

## ASX ANNOUNCEMENT

30 October 2024

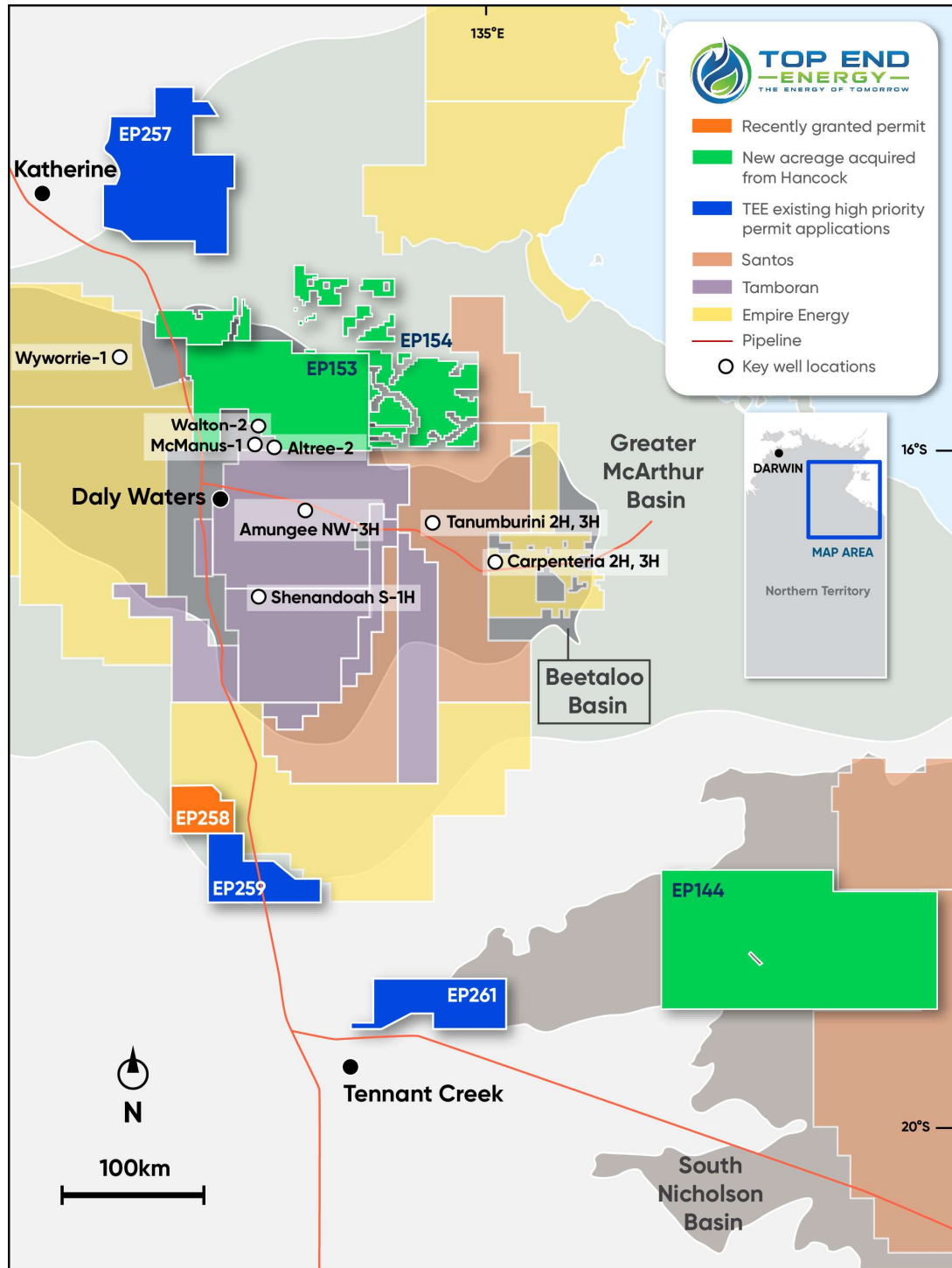
# QUARTERLY ACTIVITIES REPORT FOR PERIOD ENDING 30 SEPTEMBER 2024

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**Top End Energy Limited** (**Top End** or the **Company**) (ASX:TEE) is pleased to present its activities report for the quarter ended 30 September 2024 (the **Quarter**).

