Eastern Indonesian Seram Basin

High impact fold-thrust belt and new potential in the shallow Plio-Pleistocene play

Kim Morrison

Lion Energy Ltd

Perth Seapex Meeting

16 March 2021

A New Approach to Asian Energy

Important notice and disclaimer

Forward-looking statements

Certain statements contained in this presentation, including information as to the future financial or operating performance of Lion and its projects are forward-looking statements. Such forward-looking statements:

- should or can generally be identified by the use of forward looking words such as “anticipate”, “believe”, “expect”, “forecast”, “estimate”, “will”, “could”, “may”, “target”, “plan” and other similar expressions within the meaning of securities laws of applicable jurisdictions, and include earnings guidance and statements of intention about future matters and the outcome and effects of the equity raising. Indications of, and guidelines or outlook on, future earnings, distributions or financial position or performance are also forward looking statements;
- are based upon a number of assumptions and estimates that, while considered reasonable by Lion, are beyond the control of the Company has they are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies;
- involve known and unknown risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements; and
- may include, among other things, statements regarding targets, estimates and assumptions in respect of production, prices, operating costs, results, capital expenditures, reserves and resources and anticipated flow rates and are or may be based on assumptions and estimates related to future technical economic, market, political, social and other conditions.

This Document is provided to the recipient on the basis that the recipient understands and acknowledges that it may not rely in any way whatsoever on the Document or other information. Unless legally required, the Company undertakes no obligation to update publicly any forward looking statements, whether as a result of new information, future events or otherwise.

General Disclaimer

The Company has taken all reasonable care in producing the information contained in this document, however it does not guarantee the accuracy of information or analysis provided. The Company will not be responsible for loss or damage arising from the use of this information. The contents of this document should not be used as a substitute for detailed investigations or analysis and we strongly recommend you obtain independent professional advice before making any investment decisions about the Company.

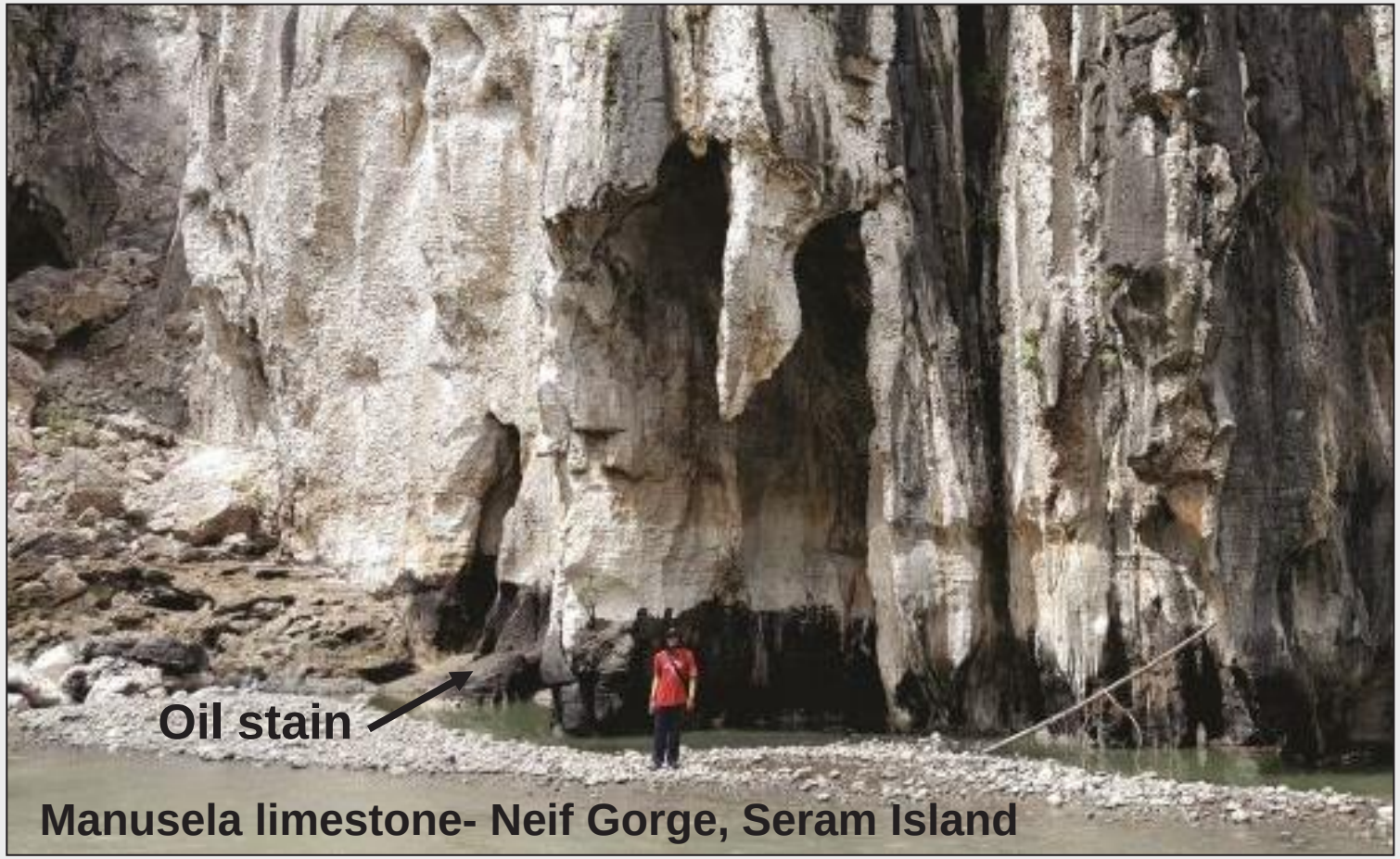
You may use the information for your own personal use or to inform others about our materials, but you may not reproduce or modify it without our express permission.

Competent Persons Statement: Qualified Petroleum Reserves and Resources Evaluator

Pursuant to the requirements of the ASX Listing Rules Chapter 5, the technical information, reserve and resource reporting provided in this document are based on and fairly represent information and supporting documentation that has been prepared and/or 30 years’ experience in exploration, appraisal and development of oil and gas resources - including evaluating petroleum reserves and resources. Mr Morrison has reviewed the results, procedures and data contained in this presentation. Mr Morrison consents to the release of this presentation and to the inclusion of the matters based on the information in the form and context in which it appears. Mr Morrison is a member of AAPG.

Presentation Outline

- Lion Energy overview
- Seram regional setting
- Stratigraphy
- Structural model
- Fold-thrust belt play
  - Exploration results
  - Prospects and leads
  - Global analogues
- Plio-Pleistocene play
  - Exploration results
  - Key plays
  - Prospects and leads
- Summary

