

21st November 2018

ASX Market Announcements
Australian Stock Exchange Limited
20 Bridge Street
Sydney NSW 2000

Gas Production Dynamic Modelling - Judith Gas Field

Offshore Gippsland Basin, Victoria

100% Emperor Energy Owned

Highlights

- Simulated Judith Production Wells estimated to each deliver 20 to 30 Million Standard Cubic Feet Per Day (MMcf/d) (**3D-GEO**)
- Production Simulation indicates the Judith Closure can deliver 29 Billion Cubic Feet Per Year (Bcf/year) for 20 years using a simple 5 well development plan (**3D-GEO**)
- Judith Closure within VIC/P47 contains a total Gas Resource of 966 Bcf Sales Gas as determined by Independent Resource Certifier, **RISC (November 2018)** released in Emperor Energy market announcement 12th November 2018.

Summary

On 12th November 2018 Emperor Energy Limited (Emperor) advised that an Independent Resource Statement had been completed for the Judith Gas Field within the 100% Emperor Energy owned Vic/P47 Exploration Permit located in the offshore Gippsland Basin, Victoria.

The Independent Resource Certifier RISC apportioned resources in accordance with the Society of Petroleum Engineers' internationally recognised Petroleum Resources Management System (SPE-PRMS 2007), identifying a 2C Contingent Resource of 122 Bcf recoverable Sales Gas within the Judith-1 discovery block and an additional P50 Prospective Resource of 844 Bcf Sales Gas in the Greater Judith structure within Vic/P47.

Dynamic Reservoir modelling completed by 3D-GEO now simulates vertical well production rates up to 30 MMcf/d, with a five well development plan simulating a gas production of 29 Bcf /year totaling 580 Bcf of Raw Gas over a 20-year plateau period. An additional 300 Bcf of gas production is forecast over the following 15-year production decline period.



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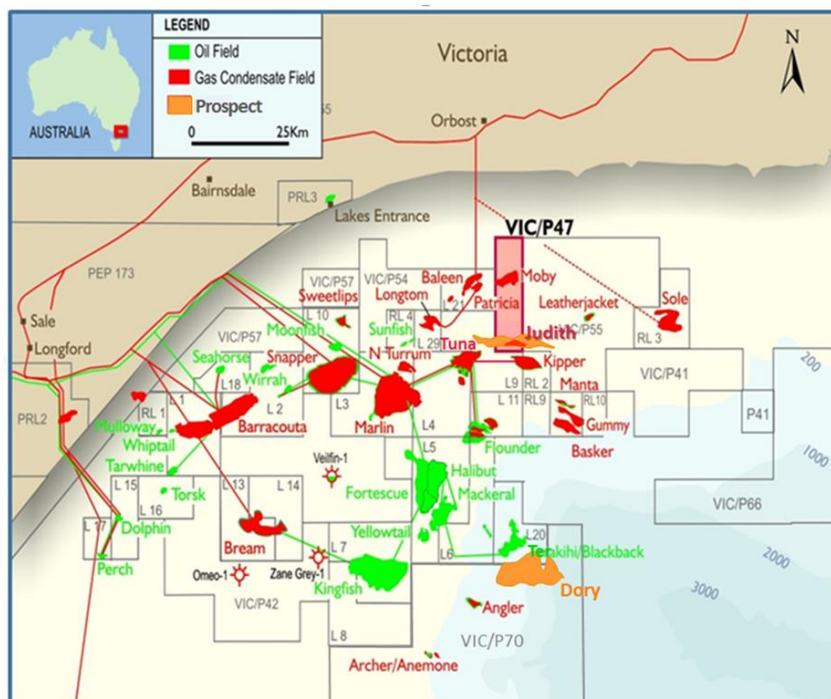


Figure 1: Location of 100% Emperor Energy owned Vic/P47 offshore Gippsland Basin showing regional permits along with oil and gas fields