### HIGHLIGHTS OF THE QUARTER

- **Successful completion of strategic acquisition:** Top End completed the acquisition of granted exploration acreage in the Beetaloo Basin and South Nicholson Basin from wholly owned subsidiaries of Hancock Prospecting Limited (**Hancock**) (the **Transaction**). The Transaction included Exploration Permits (**EP**) 144, EP 153 and EP 154 in the Northern Territory (**NT**), Australia, significantly bolstering Top End's asset base and exploration potential.
- **Frontier South Nicholson Basin play potential confirmed:** Two significant unconventional gas play fairways have been identified through analysis of offset drilling and seismic interpretation. Collaborative engagement with mining companies actively drilling on overlapping mineral licences has also facilitated the analysis of whole core samples, confirming the presence of Proterozoic organic-rich shales on EP 144, with Total Organic Carbon (**TOC**) levels reaching up to 3.1wt%.
  - **Carrara Sub-basin Extension:** 2D seismic analysis has identified a previously undrilled sub-basin with multi-stacked, gas-mature source rocks extending into EP 144. The area offers substantial exploration potential, with up to 1,200 km<sup>2</sup> of running room.
  - **Alexandria Sub-basin:** Interpretation of 2D seismic data, supported by existing independent studies and core samples, indicates the presence of a comparable multi-stacked unconventional gas play. This sub-basin provides a significant exploration opportunity, with potential running room extending over 2,300 km<sup>2</sup>.
  - **Helium and hydrogen prospectivity:** Possum belly gas samples collected during offset drilling contained traces of both helium and natural hydrogen, with hydrogen sampled at up to 27% mol (air corrected).
- **Leadership optimised for future operations:** Changes to Top End's Board and Management announced during the Quarter provide the Company with key operational management and leadership experience as field activities are expanded ahead of future potential drilling operations.



**Figure 1: Top End's diversified portfolio of granted acreage, highlights the priority Beetaloo Basin and South Nicholson Basin play potential.**

## COMPLETION OF TRANSACTION TO ACQUIRE EP 144, EP 153 and EP 154

On 27 February 2023, Top End announced the execution of a binding term sheet to acquire NT EP 144, EP 153 and EP 154 (the **Permits**) from Minerals Australia Pty Ltd and Jacaranda Minerals Limited, wholly owned subsidiaries of Hancock (together, the **Vendors**).

On 2 July 2024, Top End announced that the parties had received approval to the Sale and Purchase Agreement (**SPA**) for the acquisition of the granted NT acreage from the delegate of the Minister of Mining under section 96 of the Petroleum Act 1984.

On 12 July 2024, the Company announced the successful completion of the SPA.

## BACKGROUND

The Permits cover a combined area of 27,885km<sup>2</sup> across the northern flank of the Beetaloo (A) and South Nicholson (B) basins in the NT (refer Figure 1). The Permits are underexplored, with several independent play types identified presenting multiple opportunities to deliver transformational resource success. The Permits are fully granted and benefit from existing native title agreements.

## KEY TRANSACTION TERMS

Consideration for Top End's acquisition of the Permits included:

- (a) grant of a royalty to the Vendors equal to 2.5% of any gross revenue (measured and determined at the wellhead) received by Top End from sale, removal, or other disposal of any petroleum from the Permits; and
- (b) the assumption of the Vendor's obligations under an existing royalty deed with Jacaranda Coal Pty Ltd (ACN 131 388 942) (formerly Jacaranda Coal Limited) for a royalty equal to 1% of the gross revenue (measured and determined at the wellhead) received by Top End from sale, removal, or other disposal of any petroleum from the Permits.

Top End was required to replace existing bank guarantees in connection with the Permits on completion.

The Company intends to undertake additional geological and geophysical workstreams before finalising any potential drilling decisions and the Company is engaging with the NT regulator regarding variations to the current work program requirements to accommodate forward plans.

