and community organisations. Strong interest and preliminary support was received for collaborative and complimentary studies to build on the learnings provided by the core, and to refine ongoing approaches to the assessment of potential CSG impacts on the GAB.

Figure 1



The Walloon Coal Measures

Coal seams make up approximately 10% of the Walloon Coal Measures. The coal seams are discrete deposits of coal that are not continuous over long distances, and are encapsulated within largely impermeable siltstone. CSG water is effectively trapped within the coal deposits. The water extracted in CSG production is mostly removed from these 'pockets' of coal and not the surrounding siltstones. While some water is extracted from the coal measures, they remain fully saturated throughout CSG production.

(e) Make Good Provisions

In some cases landholders directly access the Walloon Coal Measures, or aquifers near the Walloon Coal Measures, for groundwater supply. Where this happens close to proposed CSG operations, bore levels could be potentially affected by CSG production. In these instances it is the legal responsibility of the CSG operator under the Water Act 2000 to "make good", or offset, any impacts.

CSG operators are required to pro-actively 'make good' on impacts predicted by Queensland Water Commission groundwater modelling and monitoring up to three years in advance. **This means that 'make good' requirements must be assessed and negotiated with potentially impacted landholders well before any actual impacts are felt.**

'Making good' means undertaking activity to counteract or offset any impacts. Australia Pacific LNG will consult with stakeholders to determine the best strategies to 'make good' in the impacted area. Decisions on the appropriate course of action will be made on a case by case basis.

Examples could include:

- Increasing the depth of landholder bores,
- Sinking new bores for the impacted landholder,
- Lowering, modifying or replacing pumping equipment,
- Reinjecting water into the aquifer used by the landholder to increase aquifer pressure (reinjection trials are being instigated to determine the feasibility of this option),
- Supplying treated CSG water to supplement landholder supplies, or
- Alternate compensation.

Australia Pacific LNG will 'make good' impacts to landowner bores

(f) Natural Gas and Water Bores

The presence of gas has been recorded in Surat Basin water bores from early pioneering days. Historical State Government records clearly report the presence of natural gas in many bores and in all commonly used GAB aquifers. The presence of gas in water bores is particularly common in areas such as Hopelands, ('flaming' bore on 60 Minutes and Four Corners) where the Walloon Coal Measures are shallow and are used for stock water supply. In these areas, heavy water extraction from water bores can replicate the CSG production process, depressurising the coal measures and causing significant amounts of natural gas to flow.

Australia Pacific LNG has committed to conducting baseline testing of water level and water quality of all accessible landholder bores within its tenements before production commences in their area. Tests will include water and pressure levels, water quality and the presence of gas.

Of landholder bores tested so far, more than 80% have recorded various levels of methane within the bores. This is prior to CSG operations taking place in these areas.

Naturally occurring methane can be seen producing bubbles in a groundwater monitoring bore. This bore is located in an area where CSG production is not yet taking place

(g) Collaborative approach to monitoring, modelling and ongoing investigations

Australia Pacific LNG is working with government, landholders and other CSG operators in the region to develop a consistent approach to regional and cumulative effects groundwater monitoring and to develop a publicly accessible database which will contain easy to understand groundwater level and quality monitoring data.

All CSG operators have been openly contributing data to the Queensland Water Commission to establish an independent basin-wide cumulative groundwater model. This modelling is overseen by an Independent Technical Reference Group comprising of academic and interstate experts, and the community is informed of progress through a Stakeholder Advisory Group. The model will be used as the basis for the industry's make good agreement and springs monitoring obligations.

(h) Extensive Modelling

Australia Pacific LNG was the only CSG to LNG proponent to develop a Surat basin-wide groundwater model for its EIS. The model used best available data from geological investigation drilling, existing petroleum, gas and CSG well information, groundwater bores, and government GAB and stratigraphic investigations. The development of the model was overseen by hydro geological experts from Australia and Canada and drew on significant experience in building similar regional models in Canada's CSG and tar sand areas. It also considered the cumulative impacts of all (then) proposed CSG operations.

Since the release of the EIS, Australia Pacific LNG has developed and implemented detailed aquifer, aquitard, and interconnectivity testing and monitoring plans to assist in improving impact assessments. More than 25 dedicated investigation and monitoring boreholes totalling in excess of 11,000m of drilling have been completed under these plans to date, with results confirming the conservative nature of the original modelling assumptions.

The results of the modelling indicate that CSG activities may cause minor depressurisation in the geological layers directly above and below the coal measures, but in general will have insignificant impacts on groundwater pressure and, therefore, bore water levels in commonly used aquifers. This conclusion is reinforced by analysis of the 3 deep drill holes through the entire GAB sequence in the Surat Basin CSG areas noted above.

Australia Pacific LNG has established a wide-ranging bore monitoring network based on an extensive regional knowledge of GAB aquifers. This knowledge has been gained from operations within existing CSG fields in the Bowen and Surat Basins over the last 10 years, including comprehensive exploration drilling and seismic programs, detailed field investigations and testing.

Australia Pacific LNG conducts water quality and water level monitoring in the major aquifers, as well as in other geological layers not generally accessed for groundwater. Monitoring is conducted in both existing landholder bores and purpose-built monitoring bores.

Australia Pacific LNG's dedicated groundwater monitoring bore network will include more than 70 bores, approximately 25% of which have already been completed. Up to 500 existing landowner bores will be baseline tested and up to 100 of these bores will continue to be monitored on an ongoing basis.

One aspect of the monitoring network is focussed on detecting pressure and water quality changes in geological zones just above and below the coal seams. These results will provide advanced warning of potential impacts to aquifers. This early detection monitoring is designed to provide Australia Pacific LNG with sufficient time to implement mitigation of any impacts before any effects are noticed at landholder bores. To date the monitoring program

has not shown any effects outside of coal formations due to existing CSG activities. This is in-line with, or better than, modelling predictions.

Australia Pacific LNG has committed to conducting baseline testing of water levels and water quality of all accessible landholder bores within the project's tenements before production commences in their area. This data, combined with historical records, will provide invaluable information to landholders and government.

Installation of one of Australia Pacific LNG's many new monitoring bores

(i) Adaptive Management

The Queensland and Commonwealth Governments have taken the approach of adaptive environmental management with regard to the CSG to LNG industry. This acknowledges that there are some unknowns with regard to groundwater behaviour and allows for changes to be made to processes to accommodate new understandings. It also allows for best practice environmental management to be implemented as new technology becomes available.

This adaptive framework is being used to ensure environmental values and groundwater resources are protected and managed into the future.

To date industry-wide modelling has been very conservative and, as already seen, is likely to be over-predicting any drawdown effects. Queensland and Commonwealth Government environmental approval conditions for CSG to LNG Projects have been based on, amongst other things, the results from this conservative modelling. These environmental approvals involve very stringent environmental monitoring and management conditions. These conditions could therefore be amended as more accurate information becomes available.

The Australia Pacific LNG Project will be developed gradually in stages. As a result, there are large areas within the Project's tenements that are not planned to be developed for more than ten years. This will mean that any lessons learned in the initial stages of production will improve the processes for subsequent stages of development.

As noted in the Queensland Government's submission to the Committee:

"Both State and Commonwealth (environmental approval) conditions require progressive monitoring by CSG operators and are adaptive to allow adjustments to approvals on the basis of monitoring results. This allows any unforeseen environmental impacts to be addressed by the proponents if they arise. It ensures that the proponents, not the environment, bear the risk of outcomes departing from projections" (page 16).

