



## **Arrow Energy – the Bowen Basin**

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# Arrow Energy – current position

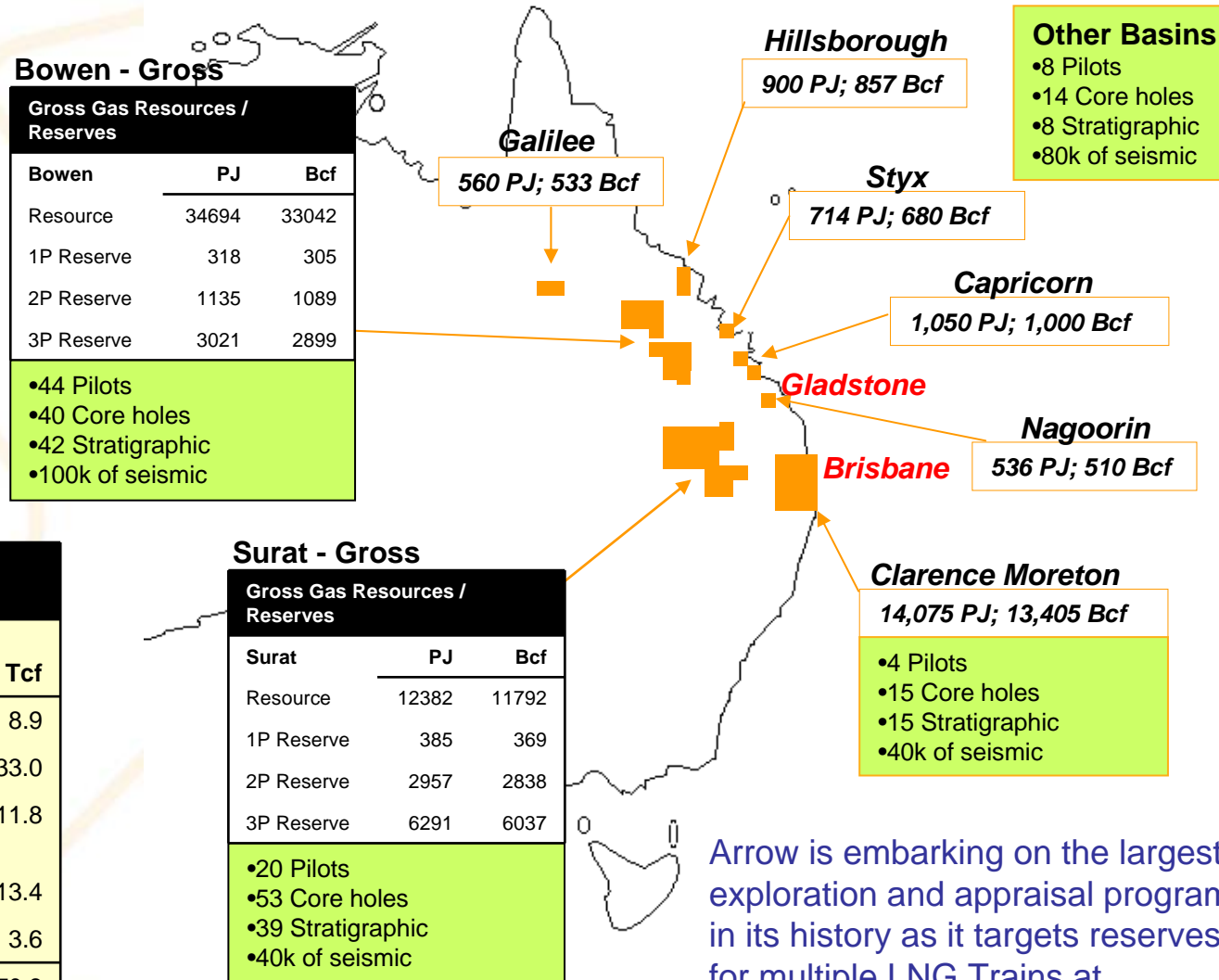


- A \$3.3 Bn vertically integrated, specialist CSG company operating in five countries
- Australian/Asian alliance with Shell. JV Partnerships with some of Asia's leading companies
- Huge domestic acreage position over eastern Australian coal beds with over 9 TCF of 3P reserves. Supplying 24% of Queensland's gas together with 488 MW of net generation capacity
- Advanced plans for the world's first export CSG to LNG plant on Fisherman's Landing in Gladstone, Australia and later, larger quantities from a proposed Shell world-scale plant on Curtis Island
- Cash at end of year: A\$399m