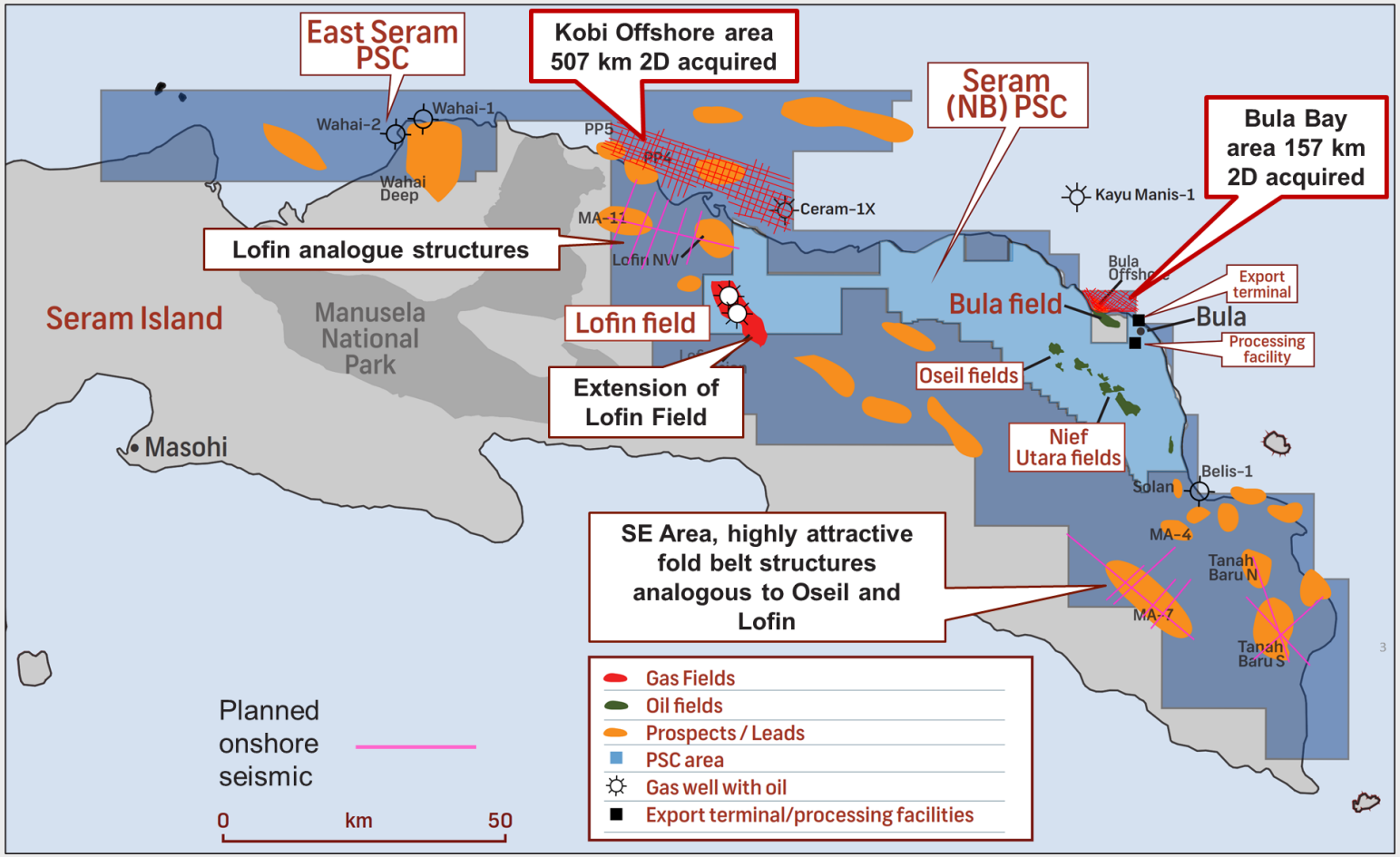


Manusela limestone- Neif Gorge, Seram Island

Overview of Lion Energy

ASX listed, majority Indonesian owners, Seram focused E&P company

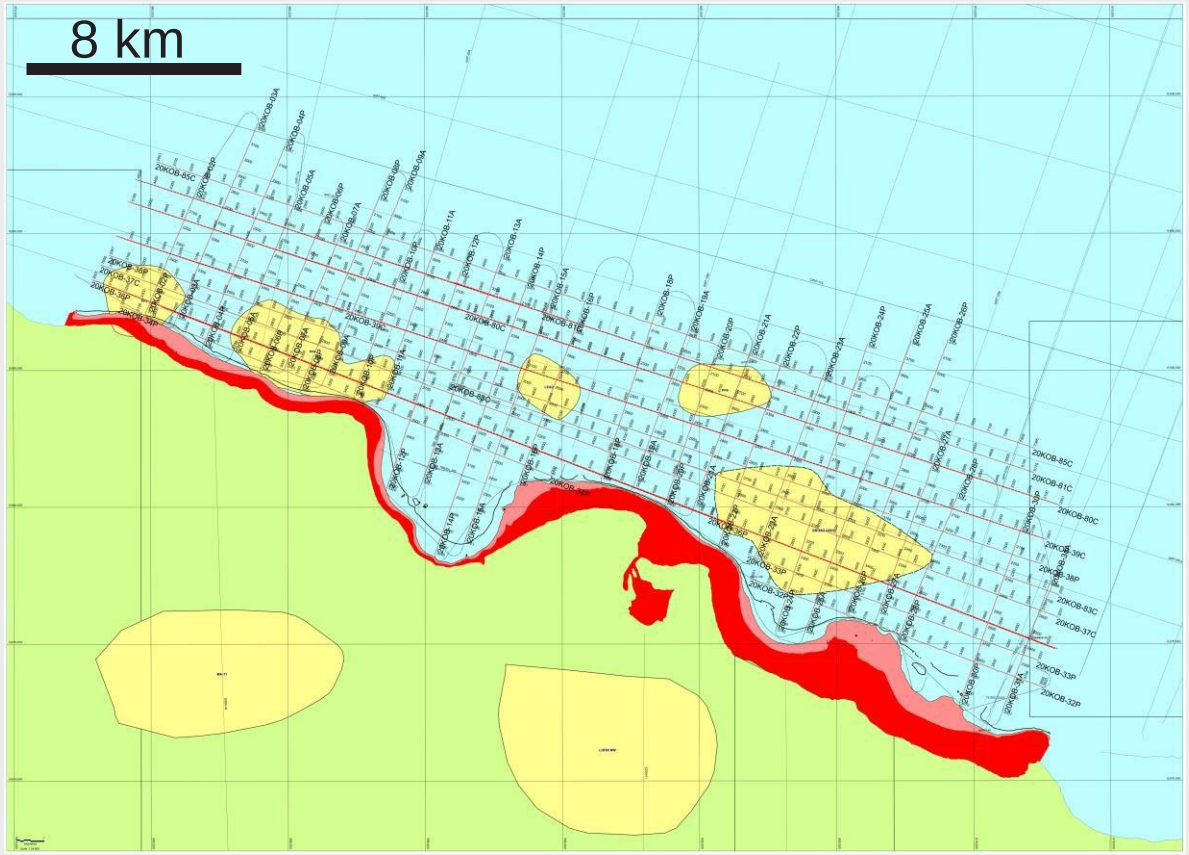
- 60% & Operator East Seram PSC
  - OPIC (Taiwanese NOC) 40%
  - 6510 km^2, signed July 17 2018
  - Extension of Lofin, Bula oil field
  - Fold-thrust belt play, large leads
  - Plio-Pleistocene foreland play
- 2.5% Seram (Non Bula) PSC
  - Oseil field currently ~1550 bopd
  - Contains 1-2 TCF Lofin gas field
- 2000-2005 Lion operated the Bula oil field



East Seram PSC – has attractive terms (Gross Split) with expected Total Contractor Return of at least 50%

664 km new offshore seismic being interpreted

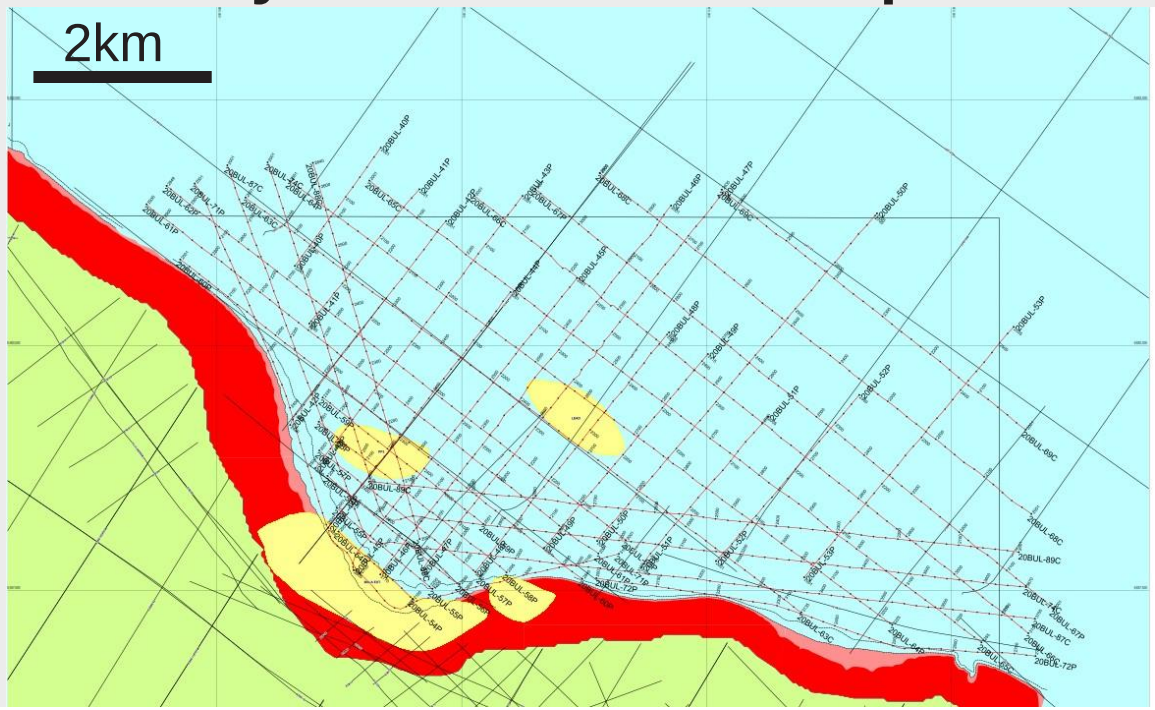
Two area targeted – offshore Kobi and Bula Bay area