## EP 144: EMERGING UNCONVENTIONAL GAS POTENTIAL

EP 144 represents highly prospective underexplored acreage in a proven hydrocarbon region, with potential ties to the Proterozoic shale plays of the Lawn Hill Platform and the Beetaloo Sub-basin Velkerri Formation. Santos Ltd (ASX:STO) is the only other energy company with a granted acreage position in the South Nicholson Basin.

EP 144 is strategically located in proximity to the Northern Gas Pipeline, which provides access to Mount Isa and the East Coast gas market. There is significant existing hard rock exploration and mining activity in the area (including Teck Resources, South32 and Endeavour Resources), providing potential opportunities for additional data sources, exploration collaboration and

offtake counterparties.

A Co-existence and Exploration Agreement is in place with the Traditional Owners of the EP 144, which is in year three of the initial five-year exploration period, and renewable for up to two further periods of up to five years each. Environmental Management Plans and Well Operations Management Plans have been approved for drilling of stratigraphic wells on the Permit, and the Company is engaging with pastoral lease holders to extend existing Land Access Agreements.

Outcomes of a comprehensive review of existing data acquired across the South Nicholson Basin, and EP 144 specifically, was announced in July 2024 (refer to ASX announcement dated 15 July 2024). This dataset included:

- NDI Carrara-1 stratigraphic well (TD 1,751m) drilled by Geoscience Australia (**GA**) in late 2020 under the Exploring for the Future (**EFTF**) program;
- Existing 2D seismic data acquired by GA in the area, including approximately 325-line kilometres across EP 144;
- Historic exploration wells drilled across the basin;
- Existing gravity and magnetic data sets; and
- Industry publications and peer interpretations.

Top End has identified the potential for two significant conventional and unconventional gas play fairways on the EP 144:

1. The **Carrara Sub-basin Extension**: ~600km<sup>2</sup> (~125,000 acres) of high potential core play fairway with running room of up to ~1,200km<sup>2</sup> (300,000 acres); and
2. The **Alexandria Sub-basin**: ~1,100km<sup>2</sup> (~270,000 acres) of high potential core play fairway with running room up to ~2,300km<sup>2</sup> (~580,000 acres).

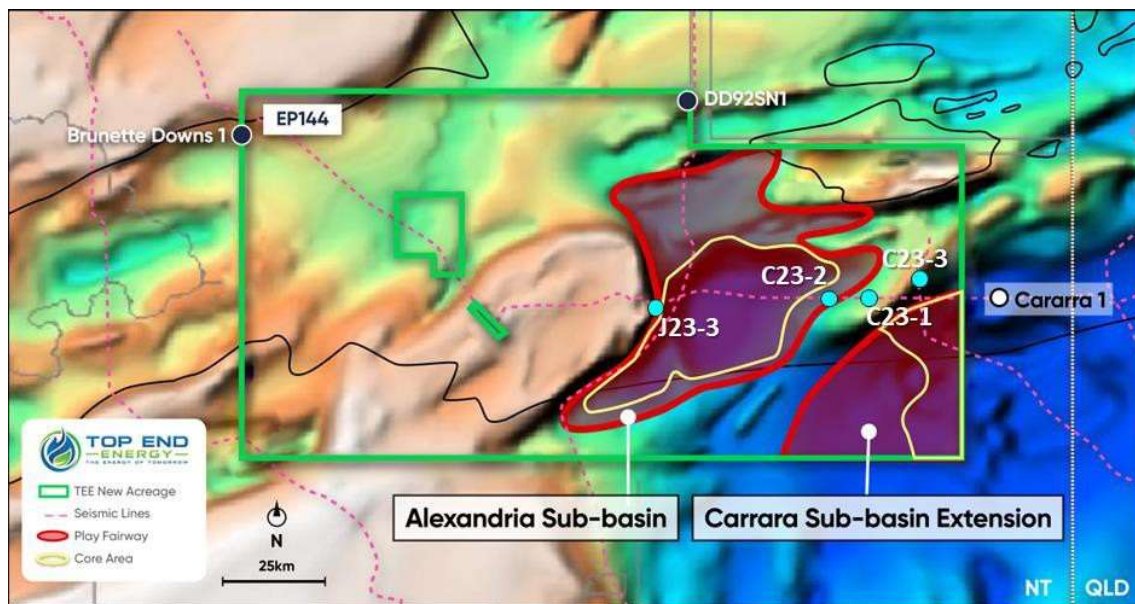
Helium and hydrogen potential has also been indicated, with possum belly gas samples collected from the NDI Carrara-1 well containing traces of both gases. Hydrogen sampled at up to 27% mol (air corrected). Helium was also present in samples collected during the Egilabria-2 well test (~0.9%). Potential hydrogen gas seepage pathways and a potential structural trap in EP 144 have been identified on the 17GA-SN2 2D seismic line acquired by GA. Surface depressions observed on satellite imagery in the area are potentially linked to the hydrogen seepage pathways interpreted on the seismic.

