

## Corporate Snapshot



#### **Pro-Forma Capital Structure**

Shares on issue 2,313m

Share price A\$0.018

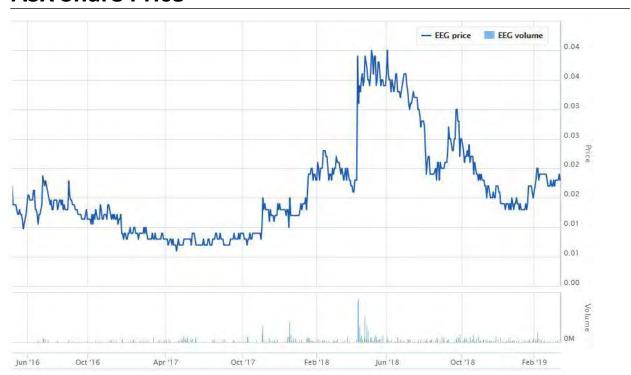
Market cap A\$41.6m

Net debt A\$32.4m

Enterprise value A\$74.0m

Cash at bank A\$4.5m

#### **ASX Share Price**



#### **Corporate Structure**



## **Pro-Forma Top 5 Shareholders**

Macquarie Bank Limited	14.7%
Global Energy and Resources Development Limited	10.7%
Liangrove Media Pty Limited	5.3%
HSBC Custody Nominees (Australia) Limited	2.9%
Board & Management	6.4%

## 2018 Year in Review

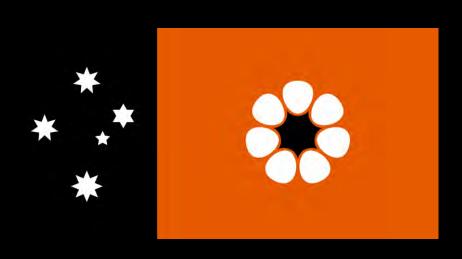
- April 2018: NT fracking moratorium lifted
- August 2018: Company recapitalisation reduced debt by > 30% and substantially improved cash position
- August 2018: Former CEO Bruce McLeod retired and sadly passed away
- August 2018: Alex Underwood became CEO
- November 2018: Board renewal commenced in November with appointments of John Gerahty and Paul Espie AO followed by John Warburton in early 2019
- November 2018: Successful Kansas Production Enhancement Program
- Full Year 2018 US EBITDA +A\$5.9m
- Throughout 2018: Reduction in corporate overheads to preserve cash
- Late 2018: US asset sale process kicked off. Negotiations progressing well

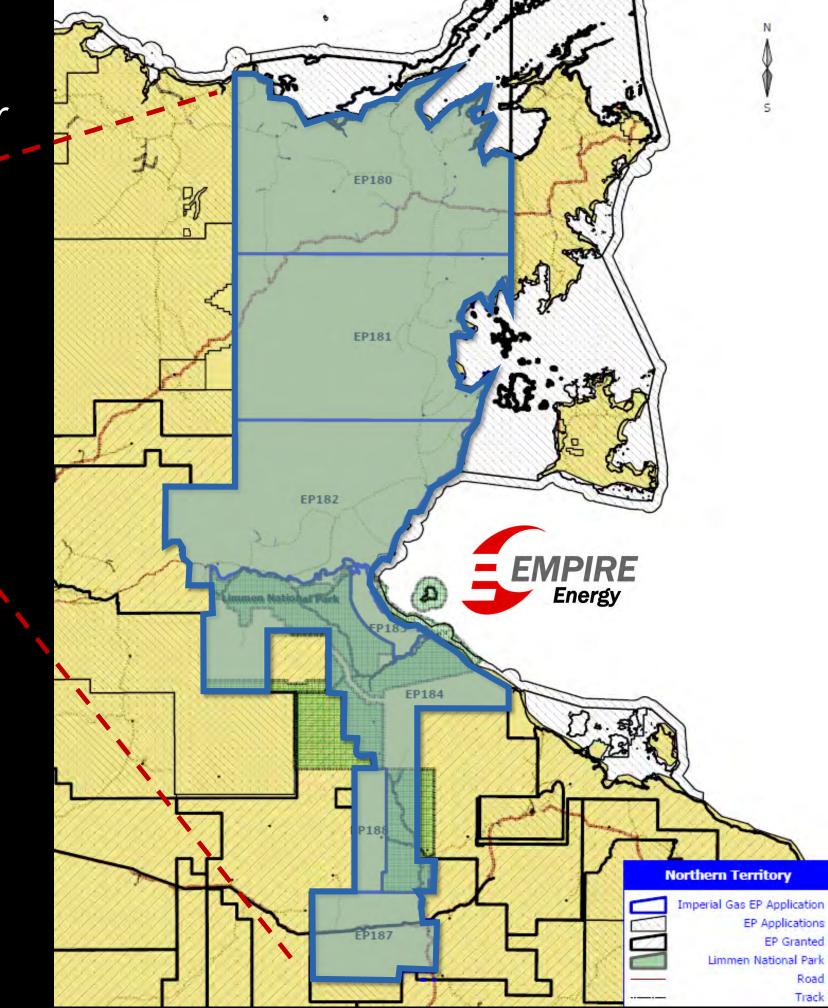
# Northern Territory has unshackled a vast hydrocarbon frontier: The McArthur and Beetaloo Basins



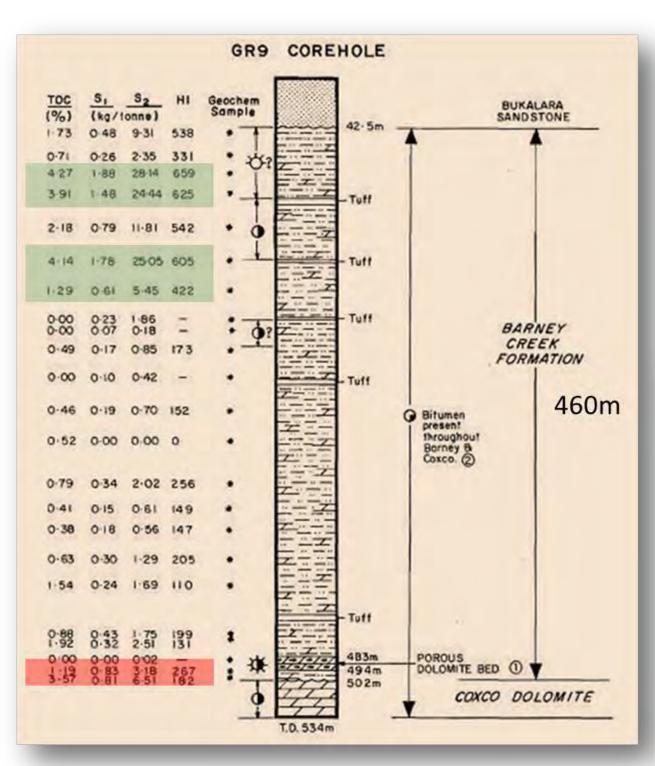
# The heart of NT's big hydrocarbon frontier