Kobi Offshore area 507 km 2D acquired

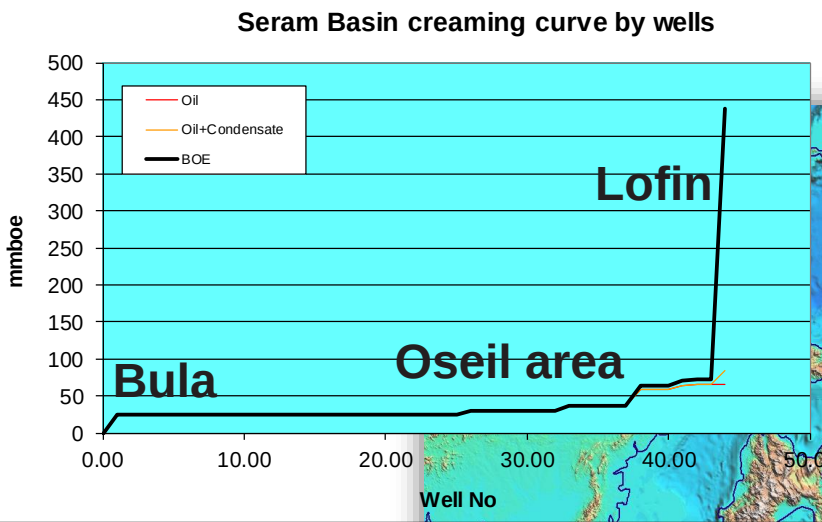
PT Taka Geodrill conducted survey using Indonesian registered SS Barakuda and seismic acquisition & recording equipment from UK company TTS, processing by PT Pentacru

Bula Bay area 157 km 2D acquired



Region contains prolific hydrocarbon provinces

Proven, under-explored Seram Basin fold belt play (partly) analogous to Papuan fold belt



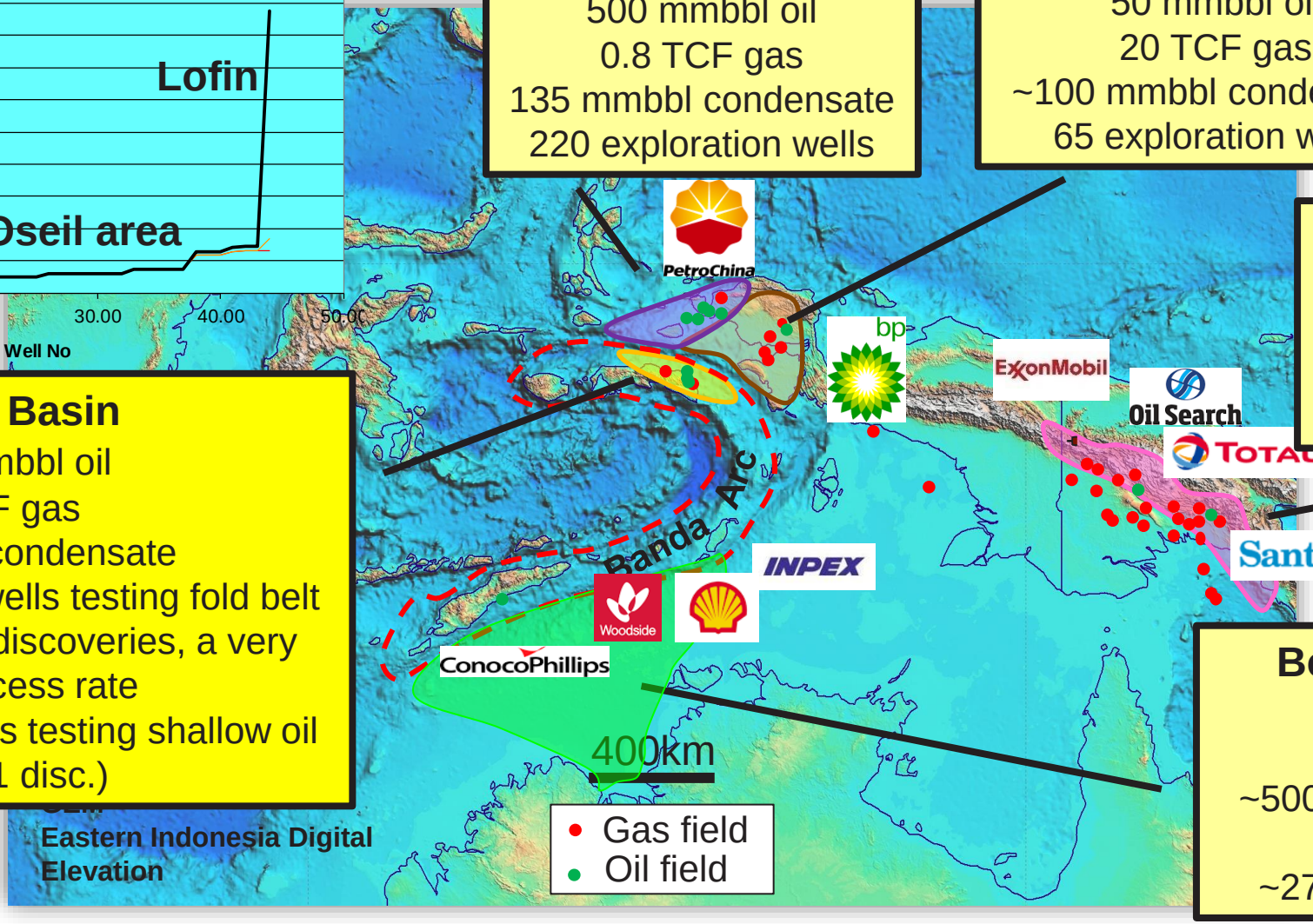
Salawati Basin
500 mmbbl oil
0.8 TCF gas
135 mmbbl condensate
220 exploration wells

Bintuni Basin
50 mmbbl oil
20 TCF gas
~100 mmbbl condensate
65 exploration wells

Papuan/Aure Fold belt
700 mmbbl oil
30 TCF gas
400 mmbbl condensate
~100 exploration wells

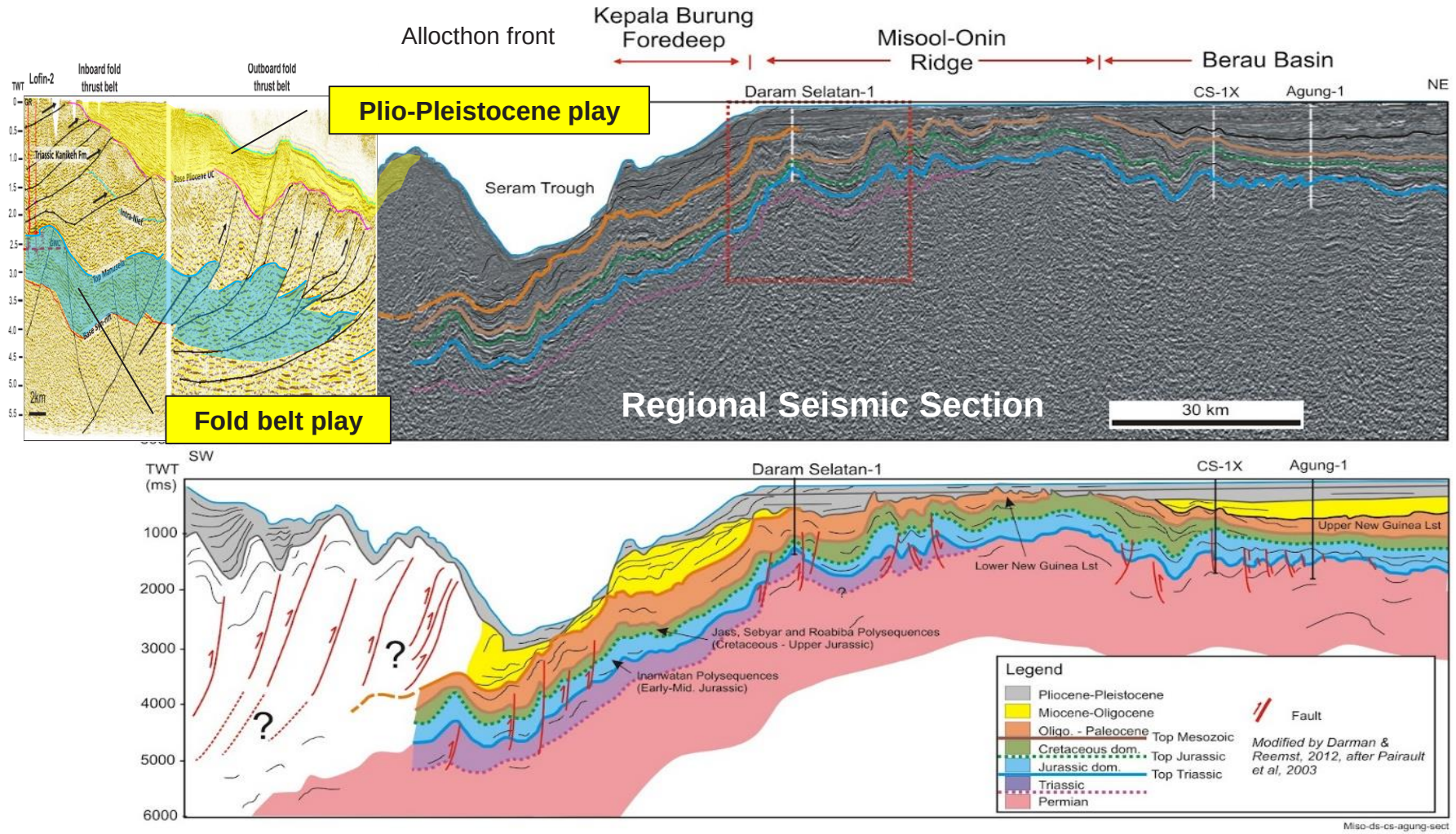
Seram Basin
>60 mmbbl oil
2 TCF gas
20 mmbbl condensate
Only 9 exploration wells testing fold belt play resulting in 6 discoveries, a very high success rate
~30 exploration wells testing shallow oil play (11 disc.)

