



Elixir Energy

ASX ANNOUNCEMENT

ASX : EXR

17 May 2023

DAYDREAM-2 FUNDING UPDATE

HIGHLIGHTS

- Advanced Finding received on R&D tax credits for Daydream-2
- Government will fund 43.5% of qualifying well costs
- Detailed technical presentation on Grandis made at the APPEA Conference today

Elixir Energy Limited ("Elixir" or the "Company") is pleased to provide a funding update on the Daydream-2 appraisal well planned for later this year (subject to rig availability) in its 100% owned Grandis Gas Project located in Queensland.

Elixir has now received an Advanced Finding from the Australian Government's Department of Industry, Science and Resources that that activities associated with the Daydream-2 project will qualify as eligible R&D Activities for the purpose of the R&D Tax Incentive. Subject to other eligibility requirements, eligible expenditure associated with these R&D activities may be claimed as a refundable R&D offset equal to 43.5% of the expenditure on eligible R&D activities. This primarily reflects the innovative technologies developed over the last decade to enhance stimulation techniques since BG Group (now Shell) drilled in the Taroom Trough.

This Finding is sufficiently strong to support non-recourse project financing of a significant majority of the amount to be claimed. Elixir is currently evaluating providers of such finance.

Elixir is also pleased to attach a presentation on a peer reviewed technical paper titled *The Permian Gas Potential of the Taroom Trough, Queensland - New ideas to unlock a multi-TCF play*. This will be delivered later today by Elixir's Chief Geoscientist Greg Channon at the industry leading APPEA Conference.

Elixir's Managing Director, Mr Neil Young, said: *"Our technical team and supporting professional advisers have done a fantastic job on procuring this R&D Finding. This reflects the innovative thinking that we believe can crack the code to release the enormous gas in place known to be in the Taroom Trough. The paper delivered today at the APPEA Conference is yet another demonstration of this technical excellence."*



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Having the Government fund nearly half of Daydream-2 is a superb outcome for Elixir shareholders – and demonstrates that the Australian Government strongly recognizes the long term criticality of new East Coast gas supplies.”

By authority of the Board:

Neil Young - Managing Director

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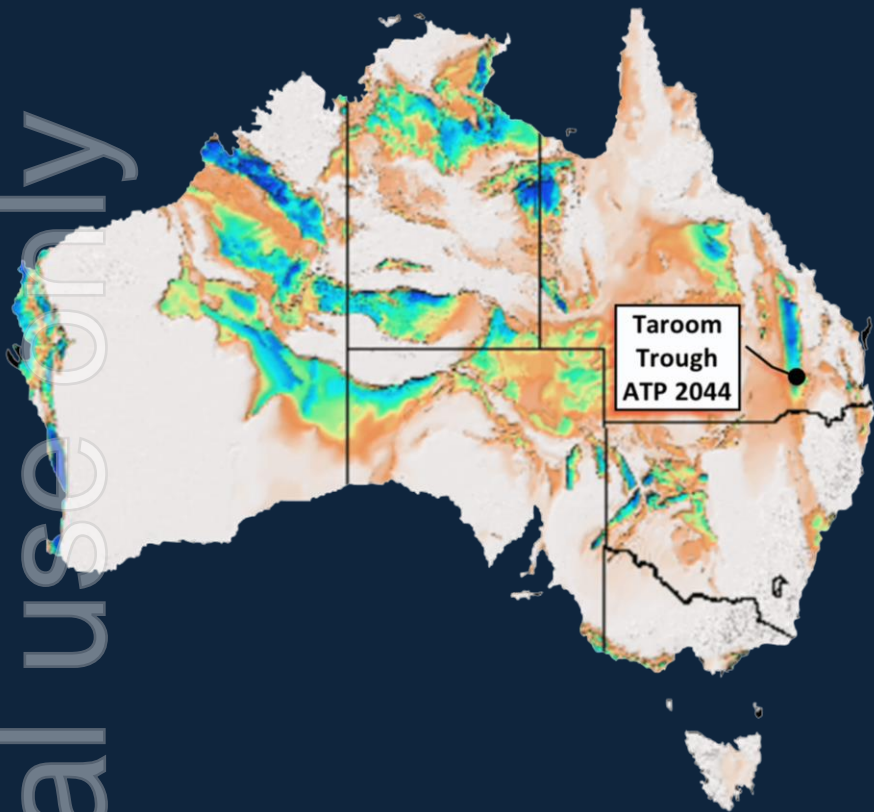


The Permian Gas Potential of
the Taroom Trough,
Queensland
*New ideas to unlock a multi-TCF
play*

