



ASX:EEG

Empire Energy – The Beetaloo Basin Pioneer moving into Production



Australian Domestic Gas Outlook Conference 2024

Empire Energy Investment Case



The Beetaloo Basin Focused Gas Development Company

- The Beetaloo's Velkerri Shale is an enormous (>500 TCF) low CO₂ shale gas resource located in Northern Australia close to Asian LNG markets and existing export infrastructure
- The Beetaloo is a stacked shale play with world class geological characteristics analogous to the prolific Marcellus Shale
- Empire holds ~3 million net effective Beetaloo acres in two contiguous landholdings
- Empire owns and operates all of its acreage with 100% working interest and ~90% net revenue interest

Empire Energy Investment Case (Cont'd)



The Beetaloo Basin Focused Gas Development Company

- Empire's acreage contains >47 TCFe 2U resource and >1.6 TCF 2C resource independently assessed by NSAI with <1% CO₂
- Recent appraisal drilling by Empire and other operators has demonstrated commercial viability
- Australian gas prices are over four times US, demonstrating an urgent need for increased supply
- Empire is targeting first gas sales from its Carpentaria Pilot Project in 1H 2025 with scope to grow to LNG scale in years ahead

Corporate Snapshot



Capital Structure

Shares on issue ¹	773.4M
Share price	A\$0.175
Market cap	A\$135.3m
Net (debt ²) / cash ³	~A\$8.6m
Enterprise value	~A\$126.7m
Cash at bank³	~A\$17.3m

Top Shareholders

Pangaea Resources	18.1%
Elphinstone Group	8.3%
Sheffield Holdings (USA)	5.3%
Global Energy and Resources	4.2%
Energy and Minerals Group (USA)	3.4%
Macquarie Bank	3.4%

ASX Share Price



Contingent and Prospective Resources

2C Contingent Resources	1.65 TCFe	1,927 PJe
2U Prospective Resources	46.6 TCFe	49,125 PJe

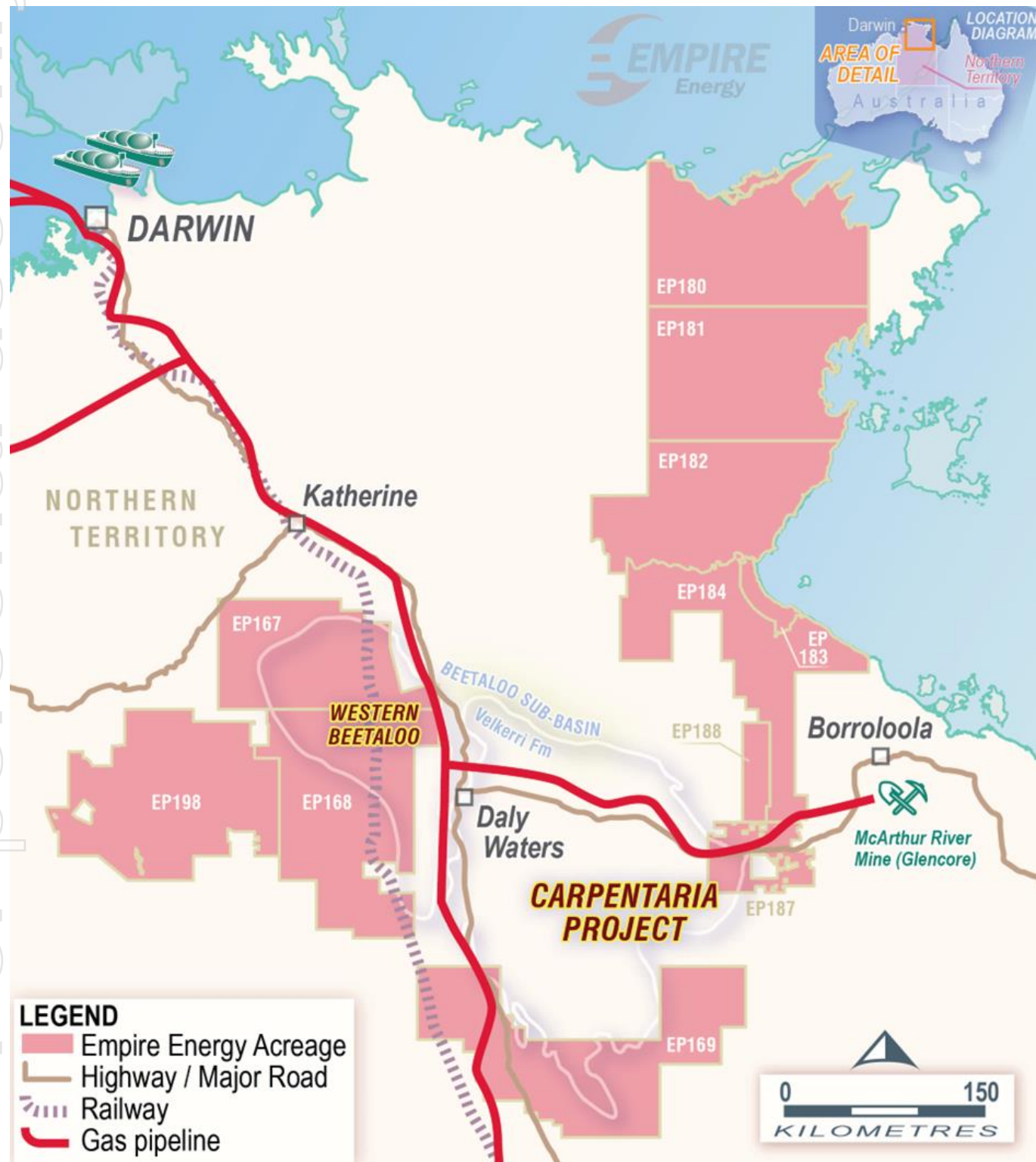
1. Empire has 78.9m unlisted options on issue with an average exercise price of ~A\$0.39 per share. In addition, there are 17.5m Share Rights on issue to members of the management team and Board, 6.9m of which have performance hurdles tied to total shareholder return.

2. Empire has a US\$7.5 million debt facility (drawn to US\$4.7 million) with Macquarie Bank maturing in September 2024 which is secured against the Company's USA gas production assets (exchange rate as at 31 December 2023, \$0.68). Empire also has in place a A\$2.25 million revolving credit facility (drawn to A\$1.8 million) and A\$5 million performance bonding facility with Macquarie Bank

3. As at 31 December 2023

Empire's Beetaloo Basin Position

5 TCF gas pilot ready Carpentaria Project with >20 TCF Western Beetaloo resource delineated

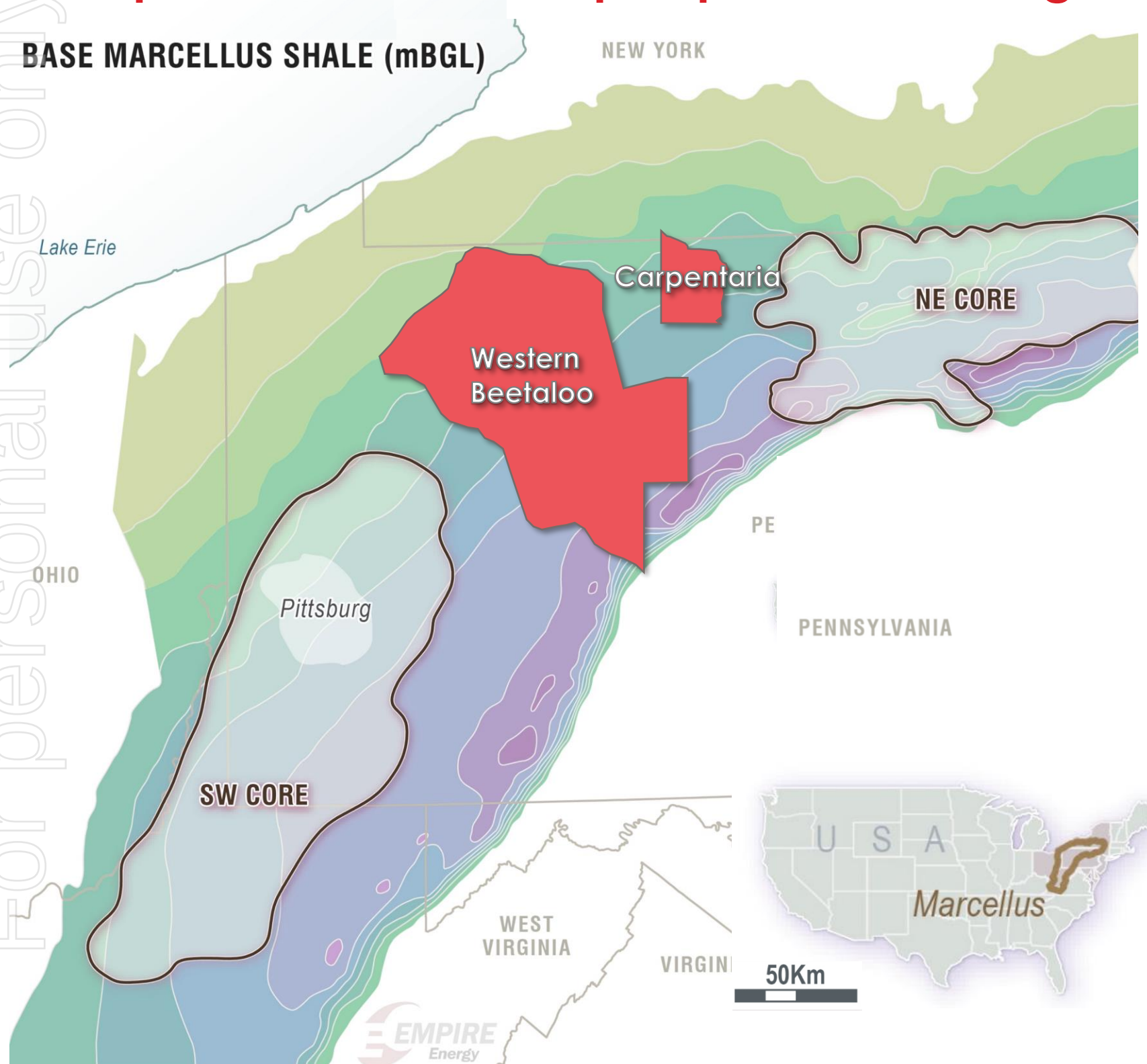


- Empire is the largest net acreage holder in the Beetaloo
- All acreage is 100% owned and operated by Empire
- Acreage benefits from high Net Revenue Interest of ~90%¹ vs typical US NRI ~75%
- Acreage is proximal to existing pipeline and road infrastructure to facilitate rapid commercialisation
- NT Government investing in infrastructure corridors to facilitate rapid industry growth
- The Carpentaria Project (EP187) is the immediate focus (5 TCF pilot ready) targeting first production in 1H 2025 with >20 TCF Western Beetaloo resource providing material drilling inventory

1. Net revenue interest (NRI) equals Working Interest (100%) minus 10% Northern Territory Government royalty (partially offset by statutory deductions) minus Traditional Owner royalty

Empire's Enormous Acreage Position

Empire's net effective prospective acreage is larger than leading Marcellus Shale Producers



- Empire's Velkerri Shale resource comparable in size to core areas of the Marcellus Shale
- Empire's Carpentaria and Western Beetaloo projects cover ~3,000,000 net effective acres* of thick, stacked shale pay zones
- For comparison, EQT the largest producer of gas in the US and has ~1,000,000 net acres in the Marcellus Shale[^]
- EQT produces ~5.1 BCF/day and has a market cap ~US\$16.4 billion