# Arrow Energy - resources



- The largest CSG acreage position in eastern Australia >65,000 sq km
- Over 90% of land still to be certified for reserves
- Arrow tenements have 24% of east coast 3P reserves



Gross Gas Resources / Reserves		
Area	PJ (x1000)	Tcf
Reserves	9.3	8.9
Bowen Basin	34.7	33.0
Surat Basin	12.4	11.8
Clarence Moreton Basin	14.1	13.4
Other	3.8	3.6
	<b>74.2</b>	<b>70.8</b>

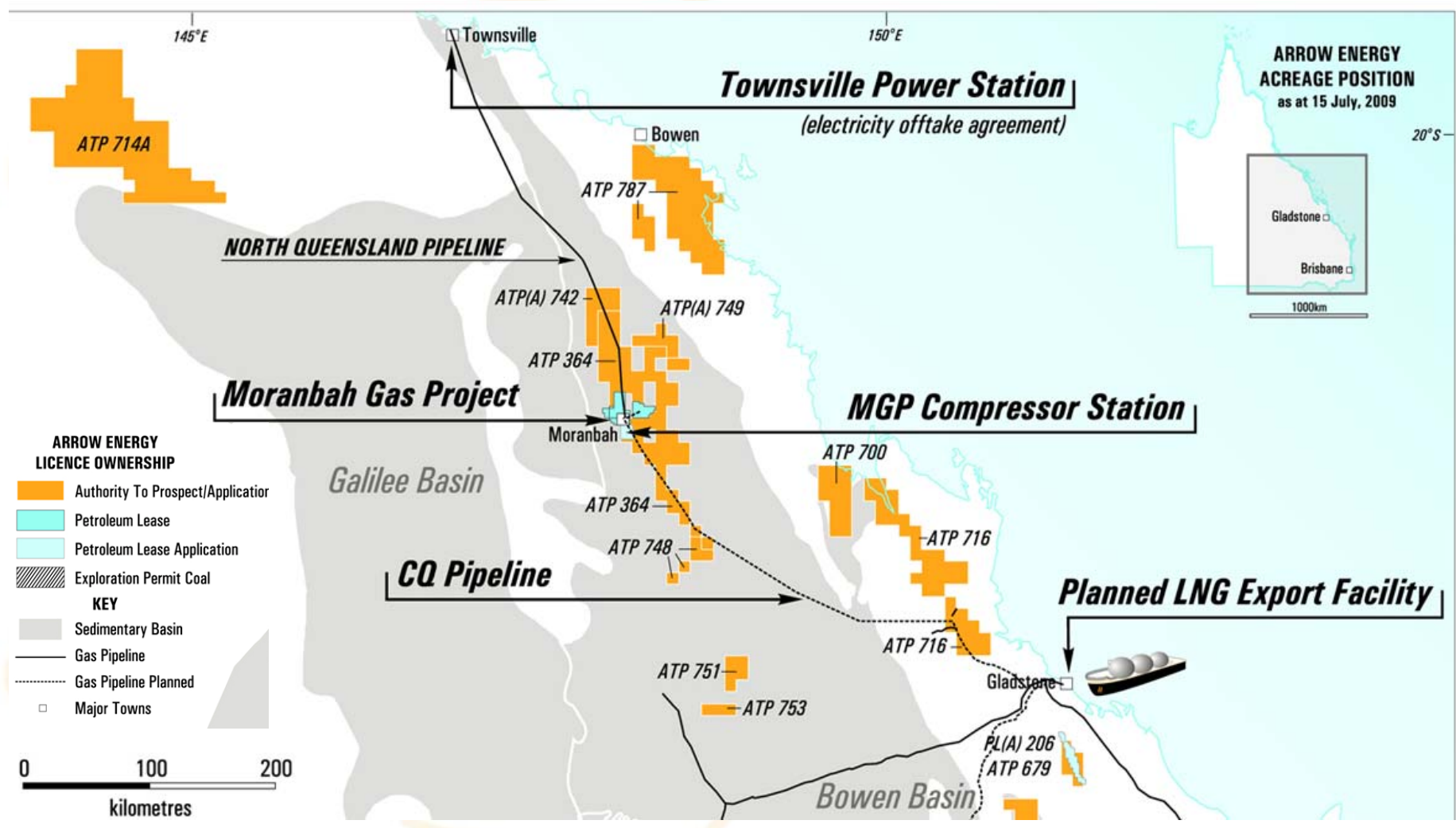
Arrow is embarking on the largest exploration and appraisal program in its history as it targets reserves for multiple LNG Trains at Gladstone