# Where the story starts... An April 1980 mineral drillhole gets a strong gas strike



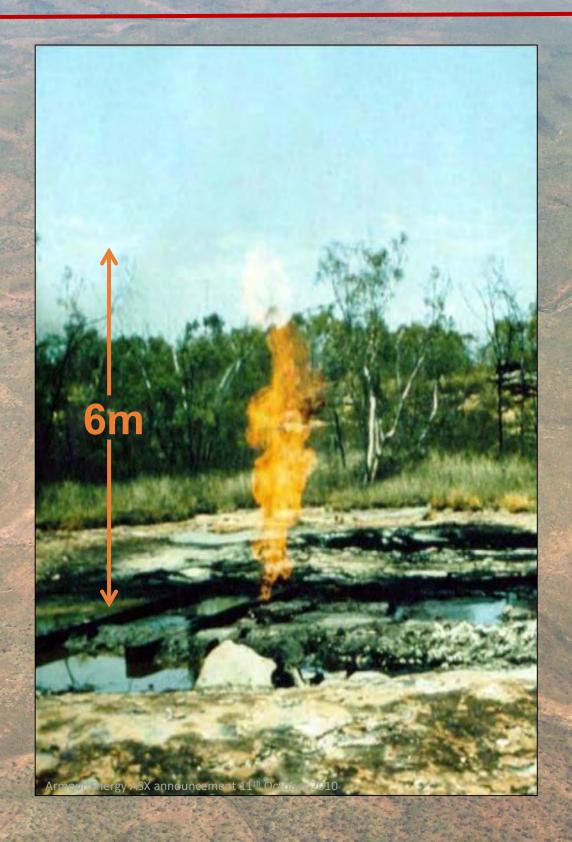
The most spectacular indication of live hydrocarbons encountered to date in the McArthur Group was in the Kennecott-Amoco mineral exploration corehole GR 9, drilled in the Glyde area. A summary log of this drillhole is shown as Figure 5, and the location is shown in Figure 2. Upon unintentional swabbing at the end of drilling (in December 1979), the corehole experienced a gas blow-out which yielded a 5-6m (15-20 ft) long flame. flow accompanying the gas, was indicated by the bright orange-yellow colour of the flame, and by an accompanying The hole flowed gas for an indeterminate sooty tail. period during the immediately following "Wet" season. By the end of the "Wet" the hole was filled with water and the gas flow had degenerated to a series of gas bubbles percolating through hydrostatic head. A sample of the gas taken at this stage yielded the following analysis:-

Methane	74.25%
Ethane	10.25%
Propane	3.25%
Iso-Butane	0.175%
N-Butane	0.60%
N-Pentane	0.105%
Hexane	0.165%
Heptane	0.08%
Nitrogen	10.75%
Carbon Dioxide	0.20%.

The hole was plugged with cement in April 1980.



# An April 1980 mineral drillhole gets a strong gas strike



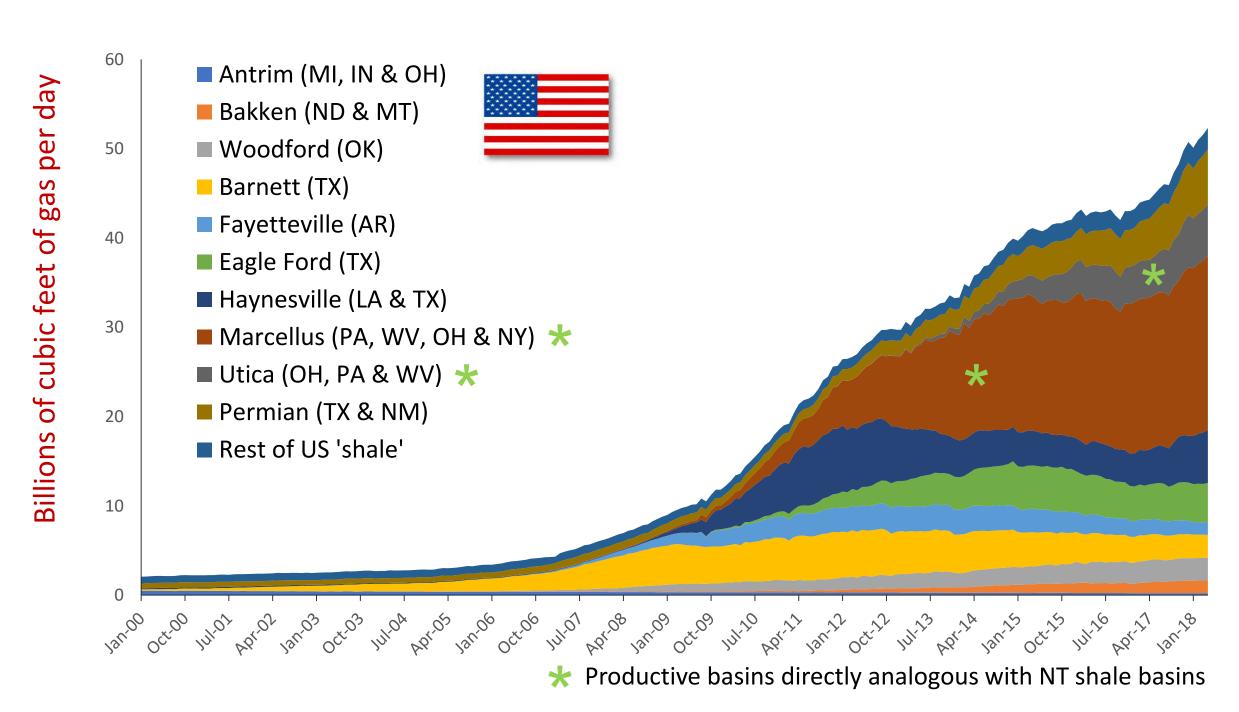
- GRNT-09 Mineral Well flowed gas & condensates at 140psi for 6 months at ~ 6 mm scfd, for ~2 bcf/yr
- Subsequently over 30 hydrocarbon wells have been drilled
- And over \$800m committed to exploring a new hydrocarbon province
- The 2018 lifting of the NT fracking moratorium is about to transform the basin potential



# Horizontal drilling and fracking shale transformed the US energy market, and its geopolitics



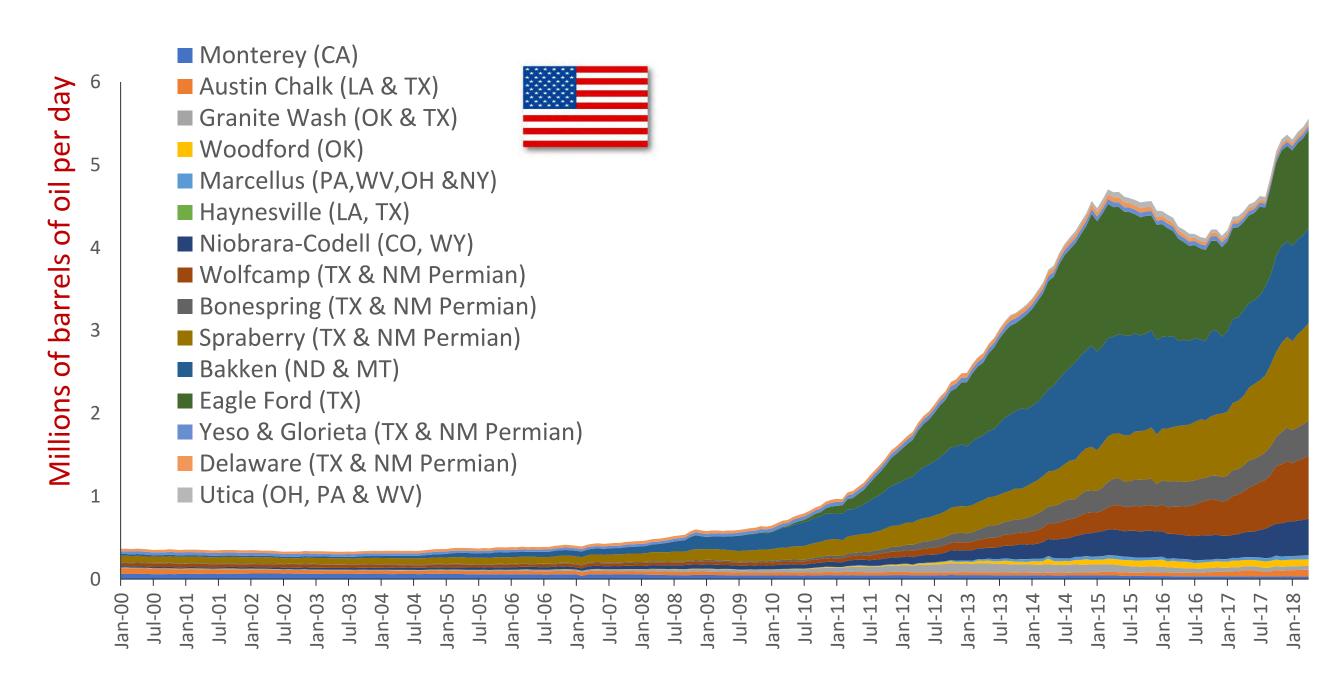
## Monthly US shale gas production figures since 2000 coloured by shale formation