And:

"The Queensland Government has taken proactive steps by introducing an adaptive management framework to regulate CSG water management. This framework can respond to any unforseen issues that may arise due to the inherent uncertainty around forecast quantities and qualities of CSG water to be produced. CSG companies are required to report annually to the government on their water management program. The Government has the power to require improved water management practices and amend approvals to enforce environmental standards" (page 17).

6. Produced Water

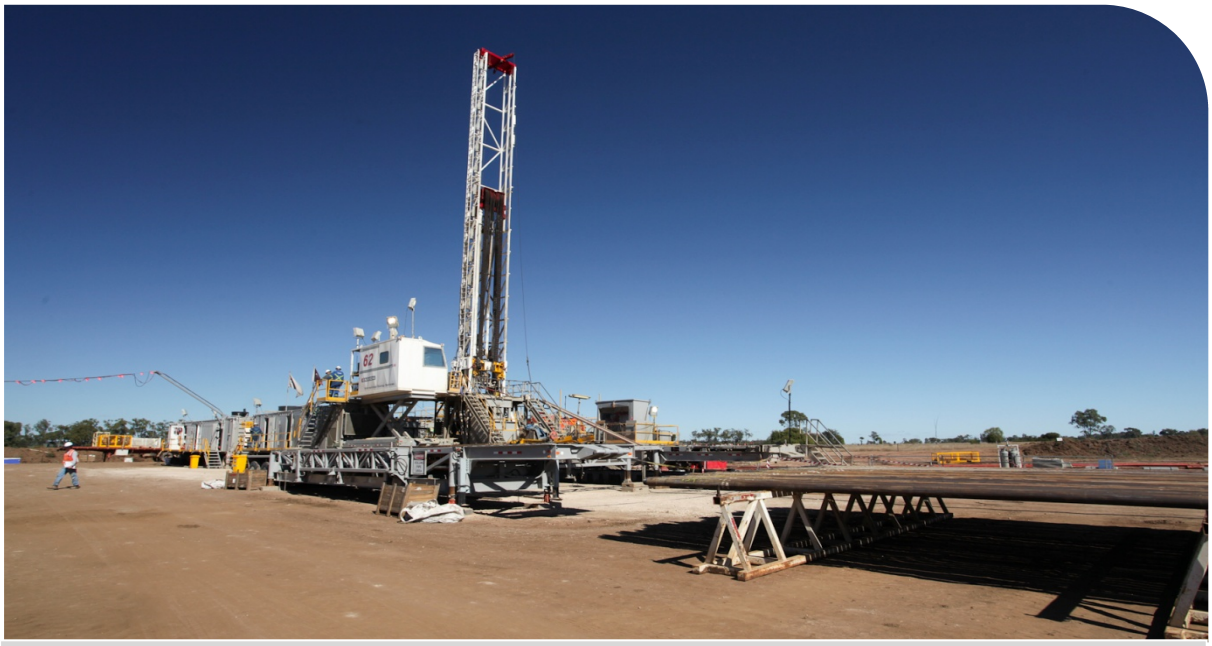
(a) Our approach: Making the best use of CSG water

Australia Pacific LNG understands the vital importance of water for all communities and the environment. It is committed to finding appropriate and beneficial uses for all associated water produced by its CSG developments. Significant investments are being made to ensure that associated water can be treated to a high standard, maximising the potential options for beneficial use.

The issues around the management and distribution of CSG water are complex. There is no "one-size-fits-all" solution. The management of CSG water will necessarily include a combination of options for water allocation, taking into account important factors such as the environment, other water users, public health and safety, logistics of water distribution and government regulations. The careful balancing of these sometimes opposing considerations in consultation with relevant stakeholders is necessary to determine the most desirable outcomes.

Australia Pacific LNG will implement a combination of the following water management options in line with the Queensland Government's Water Management Policy and the Commonwealth Government's EIS conditions for the Project:

- Injection into suitable aquifers (the feasibility of this is currently being investigated and tested),
- Provision of water for existing agricultural and industrial uses, potentially reducing demand on other groundwater and surface water resources (also described as "virtual reinjection"),
- Reuse of water in Australia Pacific LNG Project construction and operations,
- Irrigation of Australia Pacific LNG crops, and
- Supplementing environmental flows in local watercourses on a temporary basis.



Installation of trial aquifer reinjection bore

(b) Treatment of CSG water

The water that is extracted in CSG production is generally brackish (slightly to moderately salty) and needs to be treated in order to be suitable for many uses. When treating CSG water for discharge, Australia Pacific LNG is committed to meeting Australian Drinking Water standards. Put simply, in terms of the parameters of these well established guidelines, this water would be similar - if not better - than other water treatment facilities currently supplying water directly for domestic consumption purposes.

Almost $100 million has already been invested in state-of-the-art reverse osmosis (RO) treatment facilities at Spring Gully and Talinga. The Spring Gully plant was the first of its kind to be integrated in the CSG production process in Australia. There are plans for the construction of additional RO plants throughout the Project development.

Currently more than 90% of the water treated by the RO facilities becomes clean, usable water. We are reviewing technology improvements in this area that could allow us to raise the recovery rate to around 97.5%.

CSG water is purified at our water treatment facilities

(c) Injection of water into aquifers

Injecting CSG water into aquifers involves pumping the water removed during CSG production into underground water aquifers. This water could be treated by desalination or filtration, or a combination of both, provided it is of equivalent or better quality than the groundwater in the target aquifer.

Injection could be used to top up aquifers, and potentially offset the groundwater level declines in some areas that have occurred over the last hundred years.

Australia Pacific LNG is currently instigating injection trials in various aquifers near each of the two existing and two future planned water treatment plants.

Aquifer injection is not a simple process. It involves pumping water into rock formations underground and is not as easy as using a hose to fill up a swimming pool or pumping water down a well. There are a number of factors that need to be taken into consideration such as aquifer permeability, aquifer pressure levels, existing water quality and chemical makeup, mineralogy of receiving aquifers, removal of oxygen from the water prior to injection and the capacity of each injection well.

Following the expected completion of these trials in 2014, Australia Pacific LNG would be in a position to determine whether it would be feasible to successfully undertake re-injection and the conditions under which this could occur.

(d) Beneficial use of water: Irrigation

One of the highest value uses of water is to irrigate crops that will feed and benefit the local community. Australia Pacific LNG has committed to using some of its associated water in this way.

Two separate irrigation projects to be fed by treated CSG water have been established. As already noted, one project is underway at a 300 ha site near the Spring Gully water treatment facility involving the establishment of a Pongamia plantation on an existing 4500 ha grazing property. Pongamia is a sustainable crop where every part of the plant, down to the last leaf, can be utilised. The Pongamia seed is used in the production of a bio-diesel and the stalks and leaves can be used for farm fodder. We plan to process the seeds, which will also produce a feed meal by-product for cattle on the property.

A second irrigation site is near the Talinga water treatment facility. This 1100 ha property is destined to produce broad acre crops such as sorghum, chickpeas and lucerne (approximately 530 ha to be irrigated). These crops will mainly be used for animal feed. A further two broad acre irrigation projects are planned for properties adjacent to the future Condabri Central and Reedy Creek water treatment plants.

Australia Pacific LNG's irrigation projects will provide benefits to the community by employing local farm managers and staff, engaging contractors that live in the community and sourcing farming inputs locally, benefitting local suppliers.

The products harvested on Australia Pacific LNG's properties will increase the amount of reliable grain and fodder supplies available to local feedlots. Production will continue even in times of drought, providing economic activity in the community in traditionally slower periods.