Gareth Cooper, Greg Channon*, Pete Bekkers
and Neil Young
*presenter

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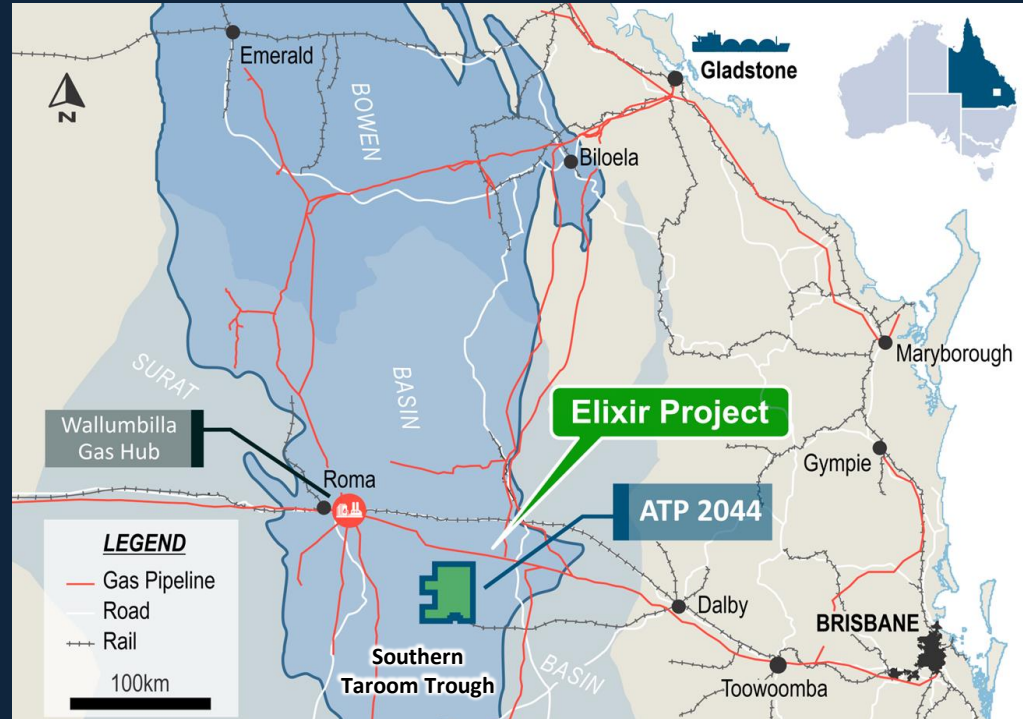
Regional Location



- One of the few remaining places onshore Australia where a substantial gas resource could exist
- Permian coals have sourced oil and gas fields on the flanks, but considerable gas volumes may remain trapped within the depocentre
- The unique geology of the Taroom Trough means this basin may succeed where others (e.g. Nappamerri Trough – Cooper Basin) have failed
- Stress modelling by Elixir has recognised the importance of stress partitioning and stress anisotropy in this area resulting in the derivation of an optimal fracture stimulation program

Location and Key Points

- Synclinal depression in the southern Bowen Basin
- Large resource known to exist with major and smaller operators now active
- QGC (now Shell) flowed gas and condensate to surface from adjacent wells targeting the same play
- East Australian and international gas markets access via Gladstone
- Not subject to any form of domestic gas reservation
- Elixir owns 100% of ATP 2044 and will drill the Daydream-2 appraisal well in late 2023/24



Stratigraphy of Southern Taroom Trough

BASIN	PERIOD	PALY ZONE	STRATIGRAPHY	LITH.	EVENT	FACIES
Surat Basin	CRET.	EARLY	PK5		Tasman Rift	
			PK4		Uplift 90Ma	
			PK3			
			PK2			
			PK1		Thermal Sag 3	
	JURASSIC	LATE	Gubberamunda Sandstone			
			Westbourne Formation			Lower Deltaic
			Walloon Subgroup			
			Jundah Coal Measures			
			Tangalooma Sst/Proud Sst			Coal Swamp & Deltaic
Bowen Basin	JURASSIC	MIDDLE	Taroom Coal Measures			
			Eurombah Formation		Thermal Sag 2	
			Hutton Sandstone			Fluvial
			PJ3			
			Evergreen Formation			Fluvio-Lacustrine
	JURASSIC	EARLY	Bonville Sandstone			
			Lower Evergreen Member			
			Basal Evergreen Sst/Precipe Sst			Fluvial
			PJ1			
			PJ2			
	TRIASSIC	MIDDLE	PT5		Hunter-Bowen Compression	
			PT4			
			Moolayember Formation		Uplift	
			Moolayember Shale Mbr			
			Basal Moolayember Sandstone			Fluvio-Lacustrine
Bowen Basin	TRIASSIC	EARLY	Snake Creek Mudstone			
			Showgrounds Sandstone			
			PT3			
			PT2			
			Rewan Formation		Foreland Loading	
	PERMIAN	LATE	Basal Rewan Sandstone			Red Beds Volcano-clastics
			PT1			
			Blackwater Group			
			Kianga Formation		Compression	Deltaic
			Black Alley Shale			Coal Swamp
Bowen Basin	PERMIAN	EARLY	Winathoola Coal Mbr			
			Tinowan Formation			
			Wallabella Coal Mbr			Marginal-marine
			Muggleton Formation		Thermal Sag	Coal Swamp
			Lorelle Sst. Mbr.			
Bowen Basin	PERMIAN	EARLY	Banana Fm. Flat Top Fm.			
			Barfield Fm.			
			PP5			
			Back Creek Group			
			Blackwater Group			
Bowen Basin	PERMIAN	EARLY	PP3			
			PP2			
			Reid Dome Beds			
			PP1			
			Combango Volc.		Extension	Volcano-clastic
Bowen Basin	PERMIAN	EARLY	Camboon Volc.			
			Timbury Hills Formation			
			Buttall Fm.			
			Kuttung Volc.			
			PP1			