# Horizontal drilling and fracking shale transformed the US energy market, and its geopolitics



## Monthly US shale oil production figures since 2000 coloured by shale formation



# Horizontal drilling and fracking shale transformed the US energy market, and its global geopolitics



 Over 60 billion cubic feet of US gas per day and 70% of total US gas production from shale in 2018



- Over 7 million barrels of US oil per day and 60% of total US oil production from shale in 2018
- Production is from a diverse array of US basins
- Technological advancements in hydraulic fracturing and horizontal drilling have been instrumental
- US fracking technology and experience is now directly available to NT operators
- Opening Australia's McArthur and Beetaloo Basins offers Eastern Australia gas supply, more supply to a booming gas export sector, and could make Australia energy independent with petroleum
- NT Resources Minister Paul Kirby at APPEA 2019: "If just 20% of this resource is recoverable, this is twice the current proved and probable reserves of all of Australia"



# Touchdown Northern Territory, open for oil & gas business

## Empire an early entrant in NT's new frontier

 2010 tenement applications covering 14.6 million acres (~6,000 km²)





- 100% working interest
- Proven petroleum system with strong gas and liquids potential
- 2016 Origin Amungee NW-1H well flowed gas strongly from target Velkerri Shale in the Beetaloo Basin
- Two tenements awarded 2013
- Successful partnership arrangements with supportive Traditional Owners



## Major players are joining the party in a big way





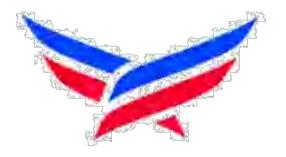






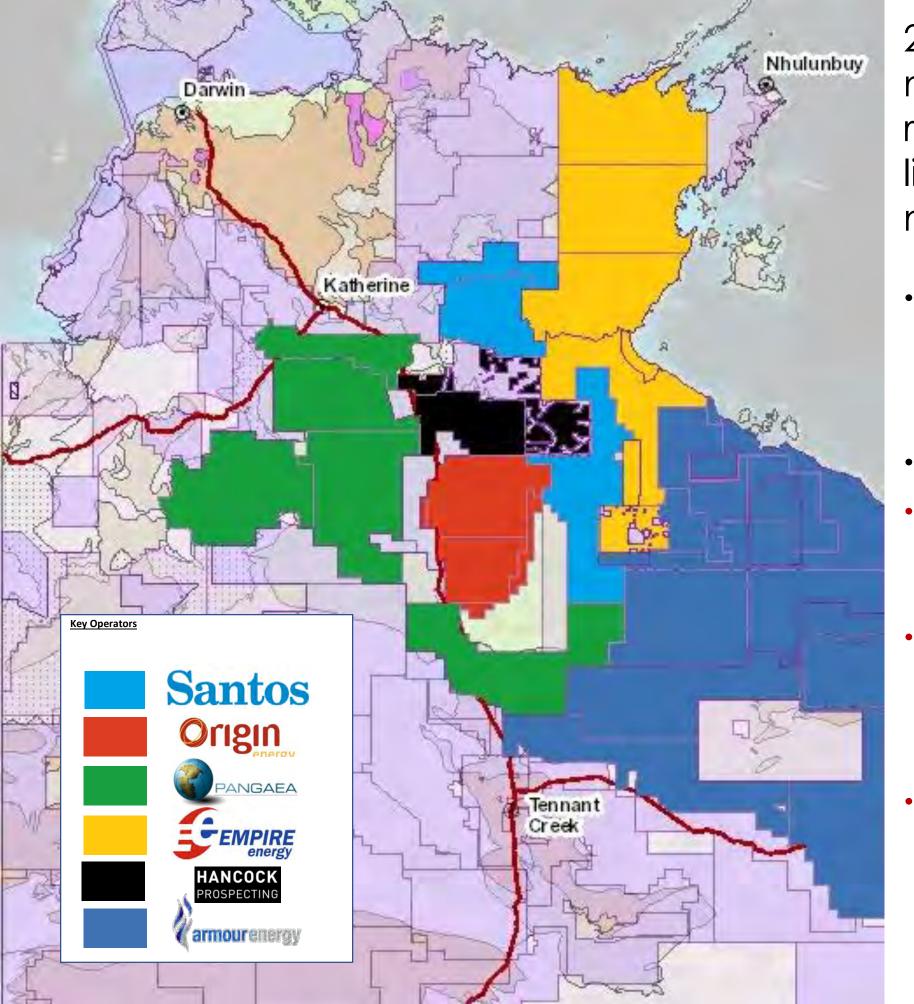






AMERICAN ENERGY PARTNERS





2019 the watershed moment – drilling ramping up with the lifting of the fracking moratorium

- Numerous large independent oil and gas companies hold substantial acreage positions in the Greater McArthur Basin
- Drilling activity is ramping up
- Santos to drill 2 fracked horizontal wells in 2019 testing Velkerri Shale
- Origin to drill 2 fracked horizontal wells in 2019 testing Velkerri Shale and Kyalla Formation
- Hancock Prospecting has indicated it may invest A\$150m - A\$200m in exploration

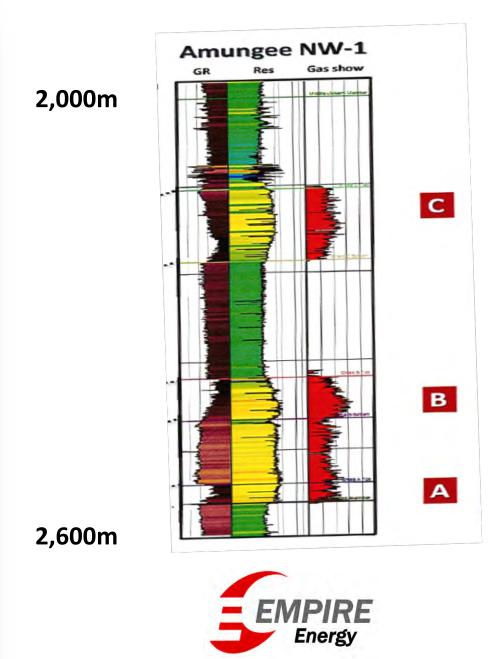
## McArthur Basin, a Vast & Proven Petroleum System



## Beetaloo's Amungee 2016 well is a gas superstar

Drilled by Origin Energy Amungee NW-1H was the first fracked horizontal well in the Beetaloo Basin. It flowed at similar rates to the US wells that sparked the shale gas revolution there in 1998. The reservoir engineers loved it.