Multiple potential sources of hydrogen are thought to be linked to thick sequences of the Leichhardt Super Basin (1800 – 1760 Ma).

In combination with the assessment and interpretation of existing available data, the Company has also been engaging with mining companies actively drilling on overlapping mineral licenses. Encounter Resources Limited (**Encounter**) (ASX: ENR) is one such company holding minerals acreage over EP 144. In December 2023, an eight well drilling campaign was completed on Encounter's mineral tenure and recently Top End examined the resulting core samples.

Following observation of Proterozoic black shale sections in multiple drill hole cores, the

Company procured samples from the cores to be assessed for TOC, pyrolysis and thermal maturity. Preliminary analysis by Stratum Reservoir in the United States confirms organic-rich source rocks are present within the Permit with up to 3.1wt% TOC and HI 24 mg HC/gTOC in the sampled intervals. This is consistent with Lawn Hill shale interval intersected in the NDI Carrara-1 well, which sampled up to 3.2 wt% TOC and mean HI 3 mg HC/gTOC. As the holes drilled by Encounter have not yet been logged, the core samples acquired by the Company were done so during core viewing. Subject to agreement from Encounter, the Company intends to undertake a geophysical wireline logging program on the drill holes, including gamma ray, density, resistivity and sonic logs with a subsequent resampling of whole core intervals post logging. The expectation is that this will provide more precise data on source rock intervals for further testing. Further preliminary TOC, pyrolysis and thermal maturity evaluation remains ongoing. It is the Company's expectation that deeper source rock intervals are also present on the Permit, including the River sequence source rocks. The River sequence has been intersected by other historical wells across the South Nicholson Basin and interpreted on 2D seismic data to be present in the Permit.



**Figure 2: Wells C23-3 and C23-1 both intersected Proterozoic black shales directly beneath the Cambrian unconformity at ~633m and ~626m respectively. Both C23-3 and C23-1 observed multiple intervals of black shales below the Cambrian unconformity until TD at ~1,000m. Well C23-2 was drilled to TD of 800m and did not intersect any significant thickness of black shales, interpreted due to shallow depth of drilling. Well J23-3 (TD 1,300m) intersected black shale at ~1,289m but samples yet to be taken at this stage**