Surat/Bowen Stratigraphy

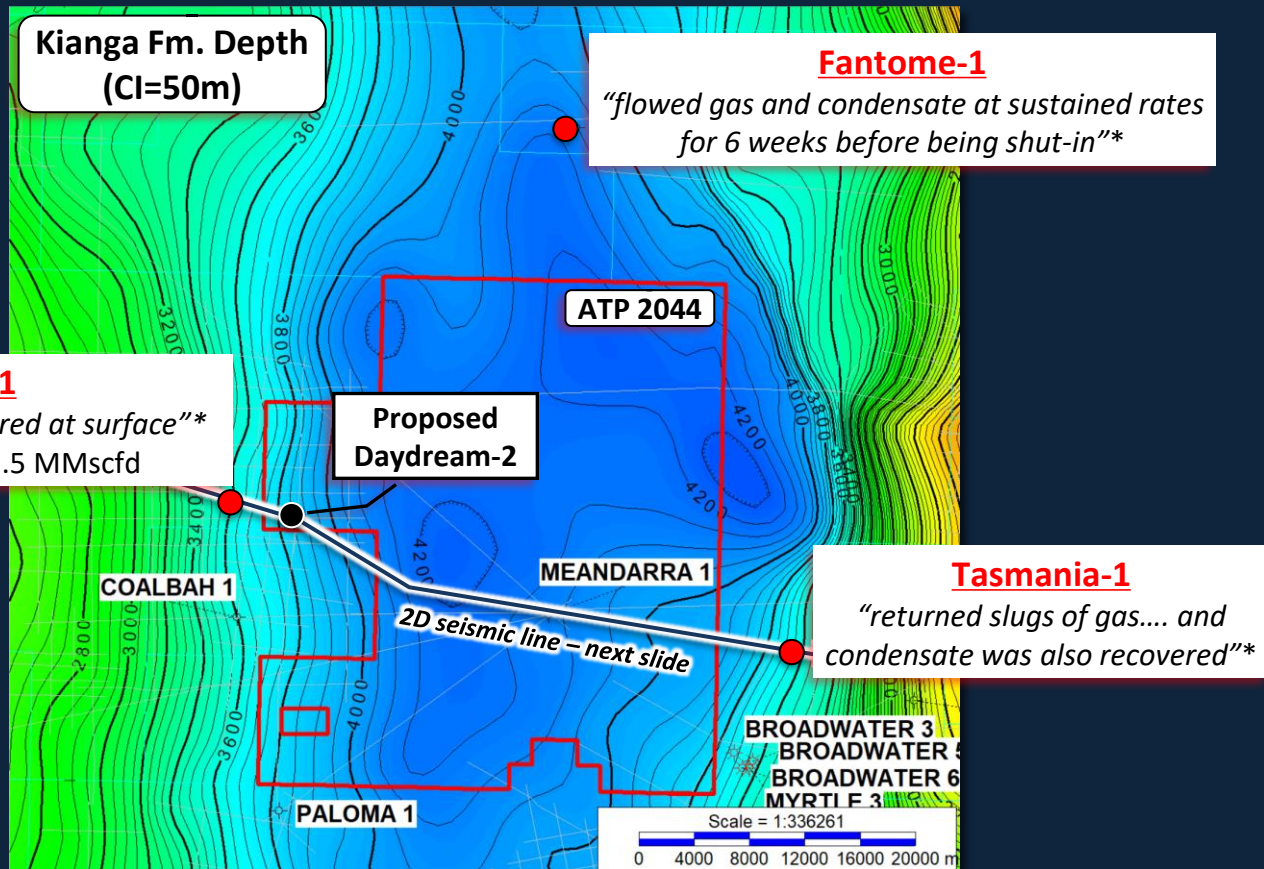
Surat Basin contains key CSG reservoirs

Kianga Fm.