- Drilled in Dec 15 TD 3,808m, incl. 1,100m horizontal section in the B Shale of the Middle Velkerri formation
- Hydraulically fracture simulated in Nov 2016
- 11 Hydraulic stimulation stages completed across approx.
   600m
- 95% of programmed proppant placed
- Successful production test in February 2017
- Av TOC ~4%; Porosity 4% to 7.5%; Permeability 50 to 500 nD
- IP averaged 1.10MMscfd over 57 days
- Final average production rate 1.07mmscfd
- Cumulative production 63mmscf
- Estimated dry gas composition of 92% methane, 3% ethane,
   5% carbon dioxide
- 2C Contingent Resource Estimate is 6.6TCF (486,000 acres)
- Three organic rich shale intervals (A, B & C shales) within the Middle Velkerri Formation with gross thickness up to 500m and net pay in B & C shales >30m each
- Average TOC 3% to 4%, Favorable geo-mechanics for hydraulic stimulation.
- 20% to 25% overpressure, excellent for volumetric and reservoir productivity
- Good porosity and gas storage



Source: Falcon Oil & Gas, Origin Energy

## Amungee is big news against the breakout well in the US

S.H. Griffin #4 Initial Production averaged 1.3MMscfd over 90 days

Amungee's Initial Production averaged

1.1MMscfd over 57 days





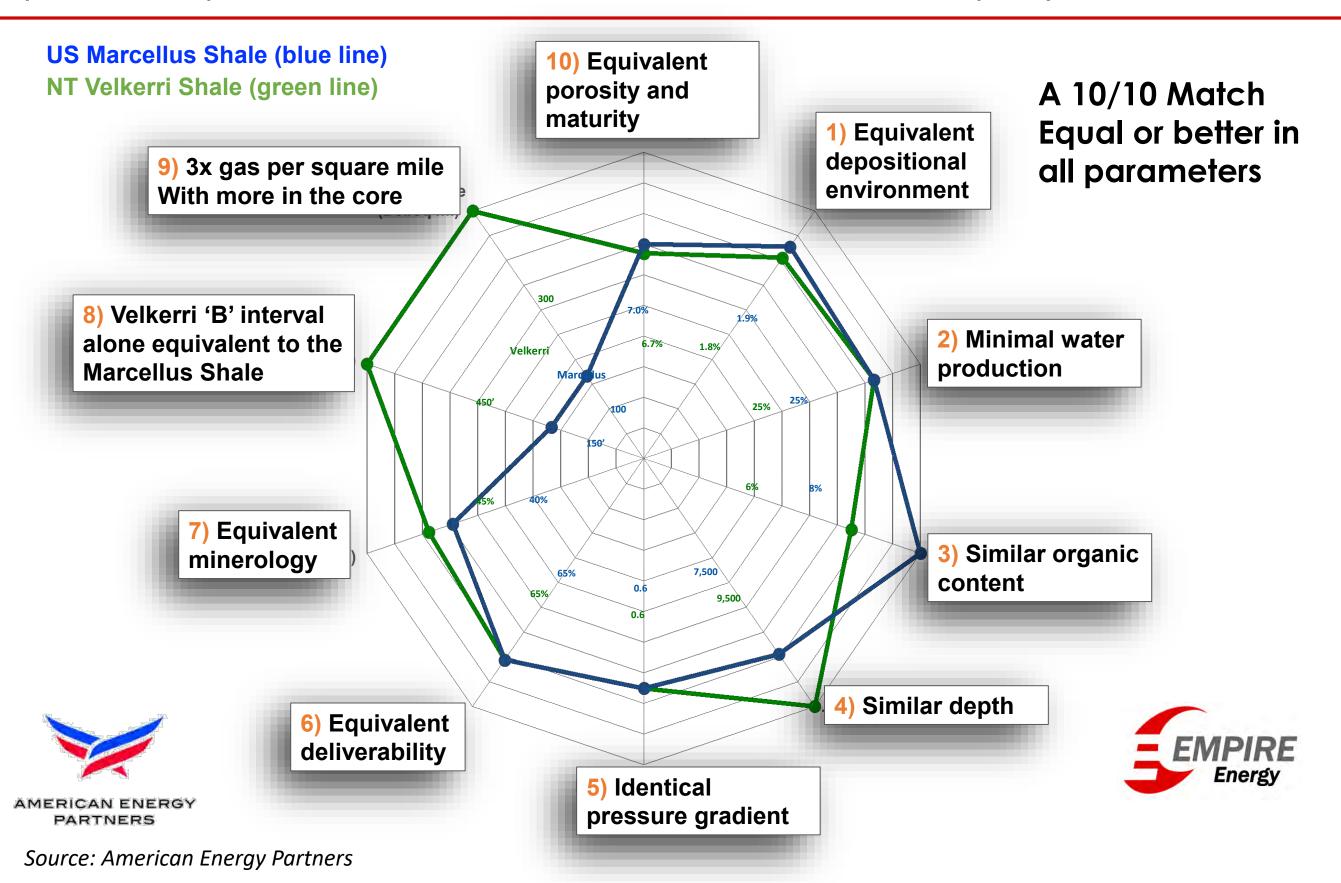
The S.H. Griffin #4 produced 1.3 million cubic feet of natural gas per day for the first 90 days, an unbelievable amount for the time. Steinsberger, in an interview with The Atlantic, said,

"This was the 'aha moment' for us, it was our best well ever in the Barnett, and it was a slick water frack. And it was my baby!" 37

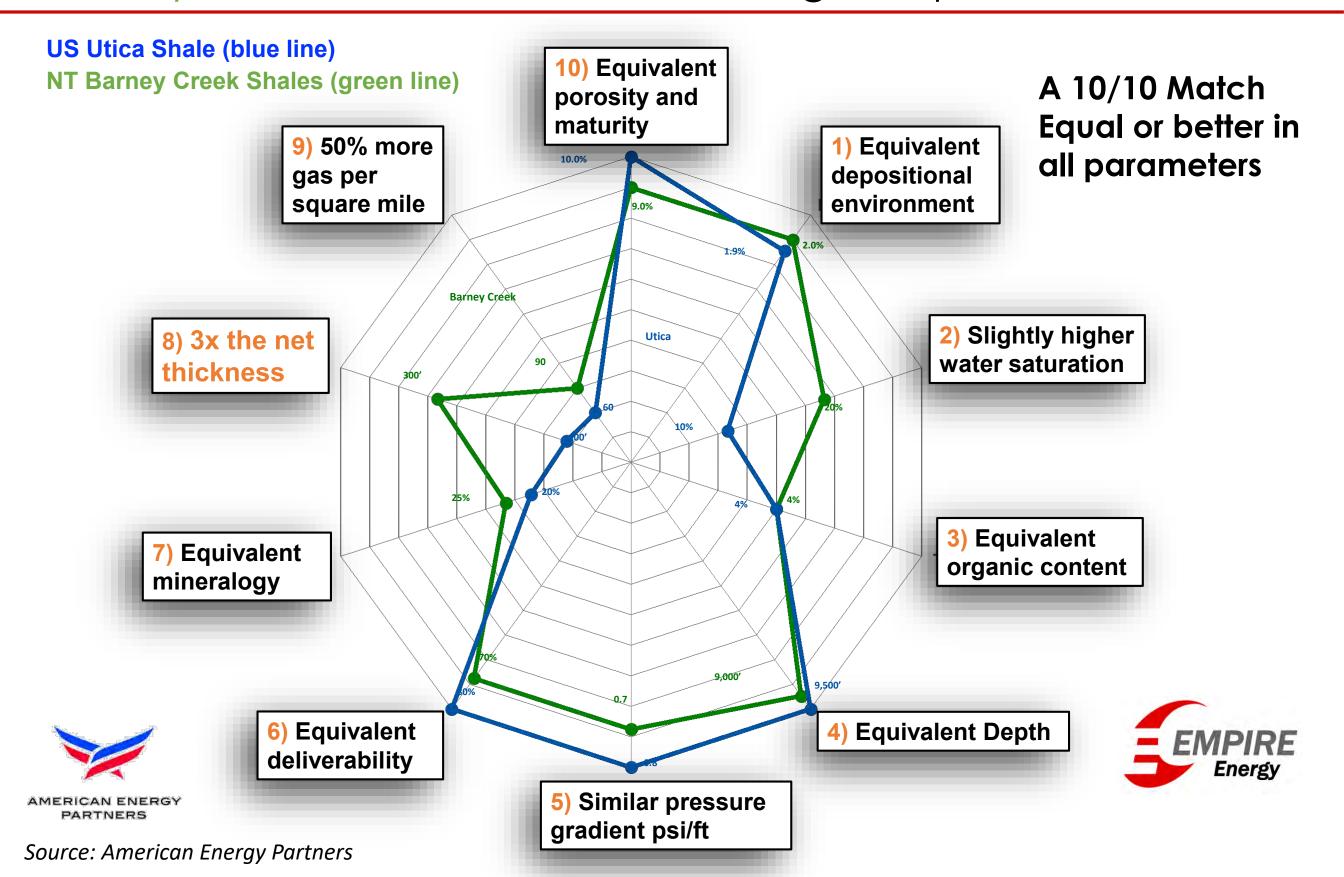
This was a revolutionary moment, marking the beginning of modern-day fracking in shale as we know it. Since the S.H. Griffin, more than a hundred thousand wells have been fracked in the United States, and most of them use a technique similar to what was first done in the Barnett Shale. Steinsberger had finally figured out how to get shale rock formations to give up their natural gas and do so in an economical way.

