ASX ANNOUNCEMENT

3D Energi Limited | ASX: TDO

12 February 2024

Otway Basin: VIC/P79

3D Seismic Reprocessing Reveals Direct Hydrocarbon Indicator at Monarch

3D Energi Limited (the "Company"; ASX: TDO) is pleased to release prospective resource estimates for Monarch Prospect, located in the Otway Basin within VIC/P79 exploration permit, where the Company is in Joint Venture with ConocoPhillips Australia SH2 Pty Ltd. The full prospectivity of Monarch has only now been revealed by recent state-of-the-art reprocessing of ~1135km^2 of the La Bella and Investigator 3D seismic surveys over key leads and prospects in VIC/P79. 3D Energi retains a 20% participating interest in VIC/P79.

Highlights

- **Monarch is now the largest recognised undrilled prospect in VIC/P79 with a gross best estimate prospective resource of 316 Bcf.**
- **Monarch exhibits Direct Hydrocarbon Indications on seismic within the Waarre C sands, the main gas reservoir in the basin, in the form of a flat spot (an interpreted gas-water contact).**
- **The Monarch flat spot is consistent with other flat spots observed in surrounding gas fields.**
- **Additional potential prospectivity recognised within the deeper Waarre A reservoir in the form of a possible further flat spot.**
- **Monarch has a high Geological Probability of Success at 47%.**

Prospective Resources are those estimated quantities of petroleum that may potentially be recovered by the application of a future development project(s) related 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.

Executive Chairman's Comments

Mr Noel Newell, Executive Chairman of 3D Energi, said today "3D Energi has long recognised the potential for a significant overlooked prospective resource at Monarch given the size of the structure, the significant noise masking the seismic reflections and amplitudes in the original data, and the encouraging signs of Direct Hydrocarbon Indicators in adjacent prospects leading up to the La Bella gas discovery.

By utilising the latest state-of-the-art reprocessing technology for the La Bella Reprocessing Project, the Joint Venture has delivered significant improvements in image quality that will support the maturation of Monarch, which is now a material part of the VIC/P79 exploration portfolio.

While we are still in the early stages of evaluating the new data, today 3D Energi estimates the prospective resource base in the permit has increased by another 316 Bcf (gross best estimate recoverable). Collectively, the near-field exploration targets identified to date are demonstrating the strong potential for a commercial gas project, given their proximity to infrastructure. It is also worth pointing out that VIC/P79 covers a very large area, and we believe there is excellent prospectivity in the western half of the permit, currently not covered by 3D seismic.

The reprocessed seismic data, in combination with the recently processed datasets in T/49P, marks a significant step forward in our ability to mature our portfolio of prospects across the Otway. Drilling locations can now be assessed and matured across all areas of both blocks as we progress towards the exploration drilling program in 2025".

Monarch Prospect shows evidence of Direct Hydrocarbon Indicators

The Monarch Prospect is a tilted fault block located on the margin of the Voluta Trough, a major depression directly adjacent to the Mussel Platform, with the two being separated by the northwest-southeast trending Tartwaup-Mussel Fault System.

Within VIC/P79, a chain of prospects has previously been delineated along the southern edge of the Mussel Platform, collectively referred to as the La Bella Complex (refer to TDO ASX release 8 March 2023). Monarch is the deepest prospect in the chain, which progressively shallows towards the east (Rosetta, Trident and Defiance, respectively) and culminates in the La Bella gas discovery, as seen in Figures 1 and 2.

The principal reservoir at Monarch is the Waarre C reservoir, which serves as the main gas reservoir in the Otway Basin. The Waarre unit thickens and deepens rapidly across the north-south trending fault separating Monarch from Rosetta, with the top of the Waarre C located at ~3000m depth at the Monarch crest. **The La Bella MC3D reprocessing has revealed previously unseen DHIs, principally in the form of an interpreted flat spot within the Waarre C reservoir (Figures 2,3)**, likely representing a gas-water contact. A second potential flat spot was also observed within the deeper Waarre A reservoir.

Flat spots (also known as contact indicators[1]) are flat or tilted reflections that cut across the naturally inclined/dipping seismic reflections and coincide with the contact between the gas within the reservoir and the water beneath (namely they represent the gas-water contact). Examples of Otway gas fields with flat spots include Thylacine, Geographe and Minerva (Figure 3). Some of these examples are tilted, such as Minerva, most likely due to overburden velocity variations caused by the channelling[2].

As previously mentioned, gas fields in the Otway are typically amplitude supported. However, no major amplitude response is observable on reprocessed seismic at the top Waarre C reservoir at Monarch, except for a narrow band of high amplitudes along the western margin of the structure (Figure 4).