Bowen Basin contains Permo-Triassic low-permeability gas/condensate sandstone and coal reservoirs
Primary target in ATP 2044

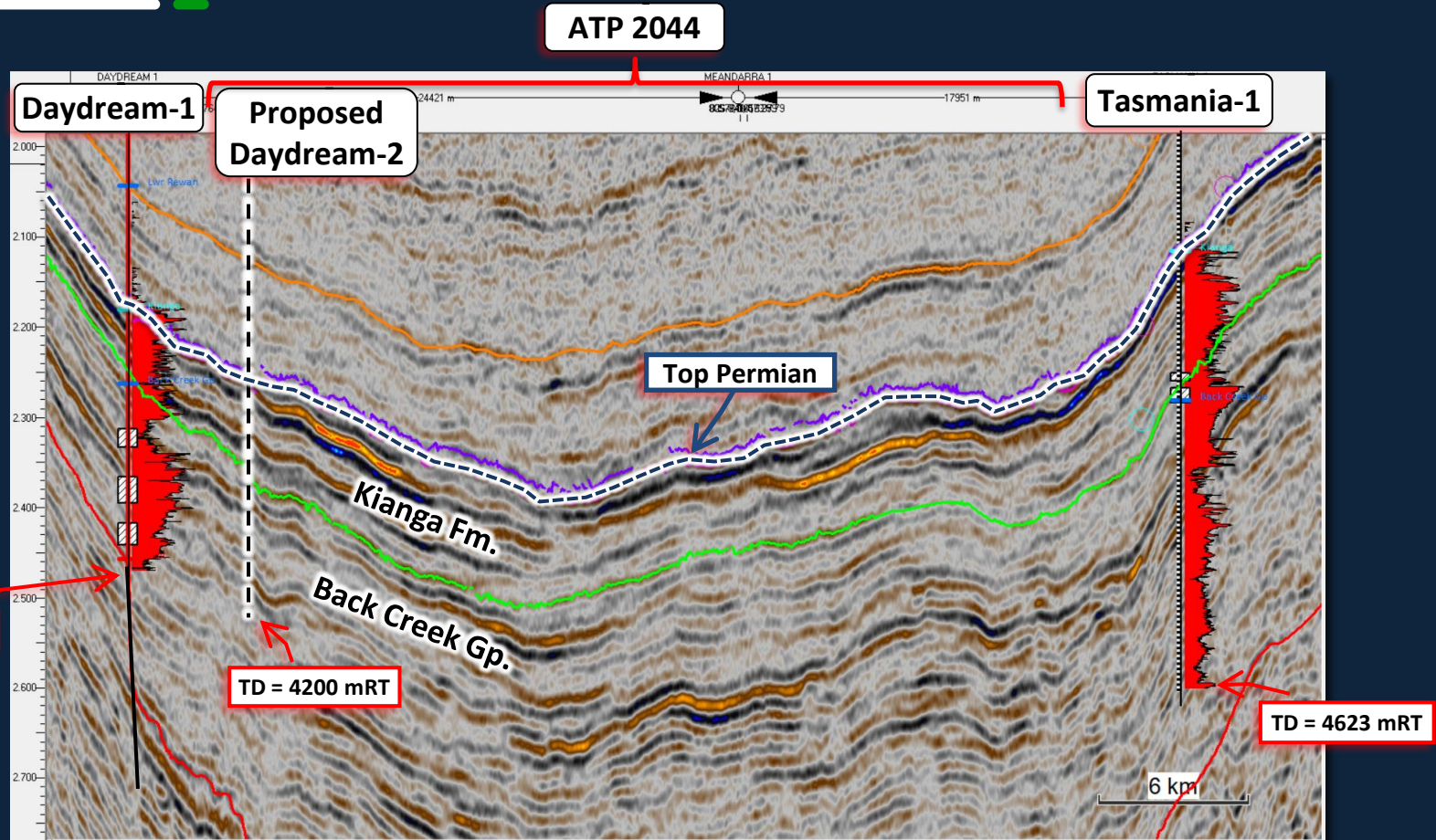
Back Creek Gp.