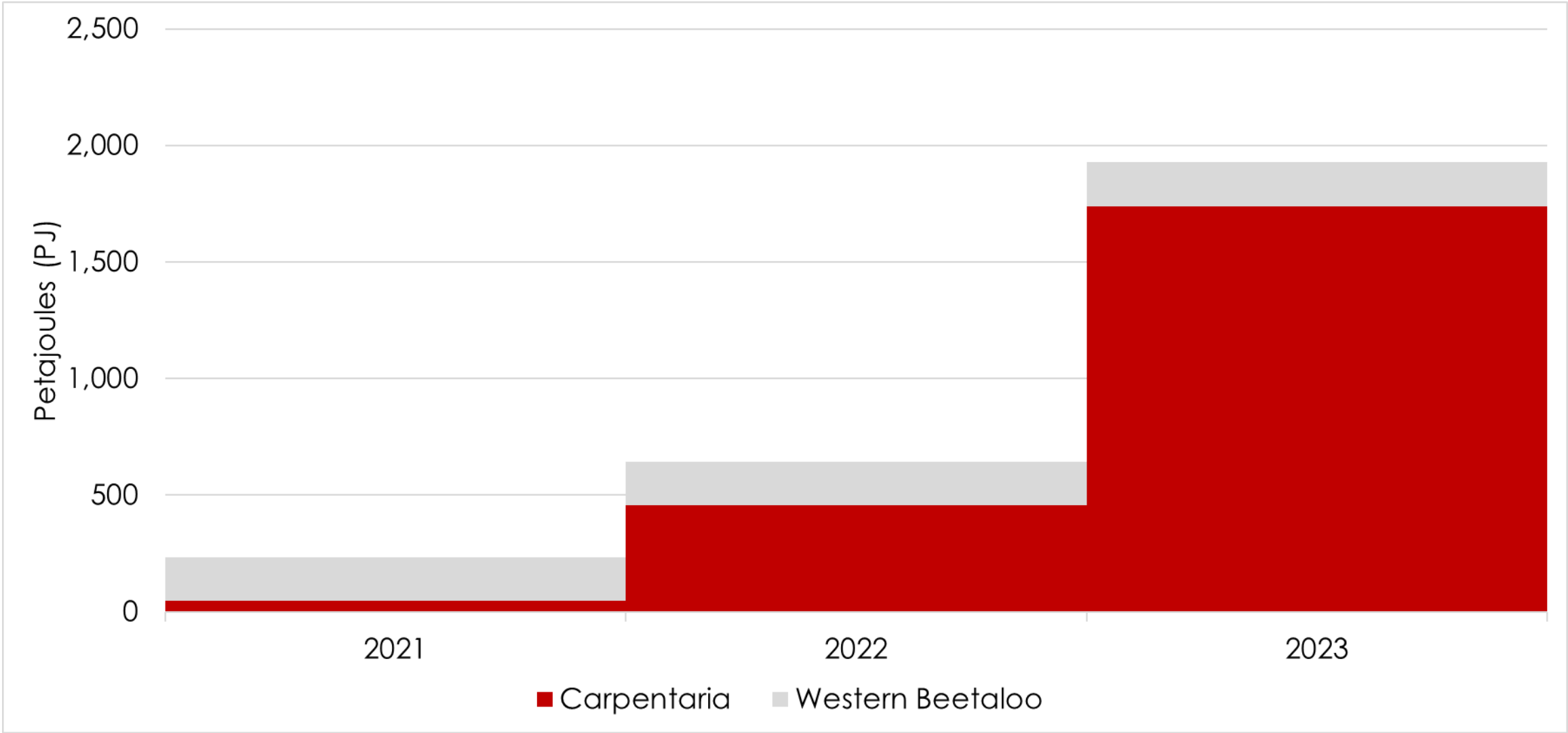
*Carpentaria net effective area: A Shale 150,000 acres, Intra A/B 112,000 acres, B Shale 109,000 acres and C Shale 93,000 acres. Western Beetaloo net effective area: A Shale 1,300,000 acres and B/C Shales 1,300,000 acres. These areas form the basis of Netherland, Sewell & Associates, INC (NSAI) Independent assessment of resources. Refer to EEG announcement dated 29 May 2023

[^]EQT Investor Presentation Q3 2022

Empire aims to Convert LNG Scale Certified 2C to 2P



Empire has rapidly grown its 2C resource base at a finding cost of <A\$0.10 / GJ and is targeting maiden 2P Reserves in 2025



2025
Targeting Initial
2P Reserves
Booking

Key Drivers of 2C Uplift

- | | | |
|---|--|--|
| <ul style="list-style-type: none">• Carpentaria-1 drill• Pangaea acquisition | <ul style="list-style-type: none">• Carpentaria-1 EPT• Carpentaria-2H drill• Charlotte 2D seismic survey | <ul style="list-style-type: none">• Carpentaria-2H EPT• Carpentaria-3H drill and EPT• Carpentaria-4V drill |
|---|--|--|

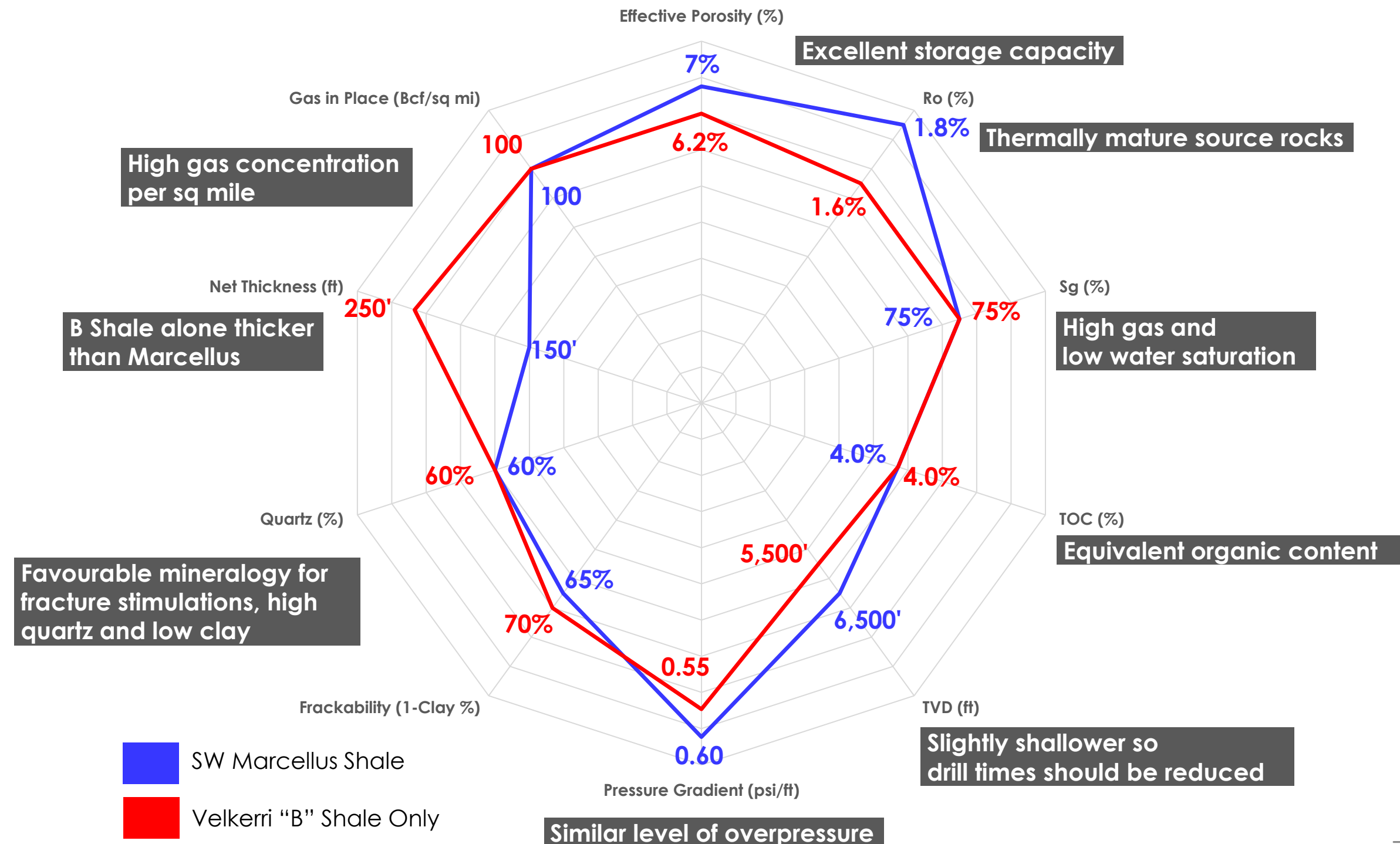
Note: Refer to EEG announcement dated 29 May 2023 for Netherland, Sewell & Associates, Inc. Contingent and Prospective Resources

Velkerri Shale is Analogous to the Prolific Marcellus Shale



Empire's wells confirm the Velkerri "B shale" reservoir properties are comparable with the prolific Marcellus Shale

- In addition to the 100 BCF/sq mile resource in the B Shale, Empire's stacked Velkerri Shale play exceeds 180 BCF/sq mile
- The Velkerri shales have consistently low CO₂ (<1 mole%) and have produced dry to high calorific gas



Source: Empire Energy, EIA

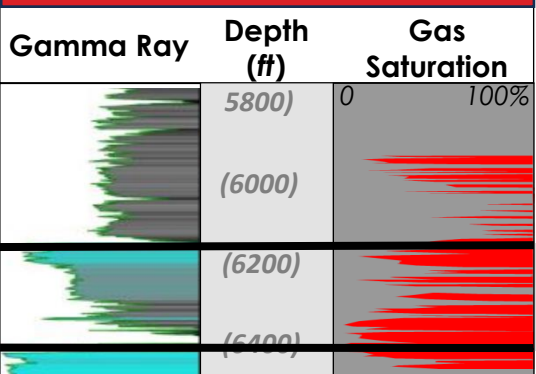
Empire's Stacked Play Improves Development Economics



Empire's four stacked shale reservoirs are 5x thicker than the prolific Marcellus