Despite the significant uplift in image quality, the overall lack of amplitude at the top Waarre C reservoir is likely due to some remaining noise in the data above Monarch and Rosetta, potentially caused by internal heterogeneity within the channel in the overburden. The relationship between the channelling in the overburden and the prospects below can be observed in Figure 5.

[1] Dunne, J. and J. Parsons, 2023. Direct hydrocarbon indications from fluid contacts – stop calling them flat spots! *AEGC 2023 Extended Abstracts*

Figure 1 – Monarch Prospect TWT map. Monarch is situated at the western end of the La Bella Complex, a series of prospects leading up to the La Bella gas discovery in the east.

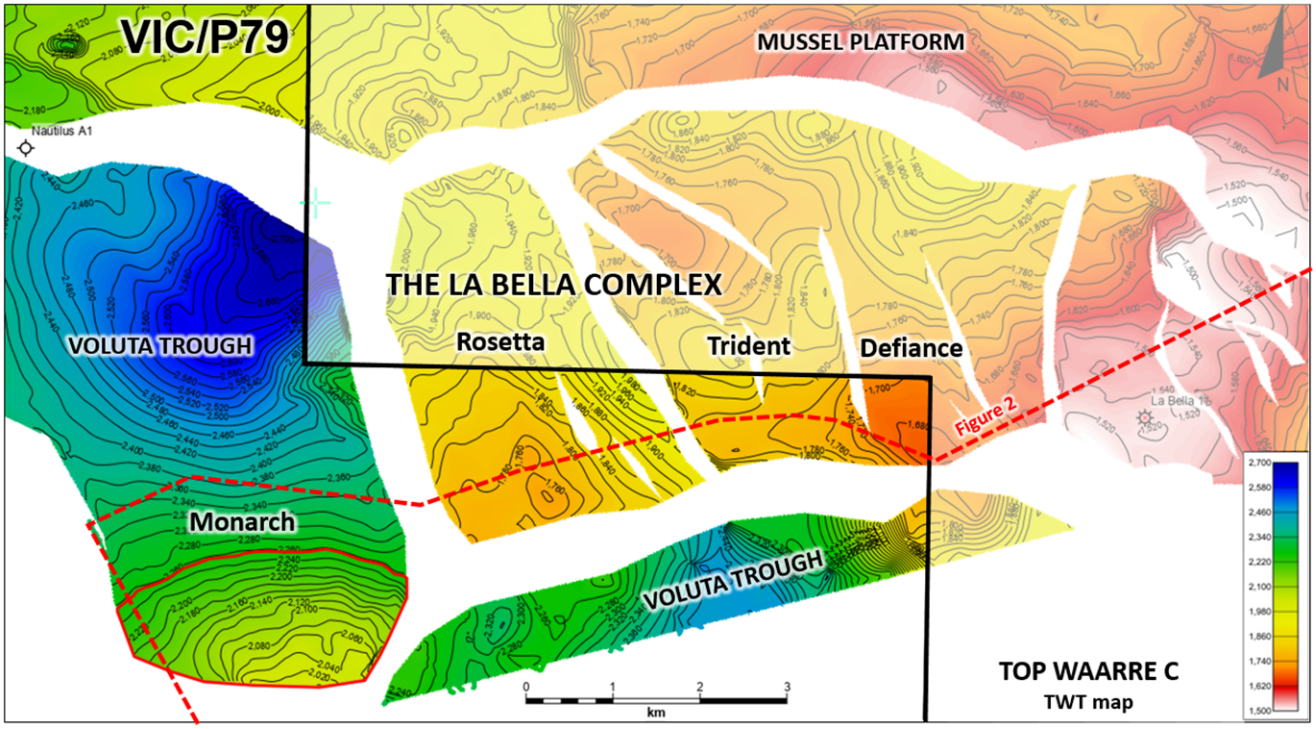


Figure 2 – Monarch Prospect exhibits a flat spot within the Waarre C reservoir, a Direct Hydrocarbon Indicator (DHI) that represents a likely gas-water contact.