1PJ = 165,000 boe

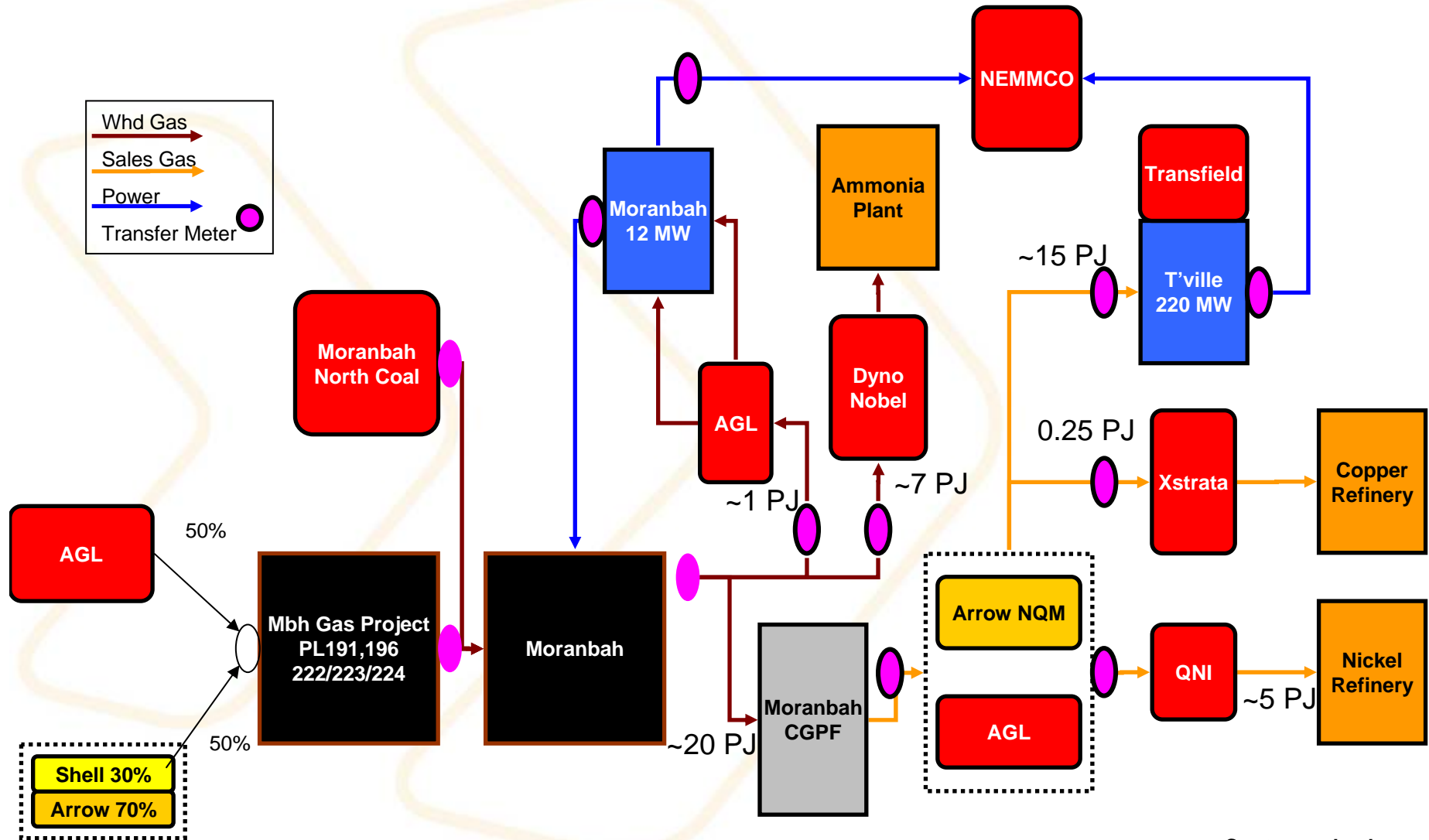
# The Bowen Basin opportunity...