Extract page 7 - An Energy Fracking Revolution: 35 Years of Fracking in the Barnett Shale – How North Texas Fracking Turned America Into an Energy Superpower (1 June 2016)

# Clear USA shale analog with Velkerri Shale with original gas in place equal to three stacked Marcellus Shale plays



# Clear USA shale analog of Utica Shale identified in the NT's Barney Creek Shale - with 50% more gas equivalent

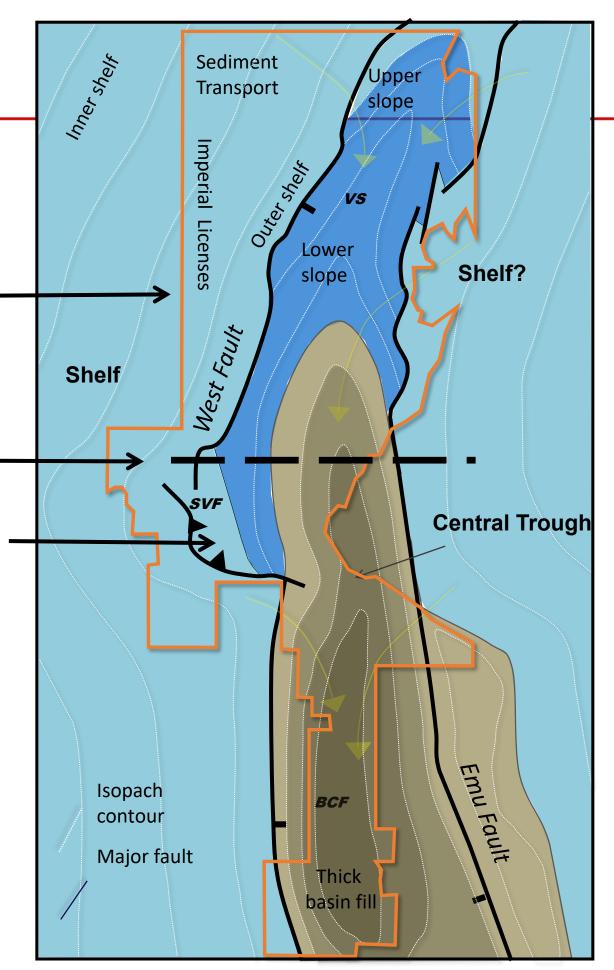


Formation of an extensive undisturbed petroleum basin

Tenement boundary

Trough Cross Section —

Empire Energy 2014 Exploration Wells

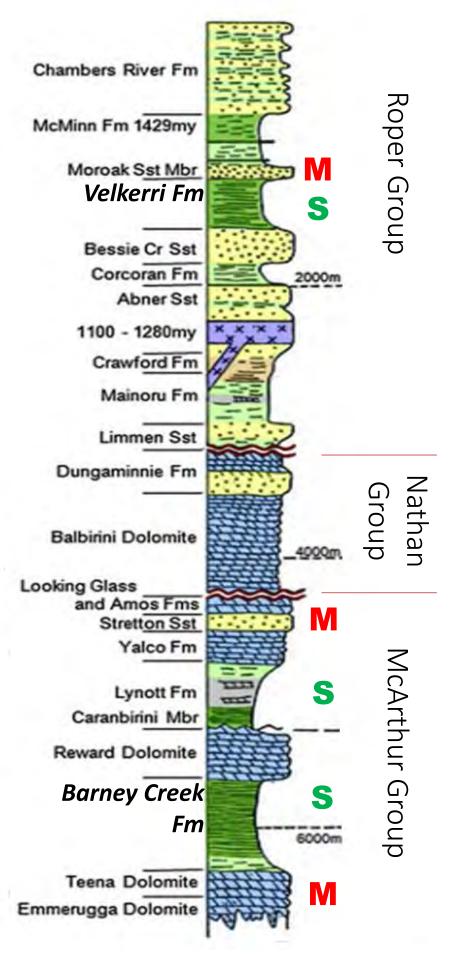




## Formation of an extensive undisturbed petroleum basin SE NW McArthur Basin Central Trough Imperial 2014 **Exploration Wells** Palaeo-Sea Level Basin - Barney Creek Fm (anoxic) Organic carbon-rich **Emu Fault** shales on flooding surfaces

# The McArthur and Beetaloo Basins could make Australia self-sufficient in oil...





Very thick, stacked sequences with abundant Organic Carbon preserved and mobilised