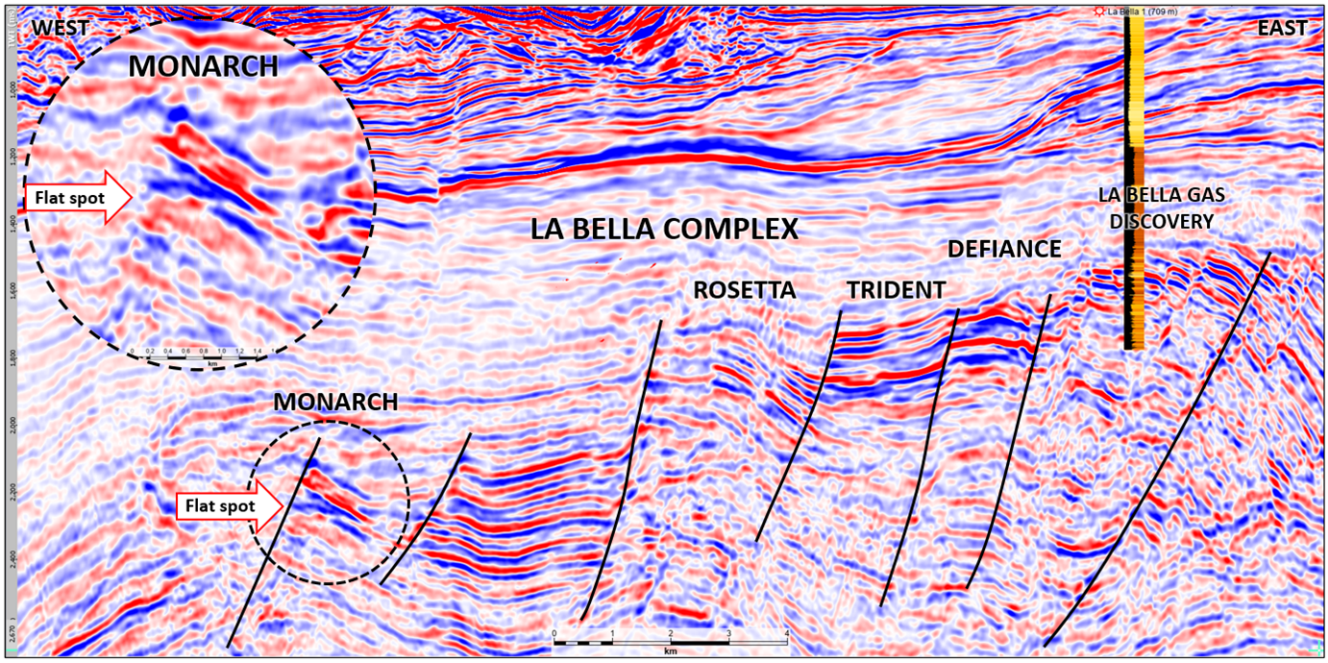


Figure 3 – Left: Minerva Field[2] tilted flat spot at the gas-water contact. Right: Monarch Prospect flat shows strong similarities to Minerva Field and appears slightly tilted.