Dry core



Wet core

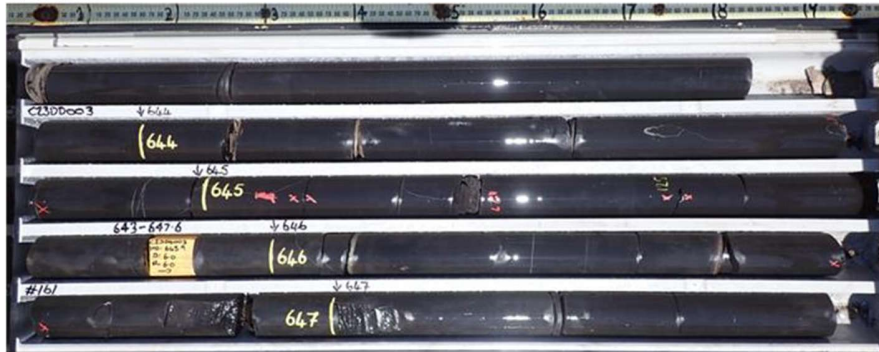
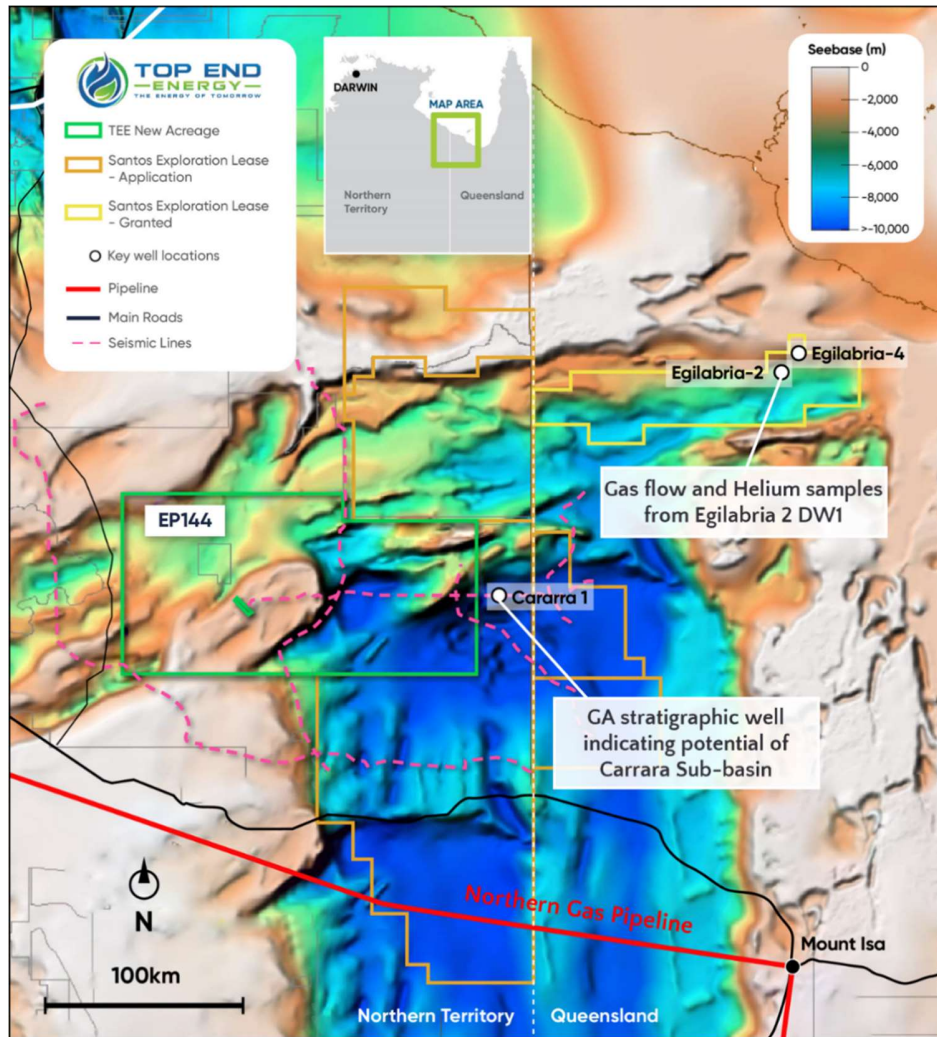


