

# East Seram PSC Opportunity

Exciting block in productive fold belt province, multiple proven plays with major oil and LNG scale gas potential

Lion Energy Ltd ("Lion") is seeking partners to participate in a newly awarded Eastern Indonesian PSC encompassing highly prospective onshore & offshore areas of Seram Island. The block has a modest work commitment of 500km seismic that will target world-class fold belt structures and shallow oil prospects with combined mean potential over 1.8 billion boe. Significantly, the PSC contains the south-easterly extension of the 2 TCF Lofin field and an offshore extension of the 20 mmbbl Bula oil field.

## Introduction

The East Seram PSC is located in the eastern part of Seram Island in Eastern Indonesia. Lion has a 100% interest in the 6504 km<sup>2</sup> PSC acquired through the Indonesian joint study process with subsequent successful bid in the 2018 gazettal round. The primary commitment consists of 500km seismic (to be acquired either onshore or offshore) and geological/geophysical studies. No commitment wells are included in the primary 3 year term.

Lion is an ideal partner to explore this highly attractive PSC. It has a strong knowledge of the region and an extensive well (>40 wells) and seismic (>3500 km 2D) database through both our 2.5% interest in the Seram (Non-Bula) PSC operated by CITIC, as well as being Operator of the Bula oil field from 1999-2005.

## Regional Setting

The East Seram PSC encompasses a significant part of the Eastern Indonesian Seram Basin. It is located in the northern part of the Banda Arc where the collision event of the Australia plate with the Sunda plates in the late Tertiary resulted in the underexplored Seram fold belt. The PSC has geological affinities to nearby provinces that host major oil and gas reserves, this includes the prolific Papuan fold belt in PNG as well as the Salawati and Bintuni basins in Irian Jaya (Fig. 1).

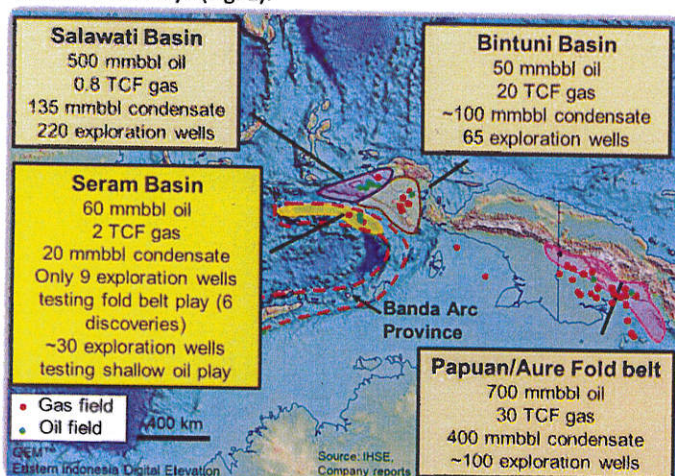


Fig. 1 Regional setting of the Seram Basin

## Seram Exploration History

Oil was first discovered in 1896 by the Dutch drilling adjacent to the Bula oil seep. To date, ~40 exploration wells have resulted in 17 discoveries with resources of ~450 mmbbl. Key fields include Bula (~20 mmbbl), Oseil (17 mmbbl produced to date) and the 2012 Lofin discovery (2 tcf). Other discoveries include Belien, Bula Tengarra, Bula Lemun, Neif, East Neif, Neif Utara A,B, Oseil Selatan & Dawang.

Only four wells have been drilled in the East Seram PSC, which surrounds the producing Seram & Bula PSC's. These all tested the Plio-Pleistocene play with the onshore 1971 stratigraphic wells Wahai-1 & 2, 1979 Belis-1 and the offshore 1973 Ceram-B1. Seismic coverage in the East Seram PSC is poor to fair onshore & fair to good offshore.

**Lion Energy Ltd** is an ASX listed oil & gas E&P company focused on Indonesia, where it has been operating for approximately 20 years

## East Seram PSC Overview

The East Seram PSC with an area of 6504 km<sup>2</sup> (65% onshore) contains some of the most prospective parts of the Seram Basin.