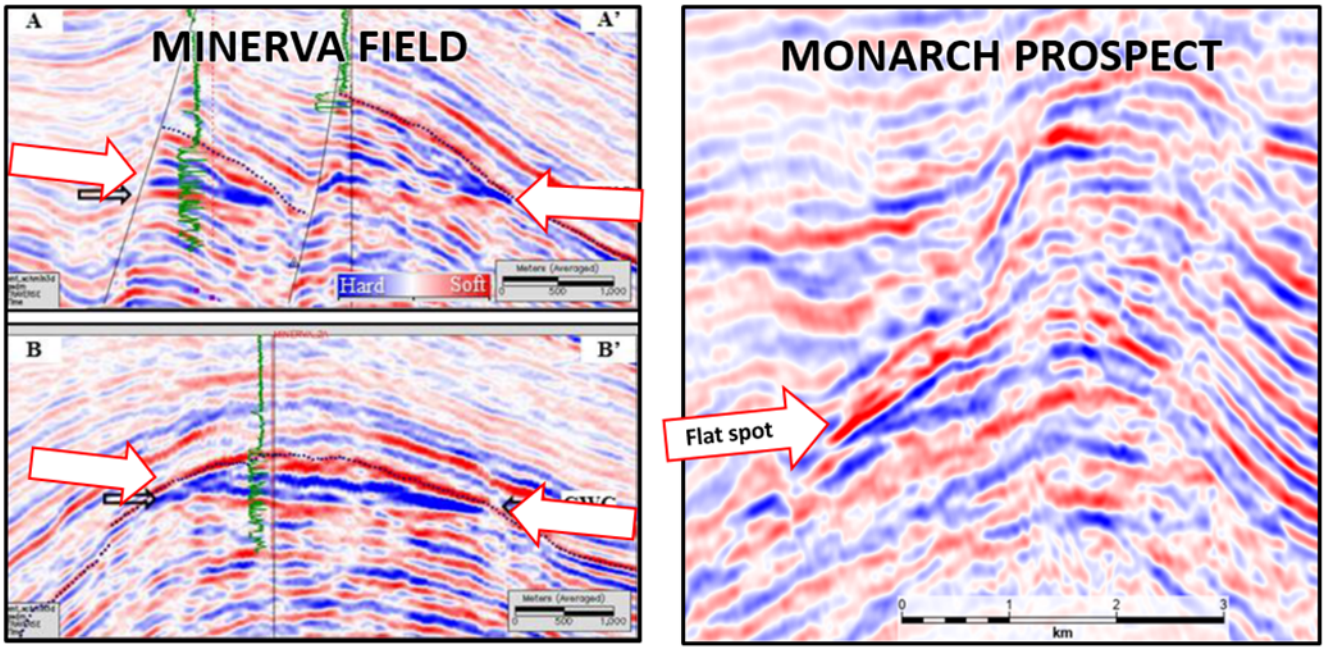
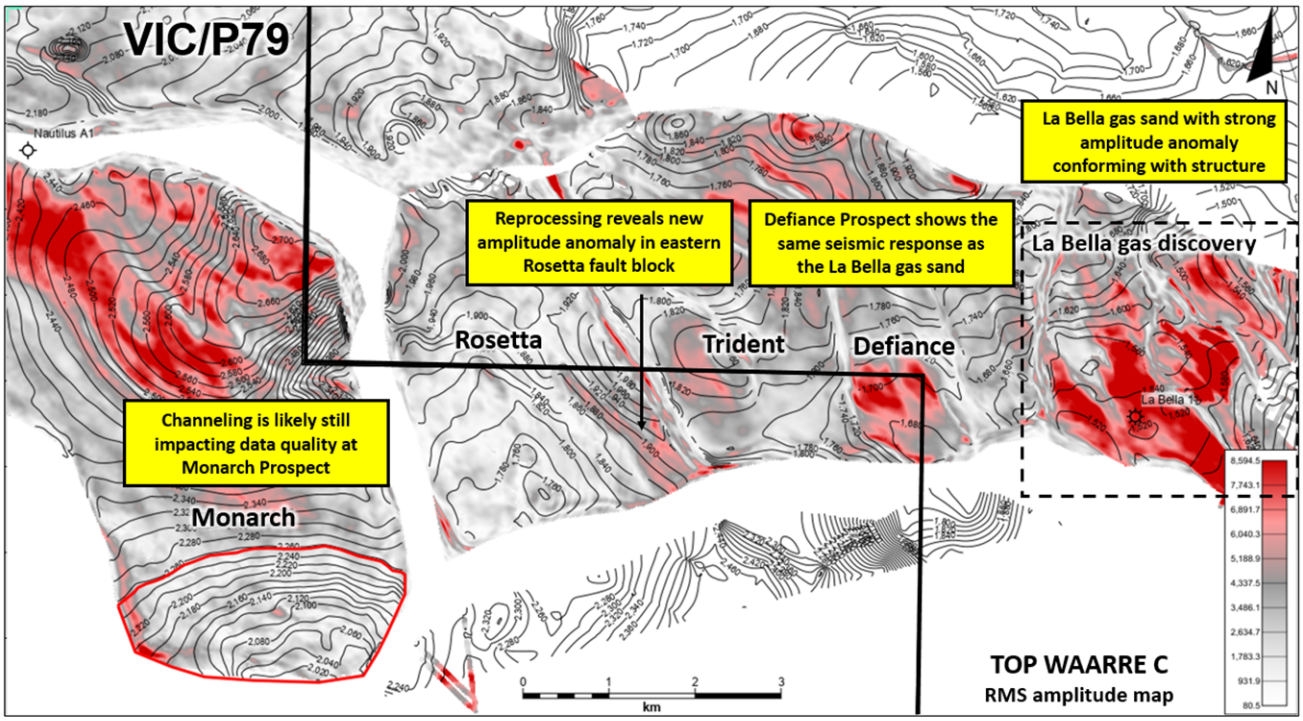
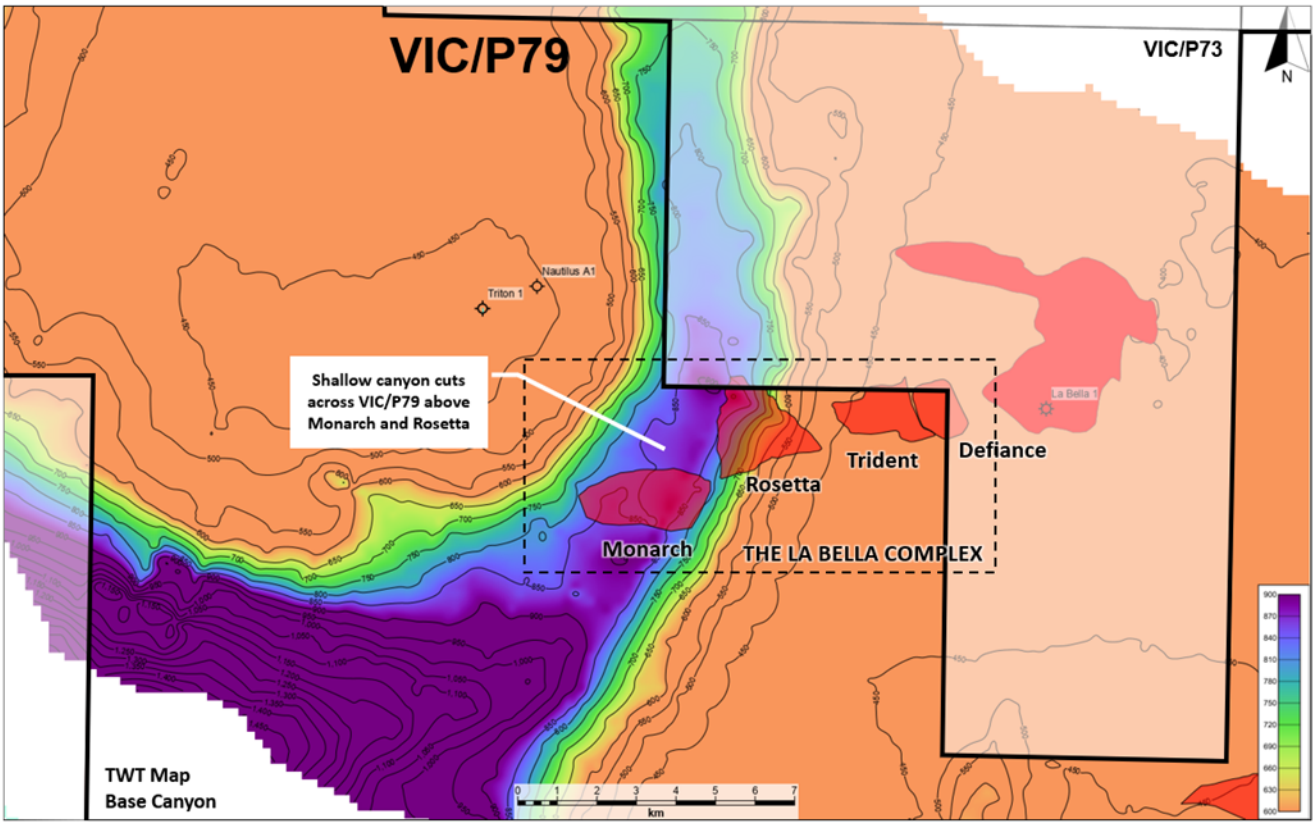