Single Reservoir

SW Marcellus Section



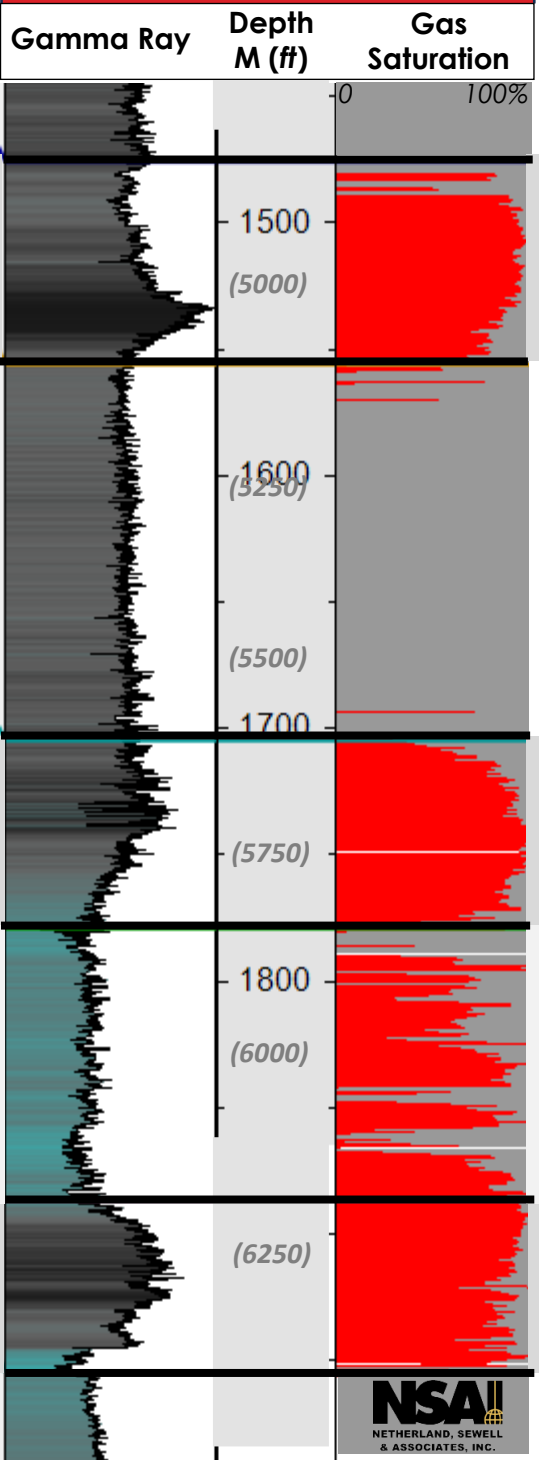
Total Marcellus Thickness ~60 m

100 m
328 ft

Marcellus

Four Stacked Reservoirs

Carpentaria-4 Type Section



C Shale

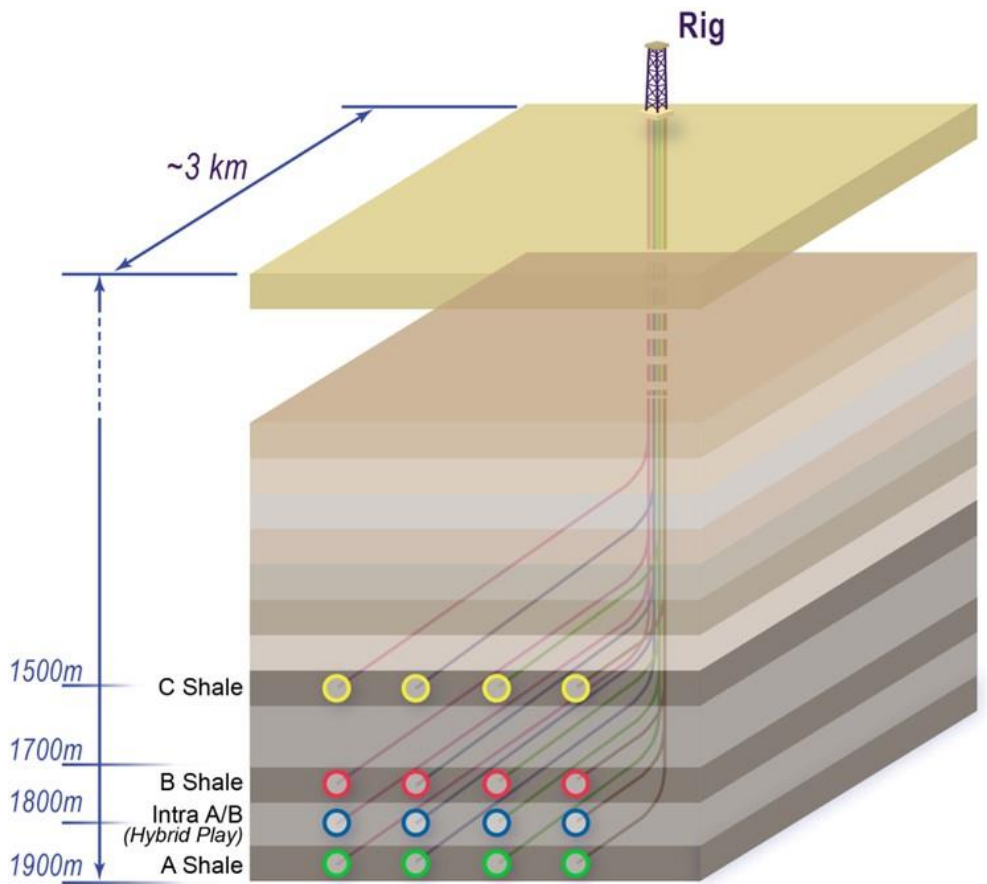
B Shale

Intra A/B (Hybrid Play)

A Shale

Total Net Thickness >300 m

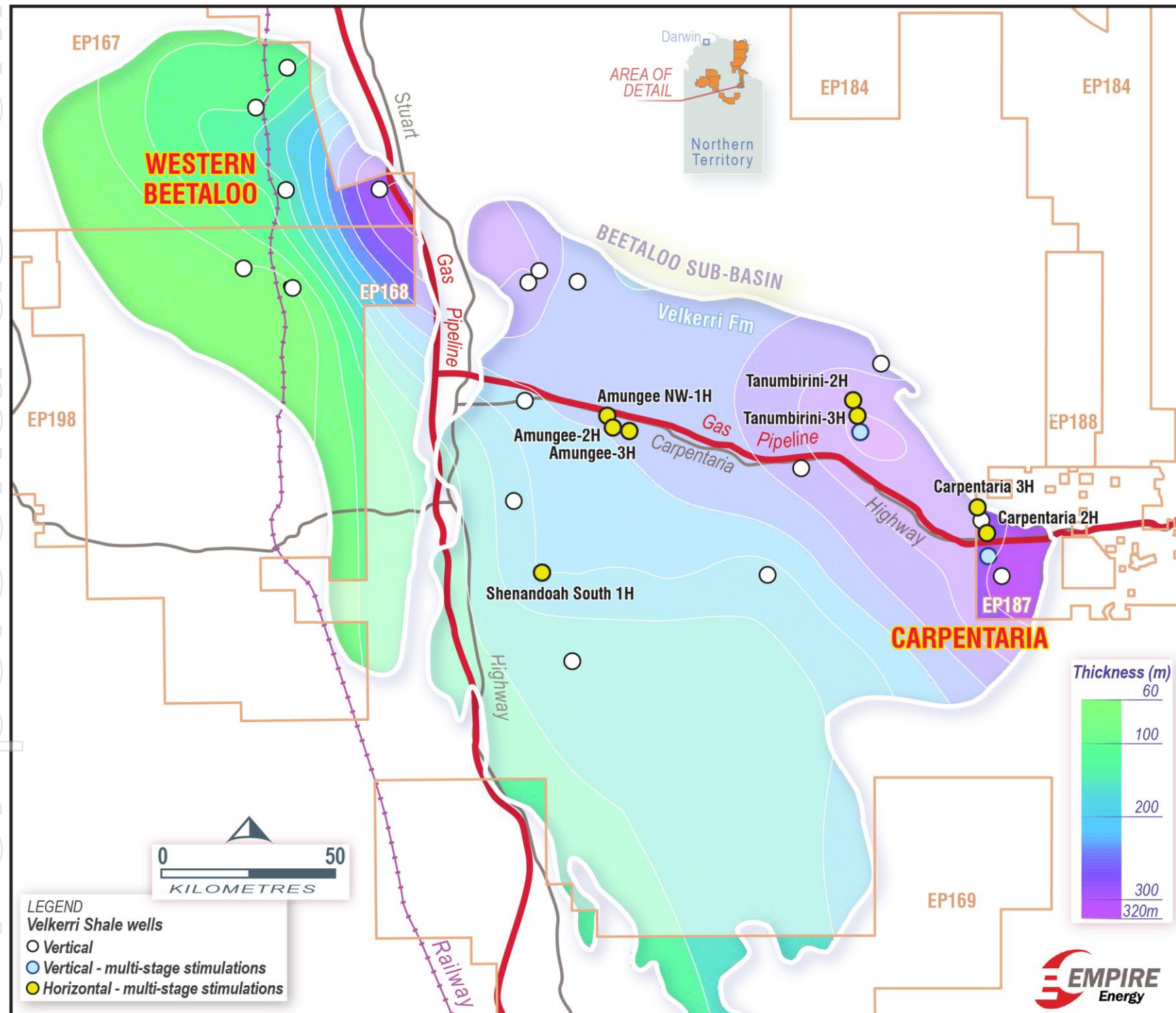
Stacked Shale Play Development Concept



- Four stacked reservoirs allows for fewer well pads with more wells
- Option for more than 30 wells per pad
- Leads to improved development efficiencies and economics
- Akin to Permian Basin style development

Positioned Across the Thickest Section of the Stacked Velkerri Shale

Combined Thickness of A, Intra A/B, B and C Shales



- Empire's Beetaloo Projects area located across the thickest section of stacked Velkerri Shale reservoirs in the basin
- Carpentaria Project has >300 m gross thickness of A, Intra A/B, B and C Shale reservoirs
- Western Beetaloo Project has the thickest stacked B and C Shale in the Beetaloo

Basin-wide Appraisal Drilling has Demonstrated the Commercial Case



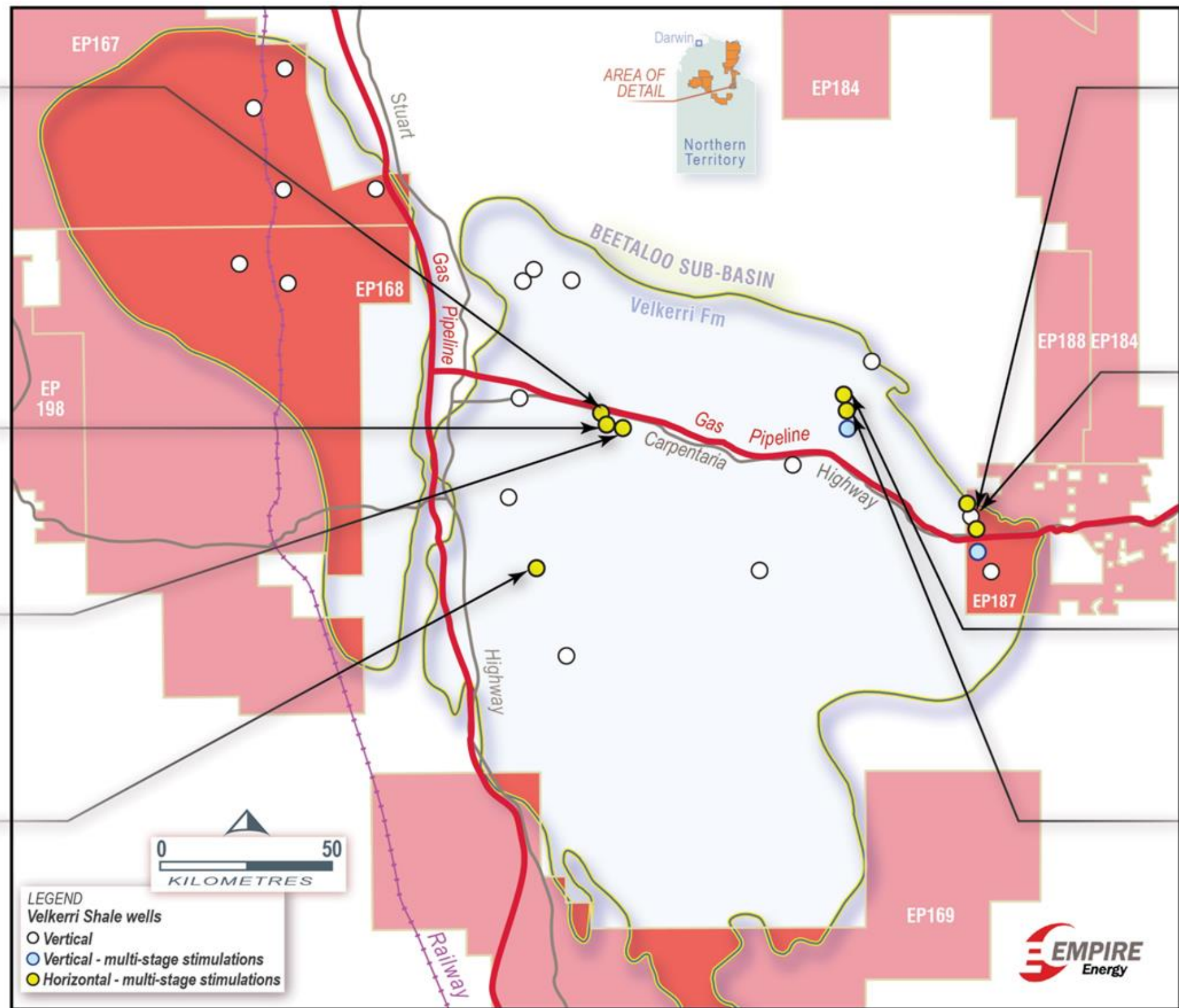
For personal use only

Amungee NW-1H (2016)
Avg. Depth of Hz: ~2,400m
Hz Length: 1,100m
Completion Length: ~750m
IP(30): 1.1 MMscf/d (~1.17 TJ/d)
CO₂: 3 to 4%