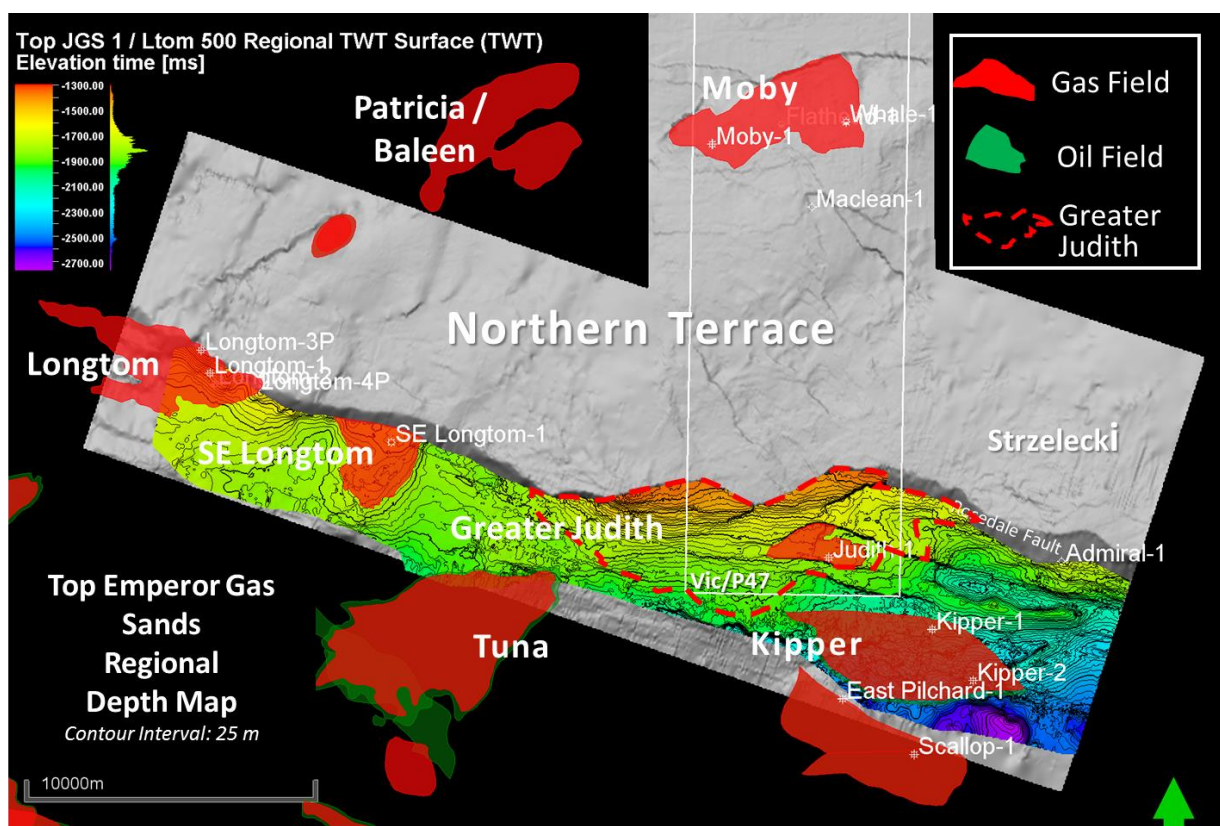


Figure 2: Regional Map of Top Emperor Gas Sands showing oil and gas fields adjacent to Vic/P47

Level 32, 1 Market Street,
Sydney, NSW, 2000
Ph +02 9275 8878

GPO Box 5360
Sydney, NSW, 2001

Emperorenergy.com.au
ABN: 56 006 024 764

Dynamic Modelling

3D-GEO as engaged by Emperor initially constructed and populated a static geological model using Schlumberger's Petrel software with which they evaluated the resources in the Judith-1 block and the Greater Judith structure. This static model has been used as the basis for the Independent Resource Statement determined by RISC on 12th November 2018.