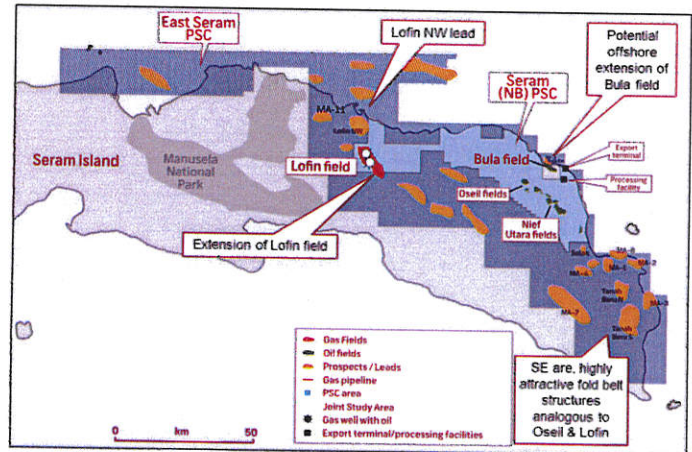


Fig. 2 East Seram PSC with existing fields & some identified leads & structures

The block contains a variety of proven plays with two distinct sequences recognised:

- The Permian to Miocene Series (part of the northern extension of the Australian continent). The Triassic Manusela limestone sealed by the Jurassic Kola Shale is the primary objective and all 6 targeted penetrations to date have been discoveries.
- The Seram Series of Pliocene to Recent age (up to 2500m thick) with objectives of sandstone & carbonate in the Fufa Fm.

A new tectono-stratigraphic model for East Seram Island has been developed (Fig.3) with deep inverted rift structures and over-riding fold-thrust duplexes. The Lofin & Oseil fractured Manusela limestone fields are shown as well as the shallow Bula oil field within the Plio-Pleistocene thrust foreland basin.

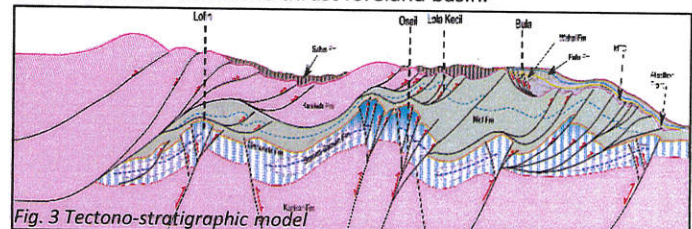


Fig. 3 Tectono-stratigraphic model

An impressive portfolio of field extension opportunities and leads has been characterised on existing seismic data as shown in Fig. 4.

In addition to the Lofin & Bula extensions key leads include MA-7, Lofin NW, MA-11, Tanah Baru S and Wahai Deep.

Combined mean potential (unrisked) of these 5 leads exceeds 1.3 bboe, planned seismic is aimed to mature key leads to drillable status.

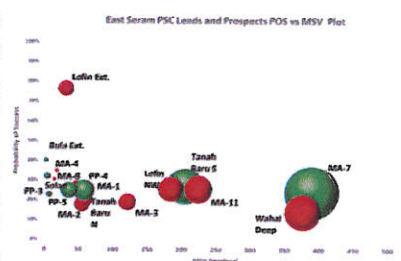


Fig. 4 East Seram Portfolio POS vs MSV



# East Seram PSC Opportunity

## Stratigraphy

The stratigraphic column for the East Seram PSC is shown in Figure 5 with primary reservoir targets being sandstone and limestone of the Pleistocene Fufa Formation and the Triassic/Jurassic Manusela Formation fractured limestone