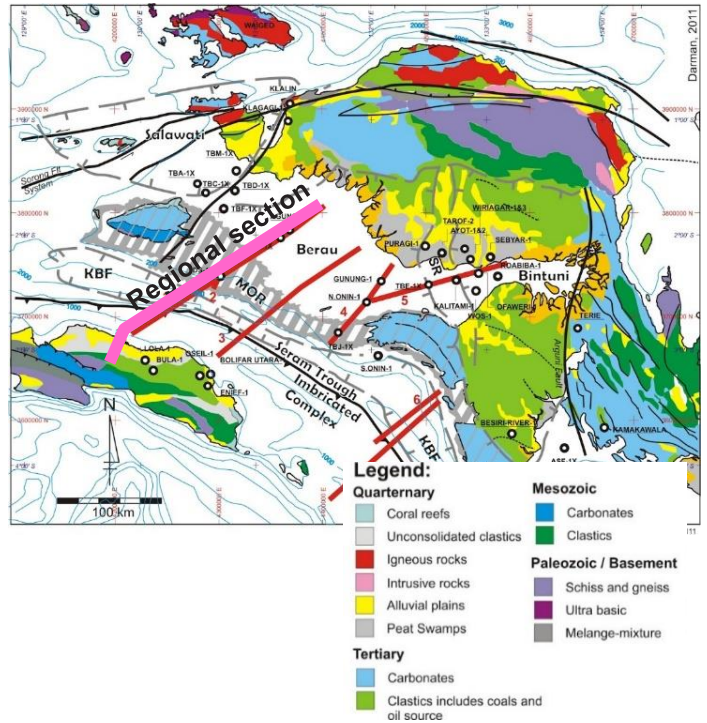
Bonaparte Basin
750 mmbbl oil
35TCF gas
~500 mmbbl condensate
60 fields
~270 exploration wells



Seram geology: collision of Australian plate & Indonesian microcontinents

Collision along Banda Arc from Late Miocene-Pliocene has produced the Seram fold- thrust belt consisting of imbricated/folded Australian continental plate section

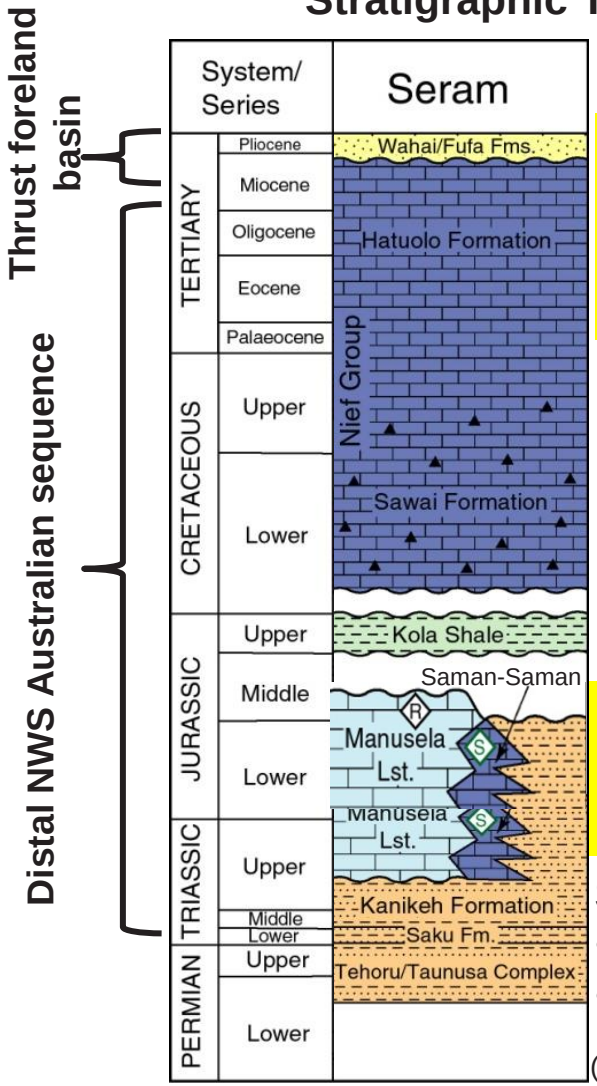




Source: Darman & Reemst, 2012

Seram Island stratigraphy - Massive Jurassic carbonate reservoir, world-class source & seal, attractive shallow Plio-Pleistocene play

Stratigraphic Table - Seram Region



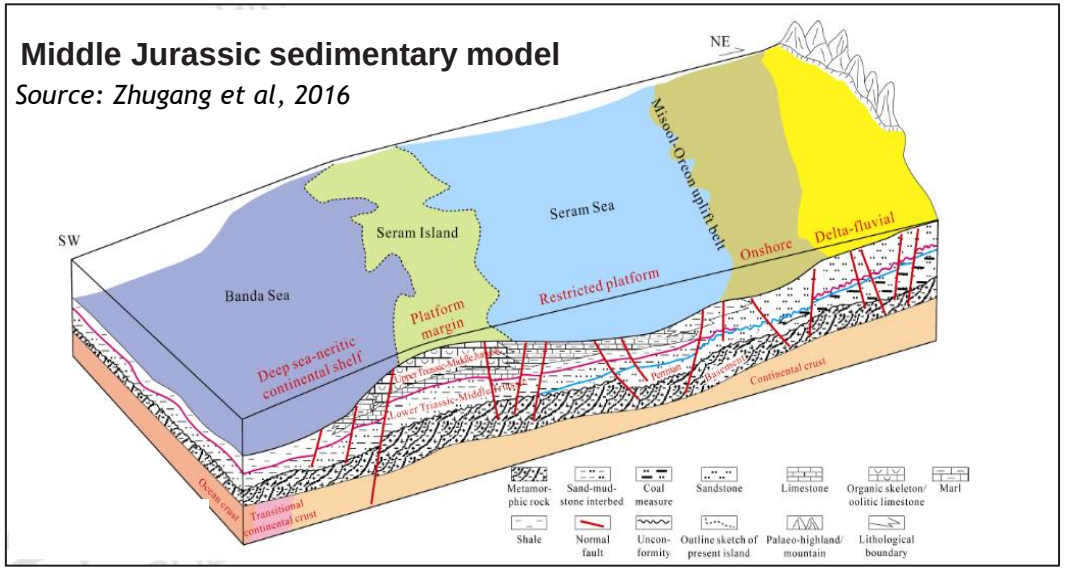
Fufa Fm- Primary reservoir
- Shallow to deep water sandstone & shallow water limestone/reefs
- Intraformational shale/siltstone seal

Kola Shale - Regional seal
- Shelfal/neritic calc. claystone & siltstone
- Seals Lofin 1300m gas column

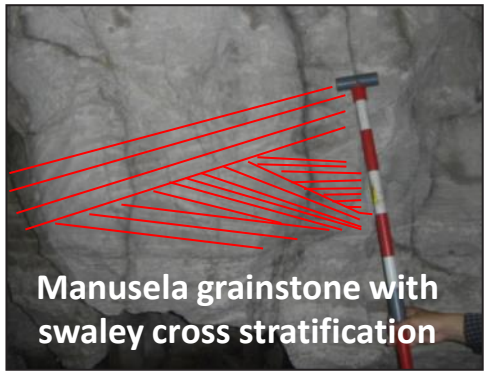
Manusela Fm - Primary reservoir
- Shallow water-shelf carbonate,
- Fracturing results in high flow rates

Saman-Saman Fm – Source
- Calcareous organic rich shales, marl
- Equiv. Buru Is shales TOC to 16% HI 540

(after Charlton, 2004; also Kemp et al, 1996)