Figure 3: C23-3 dry and wet core images with 3.1wt% TOC sampled at 645m

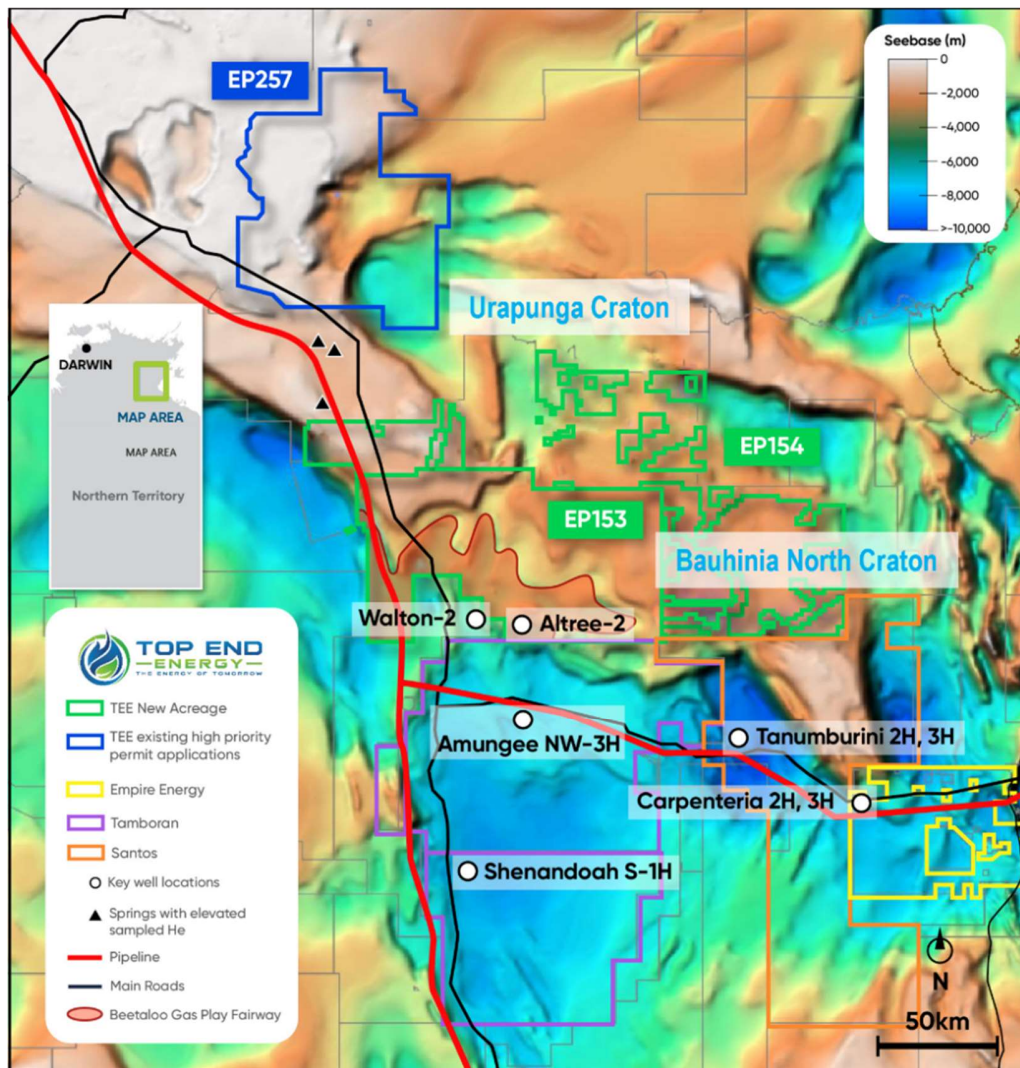


**Figure 4: EP144 location covering the South Nicholson Basin including proximate infrastructure, surrounding well location and existing seismic lines.**

## EP 153 AND EP 154: TWO PROVEN BASINS WITH MULTIPLE PLAY POTENTIAL

Of particular focus for Top End is the natural hydrogen and helium potential over EP 153 and 154 (refer to Figure 5), which is interpreted as a natural extension of the play fairway mapping completed by the Company in 2023 over its existing EP application 257. The presence of granitoid basement geology and the Urupunga Fault Trend provide potential charge and migration focus for natural hydrogen and helium. The Cambrian aged limestones present in the area are also interpreted to be conduits for thermal fluids migrating to surface and provide an initial focus area for sampling and other early-stage exploration activities.

Drilling and testing activities currently being undertaken in the core Beetaloo area of the McArthur Basin continue to mature the unconventional natural gas potential of the sub-basin. Key well testing result announcements from other basin operators are expected in the coming months, as well as development of plans for respective pilot plants, potentially paving the way for expansion of operations and commercialisation of discovered resources. It has been interpreted that unconventional gas bearing formations extend into the southern margins of EP 153 and 154. Both permits are strategically located to be able to benefit from future development activities and provide an avenue to commercialisation for any discovered resources.