Amungee-2H (2023)
Avg. Depth of Hz: ~2,400m
Hz Length: 1,275m
Completion Length: 1,020m
Total Cost: est. US\$21M to US\$23M (A\$32M to A\$35M)
IP(27): 1.0 MMscf/d (~1.06 TJ/d)
CO₂: 3 to 4%

Amungee-3H (2023)
Avg. Depth of Hz: ~2,272m
Hz Length: 1,100m
Completion Length: TBD
IP(30): TBD
CO₂: TBD

Shenandoah South-1H (2023)
Avg. Depth of Hz: ~3,100m
Hz Length: 1,074m
Completion Length: ~501m
Total Cost: est. US\$22M (~A\$34M)
IP(30): 3.2 MMscf/d (3.39 TJ/d)
CO₂: 3.4%



Carpentaria-2H (2022)
Avg. Depth of Hz: ~1,590m
Hz Length: 1,345m
Completion Length: 927m
Total Cost: US\$17M (A\$24.1M)
IP(30): 2.8 MMscf/d (~3.22 TJ/d)
CO₂: Sub 1%

Carpentaria-3H (2022)
Avg. Depth of Hz: ~1,680m
Hz Length: 2,632m
Completion Length: 1,989m
Total Cost: US\$19M (A\$27.3M)
IP(30): 3.3 MMscf/d (~3.80 TJ/d)
CO₂: Sub 1%

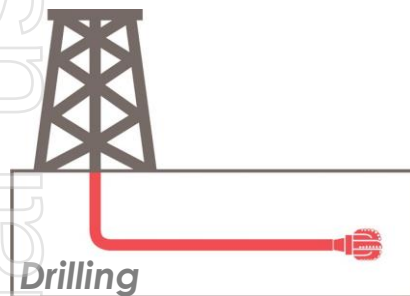
Tanumbirini-2H (2021)
Avg. Depth of Hz: ~3,450m
Hz Length: 1,100m
Completion Length: 660m
Total Cost: est. US\$25M to US\$28M (A\$37M to A\$40M)
IP(30): 2.1 MMscf/d (~2.23 TJ/d)
CO₂: 3 to 4%

Tanumbirini-3H (2021)
Avg. Depth of Hz: ~3,475m
Hz Length: 1,100m
Completion Length: 600m
Total Cost: est. US\$25M to US\$28M (A\$37M to A\$40M)
CO₂: 3 to 4%

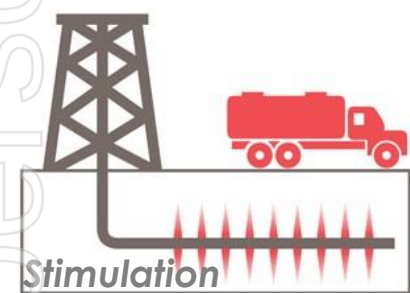
A Platform for Increased Productivity

Basin-specific drilling and completion methodologies are being developed to drive increasing flow rates and EUR consistent with the lived experience of the US Shale Revolution

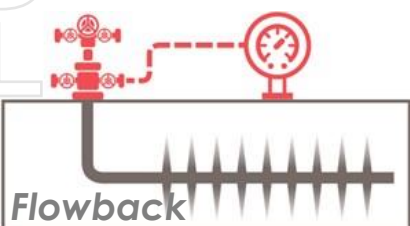
Drilled Appraisal Wells



Demonstrated Execution
> 2.6 km horizontal well drilled successfully with 4 ½" casing



Trialled multiple techniques
61 stimulation stages successfully executed without screenout
Multiple stimulation fluids trialled



Lift, Choke & Soak
No artificial lift required during flowback
Trialled choke management and soaking

Future Pilot / Development Wells

- Drilling 3km horizontal wells
- Increase casing size to 5 ½"
- Completion focus for landing zone, geosteering and cementing

- Higher horsepower and doubling pump rates to >100 barrels per minute
- One optimised strategy per well

- Post stimulation well cleanup timing and technique ("soak")
- Managed choke scheme for long term productivity



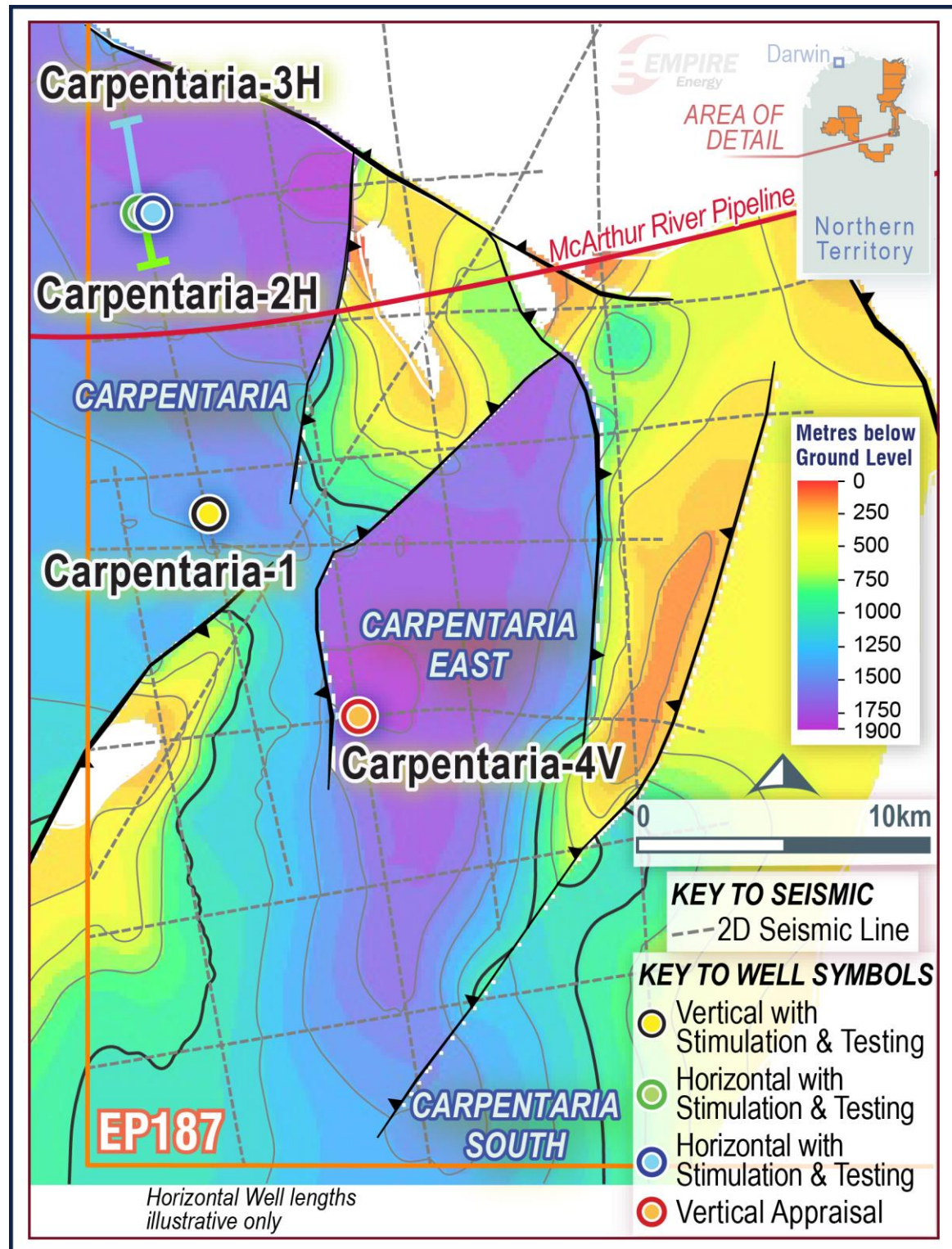
Pathway to Full-Field Development of the Carpentaria Project



Year	2024	2025	2026	2028+
				
KEY ACTIVITIES	- Construct Carpentaria Pilot Project midstream facilities and gas gathering network - Drill, fracture stimulate and connect up to 3 wells (3,000m lateral, ~60 stages)	- First gas deliveries from the Carpentaria Pilot Project (~15TJ/d) - Planning and engineering work for full-field development	- Drill, fracture stimulate and connect a further ~3 wells (3,000m lateral, ~60 stages) to grow production to ~25TJ/d - APA to commence work on pipeline and gas processing infrastructure for full-field development	'Factory' drilling - Grow production up ~1 BCF/d to supply east coast and LNG markets - All three target gas markets (NT, east coast and LNG) are structurally short of gas



Appraisal Activity has Delivered the Carpentaria Project



Cost-Effective Approach to Appraisal

- Seismic, multi-stage vertical and horizontal flow tests have delineated a large stacked play
- Four zones with a net effective area of >460,000 acres (~1,900 km²)
- ~US\$60m invested has delivered >1,739 PJ (~1.5 TCF)

Commercial rates confirmed

- Two horizontal wells stimulated
- Excellent flow rates – normalised rate of 3.5 TJ/d per 1,000 m
- High calorific value gas (1.15 TJ per MMCF)

Gas resource and productivity now established to move into pilot production

- More than 200 drilling locations delineated in the B Shale
- ~600 additional locations across A, Intra A/B and C Shales

The Carpentaria Pilot Project

Empire is targeting first production from Carpentaria in H1 2025

The Carpentaria Pilot Project aims to:

- Produce sales gas from existing Carpentaria-2H and Carpentaria-3H test wells and new pilot development wells
- Process gas through Empire's Carpentaria Gas Plant which has a design capacity of 42 TJ/d (40 mmcf/d)
- Utilise existing McArthur River Gas Pipeline capacity
- Deliver both cash flow and additional resource definition for large-scale development

Final steps to FID:

- Complete gas sales and transportation negotiations
- Complete financing negotiations
- Complete advanced regulatory approval processes



Carpentaria 2H and 3H well pad from above



Carpentaria Gas Plant in operation immediately prior to acquisition

Accelerated Path to Pilot Project Production

- **Empire acquired AGL's Rosalind Park Gas Plant (RPGP) in December 2023**

- The plant has a design capacity of 42 TJ/d – more than the Pilot Project's 25TJ/day production target

- RPGP is a fit for purpose facility that meets all Carpentaria pilot specifications and has passed stringent technical due diligence requirements

- Empire paid A\$2.5 million for the plant

- The plant is currently in storage facilities in Queensland where the equipment will be refurbished in readiness for transportation and reassembly at the Carpentaria Pilot Project in 2024

- Empire continues to work with APA under its Initial Agreement which may result in the funding of the engineering and construction of midstream infrastructure assets, if further approvals are obtained and long form agreements are entered into