In order to confirm well productivity and gas production forecasts, 3D-GEO then developed a Dynamic Reservoir Model using Schlumberger's Eclipse software. (see Figure 3) This utilized the Petrel Static Model as the base parameter input.

The Dynamic Model simulated hydrocarbon flow for the seven separate reservoirs (four Judith Gas Sands and three underlying Longtom Gas Sands) within seven different structural blocks (see Figure 7). Reservoir parameters and fluid properties from the Judith 1 Well were used for the Judith Gas Sands whilst data from the Longtom Gas Field was used for the underlying Longtom Gas Sands at Judith.

The model employed a 350 m maximum gas column in each block, except in the Judith Gas block where the contact was defined as 25 m below the Lowest Known Gas in the Judith-1 well.

Daily production was limited to a nominal 80 MMscf/d with the purpose of reflecting the capacity of the nearby Orbost Gas Processing Plant. Five vertical wells were modelled, with one well each in the Judith Gas Block, Judith Central, Judith Northeast, Judith North, and Judith Northwest.

These timing of the wells was staggered. The simulation assumes Well 1, Well 2 and Well 3 being drilled in the first year. The simulation then allows for Well 4 to be drilled in Year 4 and Well 5 to be drilled in Year 8. Well simulation results indicated well production rates ranged between 20 and 30 MMcf/d while total daily production was limited to 80 MMscfd. Decline rates were controlled by Bottom Hole Pressures in the wells.

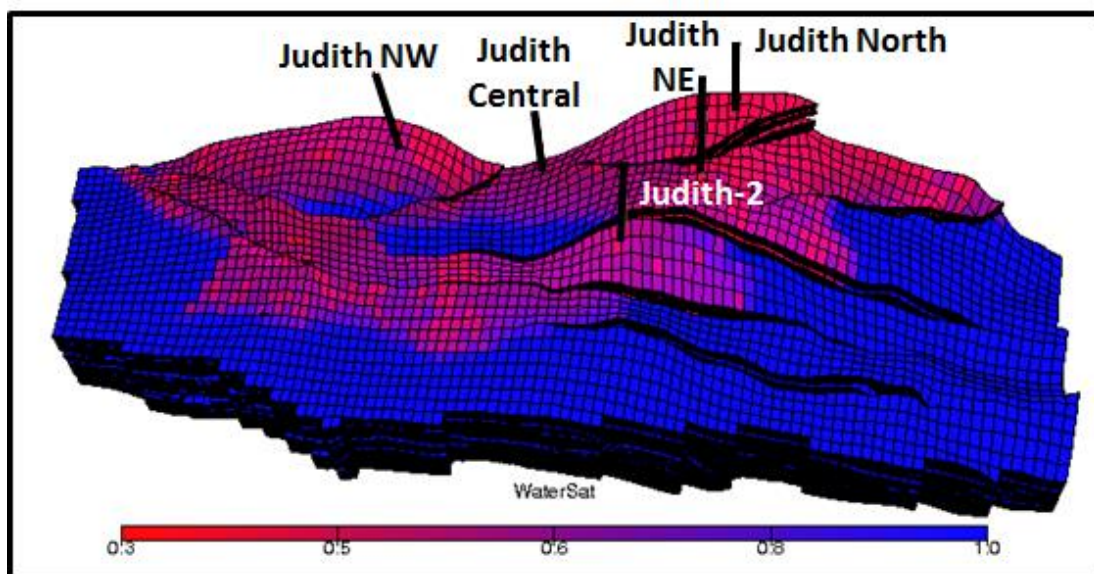


Figure 3: Dynamic Model of Emperor Gas Sands illustrating the five well development plan



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The simulation showed the Production Plateau of 80 MMscf/d was maintained for 20 years before declining to 38 MMscf/d at the end of the 35 year production profile (Figure 4).