Recorded Gas/Condensate Flows



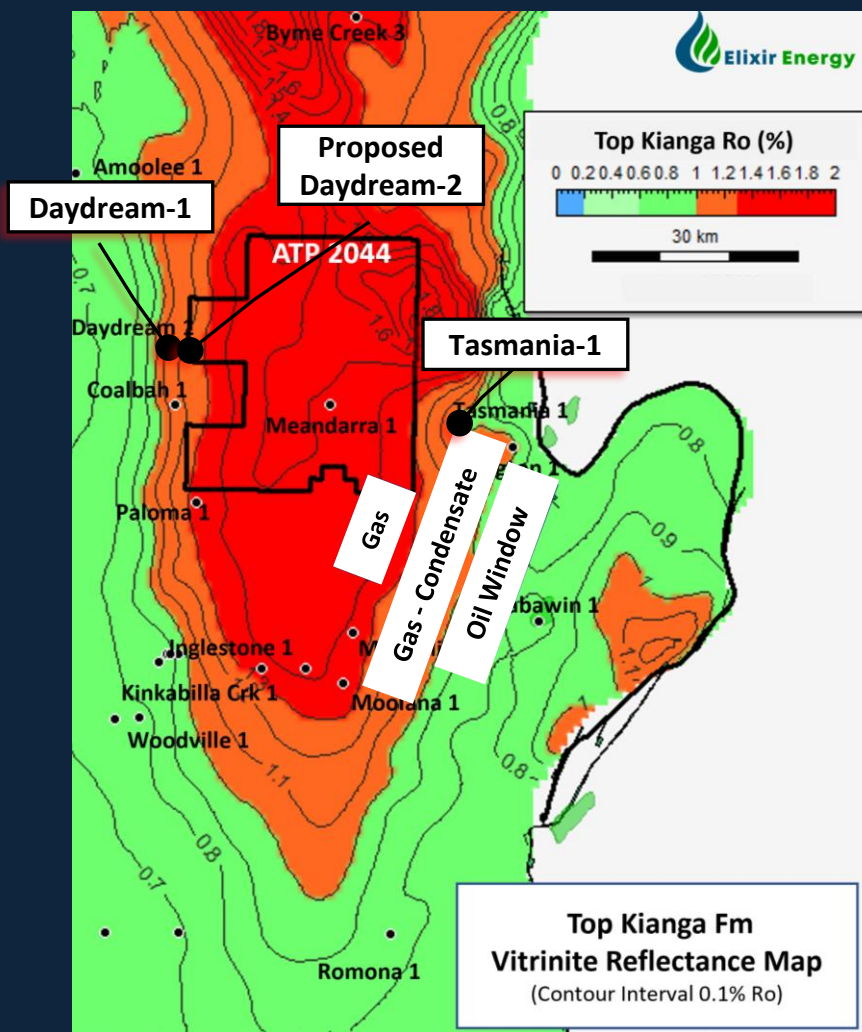
*ATP 645, BOWEN BASIN,
QUEENSLAND
Geology & Geophysical Studies
Report, 2016, Section 4.2, QGC (Shell)

Total Gas Increase Upon Drilling the Permian



Source/Maturity

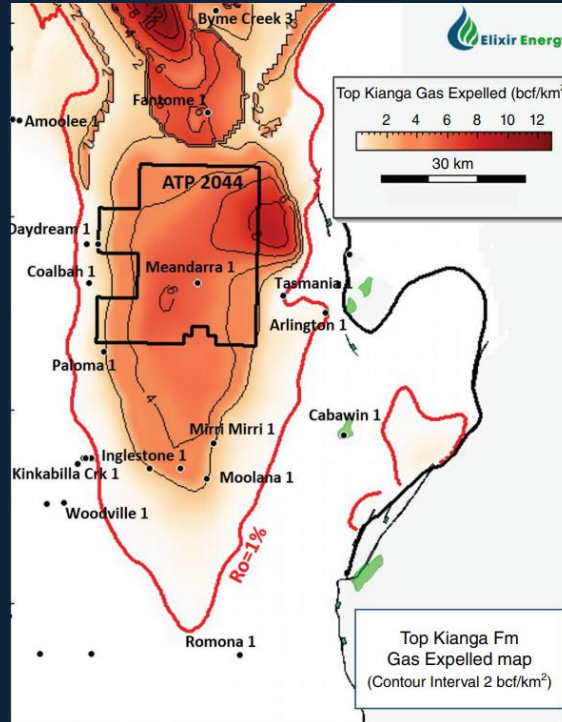
- Upper Permian Kianga Fm. and the Middle Triassic Snake Creek Mudstone contain oil and gas-prone type II/III to type III kerogen that lies within the gas and gas condensate generation window over much of the ATP 2044 area
- Additional high TOC shales are observed throughout the Early to Late Permian succession which also contribute significantly to the source potential
- Typical of Tight Gas Sand and Basin Centred Gas Plays, the reservoir and source intervals are interbedded or adjacent to each other



