



INVICTUS  
ENERGY LIMITED

# Light Oil, Gas-Condensate and Helium confirmed in Mukuyu-1

8 May 2023

- Presence of light oil, gas-condensate and helium confirmed from Mukuyu-1 mud gas compositional analysis
- Results confirm multiple oil and gas pay zones in sandstone reservoirs consistent with wireline log interpretation
- Upper Angwa reservoirs contain liquids rich gas with condensate-gas-ratio (CGR) estimated between 30 to 135 bbls/MMscf
- High quality gas with minimal CO<sub>2</sub> content of less than 1%
- Helium content is consistent with global commercial helium producers
- Results confirm multiple oil and gas pay zones in sandstone reservoirs consistent with wireline log interpretation and fluorescence observed in sidewall cores and cuttings
- Multiple source / reservoir / seal pairs through the Upper Angwa

Invictus Energy Limited ("Invictus" or "the Company") is pleased to provide an update on operations at its 80% owned Cabora Bassa Project in Zimbabwe.

## Comments from Managing Director Scott Macmillan:

*"Results from the mudgas compositional analysis definitively proves the presence of hydrocarbons in multiple reservoir pay zones at Mukuyu-1 consistent with the wireline log interpretation, fluorescence, and elevated mudgas readings.*

*"Analysis shows the presence of light oil and rich natural gas-condensate, with condensate gas ratios estimated at between 30 to 135 barrels per million cubic feet.*

*"The analysed samples demonstrate a consistent, high-quality natural gas composition, exhibiting low inert content, containing less than 1% CO<sub>2</sub>.*

*"Furthermore, the presence of helium gas in commercial concentrations in multiple reservoir units is comparable with global helium producing fields and provides an additional high value by-product.*

*"We are extremely pleased with the results from the mudgas analysis which confirm our geological modelling of the Cabora Bassa Basin and the presence of both light oil and gas-condensate provides us with confidence as we prepare for the drilling of Mukuyu-2 in Q3 this year.*

## ABOUT INVICTUS ENERGY

Invictus Energy Ltd is an independent oil and gas exploration company focused on high impact energy resources in sub-Saharan Africa. Our asset portfolio consists of a highly prospective 360,000 hectares within the Cabora Bassa Basin in Zimbabwe. SG 4571 and EPOs 1848/49 contain the Mukuyu and multiple Basin Margin prospects.

## BOARD & MANAGEMENT

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Non-Executive Chairman

**Joe Mutizwa**  
Non-Executive & Deputy Chairman

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Non-Executive Director

**Gabriel Chiappini**  
Non-Executive Director  
& Company Secretary

**Scott Macmillan**  
Managing Director

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*"Success at Mukuyu-2 and confirmation of a significant discovery will further unlock the value of our material portfolio and basin master position in the Cabora Bassa Basin."*

## Result Summary

Compositional analysis has been completed for 5 priority mudgas samples acquired during the drilling of the Mukuyu-1 / ST-1 well in selected Upper Angwa reservoir units.

The results indicate the presence of light (volatile) high API oil or oil associated gas condensate in the shallower Upper Angwa reservoirs, which progressively become drier i.e. lower condensate gas ratio (CGR) with increasing depth in the Upper Angwa formation.

The presence of liquid hydrocarbons (light oil and condensate) is consistent with the observed fluorescence and elevated mudgas readings with heavier hydrocarbon components observed during the drilling of Mukuyu-1/ST-1.

The samples analysed also show consistent high quality natural gas with low inert content and contain less than 1% CO<sub>2</sub>, which will require minimal processing.

Several samples also contain commercial concentrations of helium gas which will provide an additional high value by-product.

The results validate the Company's basin and geological models of the Cabora Bassa and the presence of multiple hydrocarbon bearing reservoirs in the Mukuyu-1 / ST-1 well.

Additional mudgas isotube samples have also been analysed with results to be confirmed and provided in due course.

Further technical information can be found on page 4, **Appendix 1** of this announcement.

## Questions and enquiries

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### About Invictus Energy Ltd (ASX: IVZ)

*Invictus Energy Ltd is an independent upstream oil and gas company listed on the Australian Securities Exchange (ASX: IVZ). The Company is headquartered in Perth, Australia and has offices in Harare, Zimbabwe. Invictus is opening one of the last untested large frontier rift basins in onshore Africa – the Cabora Bassa Basin – in northern Zimbabwe through a high impact exploration programme.*

*Invictus Energy is committed to operating in a safe, ethical and responsible manner, respecting the environment, our staff, contractors and the communities in which we work.*

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## Appendix 1

### Mukuyu-1 well mud gas compositional and isotope analysis

Analysis has been completed of five priority mud gas samples acquired during the drilling of the Mukuyu-1 well in selected intervals of the Upper Angwa reservoir.

Lab analysis indicates the presence of wet gas, gas-condensate, and potentially volatile (light) oil with associated gas within the Upper Angwa formation. The samples show a general trend of increasing gas dryness (lower condensate gas ratio/yield) with depth, however at a relatively high wet gas composition.



Figure 1 - Wetness and balance ratios vs. depth for Upper Angwa mudgas isotube samples indicating increasing gas dryness with depth

The approximate CGR is estimated to range between 135 barrels of condensate per million standard cubic feet of natural gas (bbl/MMscf) in the shallowest reservoir interval analysed, with CGR decreasing with depth to approximately 30 bbls/MMscf in the deepest analysed sample.

The wetness vs balance ratio plots show all samples analysed lie within the “productive oil / productive gas spectrum” indicating movable hydrocarbons (i.e not residual) as per Figure 1.