Total gas production was forecast to be 880 Bcf which is approximately 48% of the Gas-In-Place contacted by the five wells. Cumulative liquids production was 8.8 MMstb. There was little water production (< 30 bwpd) as the model assumes limited aquifer support.

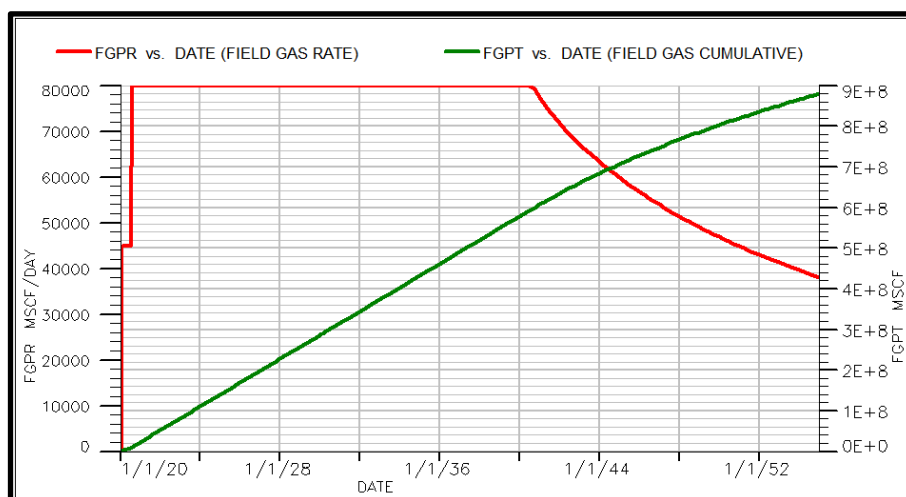


Figure 4: Dynamic Model Gas Production Forecast for five well development plan (3D-GEO)

Potential Project Scale

The nearby Esso-operated petroleum infrastructure is well developed with a network of pipelines transporting hydrocarbons produced offshore to onshore petroleum processing facilities at Longford.

The new gas conditioning plant at Longford which was constructed to process gas from the Kipper and Turrum fields is capable of processing ~147Bcf annually.

Further infrastructure exists at the onshore gas plant owned by APA Limited at Orbost and the associated Patricia/Baleen pipeline infrastructure owned by Cooper Energy. Cooper Energy is currently constructing a pipeline from the newly developed Sole Field and plan to supply 23 Bcf of gas per year into the Orbost plant. Cooper are considering how the Manta Field may follow on from Sole.

Gas from these facilities is delivered across the inter-connected South Eastern Australia pipeline network to Sydney, Adelaide and Tasmania.

The Judith Dynamic Modelling results indicate that the Judith Project could potentially operate at a production rate similar to or greater than the Cooper Energy Sole project.

The Table below illustrates the relative position of the Judith Resource compared to other recent developments and field resources under investigation.



Table 1: Gippsland Basin Current and Potential Future Developments - Field Size

Field	Production Licence / Permit	Operator	Reserve / Resource Category	Estimated Initial Resource (Bcf)	Source Reference
Judith	VicP47	Emperor	2C Contingent	122	1,2
Judith	VicP47	Emperor	P50 Prospective	844	1,2
Judith	VicP47	Emperor	Total	966	1,2
Sole	Vic/L32	Cooper	2C Contingent	236	6
Manta	Vic/RL13	Cooper	2C Contingent	101	6
Manta	Vic/RL13	Cooper	P50 Prospective	499	6
Manta Total	Vic/RL13	Cooper	Total	600	6
Kipper	Vic/L09 & Vic/L25	Esso	Uncategorized	588	5
Turrum		Esso	Uncategorized	1000	5
South East Remora	Vic/RL4	Esso	Uncategorized	265	3,7
Longtom Wells 3 & 4	Vic/L29	SGH Energy	Uncategorized	20	3,4,8
Longtom Proposed Well 5	Vic/L29	SGH Energy	Uncategorized	60	3,4,8
Longtom Total	Vic/L29	SGH Energy	Total	80	3,4,8

Background

Judith-1 was drilled and operated by Shell Company of Australia in 1989 and is contained within the Vic/P47 Permit held 100% by Emperor Energy. The Judith Gas Field is located within close proximity of the Kipper Gas Field operated by Esso (Exxon Mobil).