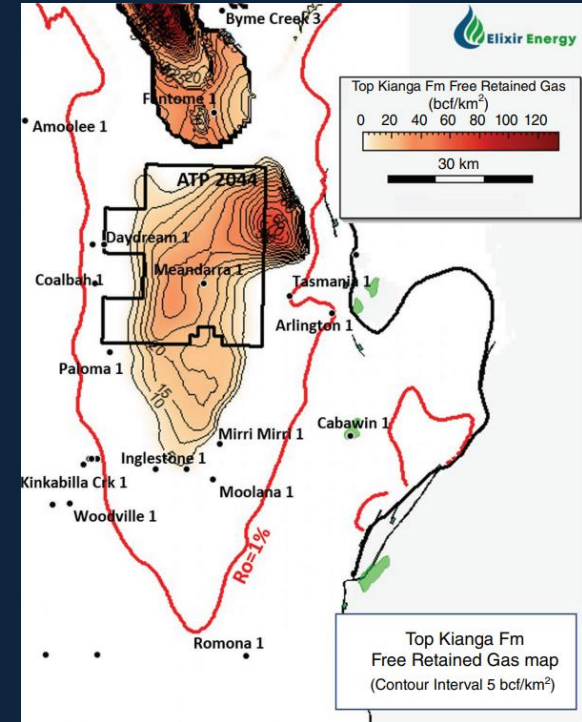
Expelled vs Retained Gas

- 73 m net coal thickness in the Upper Permian succession modelled
- Retained free gas within the contour $R_o > 1.0\%$ defines the extent of the Fractured Thermally Mature Coal (FTMC) play with a mean GIP of 14.9 Tcf
- Independent 2C of 395 Bcf within ATP 2044 only

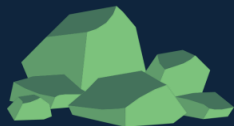
Expelled Gas



Retained Free Gas

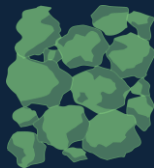


Fractured Thermally Mature Coals, Tight Gas Sands & Basin-Centered Gas Plays



FTMC

- Can contain significant free gas in fractures and cleats
- High gas readings in all wells nearby
- Coals are the mature source rock, self-sourcing ($R_o > 1\%$)
- MEM shows coals are normally stressed - obvious target for frac stimulation
- Free gas (not adsorbed)



TGS

- Sandstone $< 7\%$ porosity that trap gas via stratigraphic or unknown mechanisms
- Corresponding low permeability means fracking essential
- Conventional play utilising unconventional completion



BCG

- Regionally pervasive unconventional gas resources that requires stimulation for commercial production
- Generally abnormally pressured
- Trap requires a “permeability gaol”
- Regionally extensive
- Perms $< 0.2\text{mD}$ and low porosity
- Imperative to stimulate as many reservoirs as possible to attain commercial rates of gas production

Unable to differentiate between TGS play and BCG play

The Key may lie in the Stress Regime

1.

Current day strike slip

2.

Coals can absorb stress
and remain in a normal
stress regime

3.

Any fracture growth
will naturally propagate
to lower stressed coals

4.

Modelling show frac's
migrating out of
sandstones into coals

5.

Target coals as well as
sandstones

6.

Coals require specialised
fracture treatment

Mechanical Earth Model (MEM)

MEM = 1D representation of down-hole stress

Elastic rock properties and stress anisotropy critical for coal fracture growth

Importance of the role of stress partitioning and stress anisotropy in the Bowen Basin now recognised

The stress profile will

- Govern how fractures grow and are contained
- Determine the length and conductivity of those fractures in relation to the pump and treatment schedule

Dipole sonic and density data utilized from Daydream-1 and Tasmania-1 and were calibrated for leak-off test data and closure pressures from stimulation treatments and DFITs