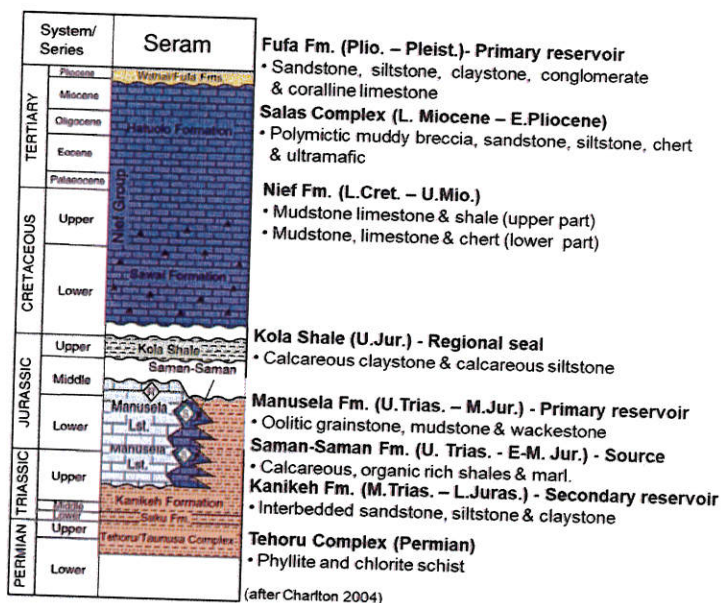


Fig. 5

## Petroleum elements of the Seram Series

**Source:** Saman-Saman Formation with oil having migrated via faults into the unconsolidated reservoirs of the overlying Fufa Formation. The oil recovered from the Fufa Formation is naphthenic, high in sulphur (3 per cent) and has a generally low API gravity (20deg).

**Reservoir** Fufa Formation unconsolidated sandstone and limestone. Porosities range up to 30% with permeabilities averaging 70 md.

**Traps** Rollovers associated with normal faulting, structural-stratigraphic traps and reefs.

**Seal** Provided by intra-formational mudstones.

## Petroleum elements of the Permian to Miocene series

**Source:** Organic rich, marine calcareous shales of Triassic-Jurassic Saman-Saman Fm (Equiv. age stratigraphy on Buru & Buton Islands where TOC's range up to 16%, HI's to 700 mg/gms).

**Reservoir** Matrix porosity are generally modest (4-12%) and production relies on the presence of an extensive fracture systems.

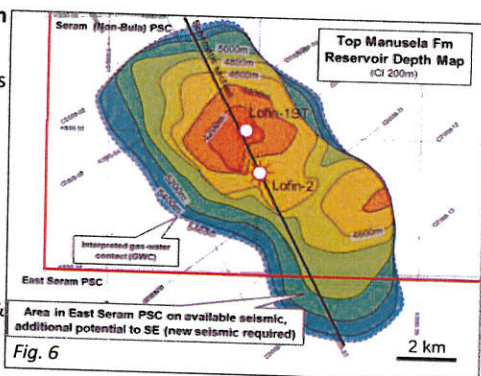
**Trap:** Large, thrust bounded anticlinal (fold-belt) complexes

**Seal:** The units that overlie the Manusela Carbonate are regionally extensive and shale prone, and provide an effective top trap seal as evidenced by the 1300 m gas column in the Lofin field.

## East Seram PSC prospectivity highlights

### Lofin Field extension (Fig. 6)

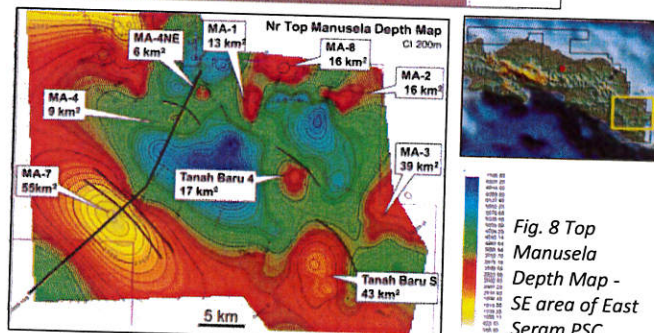
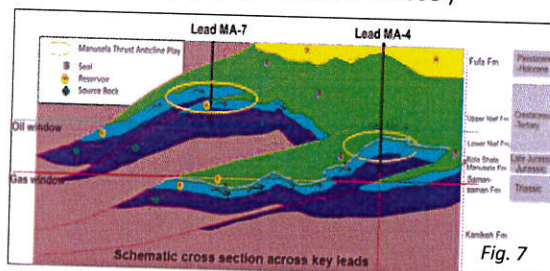
- Seismic data shows Lofin field extends into PSC (~8 km<sup>2</sup>)
- Unitisation opportunity
- Additional leads along Lofin trend with coincident surface anticlines & gravity anomalies



<sup>1</sup>**Prospective resources:** the estimated quantities of petroleum that may potentially be 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 moveable hydrocarbons.