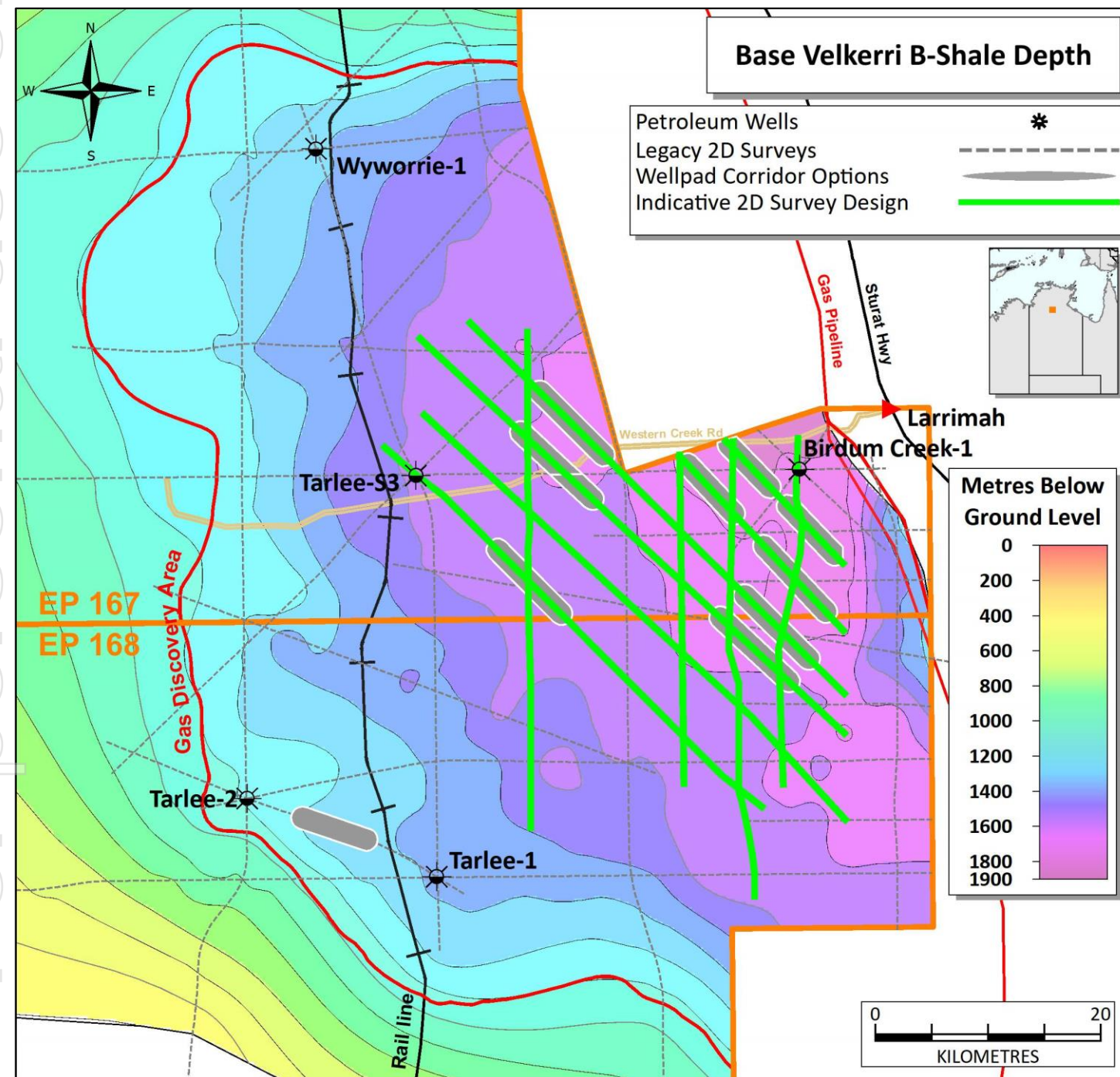


RPGP at Menangle NSW

Empire estimates that the acquisition of the RPGP may result in >\$30 million in cost savings and reduce the lead time by ~12 months compared to new build alternatives

Large Western Beetaloo Resource

Comprehensive well and seismic datasets in the Western Beetaloo Project have defined a large extensive resource strategically located on existing infrastructure



EP 167 and EP 168 100% EEG

Resource has been delineated

- Delineated ~2.6 million net effective acres
- 100+ TCF OGIP Discovery (B Shale only)
- Less than 1% CO₂
- Thickest B and C Shale in Beetaloo
- **Same rock as Carpentaria Project – Stacked Play**
- Huge running room

Forward program

- Up to 380 km in-fill 2D seismic oriented for future Hz wells
- Multiple locations cleared for drilling and flow testing

Empire is a Responsible Operator with ESG at the Core of its Strategy



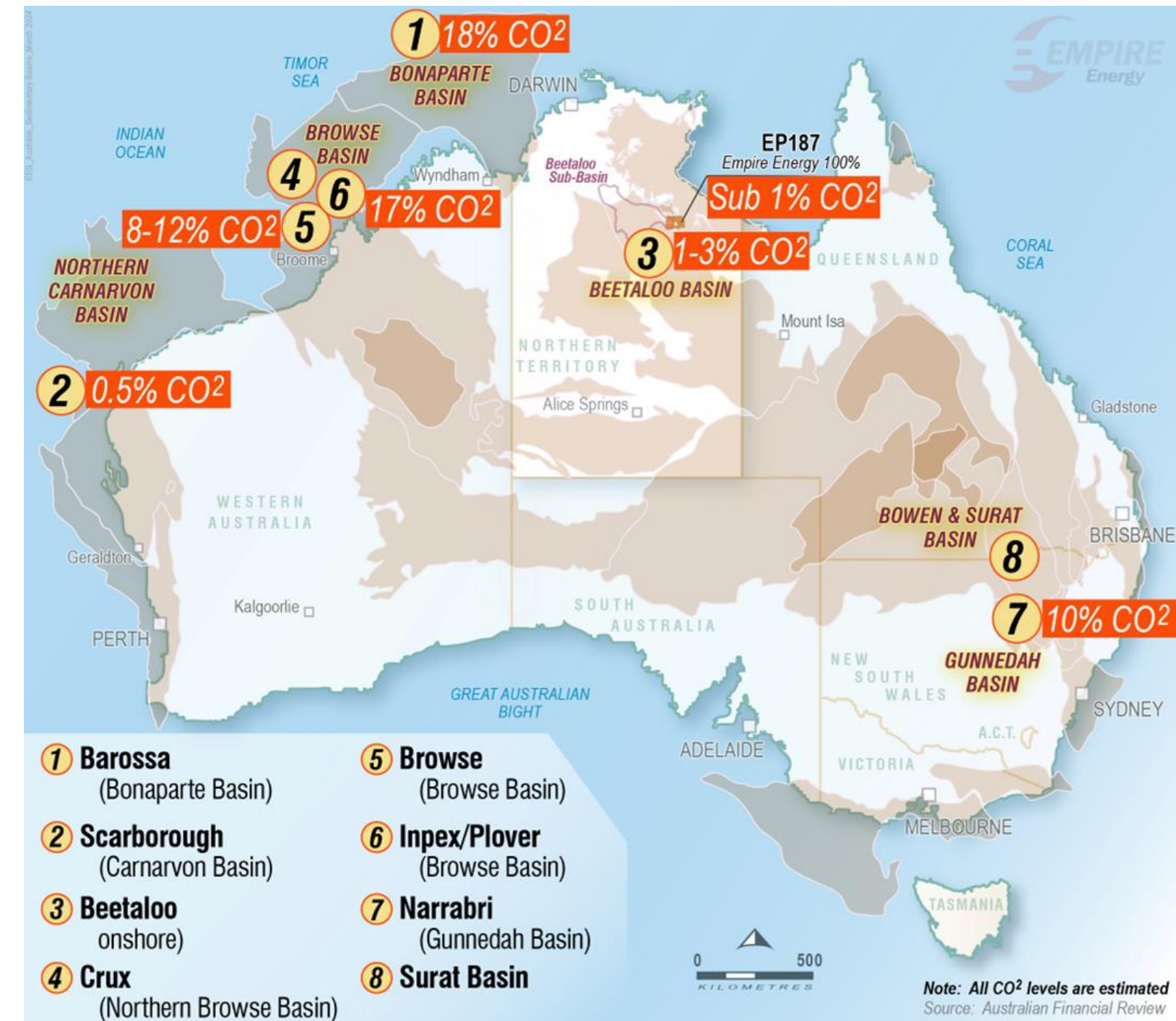
Empire's Beetaloo gas contains sub 1% CO₂ in the reservoir

Environment

- **Carpentaria CO₂ reservoir levels are extremely low compared to other new supply options**
- Empire will offset all Scope 1 emissions with minimal impact on revenues
 - ~2% of gross revenue (at A\$10/GJ gas price) for Carpentaria's full field economic life at the current Australian Carbon Credit Unit ("ACCU") price of ~A\$35 per tonne of CO₂e¹
- Stacked shale play minimises surface footprint

Social and Governance

- **Empire maintains strong relationships with Traditional Owners (TOs) and pastoralists on whose land it operates with full consent**
 - ~30 on-county meetings held with TOs to date
 - Northern Land Council exploration payments paid for the benefit of TOs and thousands of hours of employment for TOs to date
 - Land access agreements signed with pastoralists

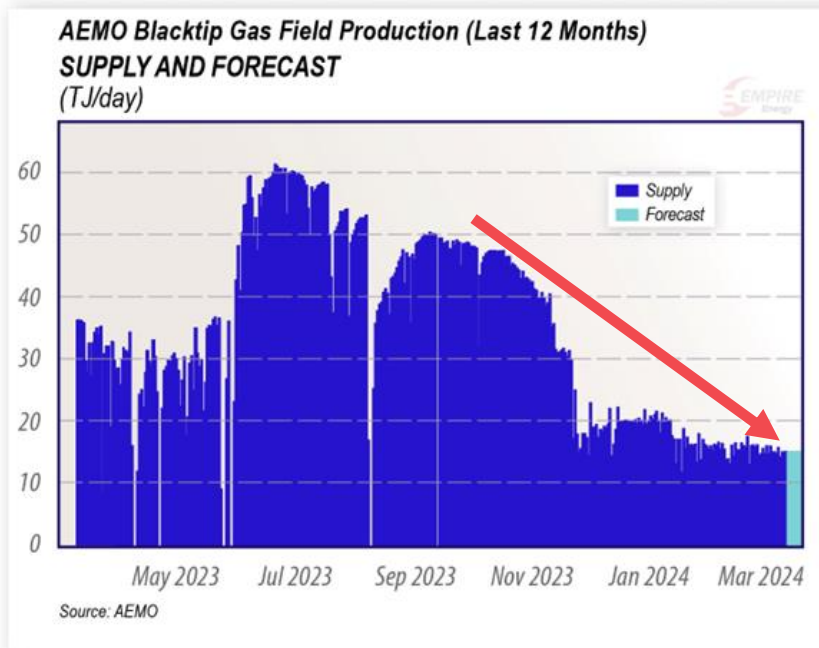


1. Estimates have been prepared by Empire and independently reviewed by HRL Technology Group Pty Limited (<https://www.hrlt.com.au>)

Australia, Asia and the World Need New Gas Supply

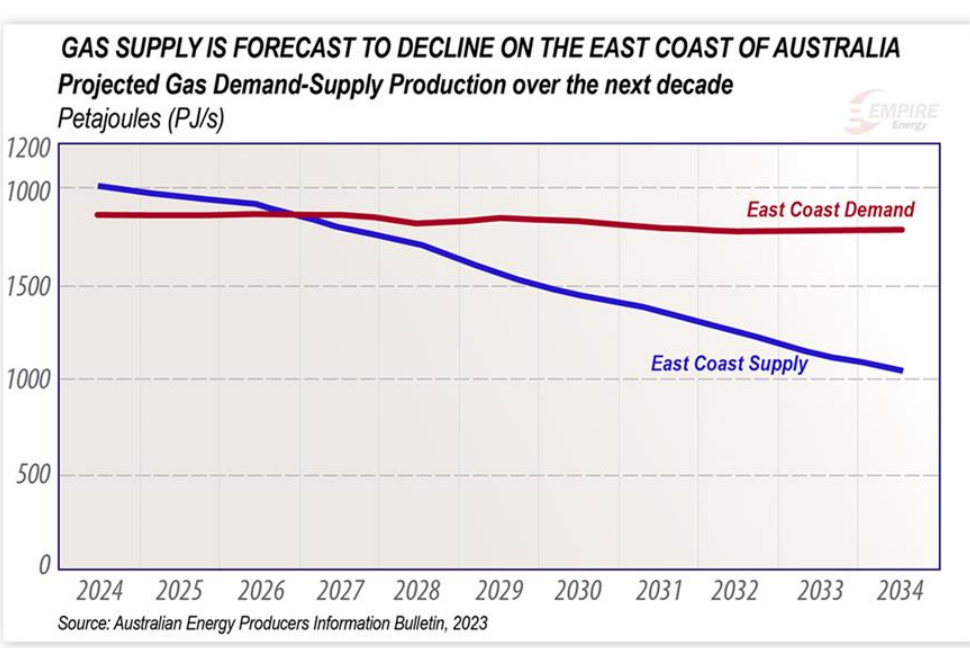
Empire's strategy is to supply domestic and international gas markets