On 10th August 2017 Emperor Energy announced that the outcomes of seismic reprocessing and subsequent analysis completed during 2017 had resulted in a significant increase in the Gas-in-Place (GIP) estimate for the Judith Structure within Vic P47.

On 22nd February 2018 Emperor Energy announced that the Vic/P47 permit had been renewed for 5 years with a work program including drilling of an exploration well in the Judith North Structure by early 2021.

On 26th March 2018 Emperor Energy announced that it had completed a thorough well log evaluation of the Judith-1 well and gas discovery. The Judith-1 results were then compared and contrasted with open file data not previously available from the four wells drilled on the Longtom Gas Field located some 22 km west of Judith-1 and the more recent South East Longtom-1 gas discovery by Esso in 2010.

Like Judith-1 and the Longtom wells, the South East Longtom-1 discovered gas in multiple Emperor



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Reservoir sandstones in a structural closure sealed by the Rosedale Fault.

On 7th June 2018 Emperor Energy Limited announced that it had engaged respected Independent Resource Certifier RISC to conduct a Resource Statement in relation to the Judith Gas Field in the 100% Emperor Energy owned Vic/P47 Permit in the offshore Gippsland Basin, Victoria.

On 12th November 2018 Emperor Energy Limited announced that RISC had completed The Resource Statement identifying a 2C Contingent Gas resource of 122 Bcf Sales Gas in the Judith Gas Field, with an additional 844 Bcf prospective gas resource in the Greater Judith closure within the VIC/P47 Exploration Permit (see the Emperor Energy ASX Market Announcement on 12th November 2018 for details).

3D-GEO Pty Ltd Interpretation and Static Modelling

The 3D-GEO/Emperor evaluation of the Judith resource potential is based on:

- Judith-1 well data
- Merged and reprocessed 3D seismic data completed by 3D-GEO in 2016/17
- Offset well data, including the Longtom and Longtom SE wells, Scallop-1 and East Pilchard-1
- Longtom Gas Field analogue
- Public domain 3D seismic volumes including the G01 Northern Fields 3D seismic surveys

The Judith gas reservoir is subdivided into four main units being Gas Sands S1 to S4. Each of these sandstone units are separated by lacustrine shales that appear to act as effective, regionally-developed, top seals. In addition, 3D-GEO has correlated the Longtom gas sands from the Longtom and SE Longtom wells to extend into the Judith structure, below the TD of the Judith-1 well.