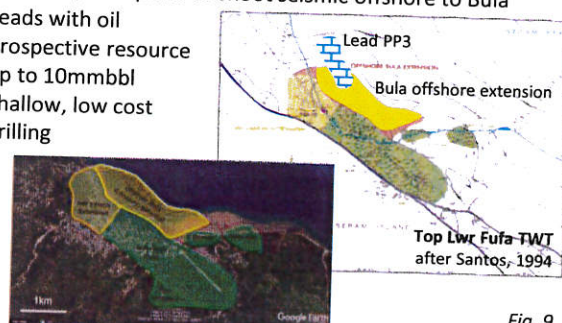
## Fold belt thrust anticlines (Fig. 7,8)

- Analogues with Oseil and Lofin field
- Fractured Manusela limestone targets
- Potential for closures >50 km<sup>2</sup> (Fig. 8)
- Reservoir depth 1500-5000m, both oil and gas expected
- Key leads include:
  - MA-7 (P90 45 - P10 1006 mmboe<sup>1</sup>),
  - MA-11 (P90 43 - P10 521 mmboe<sup>1</sup>)
  - Lofin NW (P90 39 - P10 417 mmboe<sup>1</sup>),
  - Tanah Baru South (P90 36 - P10 491 mmboe<sup>1</sup>)
  - Wahai Deep (P90 67 - P10 907 mmboe<sup>1</sup>)



## Offshore Bula Field extension (Fig. 9)

- East Seram PSC has ~25 km<sup>2</sup> area offshore to the Bula field with seismic showing attractive fault structures and potential reefal targets
- Offshore potential recognised since mid 1990's and is undrilled, Lion plans to shoot seismic offshore to Bula
- Leads with oil prospective resource up to 10mmmbbl
- Shallow, low cost drilling



## Commercial

Lion signed the PSC on 17 July 2018. Under the new gross-split regulatory regime. The terms are attractive with expected contractor take for Oil and Gas around 90% pre tax. Importantly the new contract significantly reduces the bureaucratic burden on the Operator.

Lion is anticipating total costs of Year 1-3 work program at less than USD 10 mm involving shooting 250km 2D offshore seismic and 250km onshore.

Lion is seeking a partner for up to 50% equity on negotiable terms.

**To register your interest & request an NDA to receive a comprehensive presentation, please contact:**

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# East Seram PSC Opportunity Investment Value Proposition



Up to 50% working interest and operatorship available

## Proven Basin, Immature Plays with High Prospectivity

- Extension of existing Bula oil and Lofin gas field into PSC
- 4 proven plays extending into PSC with deep and diverse leads inventory exceeding 1.8 billion boe's
- Combined un-risked mean potential of top 5 leads in Manusela carbonate play exceeds 1.3 billion boe
- Manusela carbonate play has had only 6 targeted penetration in the basin and all have been discoveries
- Immature exploration, un-creamed basin with statistical yet to find (YTF) analysis exceeding 2.5 billion boe (>1 bboe YTF in East Seram)

## Attractive Fiscal Terms Operating Flexibility

- New Gross split PSC with light handed regulation and operating flexibility to drive cost effectiveness
- Adjacent SNBB PSC benchmark splits plus contract terms indicate ~ 90% initial pre tax contractor share likely.
- 25% income tax and 10% BPT drives 32.5% tax rate. Effectively 10% Royalty and 32.5% tax
- VAT and LBT exemption during exploration phase
- Compelling economics complement world class exploration potential