Phase 1: Northern Australian Gas Market



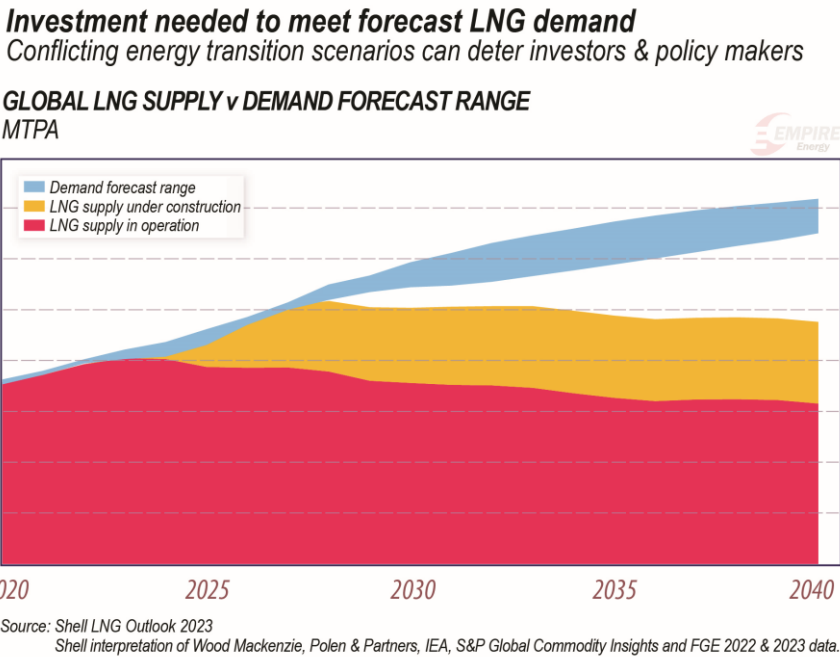
- **Blacktip Gas Field:** GSA to 2034 of 104TJ/d vs. 15TJ/d production
- NT needing to buy emergency gas from Darwin LNG terminals
- **Northern Gas Pipeline (to QLD):** expected to be closed until 30 June 2024 to hold gas in NT¹

Phase 2/3: Australian East Coast Gas Market



- Australian east coast domestic market is structurally short of gas with a supply vs. demand deficit emerging in 2027
- Existing supply sources such as the Gippsland Basin are in decline. QLD CSG largely developed and contracted for LNG to Asia

Phase 2/3: Global LNG Market



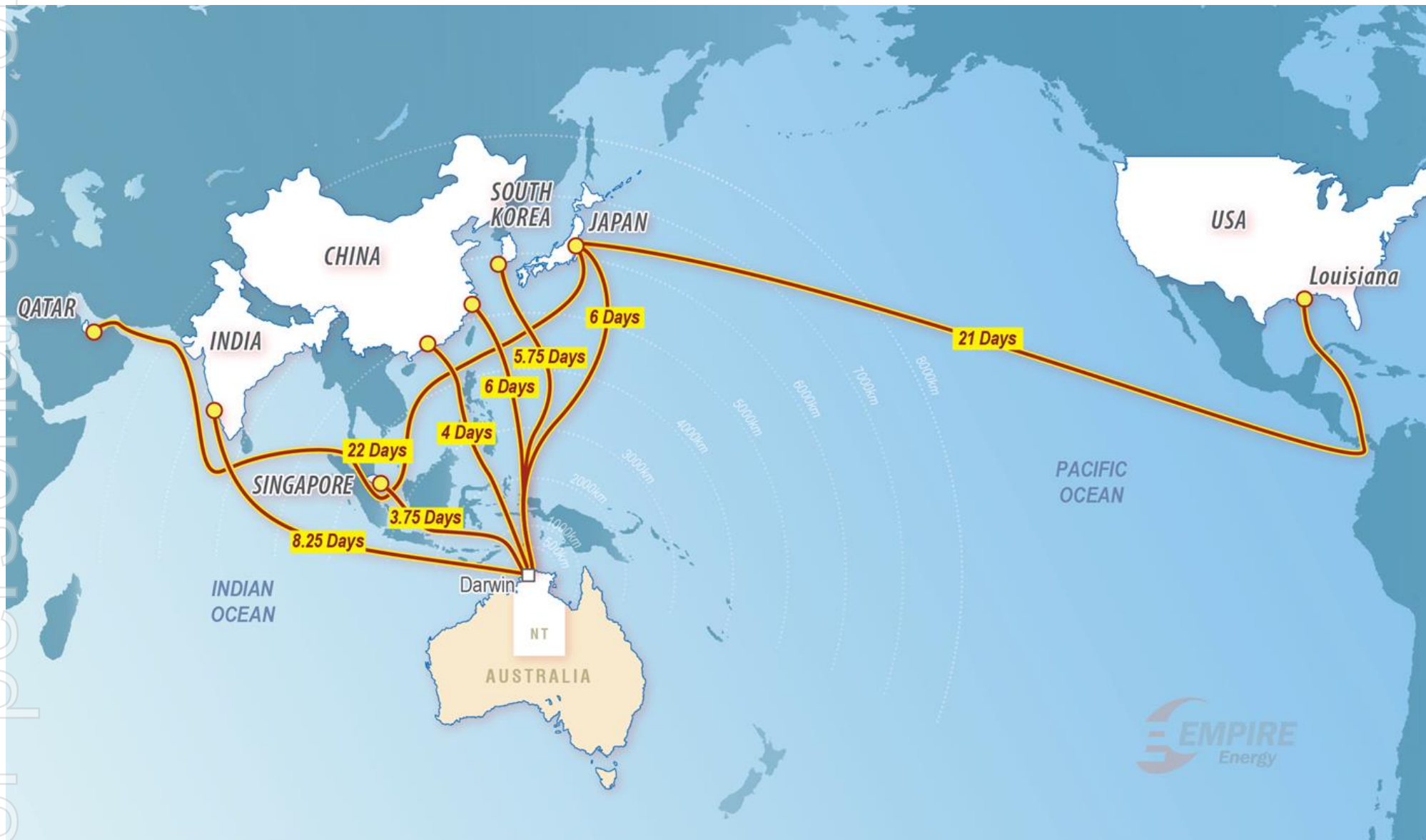
- **Empire is strategically located between Darwin and Gladstone LNG export infrastructure**
- LNG demand to reach around 625-685 million tonnes a year in 2040 (2023: 404mt) and outstrip supply by 2027²

1. Central Petroleum ASX release entitled "Northern Gas Pipeline Update" dated 15 March 2024
2. Shell LNG Outlook 2024

The Beetaloo is Strategically Located Near Asian Markets

Australian domestic gas and Asian LNG indices trade at multiples of US Henry Hub prices

LNG Tanker Sailing Days to Tokyo Bay¹



- **Exposure to Pacific Basin gas prices**
 - >US\$7 / MMBtu premium to Henry Hub
- **Japan/Korea Marker (Platts) LNG price**
 - US\$9.42 / MMBtu (as at 18 March 2024)
 - US\$12.61 / MMBtu (avg. previous 12 months)
 - US\$22.06 / MMBtu (avg. previous 3 years)
- **Henry Hub price**
 - US\$1.73 / MMBtu (as at 11 March 2024)
- **Wallumbilla (Main East Coast Australian Index)**
 - A\$10.86 / MMBtu (as at 18 March 2024)
 - US\$7.06 / MMBtu (as at 18 March 2024)

Source:

1. BloombergNEF, Tamboran Resources

The Empire Value Proposition

Phase 1 Carpentaria Pilot Project



- **Up to 25 TJ/d (24 mmcf/d)**
- **Targeting first revenue in 2025**, ramping up to ~A\$110m per annum at plateau
- Mature resource definition and type curves for larger scale development
- **Gas plant secured**

Phase 2 Domestic Gas Project



- **~200TJ/d (~190 mmcf/d) to supply Australian east coast**
- **P50 IRR: ~37%**
- **P50 NPV(10): A\$2.5bn**
- Carpentaria 'stacked play' provides additional drilling inventory across ~460,000 net effective acres

Phase 3 Full-Field Development - LNG



- **~1 BCF per day to supply LNG export markets**
- **P50 IRR: ~52%**
- **P50 NPV(10): A\$14.2bn**
- Empire estimates a landed cost of LNG into Tokyo Bay of US\$6.50 / MMBtu
- ~2.6 million net effective acres of 'running room' across Western Beetaloo



<https://empireenergygroup.net/>

ASX:EEG

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Appendix 1: A Globally Significant Resource Position



Contingent Resources (Gas)			Contingent Resources (Liquids)			Prospective Resources (Gas)			Prospective Resources (Liquids)		
Low Estimate (1C)	Best Estimate (2C)	High Estimate (3C)	Low Estimate (1C)	Best Estimate (2C)	High Estimate (3C)	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)
PJ	PJ	PJ	mmbbls	mmbbls	mmbbls	PJ	PJ	PJ	mmbbls	mmbbls	mmbbls
365.2	1,906.1	3,946.1	0.9	3.5	14.1	12,380	44,540	145,523	164	764	3,509

Empire 2C Contingent Resource of **1,906 PJ (1,625 BCF gas)** and **3.5 MMBBLs liquids**

Empire P(50) Prospective Resource of **44,541 PJ (42 TCF gas)** and **764 MMBBLs liquids**

Appendix 2: Empire's Board of Directors



Peter Cleary

Chairman

- Distinguished 29-year career representing Santos, the North West Shelf Venturers and BP in Asia. His executive career was in LNG, pipeline gas and chemicals operations
- Member of the Executive Committee of the Australia Japan Business Co-operation Committee and the Australia Korea Business Council



Alex Underwood

Managing Director

- Associate Director Energy Markets Division of Macquarie Bank Limited (Sydney and Singapore) for 10 years
- Director Natural Resources Division of Commonwealth Bank of Australia (Singapore)
- Financial Analyst BHP Billiton Petroleum (Perth)
- Experience investing debt and equity in the upstream oil and gas sector and identification of value creation opportunities for upstream oil and gas development / production assets
- Deep understanding as an institutional investor of the key drivers of shale gas value generation



Karen Green

Non-Executive Director

- Over 30 years' experience in Chartered Accountancy, predominantly in business advisory services and has lived and worked in Darwin since 1991
- Managing Partner for the Northern Territory and leader for Advisory Services for Deloitte in the Northern Territory
- 5th female ever to enter the Deloitte Australian Partnership
- Currently on the Northern Territory Investment Advisory Group and on the Northern Territory National Security Advisory Panel.
- Non-Executive Director of Airport Development Group Pty Ltd (the long-term lease holder of Darwin International Airport, Alice Springs Airport and Tennant Creek Airport)



Louis Rozman

Non-Executive Director

- Former Managing Director of CH4 Gas which merged with Arrow Energy and later acquired by PetroChina and Shell
- Founding principal of Pacific Road Capital, a resources investing manager of private equity funds
- Former Chief Operating Officer of AurionGold Limited
- Chairman of the VALMIN Code Committee for the AusIMM and Australian Institute of Geoscientists



Prof. John Warburton

Non-Executive Director

- Highly regarded petroleum geoscientist experienced in big fields
- 30 years technical & leadership experience in leading E&P companies including BP, LASMO-Eni and Oil Search
- Previously Chief of Geoscience & Exploration Excellence for Oil Search

Appendix 3: Northern Territory Gas Market Overview

The local NT gas market is in crisis due to the decline of existing supply sources