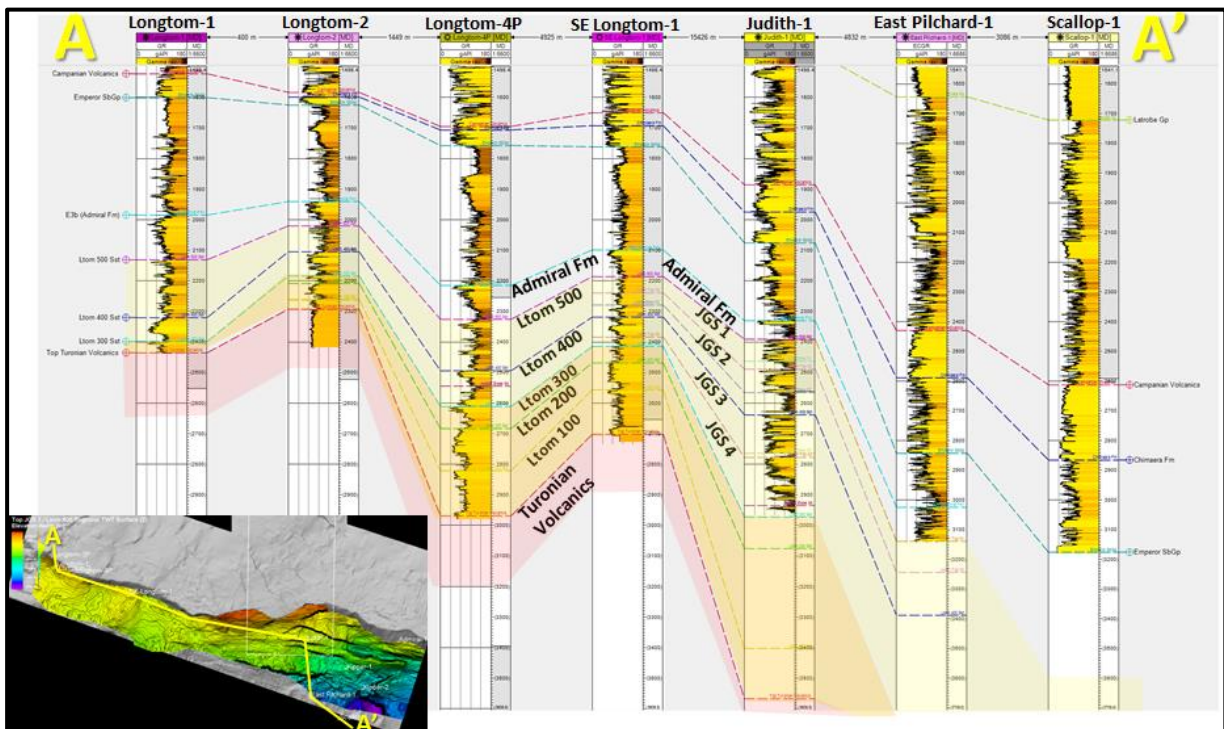


Figure 5: Well correlation of Reservoir Sands between Longtom Gas Field & Judith Gas Discovery



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Interpretation of the reprocessed seismic data was undertaken by 3D GEO and by Emperor's Geoscience Advisor. By utilizing the G01 Northern Fields 3D seismic data, the seismic interpretation was extended beyond the permit area to the key South East Longtom-1 and Longtom Gas Field wells. A 3D structural model of the horizons was generated from the seismic interpretation of the reservoir horizons.