Australia Pacific LNG's Pongamia crop at Spring Gully

(e) Providing CSG water to other stakeholders

Australia Pacific LNG is currently working with landholders and the Queensland Government to address the various issues associated with the provision of treated CSG water to farmers, irrigators and industry. Supplying water to other stakeholders is a complex issue. There are a number of inter-related considerations, including:

- How the water will be delivered,
- How much water supply can be guaranteed,
- How much demand can be guaranteed,
- How seasonal demand can be managed, and
- How the variability and decline of CSG water production over time can be managed.

Australia Pacific LNG has concerns with entering into contracts for water supply that could potentially disadvantage either party at any time and is also not willing to provide water for unsustainable short or long term activities, particularly given the variability and decline of CSG water production over time.

Australia Pacific LNG is working very hard to balance the needs and wants of all parties in the distribution of the Project's CSG water.

(f) Supplementing environmental flows

Another way that Australia Pacific LNG is currently managing CSG water is by releasing some of the water from the Talinga water treatment facility into the Condamine River. This is done under stringent environment conditions set as part of the Environmental Approval for the Talinga development. The released water meets, as a minimum, Australian Drinking Water standards.

Increasing the amount of water available in the Condamine River helps to secure water supplies in the region. It increases the opportunity for adjoining landholders to access their allocations and increases the amount of water available for communities that use river water for urban supply. It can also provide environmental benefits by returning the river closer to a pre-development flow regime. Further, improved river flows increase the habitat for organisms that feed native fish and turtle populations.

On Thursday 11 August, 2011 Australia Pacific LNG published the first of its quarterly Water Treatment Facility Discharge Reports for the Talinga and Spring Gully facilities on its website (www.aplng.com.au/publications).The reports present a summary of the water quality monitoring results obtained for treated CSG water discharged from the respective facilities for the first six months of 2011. Future quarterly reports will provide information on the preceding three months.

The water quality results demonstrate that the water treatment facilities consistently and reliably treat CSG water to a standard which is safe for discharge into a source of public drinking water; i.e., at least equal to Australian Drinking Water standards.

The reports have been prepared in accordance with the Queensland Government's *Public Reporting Guideline for Recycled Water Schemes* (DERM, 2011) and satisfy the reporting requirements of section 274 of the *Water Supply (Safety and Reliability) Act 2008.* Any water released into a watercourse must be proven to sit within water quality limits in accordance with government guidelines. To confirm that the treated CSG water does not exceed the limits prior to discharge, it is regularly monitored. The monitoring results are recorded in these publically accessible reports.

The water quality limits are based on various health criteria defined by recognised national and international public health authorities including Queensland Health, The National Health and Medical Research Council and the World Health Organisation.

These reports provide greater transparency to Australia Pacific LNG's operations and provide the public with confidence that treated CSG water can be safely discharged to a source of drinking water.

Some of the treated CSG water is used to supplement flows in the Condamine River and is subject to strict water quality and reporting requirements

(g) Treatment of Brine

As a result of the water treatment process, a high salinity stream (also referred to as brine) is produced containing the majority of the salts removed from the CSG water. Australia Pacific LNG is committed to storing brine in suitably designed ponds during the Project life (recognising the need to upgrade some existing ponds that were established under the Queensland Government's earlier regulatory regime), with transfer of evaporated solid salts to a licensed regulated waste disposal facility prior to the end of the Project.

A pond liner of very low permeability is critical to ensure that seepage from the pond system does not occur. Australia Pacific LNG has undertaken detailed analysis to inform its selection of the best brine pond liner system available. The selected liner system consists of a dual layer with intermediate drainage. A highly impermeable polymer geomembrane layer forms the uppermost layer. As a contingency in case of a leak developing in the primary liner, a secondary polymer membrane liner is laid underneath. A system for leak detection is used that consists of a pair of probes, one in the stored liquid and one in the surrounding soil, to measure the electric resistivity across the pond liner to detect flaws in the liner which allow the passage of brine. This system is installed at the construction stage and remains active for the life of the pond. This system is designed to ensure that the development of a leak would be detected soon after its occurrence.

Disposal of salt would commence from the point at which solid salt can be isolated through evaporation in ponds or enhanced crystallisation processes. Ponds are currently expected to reach significant solids contents after approximately 15 years. From this point onwards the

solids would be progressively encapsulated in sealed landfill cells until no further solids are generated and the last of the brine ponds can be decommissioned.

It is likely that a new waste facility will be required to be developed in the vicinity of the CSG fields servicing several Water Treatment Facilities and potentially several CSG projects in the area. Australia Pacific LNG has been in consultation with several established waste management companies to discuss future requirements to ensure that the appropriate facilities will be available. At least two potential locations have been identified, although detailed siting studies need to be conducted.

Following brine removal, the storage ponds which are no longer required will be decommissioned in a manner which eliminates any ongoing environmental hazard, restoring the land use and the scenic amenity of the area.

(h) Salt

Australia Pacific LNG is committed to continuously improving its processes and is investigating the potential of the commercial sale of the produced salts, as well as the option of reinjection of the saline solution into very deep, isolated geological reservoirs that are not used as water supply aquifers.

Adoption of alternate treatment technology has already resulted in a significant minimisation of brine pond size. The advanced recovery predicted with the technology selected indicates that waste byproducts (brine) to be as low as 2.5% of produced CSG water (versus about 10% now).

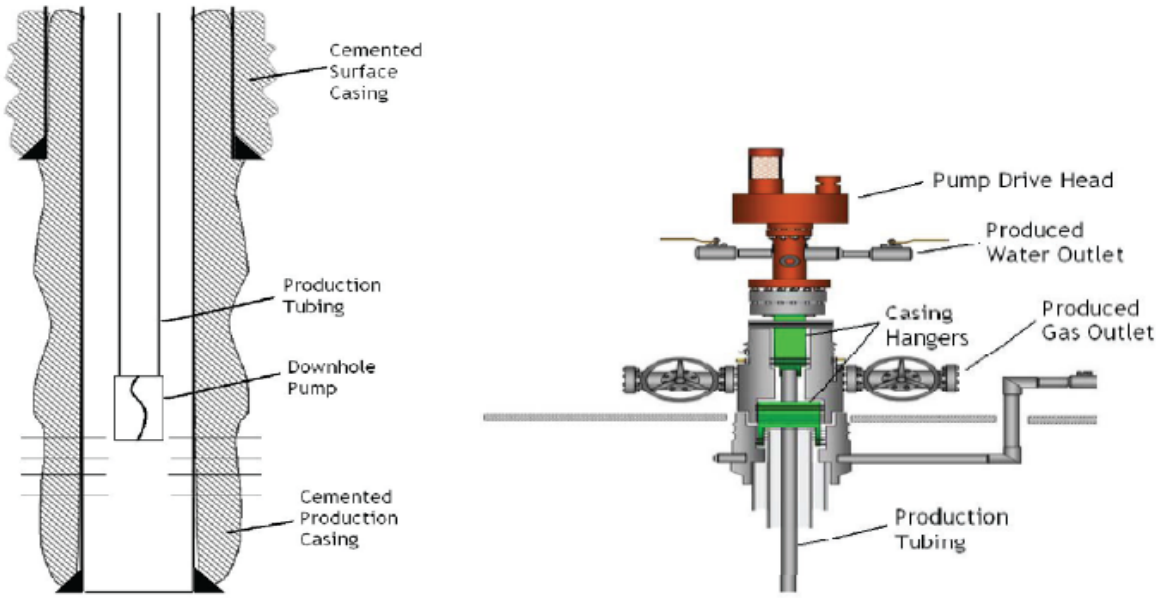
A two year technology enhancement program is underway to further improve the recovery and reliability of CSG water treatment. This includes collaboration with other industry proponents and research centres at the University of Queensland and Victoria University. The program will include three onsite pre-treatment pilots at existing Australia Pacific LNG facilities. Five different processing options for the concentration and crystallisation of the saline effluent are under investigation, including a brine concentration and crystallisation pilot trial that is likely to be conducted at the Spring Gully and Talinga water treatment facilities. If a process can be proven as technically and commercially feasible through piloting activities, a full scale crystallisation plant would be investigated to manage the amalgamated brine streams from several projects.