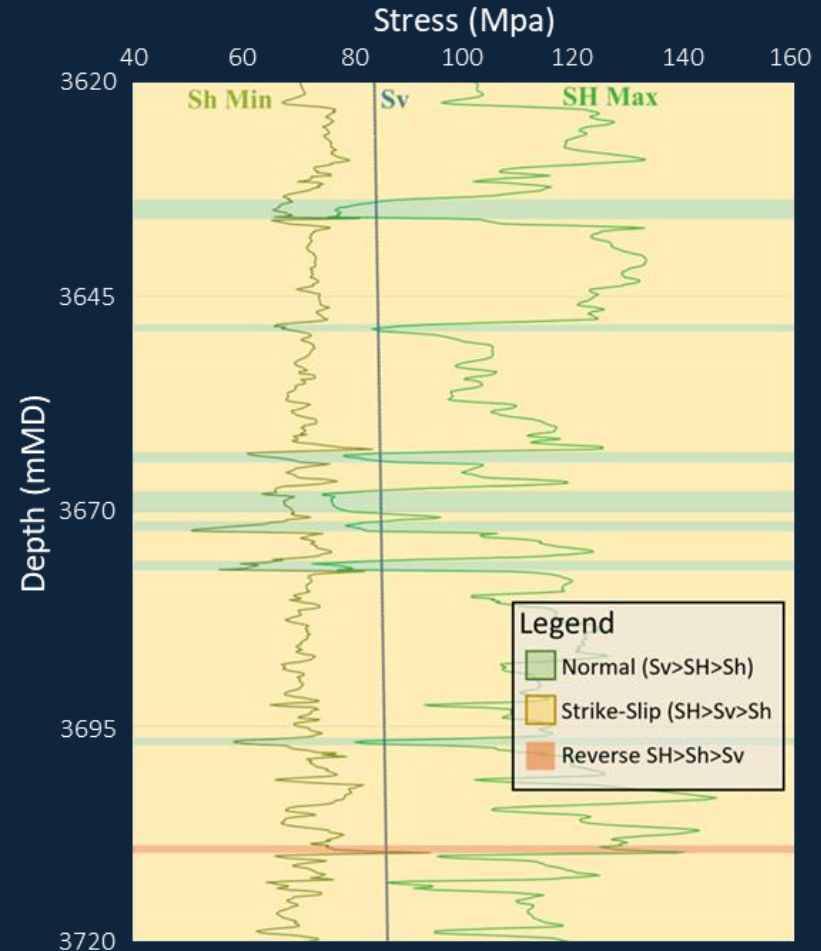
Key Metric Comparison

Key Metric	ATP 2044 (2023)	QGC (2012)	Cooper Basin (2010-2015)
Play Type	FTMC/TGS/BCG	TGS	BCG
Depth to target	4300m	4650m (max)	3600-4000m
Heat flow (average)	75 mW/m2	75 mW/m2	130-190 mW/m2
Max temperature at target depth	127 C	140 C	215-246 C
Stress regime of target	Normal/Strike-slip	Strike-slip	Reverse
Frac gradient (Shmin)	0.65-0.80 psi/ft	0.80-0.90 psi/ft	1.1-1.60 psi/ft
Overpressure	0.51-0.66 psi/ft	0.66-0.83 psi/ft	0.73 psi/ft
CO ₂	<5%	<5%	~30%
Source/reservoir maturity Ro%	1.0-1.4 Ro%	1.0-1.5 Ro%	2.7-6.4 Ro%
Source/reservoir window	Gas-condensate	Gas	Late Gas-Thermally exhausted
Permeability	<0.2 mD	<0.2 mD	0.1 mD
Porosity	5-7 %	5-7 %	4-6 %
Frac optimisation - frac fluids	10-20 pound Guar + XL Gel	35 pound borate	35 pound borate
Frac optimisation - viscosity inhibitor	Yes	No	No
Frac optimisation - phasing	60 deg	180 deg	60 deg
Frac optimisation - main mesh size	30/50	20/40 & 40/70	20/40 & 30/50
Frac optimisation - step-down test optimisation	Yes	No	No

MEM Findings

- Stress in the deep Permian succession changes vertically throughout the bore with lithology, although the overall far-field stress regime is strike-slip
- Both sandstones and coals are in suitable stress states to accommodate the growth of vertical fractures on stimulation; however, as coal is less stressed - preferential target for vertical fracture propagation
- Perforations targeting adjacent sandstones need to have sufficient stand-off to prevent the diversion of fractures toward the lower-stress coals

Daydream 1 Depth v Stress

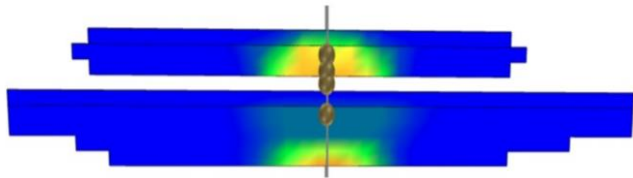


Using the results to build simulation models

- Numerical simulation models built with multiple iterations in Gohfer and ResFrac software
- Marked improvements using new stress profiles, pump and treatment schedules observed

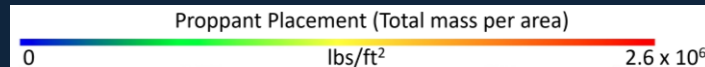
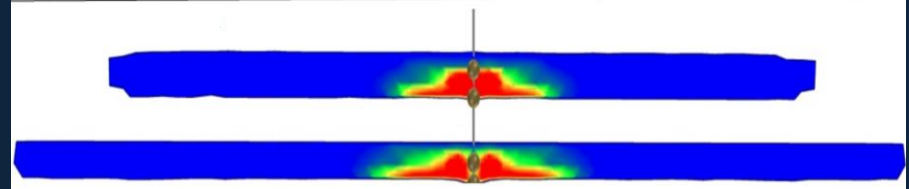
Stimulation MODEL A – previous operators

- Initially used a generic MEM where the contrast in Poisson's ratio between coal and sandstone is similar to that observed in USA basins, resulting in high stresses in the coal
- Perforations were placed solely to target tight gas sandstones (TGS) in the Kianga Formation