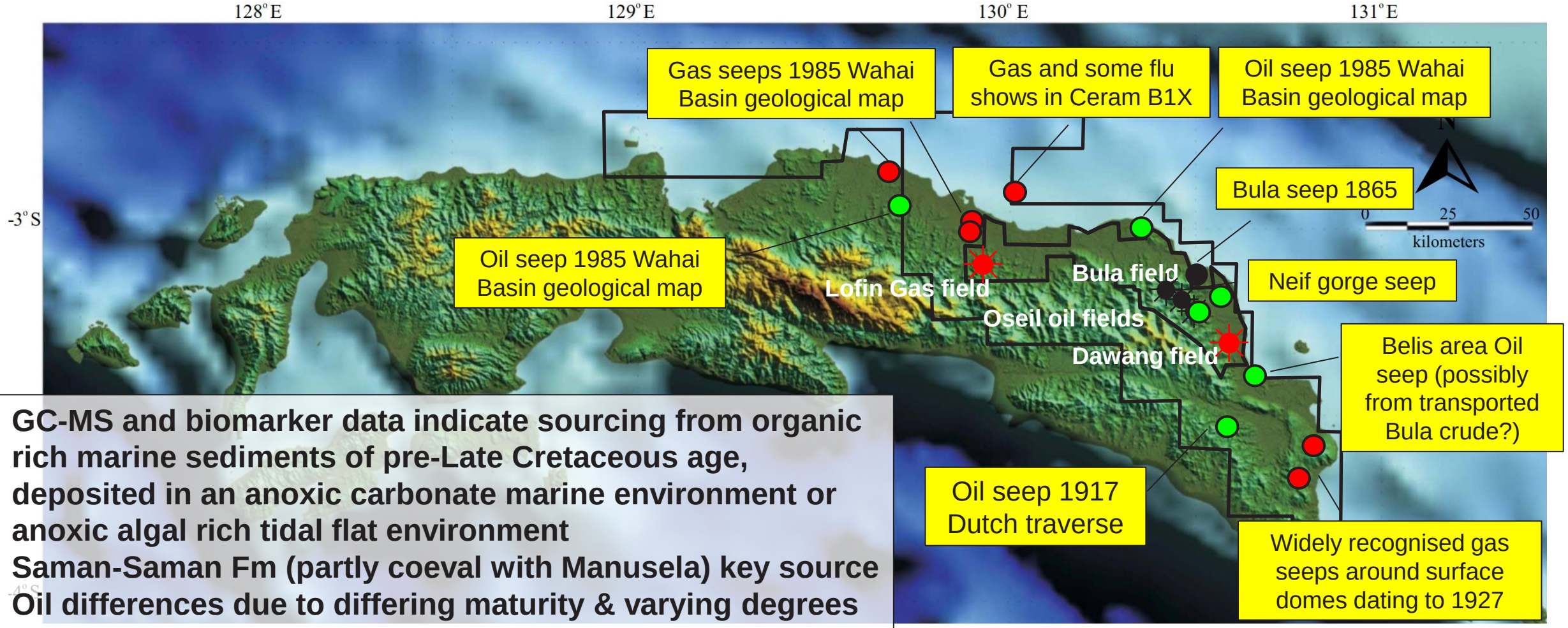
Seram has Triassic rift related outboard highs with Jurassic shallow water carbonates and co-eval rich marine source rock deposited in syn-rift lows



Seram Island oil and gas occurrences

Numerous oil and gas seeps support present day generation

Bula Field originally discovered due to drilling near seep documented in 1865

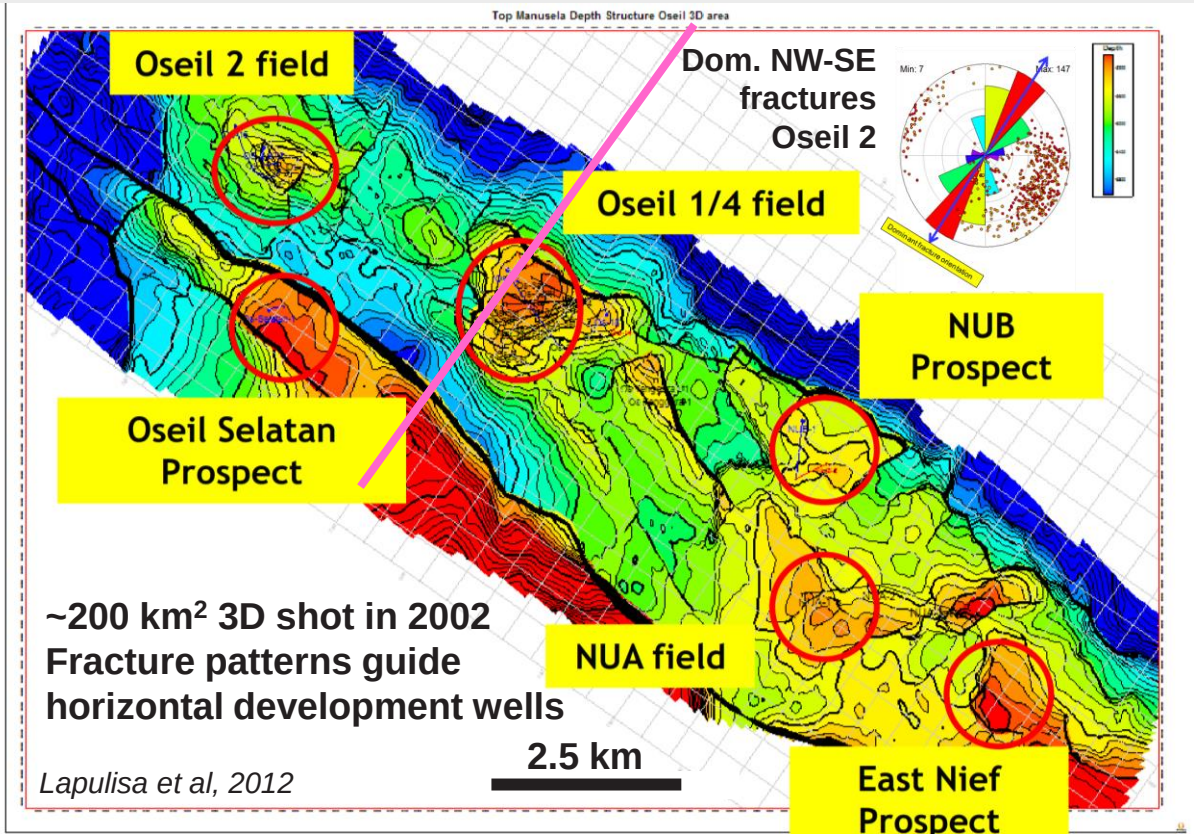


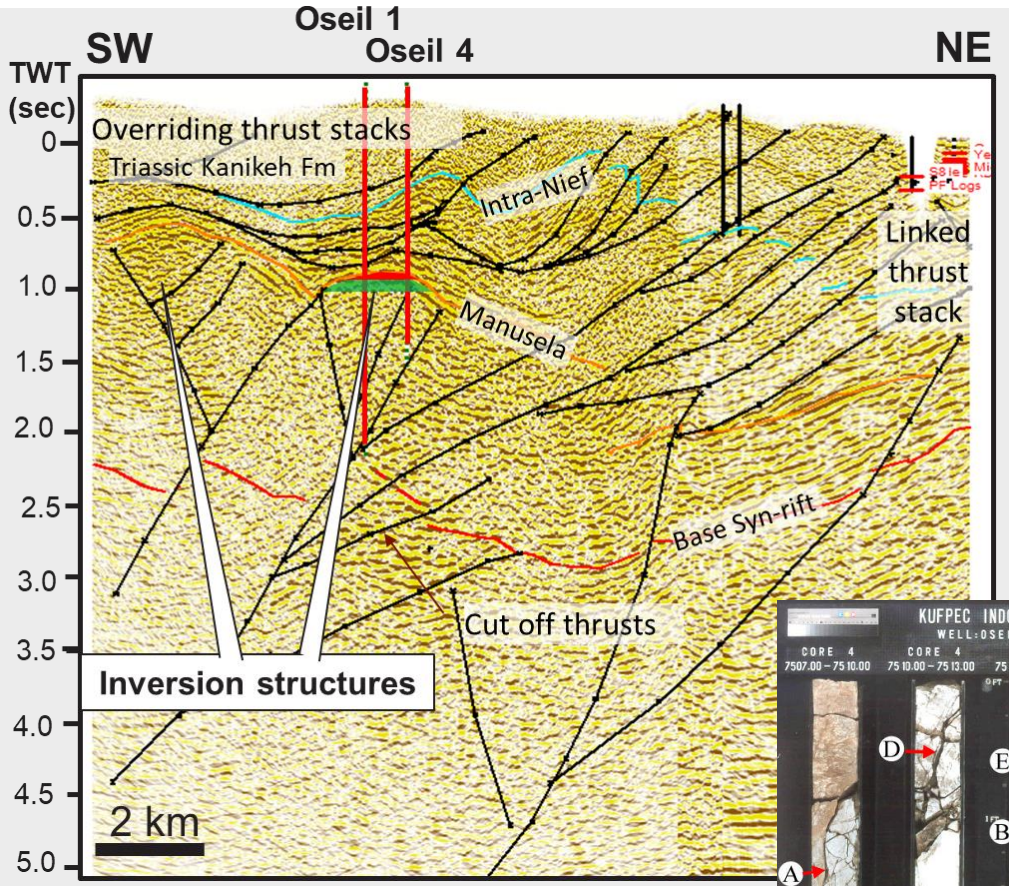
- GC-MS and biomarker data indicate sourcing from organic rich marine sediments of pre-Late Cretaceous age, deposited in an anoxic carbonate marine environment or anoxic algal rich tidal flat environment
- Saman-Saman Fm (partly coeval with Manusela) key source
- Oil differences due to differing maturity & varying degrees of biodegradation