A number of salts contained in CSG water have some commercial value. Australia Pacific LNG is, as noted above, investigating the potential of the commercial sale of the produced salts. It is working closely with several companies on the feasibility of establishing a local industry based on the beneficial use of the produced salts (e.g., soda ash).

As also noted above, another optimisation opportunity for brine disposal is injection into geological storages that have appropriate containment characteristics, Regional hydro geological targeting investigations have been undertaken, with the most prospective target identified being depleted CSG coals. Investigations into both the feasibility of reinjection to coal and the development of alternative targets are ongoing. If the coal seam is to be used, feasible injection may be 5-10 years away. It is noted in this context that ponds are not expected to reach a significant solid contents state for approximately 15 years.

7. CSG Well Integrity

Australia Pacific LNG CSG wells are constructed and designed with multiple barriers that prevent fluids and groundwater from moving between formations or coming to the surface. During drilling, the drilling fluid prevents groundwater from entering the well, the Blow Out Preventer system specifically designed for onshore drilling purposes controls any fluids that do not enter the well from being released.



CSG well integrity is assured by meeting stringent design standards and regulations

Once the well is drilled, a steel casing is installed and cemented in place which forms a very secure barrier, allowing water and gas to be extracted safely. Cement fills the annular space between the casing and the well bore, preventing fluids moving through it.

All casing and tubing used in Australia Pacific LNG's oil and gas operations are manufactured to American Petroleum Institute (API) 5CT requirements. This sets minimum standards for manufacture and testing. It also sets minimum performance properties for API grade casing and tubing (burst, collapse and tension). Using these casing specifications allows each casing and tubing string to be designed so that the well can be operated safely for its entire producing life and then to be effectively abandoned.

Components in wells are designed, manufactured, and/or tested according to published standards or recommended practices. These include:

Component	Standard
Casing and tubing	International Organisation for Standardisation (ISO) 11960:2004 / API Spec 5CT
Wellheads	Design, manufacture, testing - API Spec 6A
Blow out preventer	Compliance - ISO 13533:2001 / API Spec 16A
Cement	Design - ISO 10426-1:2000 / API Spec 10A Testing - ISO 10426-2:2003 / API RP 10B-2
Well construction	API RP 65 and API Guidance Document HF-1

To prevent fracture stimulation (fraccing) fluids and gas from entering surrounding aquifers, Australia Pacific LNG follows strict design standards and confirms the well integrity prior to fraccing. All wells that are programmed to be fracced have steel casing and a wellhead system that is designed specifically to manage the fraccing process. A cement bond log is also run to confirm isolation between any zones that would be fractured and formations above or below that zone.

Fraccing is designed to only fracture the coal seam, and the cemented casing forms a barrier between the coal seams and any other permeable zones to mitigate cross contamination of the fluids into surrounding aquifers.

Well abandonment occurs when the well is no longer productive. The life of a well is generally around 20-30 years. At abandonment the well is plugged with cement to ensure all formations are isolated from each other. The cement ensures the well's longer term integrity and maintains isolation from other zones. The plug and abandonment procedure used complies with Queensland Government regulations under the Petroleum and Gas (Production and Safety) Act 2004 and applicable industry standards.

Australia Pacific LNG has been closely involved with the Queensland Government in developing a Queensland CSG Drilling and Completions Code of Practice to ensure consistent compliance to all applicable standards by the CSG industry.

a) CSG Wells and Public Health and Safety

CSG is predominantly methane; a non toxic, colourless, odourless gas that dissipates quickly in the atmosphere. CSG does not contain toxic chemicals and there are negligible health risks with exposure to CSG or a leaking well. Because there is no health exposure risk, our field operators have no specific PPE or health related procedures for dealing with CSG other than gas detection because of its flammable properties

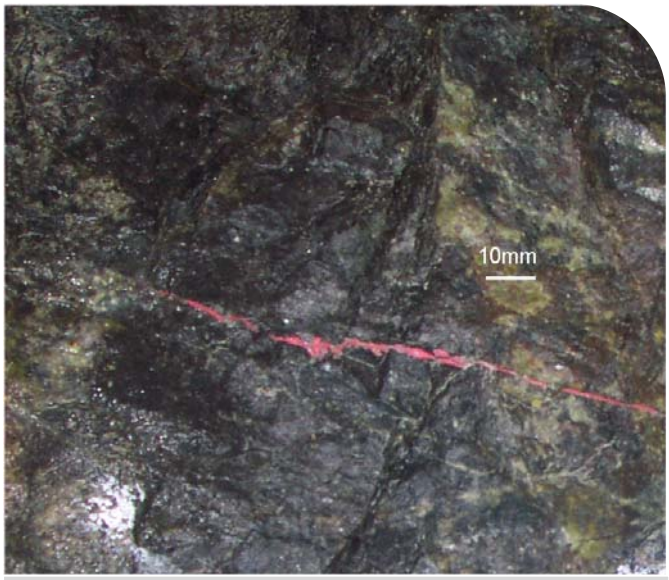
Minor gas leaks at a well are typically only detectable within one metre of a well. All leaks are monitored and repaired. An industry-wide well head safety program was commenced by the Queensland Government's Petroleum and Gas Inspectorate in May 2010 to audit all CSG wells for reportable leaks. The number and volume of leaks that were detected by this audit was very low and posed minimal risk to community safety.

As an outcome of this well head safety program, a new *Code of Practice for CSG Well Head Emissions Detection and Reporting* has been established. This standard for well head testing in gas fields is more stringent than that used by gas and emergency workers exposed to gas leaks in urban settings. Australia Pacific LNG has stringent surveillance and inspection programs in place to ensure the integrity of its wellhead equipment.

8. Fracture Stimulation

Fracture stimulation has been used for over 60 years internationally and for over 40 years in Australia. In the past 10 years fracture stimulation has proved to be particularly successful in unlocking significant reserves of gas from unconventional gas resources such as CSG. This has recently led to significant focus on this technique from environmental groups, some of whom do not support the use of gas as a transition energy source replacing coal for electricity generation purposes. Regrettably this has led to a campaign of misinformation and, in some cases, extreme claims that have unnecessarily raised concerns amongst communities where CSG development is planned.

Fracture stimulation (fraccing) enables a more effective release of gas and water from underground gas reservoirs and also increases the drainage area of the well. It is mainly used in low permeability reservoirs.



Fracture stimulation does not 'shatter' the coal seam. Actual fractures are generally between 5-20mm wide and extend >100m laterally in a directional/planar way (from SPE 119351). Fracture highlighted in red

The Queensland Government has introduced strict regulatory requirements covering the fracture stimulation process and the additives used in fraccing fluids.