Stromatolitic carbonate

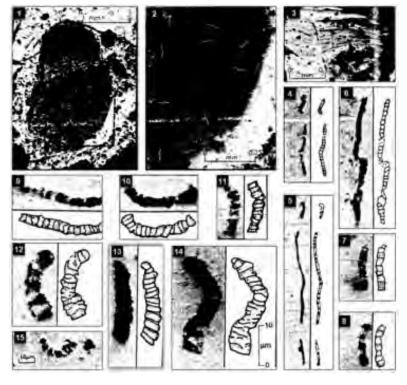
Sandstone

Carbonaceous shale

Source Rocks

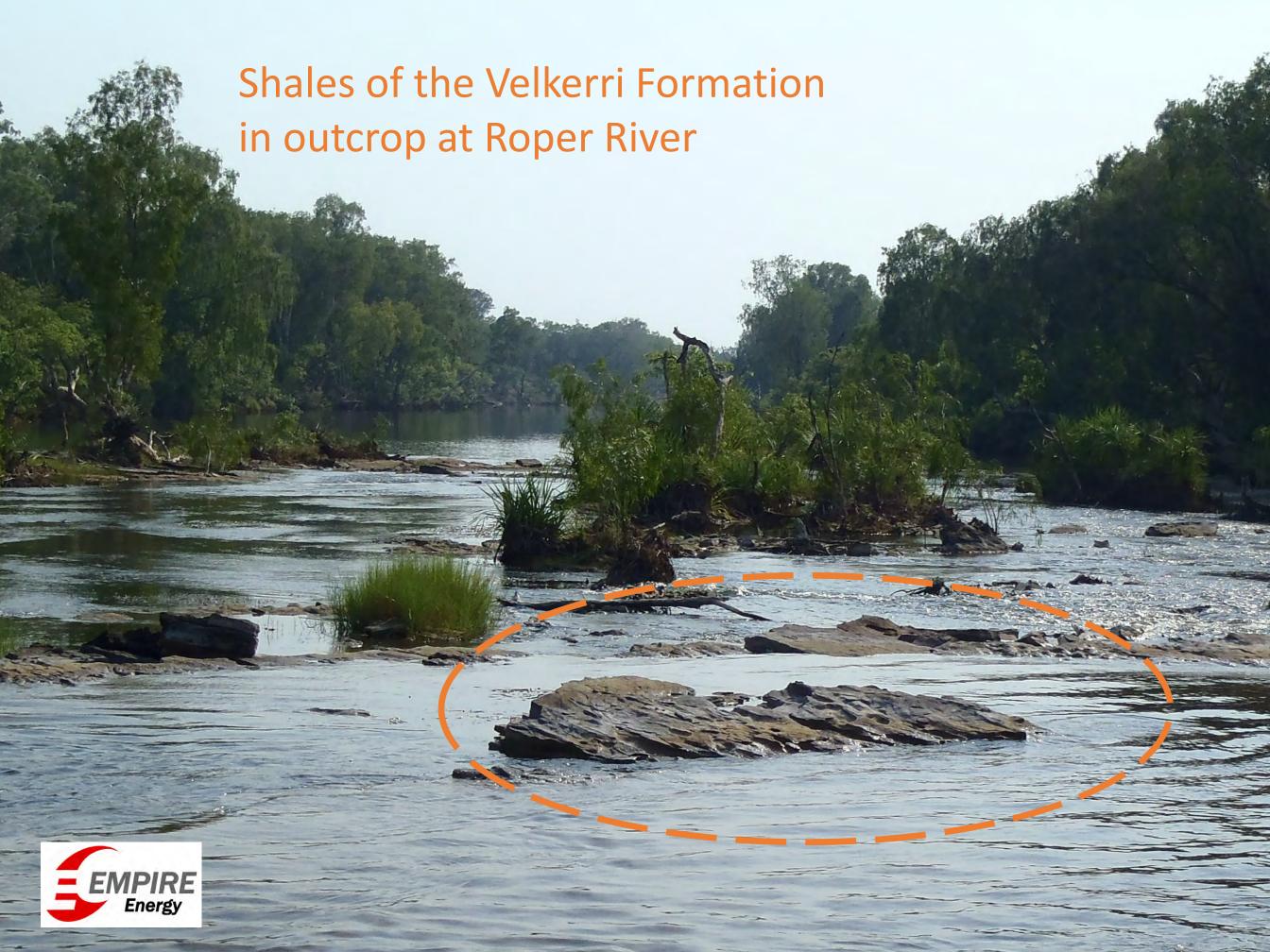
M Migrated hydrocarbon

Typical microscopic life forms from the Era



Brock J.J. 2007. Molecular fossils and early life on Earth





## McArthur Basin – Substantial Committed Investment

Numerous farm-out deals have been carried out resulting in capital commitments of hundreds of millions of dollars by major oil and gas companies<sup>1</sup>

Year	Vendor	Investor	WI	Basin	Cash Upfront	Carried expenditure	Acres (mm)
2011	FALCON	HESS	62.5%	Beetaloo	A\$27m	A\$162m	6.2
2013	Tamboran	Santos	75.0%	Beetaloo / McArthur	N/d	N/d	6.4
2014	FALCON	Ongin SasoL	70.0%	Beetaloo	A\$20m	A\$185m	4.6
2015 <sup>2</sup>	<b>EMPIRE</b> energy	AMERICAN ENERGY PARTNERS	80.0%	Beetaloo / McArthur	A\$20m	A\$80m + A\$133m	14.5
2015 <sup>2</sup>	armourenergy	AMERICAN ENERGY PARTNERS	75.0%	McArthur / Nicholson	A\$31m	A\$173m + A\$133m	31.3

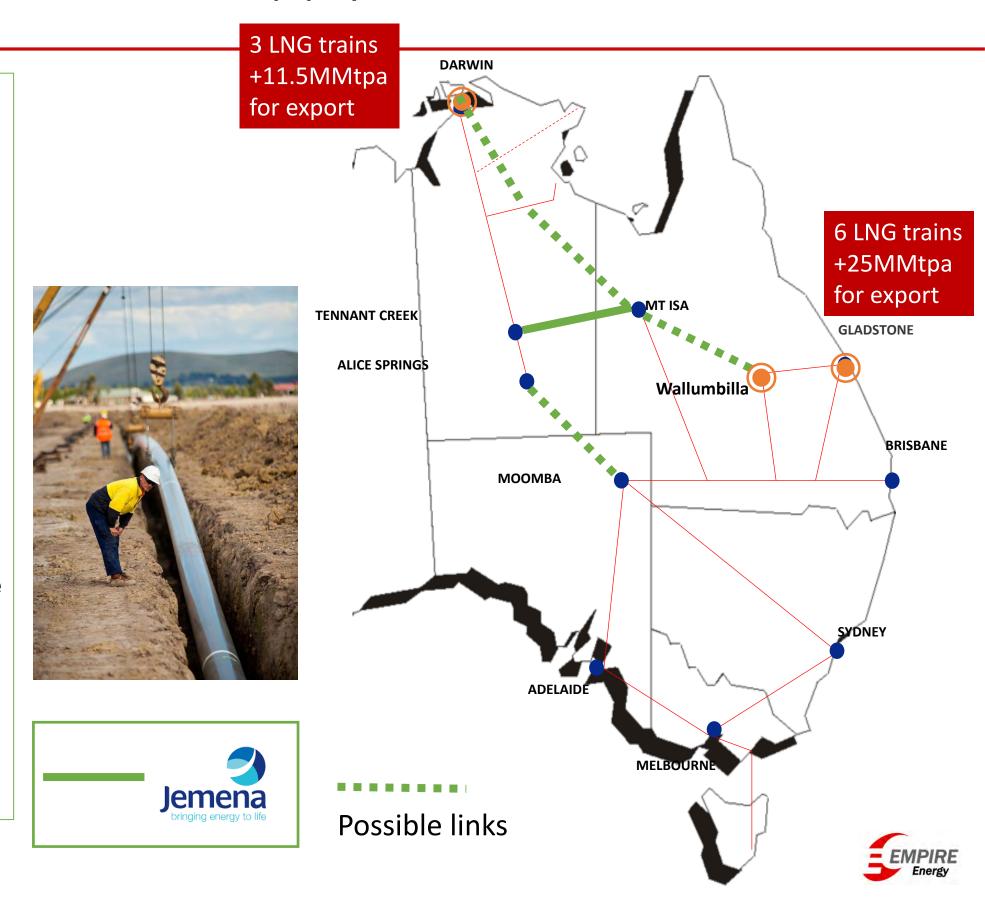
- Large JV deals have been carried out across the basin
- Major global oil companies recognize that the Beetaloo / McArthur Basin shales have world scale potential
- The lifting of the fracking moratorium and recommencement of appraisal drilling activities pave the way for a resumption of Empire Energy's corporate activity
- Empire is one of the only tenement holders in the basin with 100% equity and enormous acreage footprint
- With US asset sales advancing, Empire Energy will become a pure NT hydrocarbon play and its shares will offer the single best stock market exposure to the potential of the McArthur / Beetaloo Basins

## **NEGI** link opened the supply route to East Australia

Massive buildout of East Coast LNG has created substantial domestic gas shortfall

Jemena's Northern
Gas Pipeline has
connected NT to the
East Coast

The Northern Territory & Federal Governments now working to facilitate the development of the North East Gas Interconnector to meet Eastern Australia energy demand



## Infrastructure for Domestic and Export markets

- Current LNG plants operate below capacity and further, expansions could double installed capacity
- Australia is strategically located to fulfil rapidly increasing Asian demand with low sovereign risk
- There is already a pipeline corridor directly through Empire's EP187 tenement allowing for near-term commercialisation, and a larger pipeline can be added alongside existing
- A 1.0 Bcf /day pipeline to Darwin would cost ~\$1.5bn, and could be expanded to 2-3 Bcf /day with compression. This cost could be borne by pipeline operators upon reserve certification by Santos / Origin / Pangaea / Empire
- Jemena has publicly stated that following lifting of the NT Fracking
   Moratorium it will increase its \$800m investment in the Northern Gas Pipeline
   by up to \$4bn to increase installed capacity from 90 Pj / day to 700 Pj / day

Domestic

 "Santos is focused on further exploring and appraising the McArthur Basin in the NT, a multi-TCF prospective resource position analogous to US shale plays.
 Santos' focus for this region is to support Darwin LNG backfill, expand our acreage footprint and explore and appraise the McArthur Basin."