- Area – our Bowen Basin tenements cover more than 5000 sq. km – a large area to explore
- Multiple targets – there are 3 different coal measures, each with multiple targets – this requires application and trialling of appropriate techniques
- Geological complexity – more variable geology than Surat Basin – requires more exploration work to delineate individual project areas
- The original work was started by CH4, who were focussed on developing the MGP. Now AOE has cash and enormous growth aspirations
- The prize is large!

# Arrow's existing Bowen Basin assets



# MGP: The current producing project

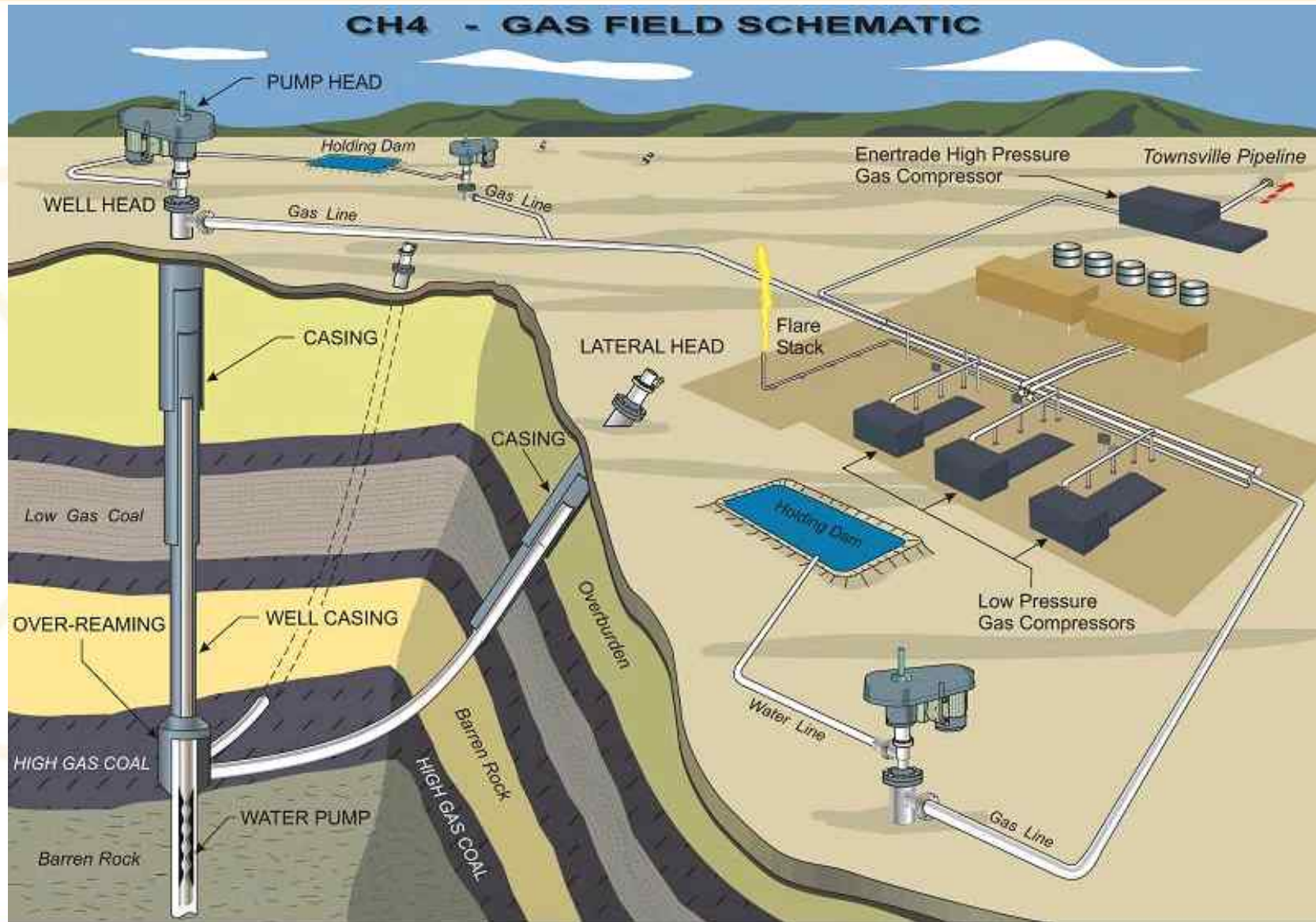


Contractual volumes

# Bowen Basin

- Focus on the MGP, our existing producing asset in the Bowen Basin.
- Key facts
  - Currently producing ~ 50 mmscf/d, with plans in place to increase to ~80mmscf/d over the next 12-18 months
  - World leading project in terms of development and use of SIS drilling technology for CSG
  - Over 150 wells drilled, >25000HP of compression installed
  - Operational team of ~60 people
  - >\$350M invested in the project so far

# MGP – Well & field layout



# Key learnings from the MGP

Our experiences in the MGP have prepared us well for a large development project in the Bowen Basin. Key learnings include:

- Ongoing improvement of SIS drilling; such as optimising lateral well orientation - experience of wells with 10x production rates than nearby wells in sub-optimal orientations
- 1000's of wells to be drilled, completed and ultimately operated and maintained. CSG development needs to be viewed as a manufacturing business (LEAN)
- Hydro-fracturing; potential to open up multiple seams in one well bore, reducing drilling, completion and connection costs per GJ produced. It will also allow us to access previously ignored coal measures.