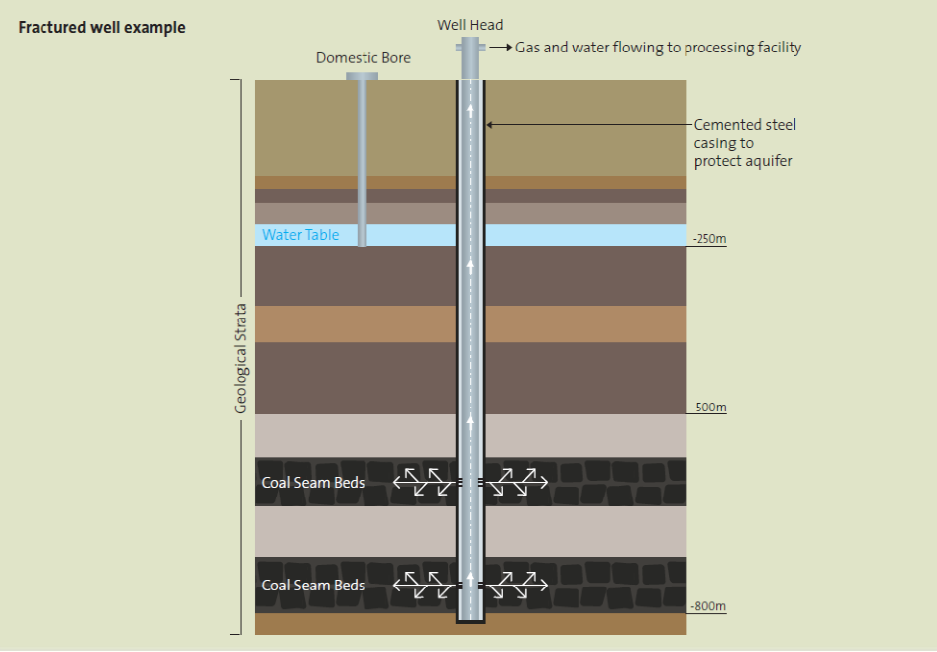
Australia Pacific LNG is undertaking fracture stimulation activities as part of its current appraisal program to prove up CSG reserves. At the end of August 2011, 29 wells of a planned 72 appraisal wells had been fracced. In addition, during the first 5 years of the current Australia Pacific LNG Project Implementation Plan, it is not expected that any development wells in the Walloons areas will need to be fracture stimulated as wells will be located in areas of high permeability coals. The use of fraccing will progressively increase as lower permeability areas are developed later in the project life.

Australia Pacific LNG uses a combination of two types of fraccing: water fraccing and gel (water based) fraccing.

Water fraccing uses only treated water, sand and a small amount of additives. This technique needs large volumes of water to hold the sand in suspension while pumping.

The gel fraccing process uses some additives in very low concentrations to make a thick fluid which carries more sand and, therefore, a fracture can be created and propped open by using less water. Gel fraccing is not new and has been used in Australia and overseas for more than 50 years. The technology continually improves and the additives used are now much cleaner and safer.

Only experienced service contractors are used to pump fracs and their equipment is certified and tested prior to every frac. A frac site is a very controlled and monitored work environment.



Fractured well example – Coal Seam Gas well

The majority of fluids which are pumped underground during the fraccing process are removed or recovered after the completion of the fraccing job. Any waste that is created on site is removed and disposed of appropriately.

Any fluid that remains in the coal seam will stay there or will be recovered over time, together with water removed via the well bore. Recovered fluids are contained in lined ponds or transported to treatment facilities. The storage, transport and disposal of these fluids is tightly regulated. Any fluid that remains in the coal seam will, over time through biodegradation and neutralisation, become saline water consistent with the water within the coals.

There is extremely low risk of any chemicals that remain in the coal measures migrating to adjacent aquifers. This is because:

- Fraccing is mainly used in low permeability coal seams and fluid flow within the seam (except along the created fracture) is highly unlikely,
- The fracced coal seams are separated by thick extremely low permeability aquitards (siltstone and shale) from adjacent aquifers, and

- The chemicals are pumped in diluted form and undergo further dilution in the coal seam (by a factor of 100 within 100 metres of the well bore for example).

An average of 97.4% of water and sand and 2.6% of additives (containing 2% Potassium chloride, a simple salt) are in gel fraccing fluids. The frac sand is washed and sieved quartz sand. The additives are not considered harmful in the diluted and small amounts in which we use them.

Most of the ingredients we use are regularly found within homes, such as breaker (enzymes in washing powder), Potassium chloride (a substitute for table salt), ethanol (drinking alcohol) and surfactants (sweet orange oil, an essential oil).

Australia Pacific LNG does not use BTEX (benzene, toluene, ethylene, zylene) in its fraccing fluids. The use of BTEX is now also restricted by Queensland Government regulations.

Hydraulic fracture stimulation activities are subject to stringent internal processes and, as noted above, Government regulation and reporting. This includes:

- The Australia Pacific LNG Coordinator Generals' report (Gas Fields Condition 22) required that an independent impact assessment of hydraulic fracturing be carried out. This impact assessment completed by major independent environmental consultancy URS focused on process, equipment, best international practise, chemicals to be used, geological modelling, faulting, seismic history, aquifer locations and properties, diagnostic techniques, engineering controls to maintain frac within target formation, location of water bores, toxicity, eco-toxicity, bio-accumulation, human exposure pathways, environmental hazard assessments, air quality , noise and vibration assessments and methodology to monitor the above.

- Environmental Authorities for project development areas now include over 13 specific hydraulic fracture stimulation conditions and over 20 monitoring conditions, with a monitoring regime for over 45 analytes (chemical, chemical compound or physical property).

- Source water sampling prior to fraccing stimulation is undertaken. The mixed fraccing fluid is sampled and tested before being used to ensure they meet regulatory requirements. Samples of the fraccing fluid being pumped are taken and tested. The testing is undertaken by independent National Association of Testing Australia (NATA) certified laboratories. All testing results are available to the Regulator.

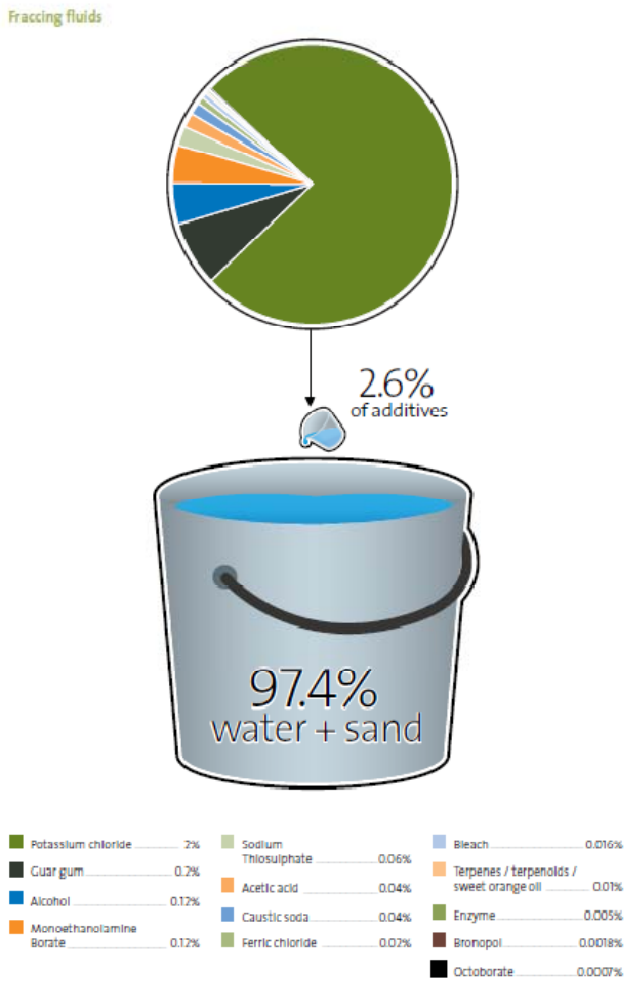
- Water bores adjacent to a fraccing stimulation well site are baseline tested prior to the fraccing activity and, then, on a regular basis as per regulation.