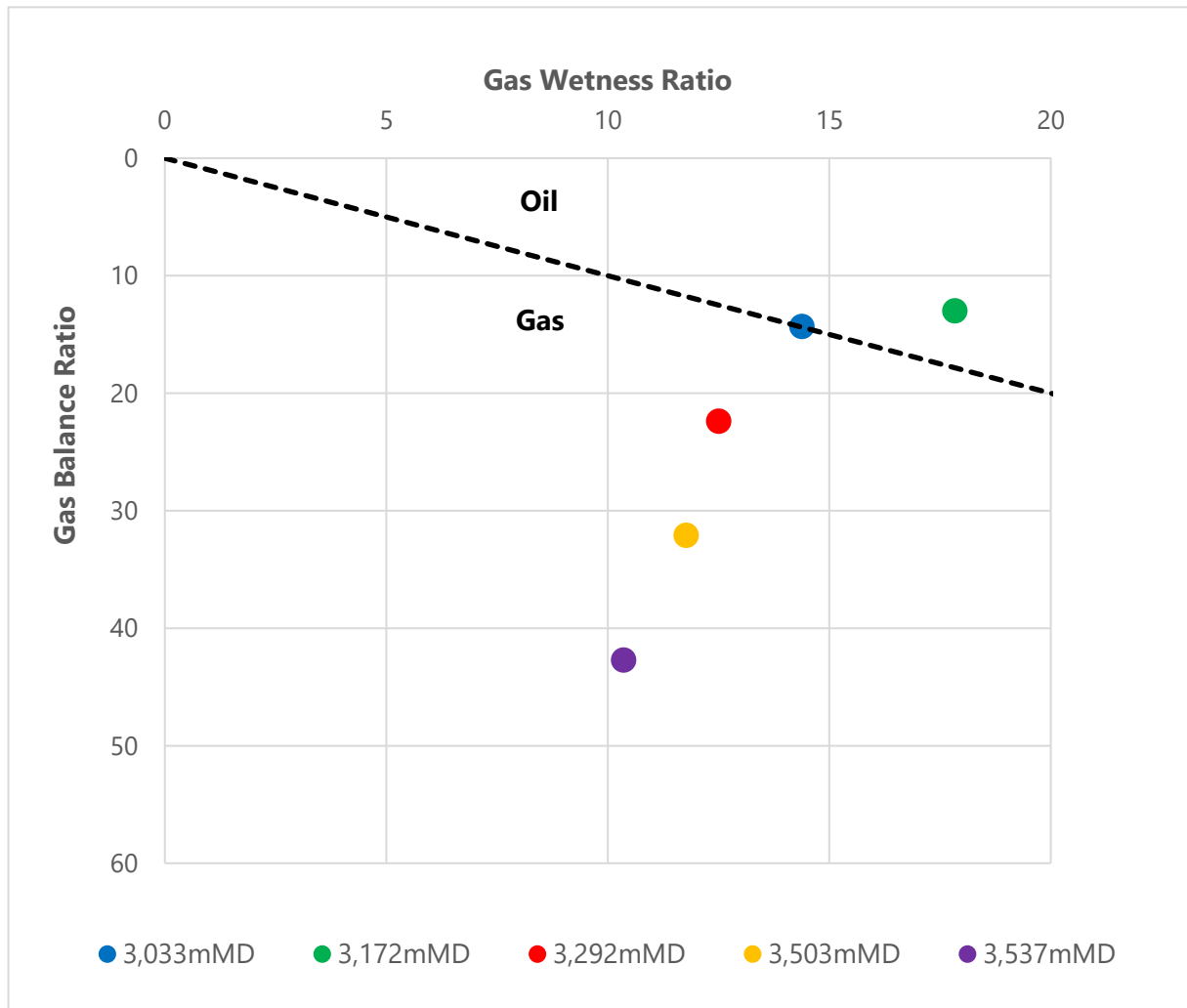


Figure 2 - Mukuyu-1 / ST-1 mudgas isotube analysis showing presence of light oil and gas condensate with increasing gas dryness with depth

The shallowest samples analysed from the Upper Angwa show that they lie on the oil or oil associated gas classification which was consistent with up to 100% fluorescence observed from these reservoir intervals in the cuttings during drilling and progressively becoming drier (shown in Figure 2).

The samples analysed also show consistent high quality natural gas with low inert content and contain less than 1% CO<sub>2</sub>, which will require minimal processing. The CO<sub>2</sub> isotopes suggest all samples have a mainly organic (kerogen) origin.

The gas isotope data suggests expulsion from similar good quality source rock for all samples analysed and indicates gas wetness is being controlled by maturity of the source rock, which is a function of depth and temperature.

## Helium gas content provides opportunity for additional revenue stream

Compositional analysis of the mud gas revealed the presence of helium at commercial concentrations of ~0.1%, which will provide an additional high value by-product from the gas streams.

The concentration is potentially greater within the reservoir than measured as helium, due to its small particle size, can escape through the micropores in glass isotubes used for gas sampling and storage. As a result, copper tubes are often used to store helium samples, helping to minimise losses and provide a more accurate measure of the helium content in the reservoir.

Helium's unique chemical properties makes it irreplaceable in many high-end technological applications, including semiconductor and fibre optic fabrication, aerospace, Magnetic Resonance Imaging (MRI), and cryogenics.

The helium market has unique supply, demand and storage dynamics, which has led to significant price increases over the last decade.

The current long term contract bulk helium price is approximately US\$450 per thousand cubic feet, which is 50-100 times greater than typical long term natural gas prices.

The majority of helium (~95%) is sourced as a by-product of hydrocarbon production, with less than 3% of natural gas deposits containing more than trace amounts of helium. Commercial production typically requires helium concentrations between 0.04-0.35%