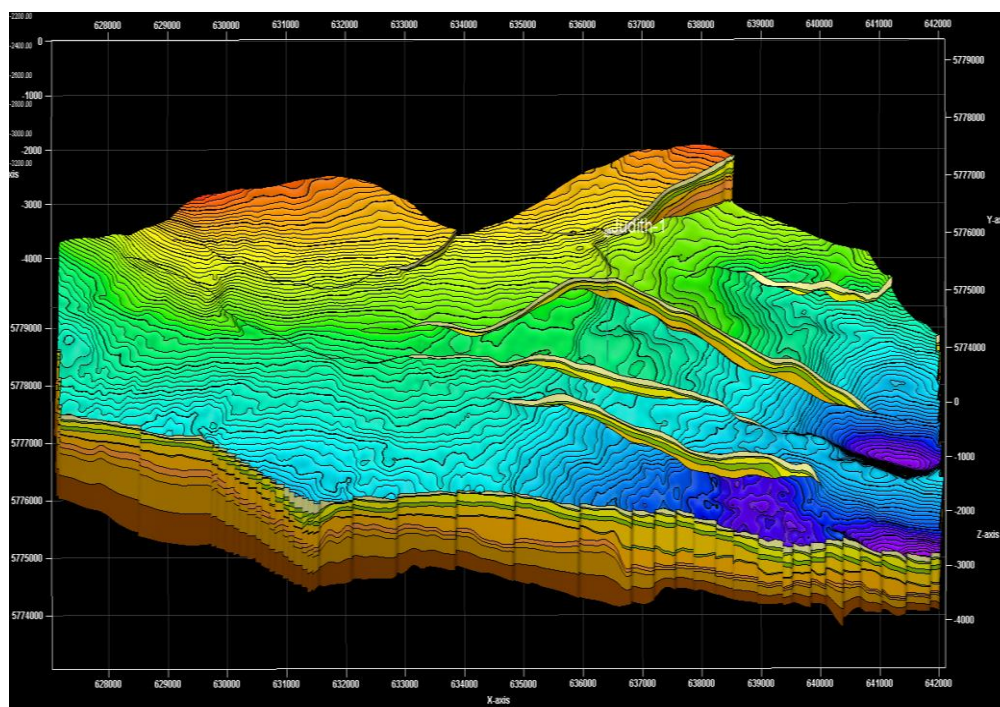


Figure 6: 3D Structural Model of the Greater Judith Structure (3D-GEO)

3D-GEO/Emperor then constructed and populated a static geological model in Schlumberger's Petrel software with which they evaluated the resources in the Judith-1 block and the Greater Judith structure. Parameter averages were then extracted for each fault compartment and fluid contact scenario and input into a Monte Carlo statistics package by 3D-GEO from which probabilistic Gas-in-Place (GIP) and Recoverable Resources were calculated.

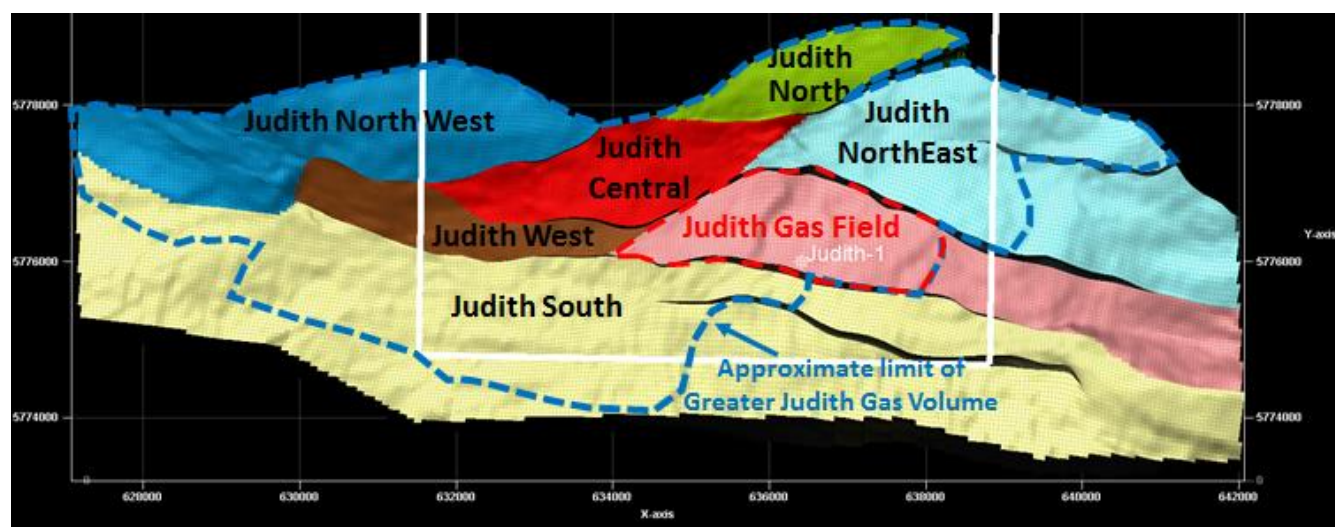


Figure 7: Judith Gas Field, Prospects and Leads (3D-GEO, November 2018)



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3D-GEO initially used a P50 gas column height of 450 m in each block, slightly less than the gas column height of the main 200 reservoir sandstone in the analogue Longtom Gas Field. This model derived a probabilistic P50 Gas-in-Place of 2.513 Tcf and a P50 Prospective Gas Resource of 1.378 Tcf within the VIC/P47 permit. Geological risking was not applied to these estimates.