- Following completion of a fracture stimulation, produced fluid samples are taken and tested on a regular basis as per regulation.

- Chemicals and fluids used in the fracture stimulation process must be in compliance with Queensland Government restrictions on the use of BTEX.

- The regulatory body (DERM) has implemented a program of on-site audits of fracture stimulation activities.

- Listings of chemicals used and Material Safety Data Sheets (MSDS) are available on the company web site.
- Each fracture stimulation job is discussed with each landowner
- A copy of the post fracture stimulation summary report is provided to the landowner and the regulator within 10 days, with a comprehensive final report provided to the regulator two months after the fracture stimulation activity.



All chemical additives are registered with the National Industrial Chemical Notification and Assessment Scheme (NICNAS). The fracture stimulation service providers used by Australia Pacific LNG are also registered with NICNAS.

It has been claimed that a range of chemicals used in the fraccing process in Australia have not been properly assessed or approved by NICNAS. What is not mentioned is that these chemicals were being used in existing industrial processes (including fraccing) at the time of establishment of NICNAS and are covered (along with tens of thousands of other chemicals) by a ‘grandfathering’ provision and do not require assessment or approval. All the chemicals used in fracture stimulation are used in other industrial processes which have higher potential human health exposure risks and do not have specific NICNAS approvals for these other applications.

The additives used in the fraccing process

Additive	Common name		Common use	Purpose of use	Average % used by volume
Acids and Bases	Acetic acid		Found in vinegar, inks and paints	pH adjustment of water as a buffer	0.040
	Caustic soda		Used in soap production, chocolate and cocoa processing, soft drink processing, paper pulp manufacturing, fuel production	Helps dissolve minerals pre-fraccing	0.040
Biocides	Bleach		Disinfectant, bleaching agent, water treatment, dental sterilisation	Eliminate bacteria in water	0.016
	Bronopol		Disinfectant, preservatives, household cleaners, water treatment		0.0018
Breaker	Enzyme		Enzyme active, washing powder	Allows a delayed breakdown of the gel polymer	0.005
Potassium chloride	Potassium chloride		Table salt substitute, also used in fertilisers and some medical treatments	Stabilises clays to prevent swelling and maintains effectiveness of other additives	2.000
Crosslinker	Monoethanolamine Borate		Antiseptic, flame retardant	Increase and maintain fluid viscosity	0.12
	Octoborate		Agriculture sprays		0.0007
Surfactants	Alcohol		Alcoholic beverages, fuel	Reduce surface tension to aid in gas flow	0.12
	Terpenes / terpenoids / sweet orange oil		Pharmaceuticals, contributes to flavour of cinnamon, cloves and ginger		0.01
Guar gum / gel	Guar gum		A thickener in cosmetics, baked goods, ice cream, toothpaste, sauces and salad dressing	Thickens fluid (water) to help suspend sand	0.2
Gel Stabilizer	Sodium Thiosulphate		Aquarium and Aquaculture	Removes chlorine	0.06
Flocculant	Ferric chloride		Water treatment	Removes clay	0.02

9. Social Impact and Community Investment

As part of the development of the Australia Pacific LNG EIS, extensive research was undertaken into potential social and community impacts from the CSG to LNG Project. During the development of the Social Impact Assessment (SIA) and the Social Impact Management Plan (SIMP), Australia Pacific LNG consulted extensively with stakeholders, including all affected local government authorities, key state government agencies and departments and communities. Ongoing consultation with stakeholders and partners is a crucial component in the implementation of the SIMP and this is outlined in the community and stakeholder engagement plan.

The SIMP identifies seven **action plans** which aim at mitigating social impacts, a framework for a **monitoring program** which will seek to monitor and measure the effectiveness of the SIMP and a **community engagement strategy** which will promote the ongoing role of the communities in which Australia Pacific LNG operates throughout all stages of the SIMP.

Australia Pacific LNG has developed a Social Impact Management Plan which will be implemented with input from Regional Community

The **Housing and Accommodation action plan** identifies measures to mitigate the potential impacts of rising housing costs in the gas fields region, due to an influx of construction and operations workers. Measures include providing accommodation for the construction workforce in temporary accommodation facilities. In addition, Australia Pacific LNG will invest in a range of mitigation strategies aimed at minimising housing impacts and supporting long term, sustainable growth of the local housing markets.

A **Community Investment action plan** has been developed to assist communities in the gas fields and pipeline region mitigate social impacts and leverage off project induced benefits. Australia Pacific LNG's community investment will primarily be centred around four themes; skills development, natural resource stewardship, safe and healthy communities, and sustainable management of population. It will be delivered through four main delivery mechanisms:

- Investment in social infrastructure
- Partnerships between Australia Pacific LNG and community organisations
- Sponsorships and donations to local organisations' projects or events
- Australia Pacific LNG employee giving and volunteering.

Australia Pacific LNG has also developed an **Indigenous Engagement action plan**. Key components in the action plan are targeted measures to mitigate social impacts to the Indigenous population and traditional owners. These include providing training and education and employment opportunities, assisting Indigenous businesses with business development and fostering respect for Indigenous cultures and values within Australia Pacific LNG.

A **Community Health and Safety action plan** has been developed in response to concerns about the health and safety impacts to the region. Key actions are to undertake emergency response planning to address impacts to traffic, transport and emergency services, to develop or support community health and safety initiatives, and to provide strong workforce health and safety rules and protocols.

The Project's **Workforce and Training action plan** establishes cooperative strategies to provide training for existing and potential project employees. The strategies aim at providing relevant training to residents of the gas fields and pipeline communities, as well as to underrepresented and disadvantaged groups. Australia Pacific LNG will work closely with organisations such as Energy Skills Queensland (ESQ), Queensland Minerals and Energy Academy (QMEA) and the Department of Education and Training (DET) to implement the action plan.

The **Local Content action plan** includes implementing a local content policy aligned with the Australian Government's Australian Industry Participation Plan, to encourage local business participation in the Australia Pacific LNG Project. Australia Pacific LNG is working with the Department of Employment, Economic Development and Innovation (DEEDI) and the Industry Capability Network Queensland (ICN) to assist local businesses to understand tendering requirements. To date, more than 2,000 Australian businesses have registered their interest in being part of the Australia Pacific LNG Project.

A **land use and land access action plan** has also been developed, outlining actions Australia Pacific LNG will take to minimise land and amenity impacts, as well as identifying means of sharing project benefits with directly impacted landholders as detailed earlier in this submission.

A **community engagement plan and grievance and dispute resolution policy** has also been developed for the SIMP. Australia Pacific LNG is establishing Regional Community Consultative Committees (RCCC) as a key mechanism to foster dialogue with communities and stakeholders, to engage communities in the delivery of the action plans and to ensure participation in social impact monitoring.

Examples of existing SIMP Programs and Partnerships

- **Skills Scholarship Program**

Origin introduced the Community Skills Scholarships Program in 2007 to address local skills shortages in the Surat Basin region and to enable people to be able to live and work locally. Scholarships are open to apprentices in trades listed on the National Skills Needs List, not just in the oil and gas industry.

Scholarships have been provided across a diverse skills base including butchery, hairdressing, motor mechanics, electrical, carpentry and plumbing.

Recipients receive a series of pre-tax payments of up to $13,500 as they progress through their training, which can be used to purchase items such as textbooks, tools and uniforms. Businesses also receive incentives of up to $3,000. There is also a bonus cash payment if a recipient stays with their employer for a least a year following their training completion. There are currently approximately 70 recipients of the scholarship.