Figure 4 – Waarre C RMS amplitude map shows the strong amplitude anomaly at La Bella caused by the gas sands, with a similar response at Defiance and new fault block east of Rosetta.



[2] Nixon, S, Hallam, T and Constantine, A 2018. Ranking DHI attributes for effective prospect risk assessment applied to the Otway Basin, Australia

Figure 5 – TWT map showing the extent of the canyon (purple/blue colours) within the overburden above the Monarch and Rosetta prospects.



Seismic reprocessing delivers on image quality and the definition of Monarch

Previous explorers have overlooked the significant exploration potential of Monarch due to the challenge of discerning seismic reflections beneath the significant noise (seismic multiples) present in legacy data beneath extensive Tertiary channelling (Figure 5). This noise is particularly evident across the central La Bella 3D survey, reducing the seismic data quality beneath.

For the first time, the Joint Venture has obtained a clear and continuous image of the seismic reflections in the Monarch Prospect, as well as Rosetta Prospect directly to the east. The La Bella MC3D Reprocessing Project has applied the latest processing and imaging techniques, including Full Waveform Inversion and shallow water demultiple technology, resulting in a significant improvement in image quality beneath the channel (refer to TDO ASX release 31 January 2024).

The presence and quality of 3D seismic in Otway Basin exploration are critical to successful exploration. By utilising 3D seismic, Operators within the Otway Basin have reported world-class success rates in drilling prospects supported by Direct Hydrocarbon Indicators in the offshore Otway Basin, with reported success rates of 100% respectively, within permits located adjacent to VIC/P79[3,4].

[3] Beach Energy: FY22 full-year results, 15 August 2022
[4] Cooper Energy: Otway Basin Exploration Prospective Resource Update, 9 February 2022

A material prospective resource is estimated at Monarch

Prior to the La Bella MC3D Reprocessing Project, no prospective resource estimates were provided for Monarch as poor data quality hampered an accurate evaluation. Given the significant uplift in image quality of seismic reflections beneath the channel, in conjunction with the observation of a likely gas-water contact in the structure (coinciding with a flat spot), TDO is now able to provide a more accurate prospective resource assessment.

Monarch now forms a material part of the VIC/P79 portfolio as the largest prospect (by volume) that has been identified in the permit to date (Tables 1,2). TDO estimates a **prospective resource of 316 Bcf (gross best estimate)**[5] within the Waarre C reservoir; however, in the event of more favourable reservoir properties the high estimate could reach as much as **506 Bcf**. The prospective resource estimate considers only the Waarre C reservoir, however, additional prospectivity may exist within the deeper Waarre A reservoir based on the potential observation of a second flat spot.