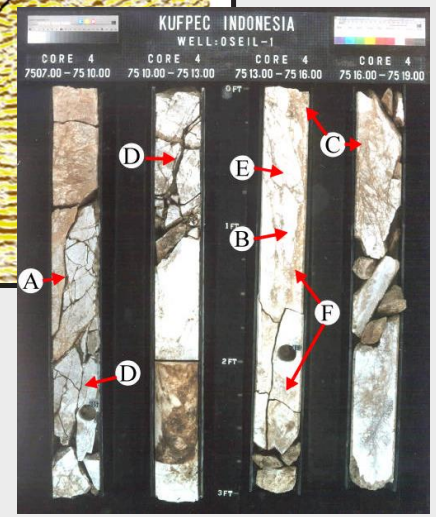
Oseil Area – inversion structure with faulted culminations

1993 Oseil 1, first production 2003, 18 mmbbl produced, OOIP ~280 mmbbl

- Up to 300m HC column, ~225m oil, gas caps to 75m
- 15-22 API oil
- Fractured, shallow water Manusela carbonate
- Primary porosity av 6.4% (up to ~14%)





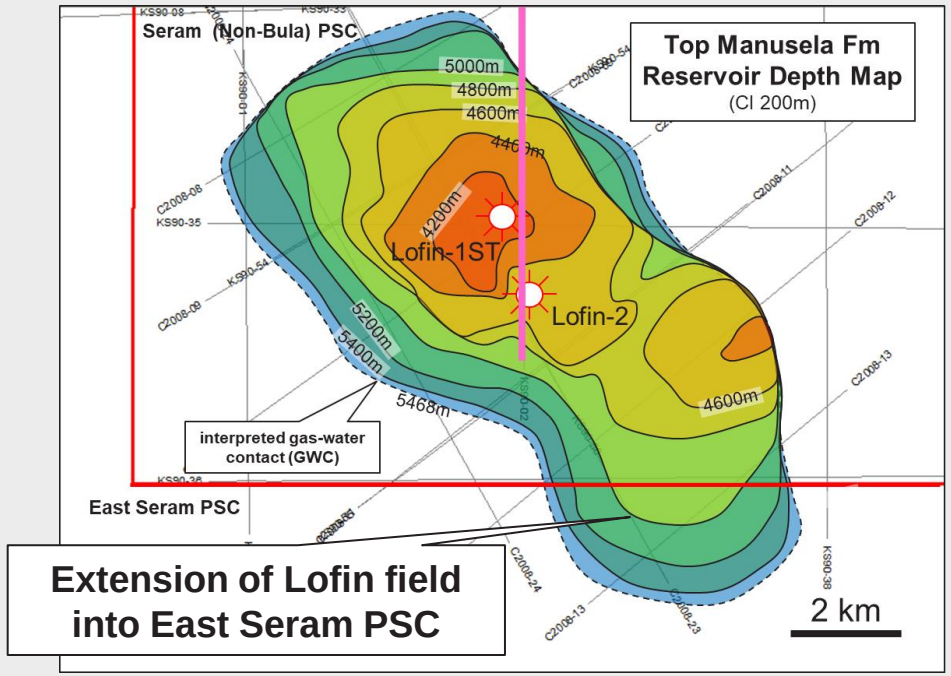


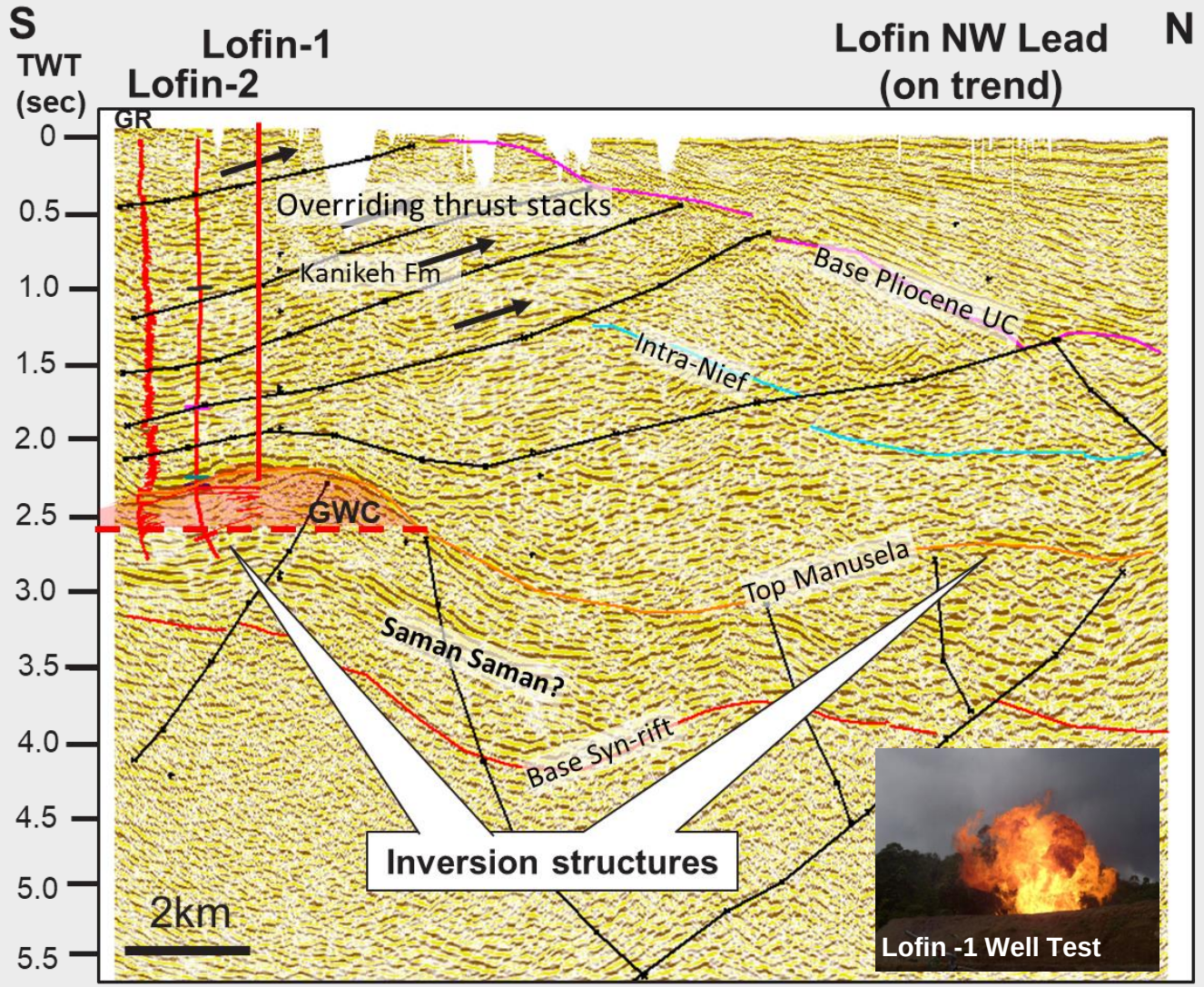
Fracturing of Manusela Fm in Oseil 1 core. Well flowed at 3800 bopd

Lofin gas discovery: inversion structure with 1300m gas column

One of largest onshore discoveries in Indonesia in decades

- 2012 Lofin 1 flowed 15 MMscfd gas.
- 2015 Lofin-2 confirmed 1300m gas column in fracture carbonate, flowed 17.8 MMscfd
- Numerous fractures from cores, image logs, losses while drilling, gas peaks
- 2C Resource = 2.020 TCF, 18.25 MMbbl cond