Skills Scholarship recipients outside Miles Memorial Hall

- **CARS Program**

The Origin Caring About Road Safety (CARS) Driver Training Program run in partnership with RACQ introduces participants to everyday scenarios they may encounter on the road and helps them develop the skills and experience to deal with them, safely and confidently. The program is available to Year 11 and 12 students from participating schools who have a Queensland Learner's Licence. The program is currently delivered in all high schools in Maranoa Regional Council, Western Downs Regional Council and Banana Shire. The CARS program combines both e-learning and practical training.

Dalby State High School students participating in the CARS Program in 2010

- **Building Regional Capabilities Program**

The building regional capabilities program aims at assisting local businesses to successfully tender for contracts in any major project.

The program has three steps:

- **Assess Capability** – Potential suppliers are assisted to register with the Industry Capability Network and instructed both in group sessions and one-on-one sessions (as required) to write an effective 'Capability Statement'
- **Reinforce and Build –** Suppliers are then invited to complete an online questionnaire (developed by Australia Pacific LNG in partnership with DEEDI) which positions them on a generic 'tiered' framework for contracting into a major project. Suppliers are also advised of areas in need of further development. In partnership with DEEDI, Australia Pacific LNG is providing training which targets the key areas of focus for tendering: Workplace Health & Safety, Managing Financial Risk, Quality Assurance, Environmental Management and overall Risk Management across the business
- **Position and Promote –** Australia Pacific LNG has a top down and bottom up approach to promoting suppliers to the primary contractors. At the top end, contractors develop and deliver against a Local Content Plan and from the bottom up, Australia Pacific LNG is working with all tiers of government (DEEWR, DEEDI and representatives from each participating LGA) to identify and promote regional suppliers who meet the criteria for operating in a major project environment to the primary contractors.

To date, approximately 260 businesses have started participating in this program across the Surat Basin and Gladstone regions.

Attachment 1: Extensive Consultative Arrangements

I. Consultative Mechanisms Established under Conditions introduced by the Queensland Coordinator General

(a) Industry Leadership Group

- Industry leader representation at COO Level
- Interface between proponent companies on cumulative CSG to LNG Project issues – and when necessary liaison with Government and senior department heads and key stakeholders
- Under the Industry Leadership Group, cross industry work groups have been established to focus on the key issues areas of Land, Water, Community and Social, Environment (including Fraccing), Regulatory Framework and Health and Safety

(b) Regional Community Consultative Committees

- Independently Chaired
- Main issues areas are social and economic impacts (implementation of project Social Impact Management Plan), review and monitoring of the Social Impact Management plan and associated Housing and Community Investment Strategies
- Membership drawn from a cross section of the communities, including chambers of commerce, welfare groups, local government, NGO's etc
- Australia Pacific LNG runs four RCCC's:
    - Maranoa Region (jointly with Santos)
    - Western Downs Region
    - Banana Shire
    - Gladstone Region (jointly with QGC and Santos)

II. Surat CSG engagement group

- Announced by the Premier and established by DEEDI
- Independently Chaired (John Cotter – ex Agforce)
- Member organisations include Agforce, National Farmers Federation, local landholder action groups, Landcare, Murray Darling Basin Advisory Committee, GAB Advisory Committee, Regional Mayors, DEEDI, DERM, DLGP, QWC
- Focussing primarily on land and water related issues
- CSG to LNG Project representation at Project Director Level
- One overarching committee and Dalby and Roma sub committees
- Water and Land Access working groups

III. Issue specific bodies

- Gladstone Infrastructure Working Group
- Queensland Water Commission technical advisory group
- Government Jobs and Skills Taskforce

IV. Region wide bodies

Surat Local Leadership Group

- Established by the Sustainable Resource Communities Partnership, between DEEDI, QRC and LGAQ
- Membership: local government (mayors), DEEDI, local stakeholders, companies

Attachment 2: Australia Pacific LNG Project – Regulatory Approval Regime

(a) Introduction

The Australia Pacific LNG Project is being developed in the context of an extensive and robust regulatory environment under the various jurisdictions of local, Queensland and Commonwealth Governments. Regulators have a large range of assessment, monitoring, compliance-auditing and enforcement measures to draw upon to ensure that favourable social and environmental outcomes are achieved.

Moreover, the Queensland Government has demonstrated its willingness to respond to new information and/or community needs through several recently introduced policy and regulatory changes, for example:

- *Protecting Queensland's Strategic Cropping Land* Draft State Planning Policy,
- Introducing BTEX standards to ensure the chemicals are not actively used in stimulation/hydraulic fracturing activities,
- Compulsory new reporting requirements to affected landholders of any drilling, hydraulic fracturing and certain exploration activities,
- Mandatory land access and compensation code,
- Regulation of beneficial reuse of CSG water, and
- *Exploration and urban areas: striking the balance between exploring for resources and urban living.*

(b) Regulatory environment for CSG Projects in Queensland

Regulatory control of the potential environmental and social impacts of the Australia Pacific LNG Project, along with other major CSG-LNG Projects in Queensland, is principally dealt with under three key statutory processes:

- Evaluation of an environmental impact statement (EIS) required for a declared 'significant project' under the *State Development and Public Works Organisation Act 1977*, managed by the Coordinator-General,
- Assessment as a 'controlled action' for potential impacts to matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999*, administered by the Minister for Sustainability, Environment, Water, Population and Communities (SEWPaC), and
- Assessment of an application for an environmental authority for petroleum activities under the *Environmental Protection Act 1994*, administered by the Department of Environment and Resource Management (DERM).

Each of these regulatory regimes requires a rigorous, public assessment process against comprehensive terms of reference or other statutory requirements, which are underpinned by the principles of ecologically sustainable development. Project proposals are only allowed to proceed if appropriate environmental, social and economic outcomes are assessed as likely to be achieved. In the case of the Australia Pacific LNG Project, the outcome of these

environmental impact assessment processes are heavily conditioned approvals, the scope and scale of which are unprecedented for any project proposal in Queensland to date.

For example, the Coordinator-General has exercised his unique powers to strengthen the regulatory regime through the imposition of newly developed legal requirements (imposed conditions) that have not been used to previously regulate project impacts in Queensland. The Coordinator-General's report on the Australia Pacific LNG Project EIS includes the following imposed conditions, over and above existing regulations:

- 58 imposed conditions mainly related to environmental and water issues,
- 16 imposed conditions related to traffic and transport issues, and
- 5 imposed conditions (including many sub-components) related to social and economic impacts.

Examples of the conditions imposed by the Coordinator-General require Australia Pacific LNG to:

- Submit a project-wide environmental offsets strategy and program for approval, which addresses the Queensland Government Environmental Offsets Policy and specific issues associated with impacts to biodiversity, protected vegetation, wetlands and coastal and marine areas,
- Cooperate with local authorities and service providers with specific actions documented in agreements and underpinned by evidence-based plans approved by the Coordinator-General where there is disagreement,
- Provide mandatory housing in communities to be affected by project-induced population increases,
- Provide financial investments in certain community services,
- Fund road upgrades agreed to by road authorities and in accordance with pre-existing standards related to numbers of vehicles using particular roads,
- Provide groundwater modelling and other relevant information to assist in the development of a CSG industry cumulative groundwater model, and
- Provide reports on cumulative impact assessment to the CSG Industry Monitoring Group as required in relation to a range of environmental values (e.g. air and water quality, ecological systems and biodiversity, acoustic environment etc.).