TDO has assessed Monarch to have a Geological Probability of Success (GPos) of 47%. This is the chance (or probability) of encountering a measurable volume of mobile hydrocarbons.

The new prospective resource estimate at Monarch upgrades the total VIC/P79 in-permit prospective resource base to **849 Bcf** (gross best estimate), with **571 Bcf** (gross best estimate) located within the La Bella Complex. All prospective resource estimates to date have been identified on 3D seismic within the eastern half of the permit and proximal to infrastructure. Full structure volumes are also provided in Table 3.

Table 1 – In-Permit Gross Prospective Resource Estimate (Unrisked recoverable) [1]

Prospect	Permit	Low (P90)	Best (P50)	Mean	High (P10)	TDO ASX Reference
Monarch*	VIC/P79	176	**316**	332	506	This release
Essington	VIC/P79	159	**246**	253	357	TDO ASX 8 March 2023
Rosetta*	VIC/P79	82	**155**	166	249	TDO ASX 8 March 2023
Trident*	VIC/P79	40	**57**	59	80	TDO ASX 8 March 2023
Defiance*	VIC/P79	28	**43**	45	65	TDO ASX 8 March 2023
Lady Robilliard	VIC/P79	21	**32**	34	51	TDO ASX 8 March 2023
Total (Bcf)		506	**849**	889	1308	

[1]In-Permit Gross Prospective Resource is 100% of the unrisked estimated volume of hydrocarbon that may potentially be recovered from any prospect within the permit only. The estimated quantities of hydrocarbon that may be potentially 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 recoverable hydrocarbons.
**La Bella Complex prospects*

[5] Refer to Cautionary Statement in relation to Prospective Resources on Page 1 of this release.

Table 2 – In-Permit Net TDO (20%) Prospective Resource Estimate (Unrisked recoverable) [2]

Prospect	Permit	Low (P90)	Best (P50)	Mean	High (P10)
Monarch	VIC/P79	35	**63**	66	101
Essington	VIC/P79	32	**49**	51	71
Rosetta	VIC/P79	16	**31**	33	50
Trident	VIC/P79	8	**11**	12	16
Defiance	VIC/P79	6	**9**	9	13
Lady Robilliard	VIC/P79	4	**6**	7	10
Total (Bcf)		101	**169**	178	261

[2]*Net Prospective Resource is 3D Energi's interest in the unrisked estimated volume of hydrocarbon that may potentially be recovered from any prospect (20% participating interest).*

Table 3 – Full structure Gross Prospective Resource Estimate (Unrisked recoverable) [3]

Prospect	Permit	Low (P90)	Best (P50)	Mean	High (P10)	TDO ASX Reference
Essington	VIC/P79	177	**267**	276	390	TDO ASX 8 March 2023
Rosetta	VIC/P79	82	**155**	166	265	TDO ASX 8 March 2023
Lady Robilliard	VIC/P79	55	**83**	88	128	TDO ASX 8 March 2023
Defiance	VIC/P79	46	**71**	74	108	TDO ASX 8 March 2023

[3]*Full structure prospective resource estimates consider the total volume of hydrocarbon within the structure.*