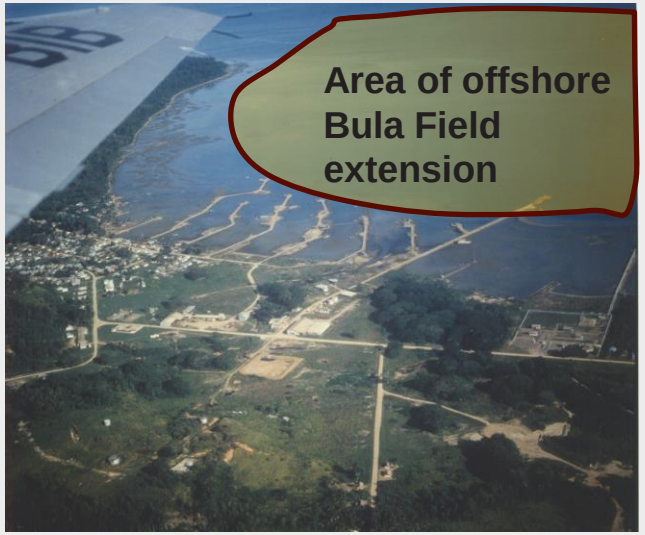


Source: Morrison & Gartrell Seapex 2019

Plio-Pleistocene play: Offshore 20 mmbbl Bula Field extension

Offshore extension potential recognised in 1990's, area not under licence until now

- Bula North flank wells show good production (122,000-300,000 bbls)
- Up to 5 mmbbl potential in East Seram
- Additional upside with faulted traps & reefal buildups
- New 2020 seismic



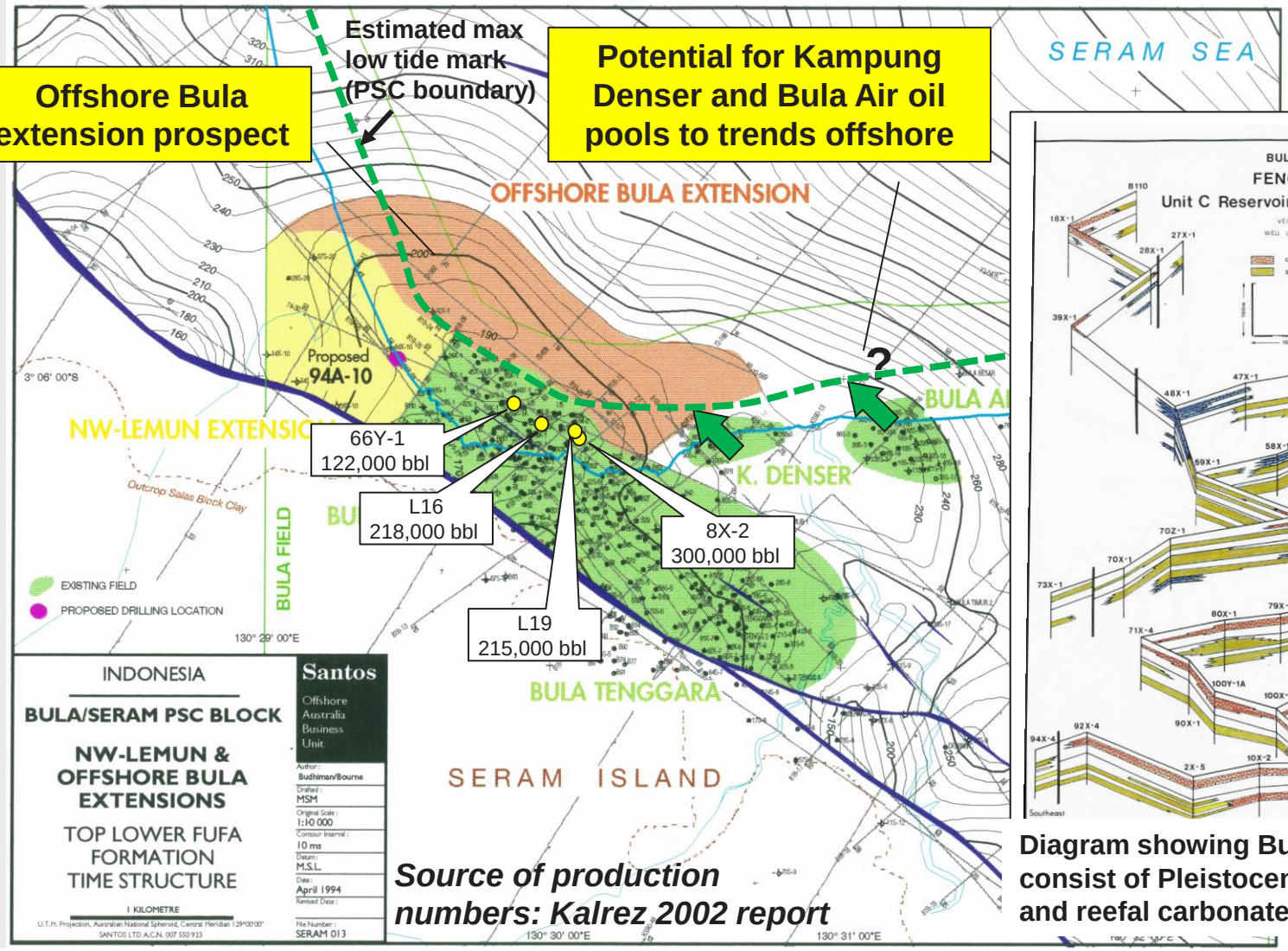
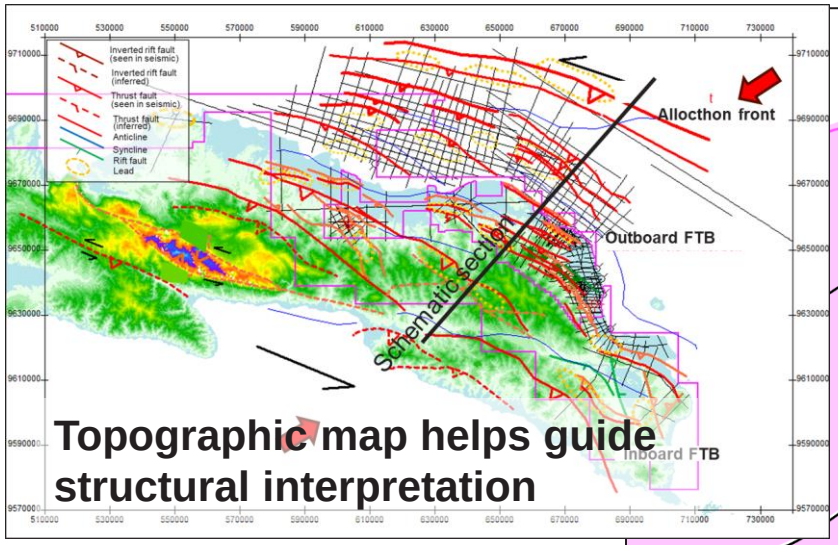


Diagram showing Bula oil reservoir consist of Pleistocene sandstone and reefal carbonate

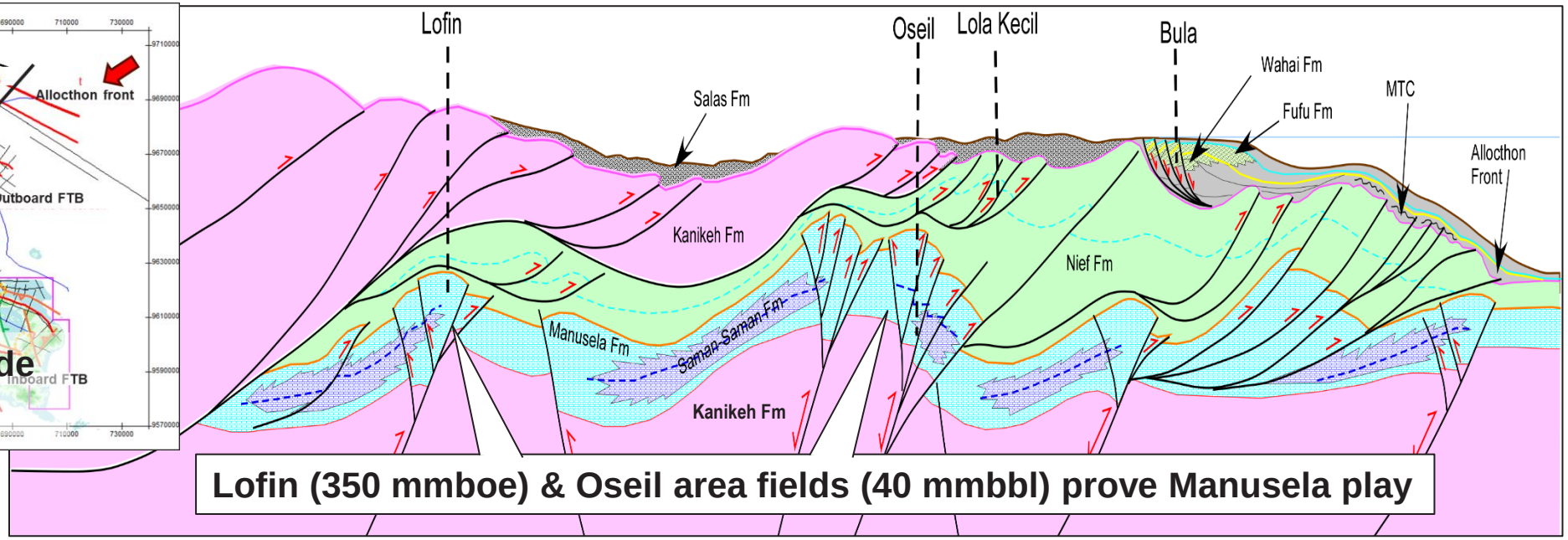
East Seram structural model - key play elements