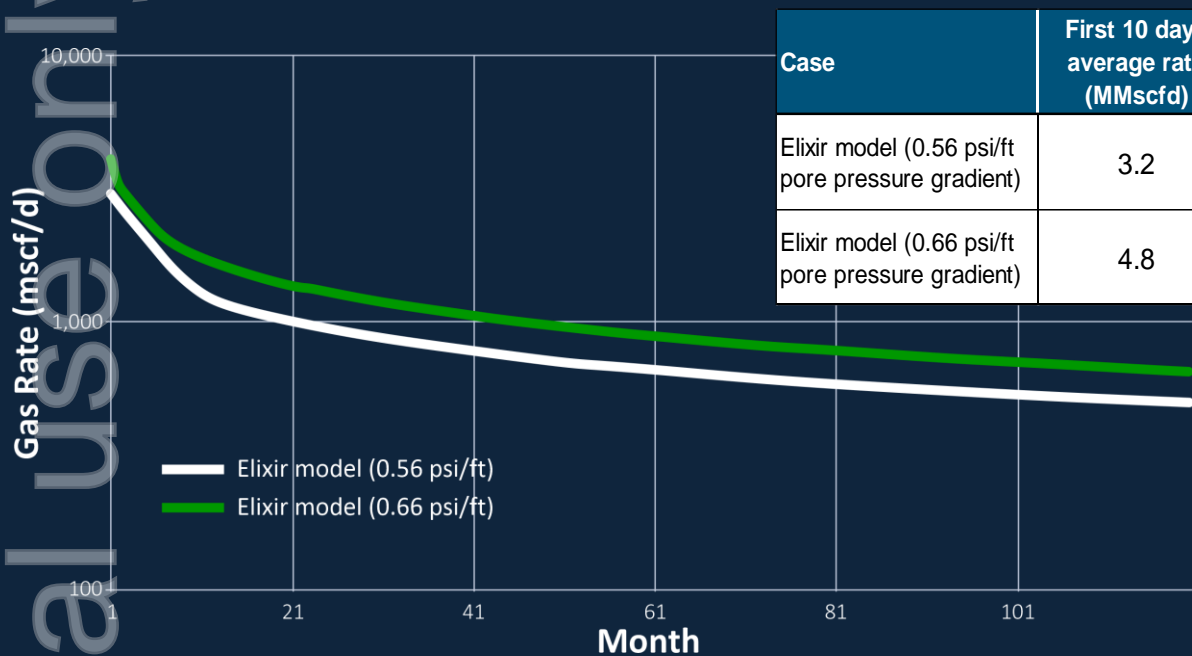
Stimulation MODEL B – Elixir MEM utilized

- Imported the new MEM where coals are low stress and perforations were placed to allow some stand-off from these coals so that growth within TGS targets could be maximised
- Both fracture length and fracture conductivity were greatly improved



Preliminary Modelled Production Profile (vertical well – 4 stages)

- IP30 modelled to flow 3 – 4 MMscfd
- A realistic range of pore pressures (0.56 – 0.66 psi/ft) has been used
- Reducing the pore pressure from 0.66 psi/ft to 0.56 psi/ft reduces long-term recovery by 33%



Case	First 10 days average rate (MMscfd)	First 30 days average rate (MMscfd)	3.3 years cumulative (Bcf)	20 years cumulative (Bcf)
Elixir model (0.56 psi/ft pore pressure gradient)	3.2	3.1	1.5	4.5
Elixir model (0.66 psi/ft pore pressure gradient)	4.8	4.1	2.0	6.7

Conclusions



Elixir has identified a large and compelling gas/condensate resource in the Southern Taroom Trough



Upon obtaining ATP 2044, ERC Equipoise certified a Contingent Resource (2C = 395 Bcf) within the sandstone reservoirs only



Operators in adjacent blocks are actively drilling the same play



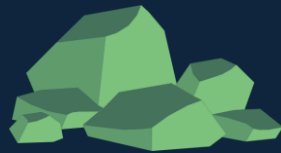
Detailed inhouse analysis and modelling has identified pitfalls and areas for improvement:

- MEM
- Different location
- Different frac design
- Different zones
- Different lithologies – both sandstones AND coals

Conclusions (cont'd)



Elixir's proprietary Mechanical Earth Model (MEM) and Reservoir/Frac Model suggest potential to improve the flowrates significantly



Focus on coals and sandstones of the Kiangra Formation and Back Creek Group



The presence of gas in surrounding wells (both on logs and multiple flows of gas/condensate to surface) proves the discovery of an extensive resource



Elixir will drill an appraisal well (Daydream-2) in 2023/24, subject to rig availability

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