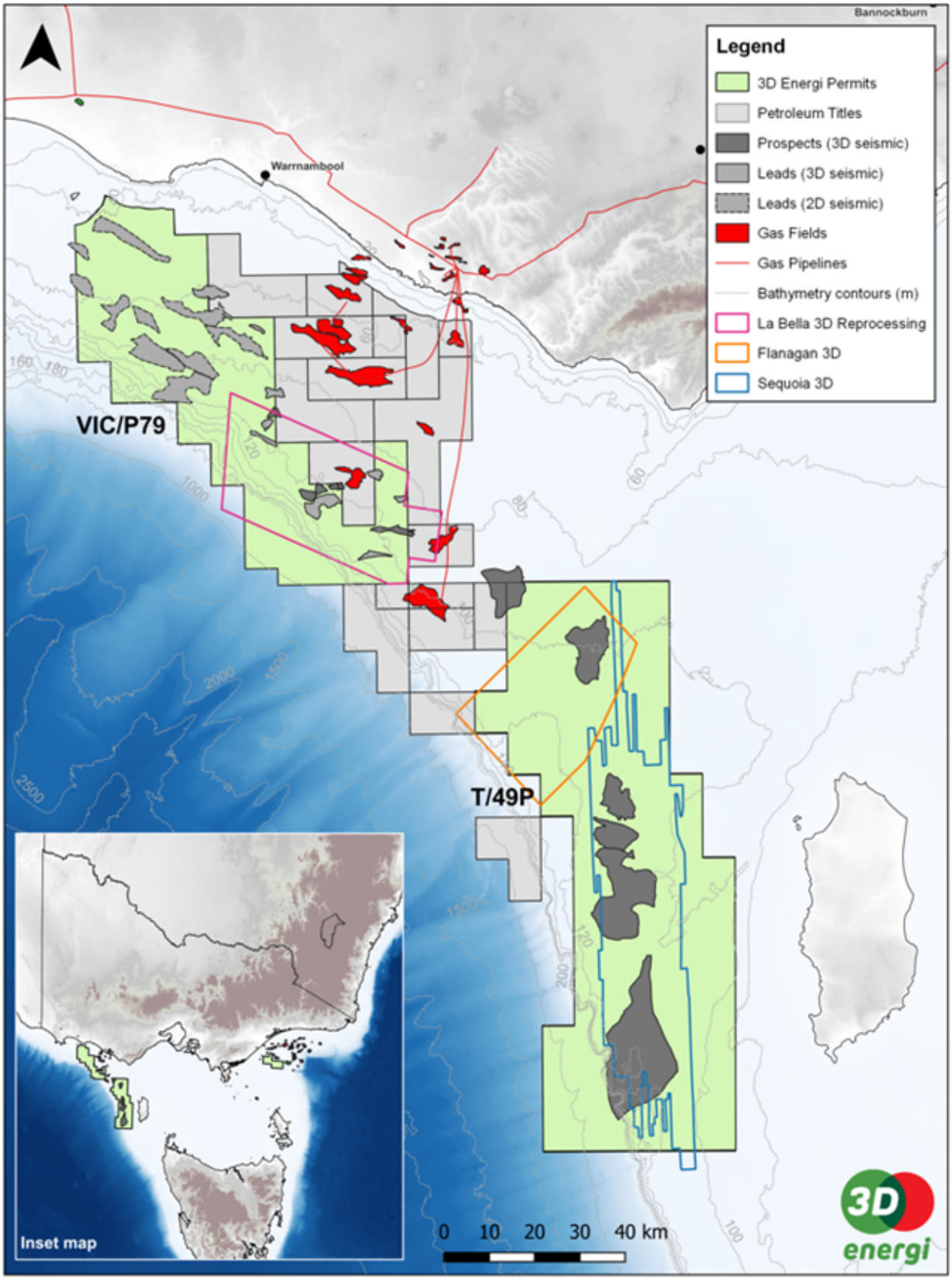
We continue progressing the maturation of our broader Otway portfolio

The Joint Venture is working towards the maturation of the broader Otway portfolio across all areas of VIC/P79 and T/49P to aid in the selection of exploration drilling locations ahead of the 2025 exploration drilling campaign, during which the Joint Venture will drill two exploration wells.

Further prospectivity and resource updates will be provided as the JV continues to evaluate the newly reprocessed La Bella MC3D, as well as the Sequoia 3D and reprocessed Flanagan 3D. As mentioned in our previous prospectivity update (refer to TDO ASX release 8 March 2023), the JV has observed multiple leads on 2D seismic over western VIC/P79 (Figure 6), which have all the required elements for robust prospects.

An Environmental Plan is being prepared for the Regia MC3D seismic survey over western VIC/P79 in preparation for the acquisition of at least 1000km^2 3D seismic (the principal commitment of the secondary term), which will enable a full assessment of the prospectivity of the area.

Figure 6 – VIC/P79 and T/49P exploration permits and 3D seismic surveys



Closing Comments

Monarch has now become a material part of the VIC/P79 exploration portfolio, boasting a gross best estimate prospective resource of **316 Bcf**[6], increasing the total current prospective resource within the permit to **849 Bcf** (gross best estimate). Monarch has a high chance of success at 47% owing to the presence of a strong Direct Hydrocarbon Indicator in the Waarre C reservoir, a flat spot (representing the gas-water contact) which is consistent with those observed at other Otway gas fields.

Evaluation of the newly reprocessed La Bella 3D will continue as the Joint Ventures progresses the maturation of our broader Otway portfolio to identify drilling locations across all areas of VIC/P79 and T/49P in preparation for the 2025 exploration drilling program. The Company is carried by ConocoPhillips Australia SH2 Pty Ltd for up to US$35 million towards the drilling costs of an exploration well in VIC/P79.

Additional specific information on permit prospectivity will be released to the market as it becomes available.

This announcement is authorised for release by the Board of Directors of 3D Energi Limited.

Enquiries

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Appendix

Permit Background

VIC/P79 covers an area of 2,575km^2 within Commonwealth waters of the offshore Otway Basin (Figure 6). The Company retains a 20% participating interest in VIC/P79 having farmed down 80% interest to Joint Venturer, and operator, ConocoPhillips Australia SH2 Pty Ltd (refer to TDO ASX release 16 March 2023). The permit primary term work program has a minimum commitment of 630km^2 of 3D seismic reprocessing and the drilling of one exploration well before February 2025. The Joint Venture recently completed the reprocessing of ~1135km^2 3D seismic across the La Bella and Investigator surveys (Figure 6).