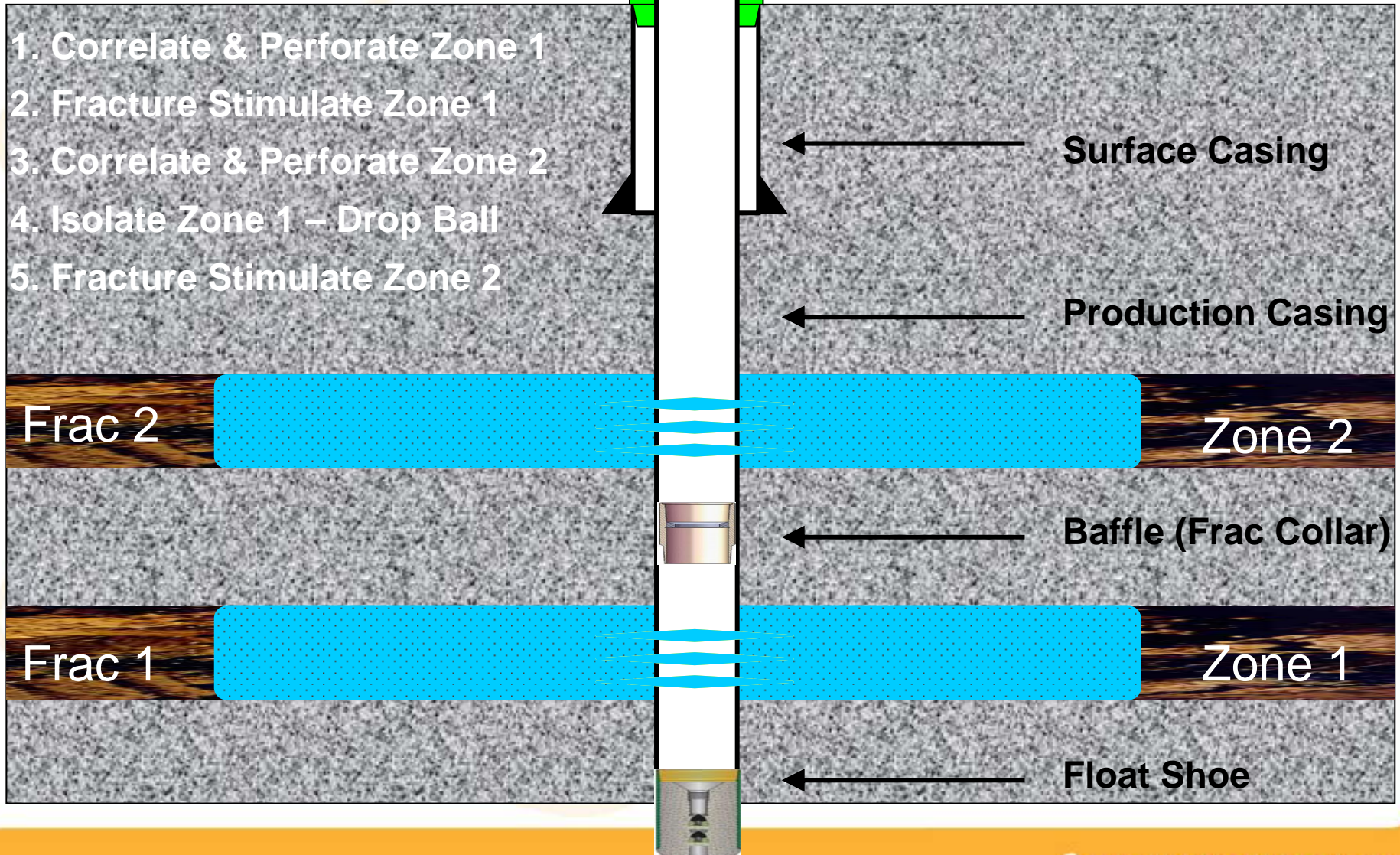
# Improvement through LEAN

- We are adopting LEAN Manufacturing practices developed by successful companies such as Toyota, except that our PLs are the shop floor
- LEAN in the Oil & Gas industry has already been successfully adopted by companies like AERA Energy.
- AERA is one of California's largest oil and gas producers with approximately 165,000 barrels of oil and 50 million cubic feet of natural gas produced each day.
- AERA currently operates more than 16,000 wells and drills more than 1,000 wells per annum
- Our improvement focus has already delivered of reductions of up to 75% in critical activities such as well connection cycle time (reducing the delay between capex spend and revenue).

# Hydro-fracturing

## Fracturing Operations

1. Correlate & Perforate Zone 1
2. Fracture Stimulate Zone 1
3. Correlate & Perforate Zone 2
4. Isolate Zone 1 – Drop Ball
5. Fracture Stimulate Zone 2



# Success with the Fort Coopers



- In 2009 Arrow became the first company to produce gas from the Fort Cooper Coal Measures (FCCMs) and have reserves certified
- For recent pilots, Arrow used the more conventional technology of (for CSG) hydro-fractured vertical wells, rather than SIS drilling normally used in Bowen Basin
- Accessing the FCCMs in Arrow's Bowen Basin acreage has the potential to double the Gas In Place over the "conventional" targets
- This completion will allow us to reduce technical risk during drilling and massively reduce spud-to-spud times (LEAN)

# The future

- The future for Arrow in the Bowen Basin is to supply to Curtis Island LNG
- The intention is that Arrow's JV acreage will supply the majority of the gas for Shell's Curtis Island LNG project
- This growth will increase Arrow's production in the Bowen Basin by 10 times the current level
- Our current estimates are that the associated project will include over 2500 wells

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The reserves estimates used in this statement and throughout this presentation were compiled by Mr. John Hattner of Netherland, Sewell & Associated, Inc., Dallas, and Mr. Gregory Hueni of MHA Petroleum Consultants, Inc., Colorado, and are consistent with the definitions of proved, probable, and possible hydrocarbon reserves that appear in the Australian Stock Exchange (ASX) Listing Rules. Mr. Hattner and Mr Hueni are qualified in accordance with the requirements of ASX listing rule 5.11 and consent to the use of the reserve figures in the form and context in which they appear in this announcement. The resource information in this ASX release has been compiled by Mr Tony Knight, a fulltime employee of the Company. Mr Knight is qualified in accordance with ASX listing rule 5.11 and has consented to the form and context in which this statement appears.