**Figure 5: Multiple play potential on the northern flank of the Beetaloo Sub-Basin.**



## **CORPORATE**

### **BOARD AND MANAGEMENT CHANGES**

Top End announced the appointment of Trevor Brooks as its new Exploration Manager on 15 July 2024. Mr Brooks brings significant subsurface and operational experience covering the full exploration and production cycle, including prospect generation and maturation, drilling operations, appraisal and development, joint venture and asset management.

On 30 August 2024, the Company announced Mr Andrew Somoff's appointment as Non-Executive Director, following the departure of Managing Director, Mr Oliver Oxenbridge. Mr Somoff brings over 30 years of experience in the energy sector, encompassing all aspects of project management, engineering, operational and resource management.

Post Quarter end, Top End announced the appointment of Mr Patrick Burke as Non-Executive Director. Mr Burkes appointment followed the resignation of Non-Executive Director's Mr Mike Fischer and Mr Richard Lampe. Mr Burke has extensive legal and corporate advisory experience and over the last 20 years has acted as a director for multiple ASX listed companies, as well as NASDAQ and AIM listed companies.

### **OTHER CORPORATE ACTIVITY**

- As per ASX Listing Rule 5.4.1, a summary of the Company's substantive oil and gas exploration activities undertaken during the Quarter is contained herein, with exploration expenditure during the quarter totalling circa A\$579,000.
- As per ASX Listing Rule 5.4.2, there were no substantive oil and gas production and development activities undertaken during the Quarter.
- Section 6.1 of the Appendix 5B provides for an amount paid to related parties of circa A\$118,000 being circa A\$118,000 for directors' fees and salaries.
- The Company has a cash balance of circa A\$1,889,000 at 30 September 2024.

## 2024 SEPTEMBER QUARTER: ASX ANNOUNCEMENTS

This Quarterly Activities Report contains information extracted from the following ASX market announcements:

| Announcement                                     | Date of release   |
|--------------------------------------------------|-------------------|
| Government Approval for NT Acquisition Received  | 2 July 2024       |
| Completion of NT Granted Acreage Acquisition     | 12 July 2024      |
| Significant Gas Play Potential Emerging in EP144 | 15 July 2024      |
| Board and Management Changes                     | 30 August 2024    |
| Corporate Presentation                           | 3 September 2024  |
| Organic-Rich Source Rocks on EP 144              | 19 September 2024 |
| Board Changes                                    | 2 October 2024    |

- END -

This release is authorised by the Board of Directors of Top End Energy Limited.

For further information contact:

**Michelle Kennedy and Kelly Moore**

Joint Company Secretaries

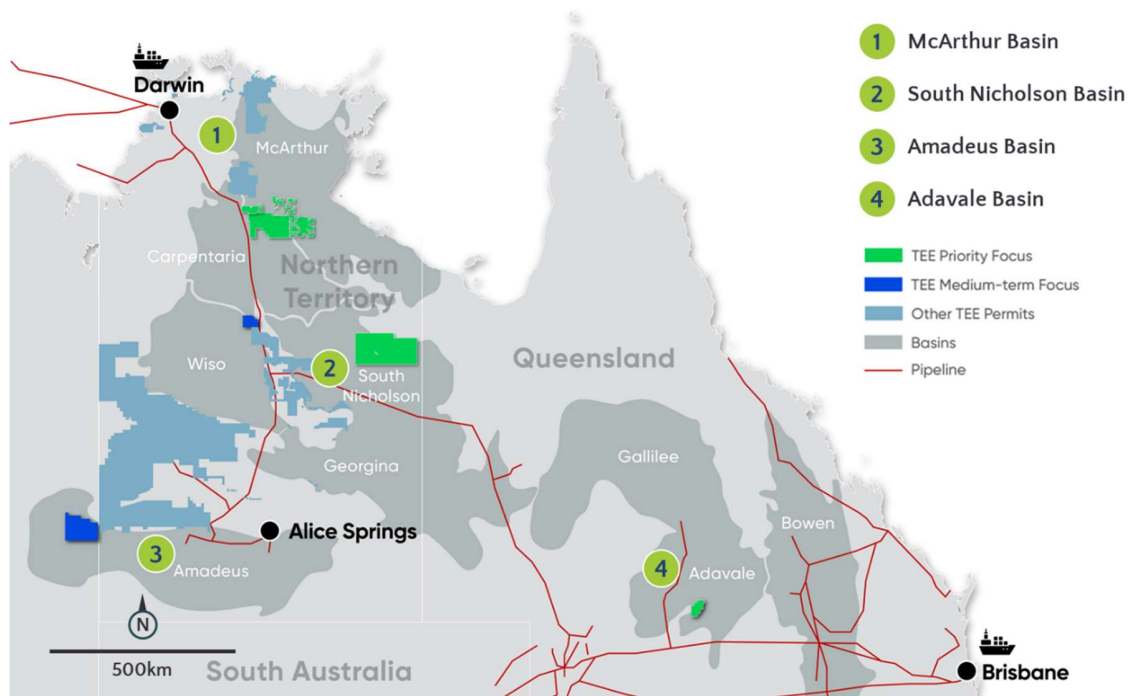
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## ABOUT TOP END ENERGY