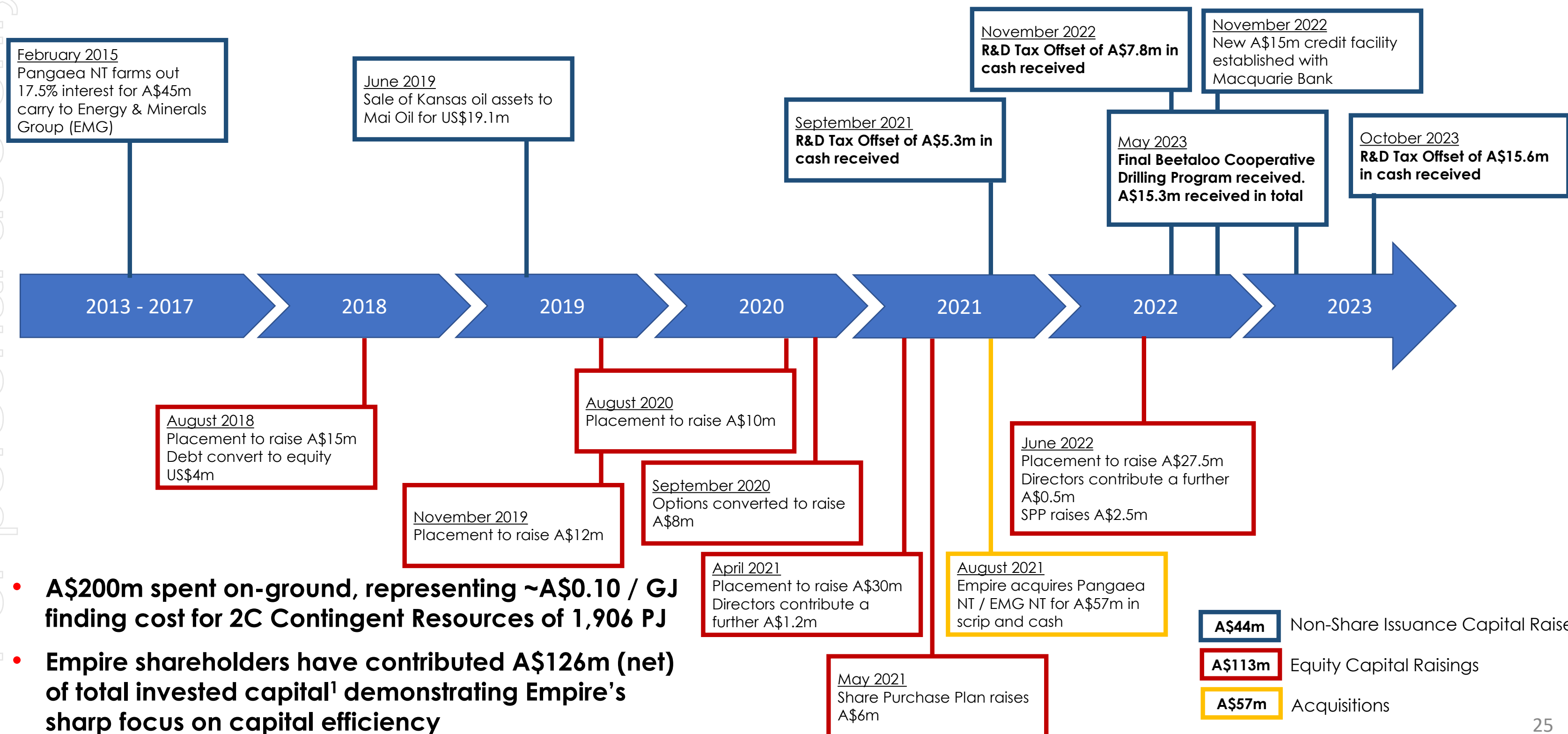
Demand Overview

- NT market requires 25 to 30 PJ p.a. (i.e. 70 to 80 TJ/d)
- Sources of demand include:
 - NT Government (via Power and Water Corporation (PWC) and Territory Generation (TGen)) for power generation
 - EDL (independent electricity producer)
 - Mining: McArthur River Mine (Glencore), Tanami Gold Mine (Newmont)

Supply Overview

- There are three existing sources of supply for the local NT market:
 - **Blacktip Gas Field (ENI owned and operated)**
 - PWC entered a 25 year take or pay with ENI commencing in 2009 for all of Blacktip volumes (up to 860 PJ). In accordance, with the GSA PWC is entitled to purchase 37 PJ p.a., at a maximum daily rate of **104 TJ/d** [**Current supply ~15TJ/d, AEMO**]
 - PWC on-sells to TGen, EDL and Newmont
 - **Amadeus Basin (Central Petroleum operated)**
 - Supplies PWC, McArthur River Mine [**Current supply ~40 TJ/d, AEMO**]
 - **Darwin LNG (Santos operated) / Ichthys LNG (INPEX operated)**
 - **Current source of NT emergency gas**
 - Bayu-Undan field is nearing full depletion

Appendix 4: Empire – Beetaloo Focused Since 2018

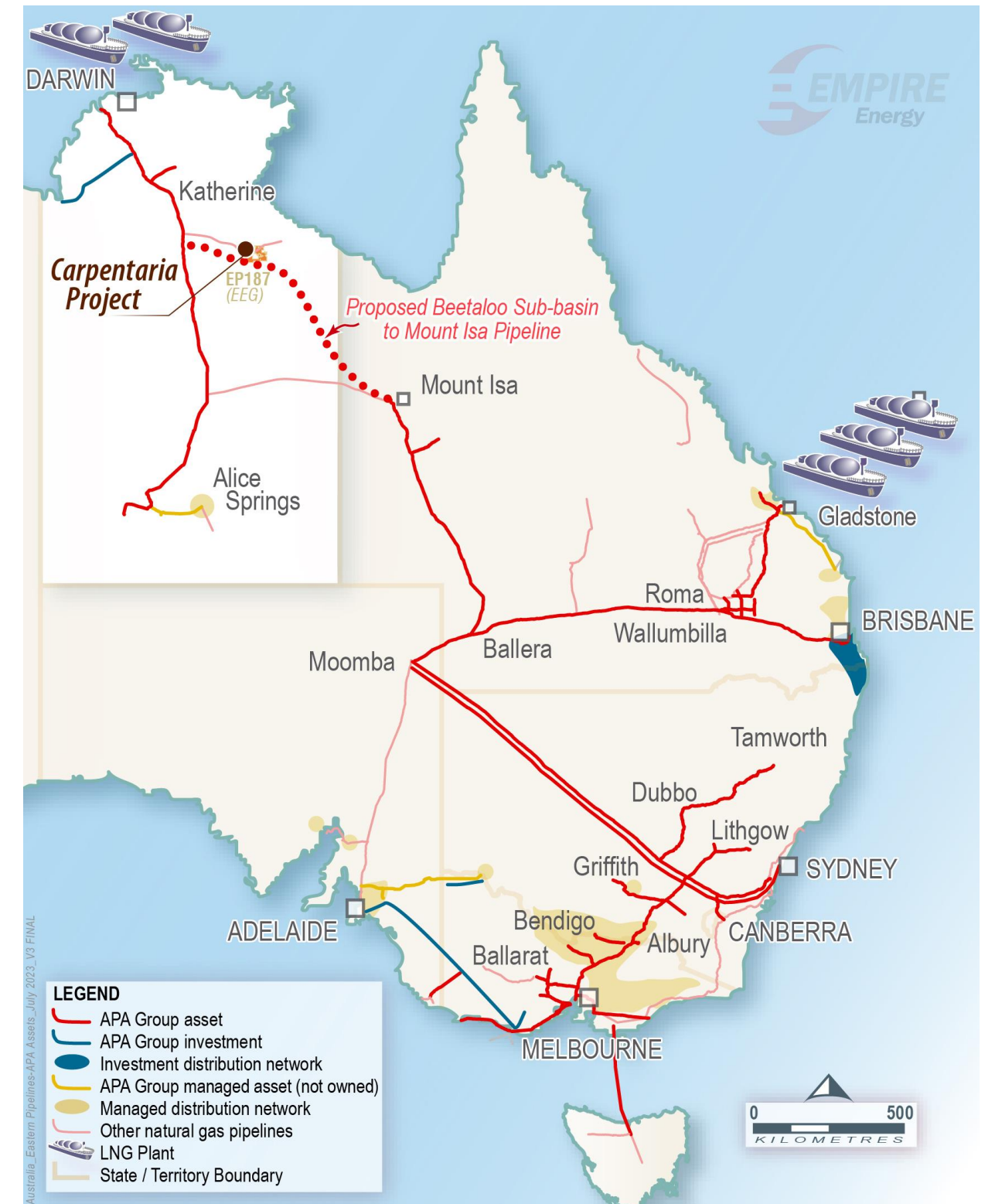


- **A\$200m spent on-ground, representing ~A\$0.10 / GJ finding cost for 2C Contingent Resources of 1,906 PJ**
- **Empire shareholders have contributed A\$126m (net) of total invested capital¹ demonstrating Empire's sharp focus on capital efficiency**

1. Calculated as equity raised plus Pangaea / EMG acquisition less Australian Government contributions

Appendix 5: Connections to Market for Large Gas Volumes

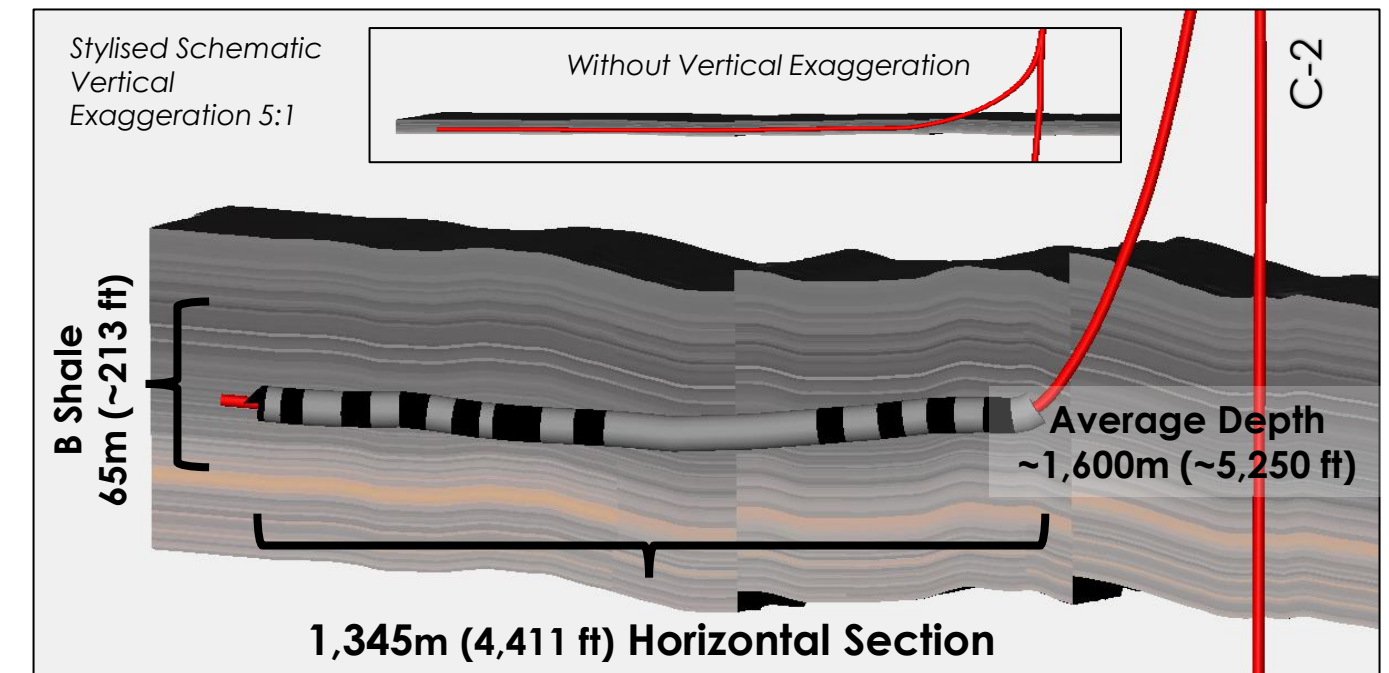
- **APA Group (ASX: APA)** and Empire have executed an agreement for the establishment of midstream gas infrastructure furthering the memorandum of understanding announced by Empire on 27 October 2021
- **APA will spend up to A\$5 million** under a proposed early works agreement on Engineering and Design Concepts for midstream gas facilities associated with Empire's Carpentaria Pilot Project, which would materially reduce the capital requirements for Empire to commence commercial production
- APA and Empire are also working on open-access pipeline concepts to transport **large volumes of gas from the Beetaloo to Australian east coast markets (in excess of 500 TJ/d / 476 mmcf/d)**. The leading concept considers the potential construction of a new pipeline connecting the Beetaloo to APA's existing Carpentaria Gas Pipeline between Mount Isa and Ballera (Queensland)
- Negotiations with NT Government owned utility **Power and Water Corporation** under the existing MOU are advancing to facilitate access to the McArthur River Pipeline
- **Empire is currently in active gas sales negotiations with multiple parties for supply of gas in both the pilot phase and full development phase**