Export



## And equally access to growing export markets

Plant	Status	Operator	Capacity Bcf/day
Ichthys Darwin	Online	INPEX	1.2
Darwin LNG	Online	ConocoPhillips	0.5
QCLNG Gladstone	Online		1.2
GLNG Gladstone	Online	Santos	1.1
APLNG Gladstone	Online	AUSTRALIA PACIFIC LNG	1.3
Total production from 9 trains			5.3

**Expansion Potential to a Total of 18 trains for 10.8 Bcf / day** 



# Empire's independently certified NT Prospective Resource Estimate

Formation	Permits	Geological factor discount	Area m acres	s Units	P90	P50	PV10
Barney Creek	EP 184, EPA180, 181, 182, 183, 188	50-90%	3,559	Bcf	3,304	8,699	20,172
		50-90%		ММВО	66	174	403
Velkerri	EP184, 187, EPA 188	50%	315	Bcf	383	1,192	3,086
		50%		MMBO	8	24	62
Wollogorang	EP 184, 187, EPA 188	90%	1,384	Bcf	524	1,185	2,371
		90%		MMBO	10	24	47
Total				MMBOe	851	2,238	5,183

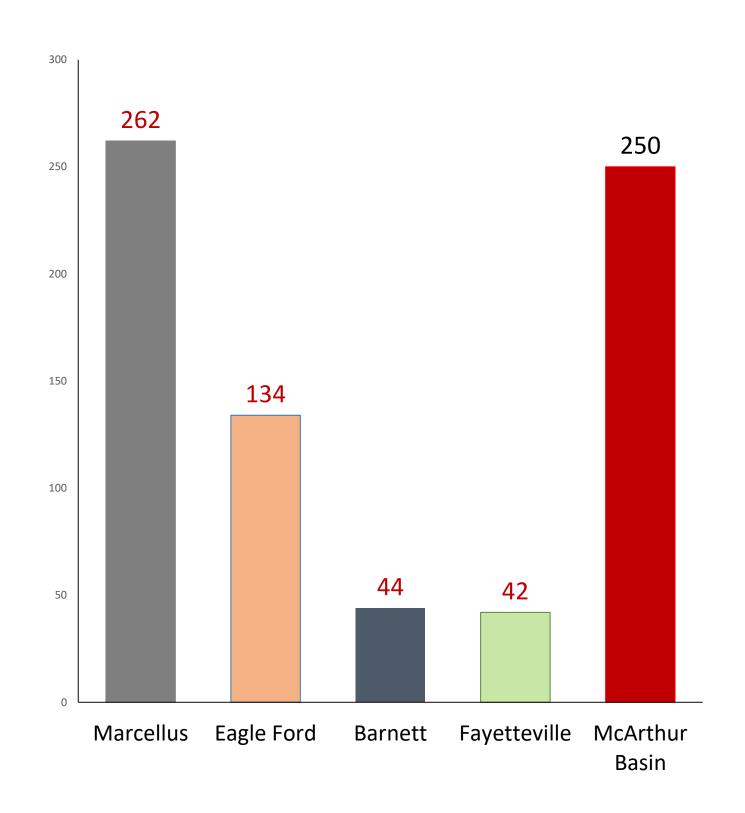
## Prospective Resource – P50 13,000 Pj equivalent

Conversion Factor: 5.485 Mcf: 1 Bbl

Northern Territory Resources by: Muir & Associates P/L and Fluid Energy Consultants



## Un-risked Prospective/Technically Recoverable Resource

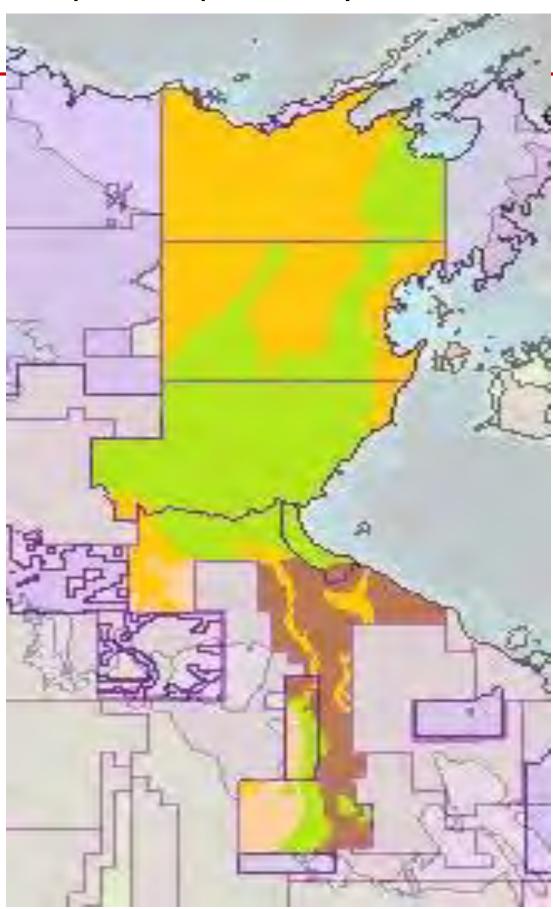


McArthur Basin
potential rivals the
Resource Potential of
the US Marcellus Shale

"Prospective Resource" is the estimated quantities of petroleum that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons.



## Empire's primary Shale Targets



Total 33,867 km<sup>2</sup> (8.4mm acres) of identified shale for Independent Prospective Resource identification

## Velkerri Shale / Kyalla (Beetaloo sub-Basin)

- 628,000 acres (>2,500km2), up to 600m thick
- Independent Prospective Resource (P50) 1.2TCF gas + 24 mmbbls oil / condensate

#### Barney Creek Formation (McArthur Basin)

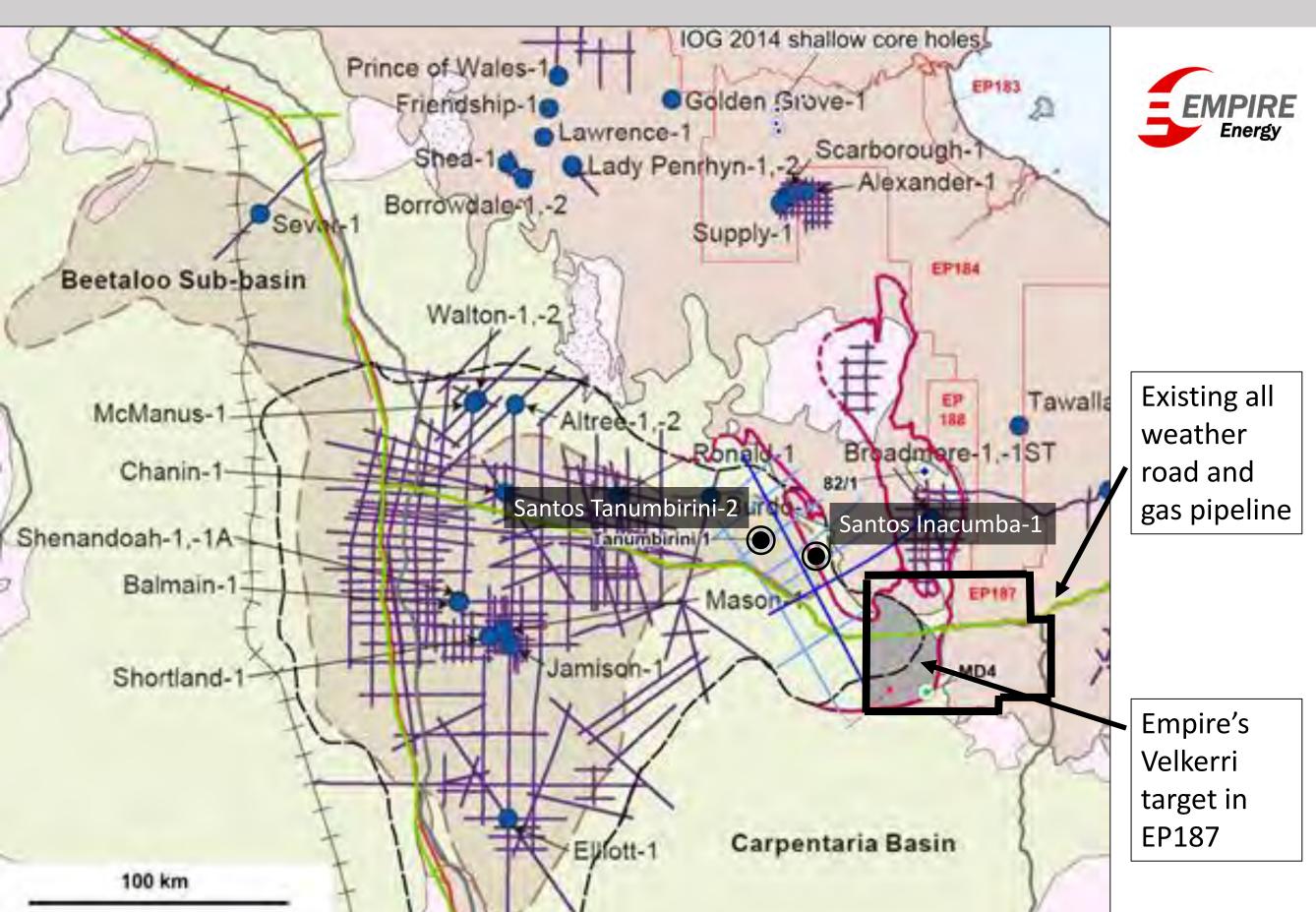
- 6.2mm acres (>25,000km2), up to 900m thick
- Independent Prospective Resource (P50) 8.7TCF gas + 174 mmbbls oil / condensate
- Shales up to 3km thick