Top End is committed to the active exploration and development of a diverse portfolio of complementary energy assets, primarily located in the NT of Australia (refer to Figure 6). The Company's exploration efforts focus on unlocking natural gas, helium, and natural hydrogen resources—vital commodities for the ongoing global energy transition.

For further information on Top End Energy Limited please visit [www.topendenergy.com.au](http://www.topendenergy.com.au)



**Figure 6: Top End's diversified portfolio of Australian exploration assets**

### Appendix 1: Tenement Schedule (ASX Listing Rule 5.4.3)

Petroleum tenements held by the Company and its subsidiaries at the end of the quarter and their location.

| Permit / Application <sup>1</sup> | Location           | Interest % | Holder                              |
|-----------------------------------|--------------------|------------|-------------------------------------|
| ATP 1069                          | Queensland         | 100.00     | Tomorrow Energy Corporation Pty Ltd |
| EP 501                            | Western Australia  | 100.00     | Tomorrow Energy Corporation Pty Ltd |
| EP 258                            | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd          |
| EP 144                            | Northern Territory | 100.00     | McArthur Energy Pty Ltd             |
| EP 153                            | Northern Territory | 100.00     | McArthur Energy Pty Ltd             |
| EP 154                            | Northern Territory | 100.00     | McArthur Energy Pty Ltd             |
| EP(A) 254                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |
| EP(A) 256                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |
| EP(A) 257                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |
| EP(A) 259                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd          |
| EP(A) 260                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd          |
| EP(A) 261                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd          |
| EP(A) 262                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd          |
| EP(A) 263                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd          |
| EP(A) 264                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd          |
| EP(A) 265                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |
| EP(A) 274                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |
| EP(A) 275                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |
| EP(A) 276                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |
| EP(A) 277                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |
| EP(A) 278                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd                 |

<sup>1</sup> The Company's petroleum tenements in the Northern Territory under application, are marked (A). Grant of applications is subject to reaching agreements with traditional owners and native title holders pursuant to the Aboriginal Land Rights (Northern Territory) Act 1976 (Cth) and the Native Title Act 1993 (Cth).



| Permit / Application <sup>1</sup> | Location           | Interest % | Holder                     |
|-----------------------------------|--------------------|------------|----------------------------|
| EP(A) 279                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 280                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 281                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 282                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 283                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 284                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 285                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 294                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 295                         | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |
| EP(A) 312                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd |
| EP(A) 313                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd |
| EP(A) 314                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd |
| EP(A) 315                         | Northern Territory | 57.68      | Territory Gas Aust Pty Ltd |
| NTC/P(A) 14                       | Northern Territory | 57.68      | NT Gas Aust Pty Ltd        |

During the Quarter, the Company announced the completion of the transaction to acquire EP 144, 153 and 154 in the Northern Territory from wholly owned subsidiaries of Hancock. Transfer of title was completed on 24 September 2024.

## Appendix 2: Summary of cash expenditure per project

| Project                               | Cash Expenditure A\$'000 |
|---------------------------------------|--------------------------|
| ATP 1069                              | 1                        |
| TG Project                            | 137                      |
| EP 501                                | 3                        |
| McArthur Energy – EP 144, 153 and 154 | 438                      |