Appendix 6: First Horizontal Well Flow Test A Success

Carpentaria-2H is the fourth horizontal well in the basin, was drilled 100% within zone, and successfully flowed gas to surface from all 21 frac stages with basin leading low rates

- **Carpentaria-2H (“C-2H”) produced a total of 323 TJ (281 mmscf) over 127 days**
 - This equates to a normalised rate of 8.25 TJ (7.2 mmscf) per day for an equivalent 3,000m horizontal development well for the entire test period
- Gas composition remained consistent with high calorific value and **extremely low CO₂ (less than 1%)**
- C-2H was brought back online after an initial 51 days of testing to test the benefit of soaking with excellent results
 - **The post-soak 2023 IP30 is confirmed at 10.5 TJ (9.2 mmscf) per day for an equivalent 3,000 metre horizontal development well**
- Completed without the need for production tubing, well free-flowed through 4 ½” casing. Empire is likely to move to 5 ½” in future scenarios
- **These rates exceed the benchmark other Beetaloo players have put forth as commercial, at a capital cost of ~2/3 of Empire’s peers**

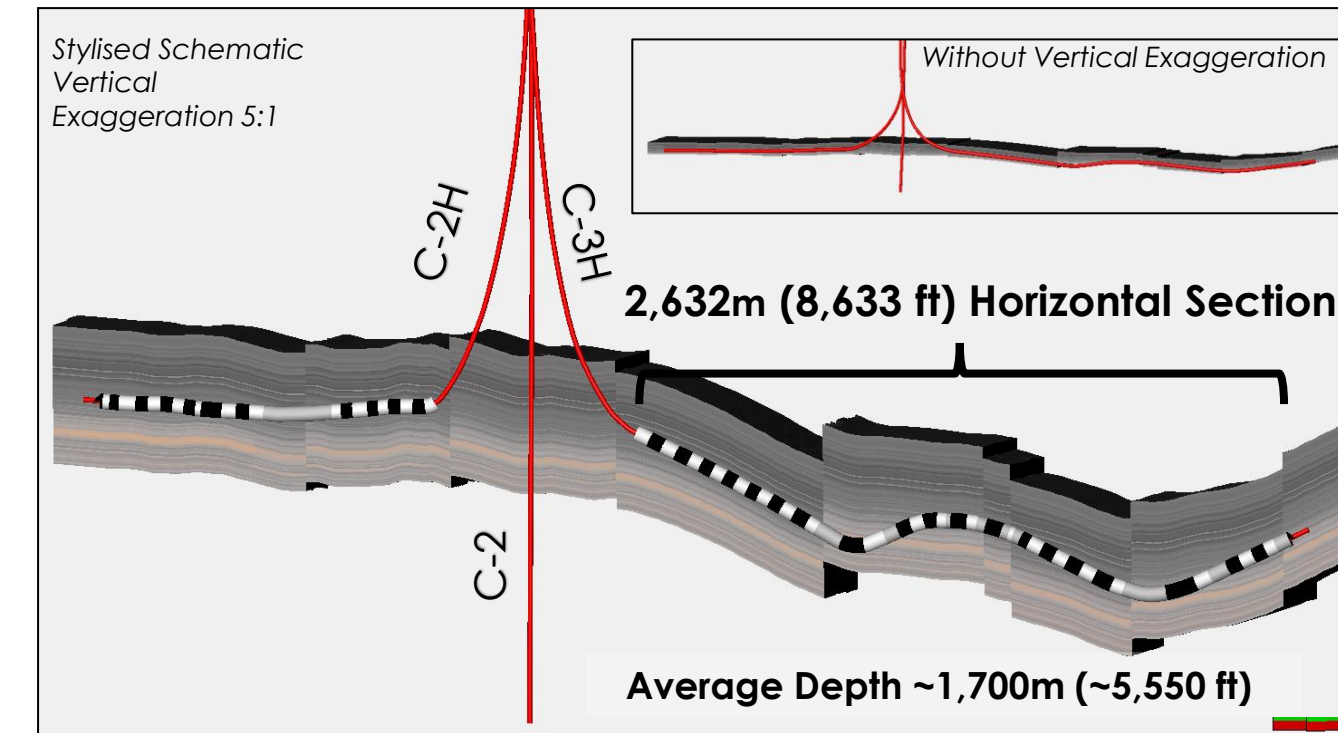


Carpentaria-2H flare

Appendix 7: Empire's Record Breaking Carpentaria-3H Horizontal Well

Carpentaria-3H is the longest horizontal shale well, and the largest frac job ever executed in Australia, on time and ~A\$6m under budget

- Empire's second horizontal well
- Total horizontal lateral length of 2,632m (8,633 ft), with 2,374 m (7,786 ft) successfully placed within the target Velkerri B shale (90% in zone), with strong gas shows throughout the target zone
 - Confirmed long horizontals can be drilled in the Beetaloo using Australia's existing rig fleet and generating material cost efficiency gains
- Carpentaria-3H successfully stimulated, significantly below budget, executing all planned 40 stages across 1,989m (6,526 ft)
- A total of 12.8 million lbs of proppant placed, averaged 319,000 lbs per stage (~2,000 lbs/ft). Comparable to US Shale frac intensity
- Carpentaria-3H was brought back online on 3 August 2023 and has demonstrated the material benefits to productivity of soaking, through significantly increased gas flow rates
- Following reopening, Carpentaria-3H flowed gas at an average rate of 3.3 mmscf / day (3.8 TJ / day) over the first 30 days ("IP30")
- The Carpentaria-3H "post-soak" average daily production rates have increased 30% over the IP27 "pre-soak" test conducted in Q1 2023
- Empire is investigating optimisation of the per stage performance compared to C-2H. Evidence of plug failures have likely contributed to materially lower productivity which can be resolved in future wells. Well bore undulation and faulting, may have also contributed to underperformance



SLB 185 Rig drilling Carpentaria-3H in EP187

Appendix 8: Beetaloo Horizontal Well Activity

#	Well Name	Year	Operator	Average Depth of Horizontal (Below Ground)	Horizontal Length	Total Measured Depth (m)	Drilling Cost (A\$'M)	Fracture Stimulation Stages	Stimulated Length	Fracture Stimulation and Extend Production Testing Cost (A\$'M)	Total Cost (A\$'M)	IP (EPT 1)	IP30 (EPT 2)	CO2
1	Amungee-1H	2015/16	Origin Energy (now TBN)	~2,400m	1,100m	3,808m		11	~750m			IP(57) 1.11mmscf/d	N/A	3 to 4%
2	Tanumbirini-2H	2021/22	Santos	~3,450m	1,000m	4,598m		11	660m		Est. \$37 to \$40	IP(14) 2.0mmscf/d	2.1mmscf/d	3 to 4%
3	Tanumbirini-3H	2021/22	Santos	~3,475m	1,000m	4,857m		10	600m		Est. \$37 to \$40	IP(10) 1.7mmscf/d	3.1mmscf/d	3 to 4%
	Carpentaria-2H	2021/22	Empire	~1,620m	1,345m	3,150m	\$11.1	21	927m	\$13.0	\$24.1	IP(30) 2.4mmscf/d	2.8mmscf/d	Sub 1%
	Carpentaria-3H	2022/23	Empire	~1,700m	2,632m	4,460m	\$10.0	40	1,989m	\$17.3	\$27.3	IP(27) 2.6mmscf/d	3.3mmscf/d	Sub 1%
4	Amungee-2H	2022/23	Tamboran	~2,400m	1,275m	3,883m	\$14.1	25	1,020m	~\$18	Est. \$32 to \$35	IP(50) 0.97mmscf/d	N/A	3 to 4%
5	Shenandoah South-1H	2023	Tamboran	~3,000m	1,074m	4,300m		10	501m		US\$22m (\$34m)	IP(30) 3.2mmscf/d		
6	Amungee-3H	2023	Tamboran	2,272m	1,100m	3,837m	\$12.6							

Sources:

- Falcon Oil & Gas (TSXV: FO, AIM: FOG) release entitled:
 - “Amungee NW-1H – Normalised gas flow rate equivalent to 5 mmcsf/d per 1,000m horizontal” dated 3 September 2021
- Tamboran Resources (ASX: TBN) announcements entitled:
 - “Operational update: Approximately 17 per cent upward revision to Tanumbirini-2H and 3H flow test results” dated 21 March 2022
 - “Tanumbirini-2H and 3H 30-day normalised flow rates exceed estimated Beetaloo commerciality threshold” dated 5 September 2022
 - Total Cost calculated as EP161: Tanumbirini 2H & 3H wells total funds used to date (\$18.5m) per Tamboran’s Q1 2023 Quarterly Report multiplied by 4 (TBN holds a 25% interest in these wells)
- Tamboran Resources announcements entitled:
 - “Operational update: Approximately 17 per cent upward revision to Tanumbirini-2H and 3H flow test results” dated 21 March 2022
 - “Tanumbirini-2H and 3H 30-day normalised flow rates exceed estimated Beetaloo commerciality threshold” dated 5 September 2022
 - Total Cost calculated as EP161: Tanumbirini 2H & 3H wells total funds used to date (\$18.5m) per Tamboran’s Q1 2023 Quarterly Report multiplied by 4 (TBN holds a 25% interest in these wells)
- Releases entitled:
 - Falcon Oil & Gas, “Amungee NW-2H Well Update” dated 22 June 2023
 - Falcon Oil & Gas, “Operational Update on Amungee NW-2H Drilling” dated 23 December 2022
 - Tamboran Resources, “EP98 Operational Update: Successful completion of 25-stage stimulation program at Amungee-2H” dated 22 March 2023
- Falcon Oil & Gas release entitled “Successful Drilling of Shenandoah South 1H Horizontal Well” dated 18 September 2023 / Tamboran Resources release entitled “SS-1H achieves commercial IP30 flow rate of 3.2 MMcf/d, exceeding pre-drill expectation” dated 26 February 2024. Capex guidance provided by Tamboran Resources Managing Director on webcast 26 February 2024
- Tamboran Resources release entitled “EP98/117 Operational Update: A3H drilled in record time in less than 18 days” dated 16 October 2023

Appendix 9: The Empire Value Proposition – the Pathway to LNG



Key assumptions for Slide 16 valuation calculations:

1. Phase 1 Carpentaria Pilot Project

- Gas price: A\$12/GJ
- Production: 25 TJ /d
- Up to 9 wells producing wells by the end of 2027 (P50)

2. Phase 2 Domestic Gas Project

- Gas price: A\$12 / GJ (indexed at CPI)
- 1,353 PJ (1.2 TCF) produced over 40-year economic life
- Type curves as provided by Subsurface Dynamics Inc
- Drilling / fracture stimulation (per well): A\$32m
- Cost learning curve: 5% per drilling campaign and 5% per stimulation campaign
- Opex includes midstream infrastructure tariffs, NT Government and other royalties, carbon offsetting costs
- Up to 36 wells producing wells by the end of 2027 (P50)

3. Phase 3 Full-Field Development - LNG

- As per Phase 2 with the exception of cost learning curve: 7.5% per drilling campaign and 10% per stimulation campaign representing expected economics of scale benefits
- 6,700 PJ (5.7 TCF) of gas produced over 42-year economic life
- Up to 162 wells producing wells by the end of 2027 (P50)

4. Landed LNG Cost to Japan

- Total upstream cost (including gas processing tariffs): ~US\$4.00 MMBtu
- Pipeline tariff, LNG processing tolling and shipping: ~US\$2.50 MMBtu

Appendix 10: Conversion Table



Exchange Rate	
US\$: A\$	0.65
Energy	
MCF : GJ	1.06
MMCF : TJ	1.06
BCF : PJ	1.06
GJ : TJ	1,000
GJ : PJ	1,000,000
Distance	
Feet : Metres	3.28

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