Conditions imposed under the *Environment Protection and Biodiversity Conservation Act 1999* approvals for each of the three components of the Australia Pacific LNG Project (gas fields, pipeline and LNG facility) total 261. Each set of conditions is comprised of three common groups of conditions or outputs as follows:

- A primary group of requirements relating to the development, approval, publication and review of various management plans relating to listed species or ecological communities that may be affected
- A secondary group of generic requirements for auditing, reporting, data collection, record-keeping, financial assurance and notification that are generally applicable to the primary specific requirements

- Additional conditions relating to specific issues associated with the particular project elements (e.g. CSG water management, and springs and groundwater impact assessment, mitigation and monitoring for the gas fields).

The recently granted Environmental Authority issued to Australia Pacific LNG for its Condabri gas field development area (the first to be developed) contains 307 conditions of approval. These conditions cover the following broad areas:

- General environmental harm prevention and control, including the operational plan, financial assurance and third party audit,
- CSG Water Regulated dams,
- Land, including disturbance controls to flora and fauna, soils, land release of treated wastes,
- Noise and air, including environmental nuisance prevention and control,
- Waste management, Rehabilitation and monitoring,
- Stimulation, including controls on hydraulic fracturing and monitoring, and
- Community issues and notification procedures.

Some of these categories are new requirements developed in response to community and other stakeholder concerns after the Coordinator-General's report was issued.

In addition, the Government has extended the role of the Queensland Water Commission to oversee and manage the cumulative impacts to groundwater in declared cumulative management areas and to implement new CSG water management regulations and policies. The Commission has been able to build on the impact assessment, planning and facilitation work of the Coordinator-General to draw on the data, resources and expertise of various proponents during the development of whole-of-region water models and cumulative impact management approaches.

(c) Compliance and enforcement

The regulatory regime includes mandatory and comprehensive third party compliance auditing and complaint recording and response systems. For the Australia Pacific LNG Project there are conditions that require:

- Aappropriately qualified third party auditors, approved by the Coordinator-General, DERM or SEWPaC, auditing compliance with the conditions within one year of the commencement of the project and then three-yearly thereafter (in the case of the Coordinator-General's requirements),
- Copies of the audit reports being provided to the Coordinator-General and DERM (and in the Commonwealth's case published on the Internet),
- Third party auditors certifying audit findings as being an accurate and independent assessment of compliance with the conditions, and
- The proponent, within a reasonable timeframe, demonstrating that any recommendations arising from the audit report have been acted upon and that actions

have been taken to prevent a recurrence of any non-compliance issues identified by the report of the third party auditor.

There are also conditions requiring separate annual environmental returns to be submitted to both DERM and SEWPaC for the life of the project. The annual environmental return for DERM must:

- Provide details regarding the status of disturbance, progressive rehabilitation and final rehabilitation associated with project activities,
- Provide details regarding complaints relating to environmental harm and environmental nuisance made during the year,
- Identify all non-compliances with conditions and commitments made in the environmental management plans prepared in support of the environmental authority applications to DERM, and
- Identify any amendments needed to the environmental management plans to achieve compliance.

The consequences for serious non-compliances involve harsh financial and other penalties. For example, under the *Environmental Protection Act 1994*, DERM can prosecute CSG operators for serious breaches of operating standards and impose clean-up requirements. The act provides for fines up to $2 million and prison sentences for up to 5 years for significant breaches.

The auditing, penalty and enforcement elements of the regulatory regime mean that proponents are not able to sustain non-compliance with conditions of approval.

(d) Balance between facilitation and impact mitigation

Through its agencies, the Queensland Government has a number of roles and responsibilities in regard to the implementation of any proposed major project proposal in Queensland. Examples of the different roles played by government agencies in achieving a balance between facilitation of development and rigorous impact mitigation are summarised below.

The various approval processes linked to the *State Development and Public Works Organisation Act 1977*, the *Sustainable Planning Act 2009* or the *Environmental Protection Act 1994* all have clear statutory requirements that ensure a distinction is maintained between the State's interest in support of a project proposal and the State's role as an assessor of the project in accordance with sustainability principles.

The Queensland Government has recently developed additional administrative structures and regulatory measures to facilitate and regulate CSG development, where feasible, while also providing for intervention and enforcement to ensure that adverse impacts are avoided and/or mitigated (i.e. impacts associated with individual projects and cumulative impacts).

The government's LNG Industry Unit drives collaborative planning and whole-of-industry issue identification and conflict resolution. The LNG Unit has also been able to stand apart from the impact assessment processes and normal planning processes (e.g. land development and transport planning) to focus on industry specific issues requiring new ways of facilitating joint planning and common ground between proponents, between proponents

and government agencies and between government agencies with sometimes conflicting objectives.

The Unit has supported work to assist the industry and the community. For example the Government has provided $27.95 million in funding for the Surat Basin under its *Sustainable Resource Communities Policy.* This policy aims to manage the rapid growth associated with the expected boom from the LNG industry. This provision includes infrastructure for transport, sporting facilities and trades, training and housing initiatives.

Conclusion

Taken together, the many statutory assessment and decision-making processes provide a comprehensive and thorough system of checks and balances designed to ensure that major CSG proposals only proceed or continue to operate if the project proponents can demonstrate compliance with the various relevant legislative requirements relating to matters such as sustainability criteria and the protection of environmental, natural resource and other community values.

Attachment 3: Regulatory Approvals: key legislative instruments

Legislation	Authority	Status
Environment Protection & Biodiversity Act 1999	Management on impacts of matters of national environmental significance	Strict guidelines for management and mitigation of impacts on vulnerable, threatened and endangered species
State Development & Public Works Organisation Act 1971	Triggers the Environmental Impact Statement process which underpins Coordinator General's authorisation of developments	Delivery of a Coordinator-General's report containing approximately 1200 conditions emphasises the high level of regulation applied to the Australia Pacific LNG Project
Environmental Protection Act 1994	Allows for issue of Environmental Authorities for petroleum activities to be undertaken on tenures, including management of associated water and salt and brine. Regulates use of chemicals in hydraulic fracture stimulation	Adaptive guidelines for the management and mitigation of environmental impacts of petroleum activities allows for approvals to be changed to respond to new information/circumstances ensuring environmental protection. Industry leading practices for protection against introduction of BTEX into the environment
Petroleum & Gas (Production and Safety) Act 2004 & Petroleum Act 1923	Permits the construction and operation of gas field facilities for the purposes of exploration and production. Establishes a land access code containing mandatory conditions which must be complied with by petroleum companies accessing private land. Entry notice requirements and a requirement that a Conduct and Compensation Agreement is negotiated before advanced activities occur Establishes a compliance regime for the safe operation of petroleum and gas facilities. Provides for right to extract associated water Requires CSG operators to notify landholders and government prior to, and after, undertaking hydraulic	Land access code is aimed at achieving 'best practice' for management of land access and relationships between land owners and petroleum and gas companies. Dispute resolution process with Land Court recognised as last resort 'independent umpire' for resolving disputes between parties. Strict compliance regime provides for ongoing audits of facilities and harsh penalties for non-compliance. Industry leading practice

	fracture stimulation	
Water Act 2000	Empowers Queensland Water Commission to manage the cumulative impacts of the CSG industry and establishes monitoring and reporting regime to assess impacts of CSG activities on groundwater bores and springs, requires CSG operators 'make good' impacts	Best practice for monitoring and management and includes declaration of Queensland's first Cumulative Management Area in relation to CSG water
Water and Supply (Safety & Reliability) Act 2008	Permits the surface discharge of associated water and aquifer injection	Stringent standards based on Australian Drinking Water Guidelines to protect drinking water supplies

This is a list of key legislation and regulatory approvals required for the Australia Pacific LNG Project, with a particular focus on water and land access issues. This is not an exhaustive list of all legislation and approvals needing to be considered for the Project.