VIC/P79 is flanked to the north by existing gas discoveries at La Bella and producing fields along the Pecten High trend (including Casino), which are connected via pipeline to the onshore Athena gas plant (operated by Cooper Energy). The Thylacine and Geographe fields lie 5km to the east, being the largest in the basin to date, between the VIC/P79 and T/49P permits. These gas fields are connected via pipeline to the onshore Otway Gas Plant (operated by Beach Energy).

[6] Refer to Cautionary Statement in relation to Prospective Resources on Page 1 of this release.

Notes on Petroleum Resource Estimates

Prospective Resources

Under the SPE PRMS 2018, Prospective Resources are "those quantities of petroleum that are estimated, as of a given date, to be potentially recoverable from undiscovered accumulations". Volumes are reported using the terms low estimate, best estimate and high estimate.

The estimates have been prepared by the company in accordance with the definitions and guidelines set forth in the Petroleum Resources Management System, 2011 approved by the Society of Petroleum Engineer. Prospective Resource estimates are for recoverable volumes and unless otherwise stated all petroleum estimates reported are aggregated by arithmetic summation by category. The estimates are unrisked and have not been adjusted for both an associated chance of discovery and a chance of development. 3D Energi uses both deterministic and probabilistic methods for estimation of Prospective Resources.

The estimates of Prospective Resources contained herein are current to the date of this ASX release. The Company is not aware of any new information or data that materially affects the estimates of Prospective Resources, and the material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed.

Qualified Petroleum Reserves and Resources Evaluator Statement

The Prospective Resources estimates in this release are based on, and fairly represent, information and supporting documents prepared by, or under the supervision of Dr Daniel Thompson, who is employed full-time by 3D Oil Limited as Exploration Manager. He holds a PhD in Petroleum Geosciences, has been practicing as a Petroleum Geoscientist for 10 years and is a member of the American Association of Petroleum Geologists (AAPG) and Petroleum Exploration Society of Australia (PESA). Dr Thompson is qualified in accordance with ASX listing rule 5.41 and has consented in writing to the inclusion of the information in the form and context in which it appears.

Glossary of Terms

3D	Three-dimensional
Bcf	Billion cubic feet
MC3D seismic	Multi-Client three-dimensional seismic
Amplitude conformance with depth closure	A type of Direct Hydrocarbon Indicator (DHI). Areas where bright anomalous amplitudes conform with the structural spill point/closure. This indicates a seismic response may be due to fluid variations in the subsurface.
DHI	A Direct Hydrocarbon Indicator. An anomalous seismic amplitude value that could be explained by the presence of hydrocarbon. Examples include AVO, flat spots and bright amplitudes (conforming with depth closure).
Geological Probability of Success (GPoS)	The probability that a prospect will find moveable hydrocarbons. The GPoS is obtained by multiplying the probability of essential geologic factors.
Flat spot(s)	A flat spot is a direct hydrocarbon indicator. It is a seismic anomaly that appears as a horizontal reflector cutting across inclined rock layers. It represents a hydrocarbon contact between either gas and oil, gas and water, or oil and water.
Otway Exploration Drilling Program	The Joint Venture is proposing to undertake an exploration program that consists of seabed surveys and the drilling of up to 6 exploration wells in exploration permits VIC/P79 and T/49P located in Commonwealth waters offshore of Victoria and King Island, Tasmania.
Joint Venture	The joint ventures formed pursuant to finalised farmout agreements announced on 11 June 2020 (T/49P) and 16 March 2023 (VIC/P79) by and between 3D Energi Limited and ConocoPhillips Australia SH1 Pty Ltd and ConocoPhillips Australia SH2 Pty Ltd, respectively.
Lead(s)	A lead is a potential trap/structure that may contain hydrocarbons and required significant geological and seismic investigation.
Operator	Company responsible for the exploration, development and production of a petroleum title.
Primary term	The first 3 years of a work program for a petroleum exploration title. This forms the minimum work commitment.
Prospect(s)	A prospect is a potential trap/structure that may contain hydrocarbons, usually defined on 3D seismic, and has undergone significant geological and seismic investigation to evaluate the petroleum system.
Prospective resource(s)	Those quantities of petroleum that are estimated, as of a given date, to be potentially recoverable from undiscovered accumulations
Reprocessing	The latest processing and imaging techniques, combined with increased compute power, can increase bandwidth and improve velocity models to enhance the detail and reliability of legacy seismic data.
TDO	ASX trading code for 3D Energi Limited.