The subsequent RISC assessment was based on a P50 gas column height of 350 m in each block, which is the approximate average of gas column heights in different sands in several fields in the region. This reduction in column height derived a P50 Gas-in-Place of 1.822 Tcf and a P50 Sales Gas Resource of 966 Bcf (unrisked) within the VIC/P47 permit (see the Emperor Energy ASX Market Announcement on 12th November 2018 for details).

Source References

- 1 RISC (2018): Judith Gas Field: Independent technical specialist's report for Emperor Energy Limited, *November 2018*
- 2 Emperor Energy Limited (2018): Independent resource statement - Judith Gas Field, offshore Gippsland Basin, Victoria, 100% Emperor owned, *12 November 2018*. ASX market announcement. Available at <https://emperorenergy.com.au/wp-content/uploads/2018/11/ASX-release-12-Nov-18.pdf>
- 3 AEMO (2018): Victorian gas planning report update. *March, 2018*. Report available at: https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/VGPR/2017/2018---Victorian-Gas-Planning-Report-Update.pdf
- 4 Offshore Technology (2018): Longtom Gas Field, Gippsland Basin. Webpage available at: <https://www.offshore-technology.com/projects/longtom-field/>
- 5 ExxonMobil (2018): Kipper Tuna Turrum (KTT). Webpage available at: <https://www.exxonmobil.com.au/en-au/energy/natural-gas/natural-gas-operations/kipper-tuna-turrum>
- 6 Cooper Energy Limited, 2018: Reserves and contingent resources update at 30 June 2018. Media release available at <https://www.cooperenergy.com.au/Upload/Documents/AnnouncementsItem/01-2018.08.10-ASX-Reserves-and-Resources-at-30-June-2018.pdf>
- 7 The Australian (2017), "Oil giants ExxonMobil and BHP bid for delay on new Bass Strait gas", 30 May 2017, available at <https://www.theaustralian.com.au/business/mining-energy/oil-giants-exxonmobil-and-bhp-bid-for-delay-on-new-bass-strait-gas/news-story/a2fcf1fdce5e889b38344be5678b0d9c> (paywall).
- 8 Seven Group Holdings Investor Presentation 3rd May 2018.

Competent Persons Statement

Consents

The technical information in this ASX release is based on, and fairly represents, data and supporting documentation supplied in an Independent Technical Resource Evaluation Report prepared by 3D-GEO Pty Ltd. The preparation of this report has been managed by Mr Keven Asquith who is CEO and Director of 3D-GEO. The Dynamic Modelling was conducted by 3D-GEO senior reservoir engineer Juan Carlos Marroquin Cabrera.

Mr Asquith holds an Honours BSc. Geology - University of Western Ontario, 1978, and a Diploma in Project Management – University of New England, 2000. Mr Asquith has over 35 years' experience in the sector and is a 30 year member of the AAPG.



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Mr Marroquin Cabrera holds an MSc in Petroleum Engineering from Texas A&M University and a BSc in Petroleum Engineering from the Universidad de America in Bogota, Colombia. Juan Carlos has over 30 years' experience in the petroleum sector and is a member of the SPE, CPIP and ACIPET.

3D-GEO was founded in 2001 to provide technical support to companies associated with the oil and gas industry. The company has successfully completed over 200 projects including evaluations in Australia, NZ, Asia, Sub-Continent, Middle East, North and South America. The company currently has offices in Melbourne, Australia and Santa Cruz, Bolivia.

“Prospective Resources” are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future development projects. Prospective Resources have both a chance of discovery and a chance of development.

Yours faithfully

Carl Dumbrell

Company Secretary

Ph +61 402 277 282

carl@emperorenergy.com.au