### Wollogorang Formation (McArthur Basin)

- 1.5mm acres (>6,000km2), up to 100m thick
- Independent Prospective Resource (P50) 1.2TCF gas + 24 mmbbls oil / condensate



## Beetaloo Sub Basin – Empire's 1-3tcf Target



## Beetaloo Sub Basin – Empire's 1-3tcf<sup>1</sup> Target



## Empire's 1 - 3 TCF target on trend with major Origin discovery and Santos work programs

- Empire ~2,543km² (630,000 acres) in eastern Beetaloo sub-basin
- Amungee NW-1H TD 2,500m Beetaloo well flowed gas from the Velkerri Shale
- Tanumbirini-1 well encountered Velkerri shale from 2,400m to >3,800m
- Santos to undertake major fracked horizontal development program in adjacent block in 2019
- Empire EP187 Work Program
- Velkerri Shale in EP187 will be Empire's initial exploration, appraisal and development target
- 231 line km 2D seismic will delineate the shape of the basin and identify drilling targets
- Initial drilling program to comprise a core well to confirm hydrocarbon content and rock characteristics
- Thereafter, fracked horizontal production wells will be drilled and put into production
- EP 187 is located on an existing sealed road and gas pipeline which reduces drilling costs and allows for near term commercialisation

## Empire's US Reserves and Resources in Kansas, NY State & Pennsylvania – currently advancing sales process



## As at December 31, 2018

Reserves (NYMEX STRIP - DEC 31, 2017)	Gross Wells	Oil (Mbbls)	Gas (MMcf)	МВое	Capex US\$M	PV0 US\$M	PV10 US\$M
Region (Reserves) - USA							
Proved Developed Producing	2,211	1,612	26,787	6,077	0	62,697	31,919
Proved Developed Non-producing	21	503	0	503	1,546	10,858	5,361
Proved Behind Pipe	6	148	39	155	532	4,988	1,472
Proved Undeveloped	80	1,027	3,396	1,593	14,542	27,755	7,480
Total 1P	2,318	3,290	30,222	8,327	16,620	106,298	46,232
Probable	83	1,248	12,654	3,357	19,776	47,087	13,519
Total 2P	2,401	4,538	42,876	11,684	36,396	153,385	59,751
Possible	208	1,749	3,772	2,378	24,589	54,735	10,284
Possible - NY Shale		90,740	12,460	92,817			
Total 3P	2,609	97,027	59,108	106,878	60,985	208,120	70,035
Prospective Resource New York Shale P(50) <sup>(1)</sup>		203,500	1,221,000	407,000	-	0	0
Total Reserves & Resources		300,527	1,280,108	513,878	,i		

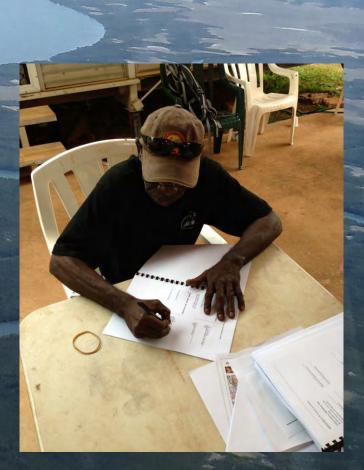
US Reserves by: Graves & Co Consulting & Pinnacle Energy Services, LLC

<sup>(1)</sup> Prospective Resource P(50) - unrisked, is the estimated quantities of petroleum that may potentially be recovered by the application of future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons



Empire's vision is to safely develop the NT's petroleum resources and to preserve cultural, heritage, customs & natural environment







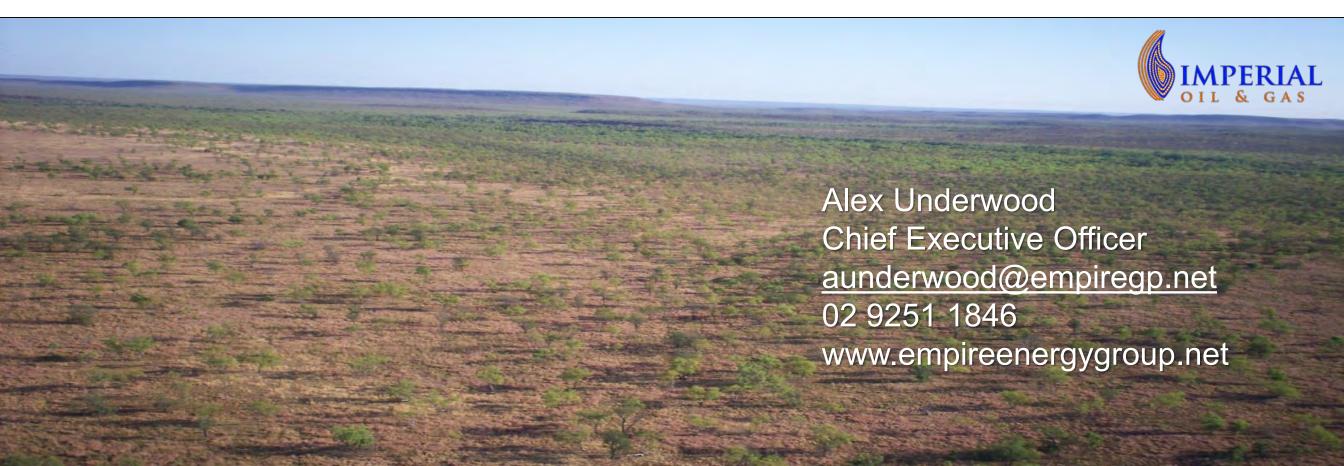
## Corporate, technical and regulatory stars align

- Empire has substantially reduced debt, increased cash balance and renewed the Board of Directors
- Strategy is to focus on the substantial value creation potential of its Northern Territory assets
- The Middle Velkerri Shale of the Beetaloo Basin is a world class resource with over 500 TCF gas in place
- Northern Territory Government is open for business
- Major industry appraisal drilling is expected to start in the coming months
- Beetaloo Basin operators are likely to commence flow testing of appraisal wells later in 2019
- Empire is the only ASX listed junior with Beetaloo Basin and McArthur Basin tenements



## ASX:EEG

With US asset sales advancing, Empire Energy is becoming an NT-focused hydrocarbon play and its shares will offer the single best stock market exposure to the potential of the exciting future of the McArthur and Beetaloo Basins



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