## Lion Data, Knowledge, & Insight Advantage

- Unique and unrivalled Seram data, knowledge and insight from long history in Seram E&P
- Operated Bula field from 1999- 2005 and been in the SNBB block since inception including discovery, development & production of Oseil oil field and Lofin Gas field
- Database of over 40 well, >3,500 km 2D seismic & 200km<sup>2</sup> 3D seismic
- Strong relationships with majority Indonesian ownership and experienced Indonesian management team

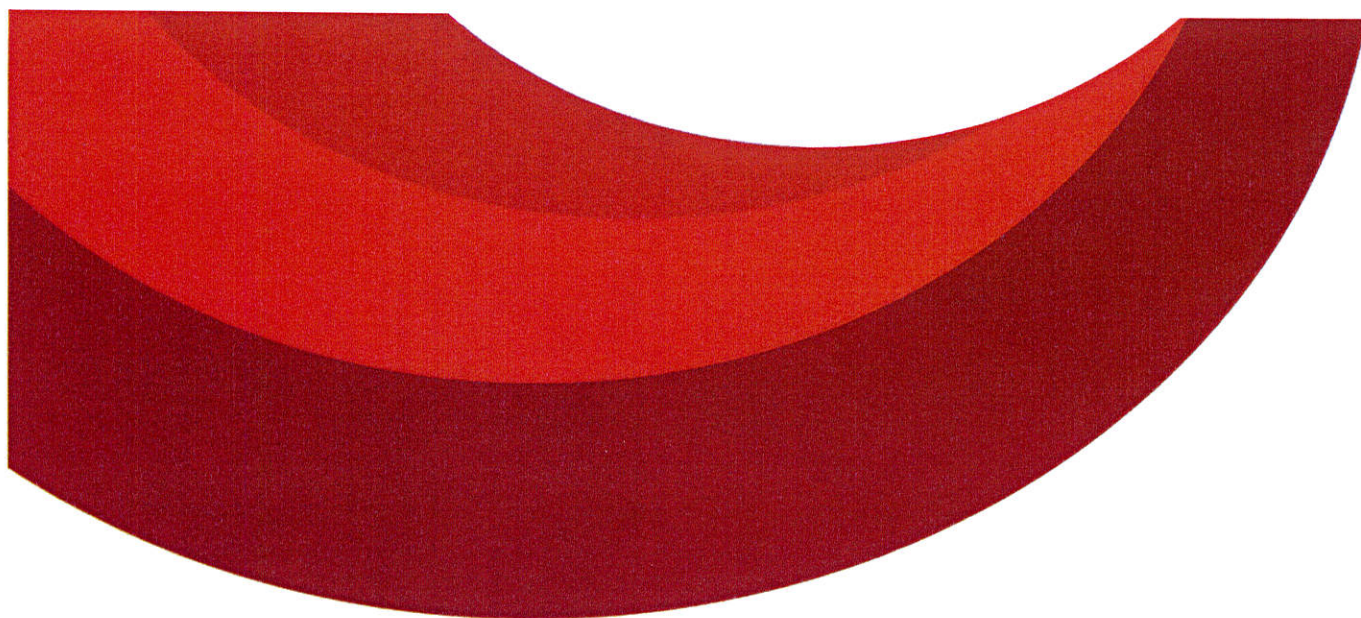
## Established Oil Production & Export Infrastructure

- Bula and Oseil oil production facilities with capacity up to 21,000 bopd, significant ullage
- Pipelines, tank farms, mini refinery, production facility, cargo jetty and 500,000 bbl marine export terminal
- Local operating expertise, support services and community engagement with over 100 years of oil production history on Seram

## Low Commitments & Low Cost Flexible Program

- Low US\$0.5 million signature bonus and US\$1.5 million performance bond negotiated and paid
- 3 year commitment is only 500km of 2D seismic. No drilling commitment.
- Seismic can be acquired onshore or offshore. Quality multi client gravity /magnetics available and being accessed
- Regulator approves work programs, not budgets or procurement





# Thank you

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