Agenda

- About AGL
- About ATP529P
- About CSG
- Environmental compliance
- Landholder consultation
- Community consultation
- Geology and Hydrogeology
- Galilee Basin study
- Coexistence & rehabilitation
About AGL

- The Australian Gas Light Company (AGLC) was formed in Sydney in 1837. It supplied gas for the first public lighting of a street lamp in Sydney in 1841 and was the second company to be listed on the then Sydney Stock Exchange. **175th Year!**
- 2,000 employees across AGL Energy, ~150 employees in AGL Upstream Gas
- Largest integrated renewable energy company
- 3.4 million customer accounts across NSW, SA, VIC and QLD.
- 57% of AGL’s installed capacity is low (gas fired) or zero emission
- 2,089PJ (2P) equity ownership of upstream gas reserves (June 2011)
- Ownership of Upstream Assets across QLD, NSW and VIC with a mixture of conventional oilfield and CSG assets (predominantly CSG)
About ATP529P

- ATP529 granted in 1992 under the Petroleum Act 1923
- Galilee Energy Ltd and AGL (50% and Operator)
- AGL farmed in July 2008
- Approximately 6,000 km²
- 542km 2D seismic
- 7 coreholes
- 3 test wells
- Glenaras production pilot:
  - 5 production wells
  - 357ML holding pond
  - Aquifer monitoring bores
  - Camps.

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About CSG

› CSG is natural gas, used by power stations, businesses and consumers
› CSG is mostly methane [CH\textsubscript{4}]
› Gas is adsorbed onto coal surfaces and held in place by hydrostatic pressure
› Gas comes to the surface once that hydrostatic pressure is released by removing some of the water off the coals
› During a pilot the gas is burnt to reduce greenhouse gas emissions
› Enclosed flare to minimise risk of bushfire and reduce light pollution

^Glenaras Flare – Apr 2012
Environmental compliance

- Petroleum Act 1923
- Petroleum & Gas (Production & Safety) Act 2004
- Environmental Protection Act 1994
- Land Protection (Pest and Stock Route Management) Act 2002
- Water Act 2000
- Nature Conservation Act 1992
- Aboriginal Cultural Heritage Act 2003
- Native Title Act 1993 (Cwth)
- Native Title (Queensland) Act 1993
- Environment Protection and Biodiversity Conservation Act 1999 (Cwth)
- Forestry Act 1959
- Queensland Heritage Act 1992
- Wild Rivers Act 2005

- Petroleum Regulation 2004
- Petroleum and Gas (Production and Safety) Regulation 2004
- Environmental Protection Regulation 2008
- Environmental Protection (Noise) Policy 2008
- Environmental Protection (Air) Policy 2008
- Environmental Protection (Water) Policy 1997
- Environmental Protection (Water) Policy 2009
- Environmental Protection (Waste Management) Policy 2000
- Environmental Protection (Waste Management) Regulation 2000
- Land Protection (Pest and Stock Route Management) Regulation 2003
- Water Regulation 2002
- Environmental Protection Regulation 2008
Landholder consultation

› Dedicated Land and Approvals manager for project
› Pay for reasonable cost of the landholder’s lawyer
› Discuss:
  » Proposed activity prior to commencing the work
  » Timeline
  » Timing of property activities
  » Minimising disturbance
  » Location of proposed well sites, roads and other works
  » Compensation
  » Activity updates.

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Community consultation

› Brief local councils and stakeholder groups (RAPAD, MITEZ, etc) about proposed activities
› Community forums and events (Longreach Show, Muttaburra Flock Ewe show)
› Open day (26th May at Glenaras Station, 10am – 3pm)
› Information sessions (21-22 Feb 2012)
› Project website
› Advertisements in local papers around activity and events
› Sponsorships.
Geology and Hydrogeology

› Alluvium (Tertiary – Quaternary)
  » Older deposits – remnant mesas in the landscape
  » Younger deposits – sediments beneath floodplains of present day rivers and creeks

› Eromanga Basin (part of GAB) (Jurassic – Cretaceous)
  » Hooray Sandstone
  » Adori Sandstone
  » Hutton Sandstone
  » Rewan Formation

› Galilee Basin (Permian)
  » No beneficial aquifers

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Galilee Basin study

- AGL’s Draft Underground Water Impact Report will be on project website from 31 May
- GBOF has commissioned a basin-wide compilation of:
  - Known geology
  - Known hydrogeology
  - Water bore data
  - Tenement information
  - Monitoring program
  - Conclusion

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Coexistence

Acacia Downs campsite - Aug 2010

Glenaras 05 well site with cattle – Aug 2011

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Coexistence

^Glenaras lay down area, Oct 2010

^Rodney Creek 3, Apr 2010

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Coexistence

^Glenaras 06 pilot well, Apr 2012

^Glenaras 06 pilot well, Apr 2012

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Rehabilitation

Acacia Downs rig site, Aug 2010

Acacia Downs rig site, Feb 2011

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Thank you

Questions?

Appendix

- Drilling
- Hydraulic fracturing
- Produced water management
- Cultural heritage
- Water monitoring
- Drilling
Drilling

› Drill with a balanced mud system using natural clays and salts to minimise impact on formation
› Pressure cement steel casing strings in place and test
› Aquifers are sealed behind steel and concrete with no connection to target coals
› At the end of testing or production the well is plugged and abandoned with cement plugs and capped below ground

^Perforated production well schematic
Hydraulic fracturing

- Production casing is perforated with focused explosive charges targeting the coal seam only.
- Water pumped at high pressures into rock to start fracture:
  - 2,000 psi – 3000 psi typical treating pressures (same as the pressure in the hydraulics in a tractor)
  - <1.0 ML of water used to stimulate 5 target coal seams (an Olympic swimming pool is 2.5 ML)
- Sand props the fracture open letting water and gas flow to well bore.
- Various ways of determining vertical fracture growth.
- Chemicals used:
  - Can be found in most households or swimming pools.
  - Undergo an independent Risk Assessment for approval by DERM.
  - Are fully disclosed to the regulator and the community.

^Schematic of fractured well

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Produced water management

^ 357ML, 11.5ha Glenaras holding pond at Sept 2011
Produced water management

› Subject to feasibility assessment, regulatory approvals and commercial agreements

› Treatment required for most options

› Disposal
  » Re-injection (virtual or actual, into tanks and troughs, GAB or coal seams)
  » Off-site disposal
  » Environmental flows

› Beneficial reuse
  » Primary production
    ▪ Irrigation
    ▪ Stock watering
  » Industrial / commercial (including mining or coal washing)
  » Raw water for town water supply? (after treatment)
Water monitoring

- Water bores
  - 36 water bores within the ATP area
  - All used for stock & domestic purposes
  - Few in alluvium
  - Most in GAB aquifers; none in Galilee Basin aquifers

- Baseline Assessments (BA)
  - Priority area assessed around pilot testing area
  - BA completed of the 3 bores in priority area

- Flow testing programs
  - Glenaras flow testing program
  - Since October 2010

^Galilee Gas Project water monitoring bores

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  - May 2012
  - AGL External
Cultural heritage

Aboriginal people are the primary guardians, keepers and knowledge holders of their cultural heritage

- Aboriginal Cultural Heritage Act 2003

- Companies have a duty of care to take all reasonable and practical measures to avoid harming Cultural Heritage (CH)
- CH Management Plan approved by the Central Western Aboriginal Corporation (CWAC)
- AGL’s desktop studies
- CWAC if project areas have CH significance
- Officials visit site before activity occurs and undertake monitoring to identify any issues of CH significance

\^Registered Cultural Heritage Bodies

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