1.Triassic- Jurassic Manusela carbonate, rich co-eval Saman-Saman source, Kola Fm seal

2.Plio- Pleistocene sands (shelf and turbidites), reefal buildups, intraformational seals, Saman-Saman source



Source Dr Anthony Gartrell East Seram PSC Structural Study

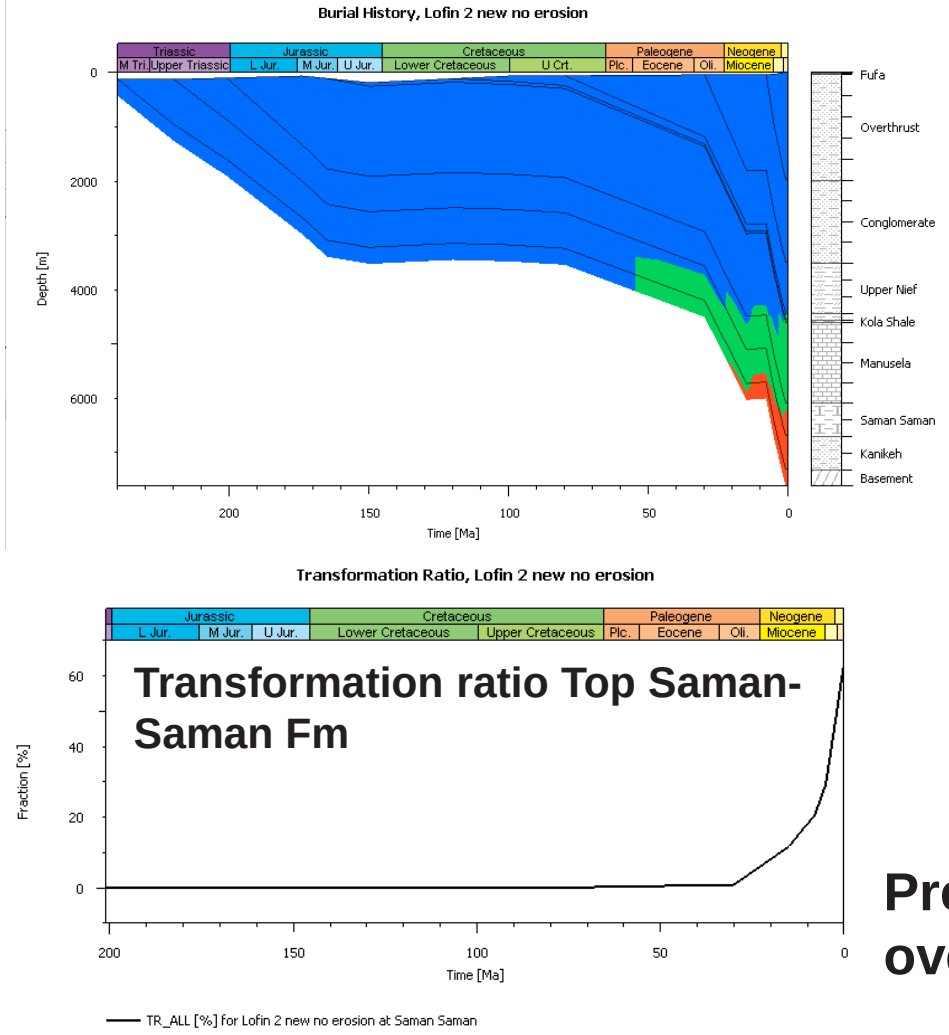


- **Late Miocene reactivation of rift faults producing inversion anticlines (e.g Lofin, Oseil fields)**
- **With ongoing collision section overridden by low-angle thrust faults & Kanikeh overlying younger rocks & driving burial & maturation of syn-rift source rocks**
- **Plio-Pleistocene thrust foreland basin from erosion of uplifted section (including outer shelf and turbidites sandstones of Kanikeh), faults provide conduits for mature Saman–Saman charging shallow structures (e.g. Bula field)**

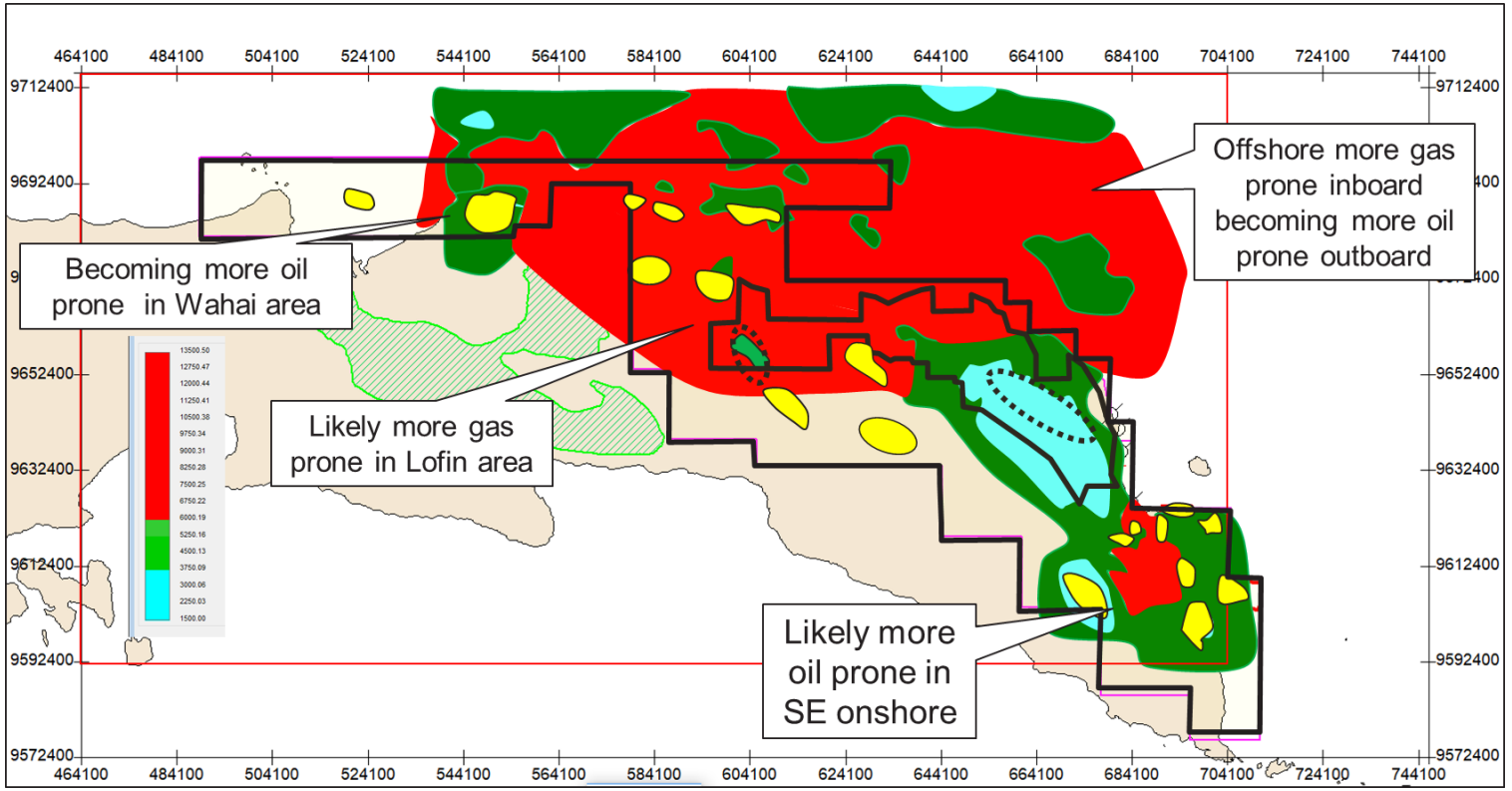
Maturation modelling: SE area more oil prone, NW more gas prone

Oil window from ~4000-5600m, gas window from 5600m due to low heat flow in area (~40mw)

Lofin 2 Burial History



Present day Oil and gas windows for inferred Saman-Saman source



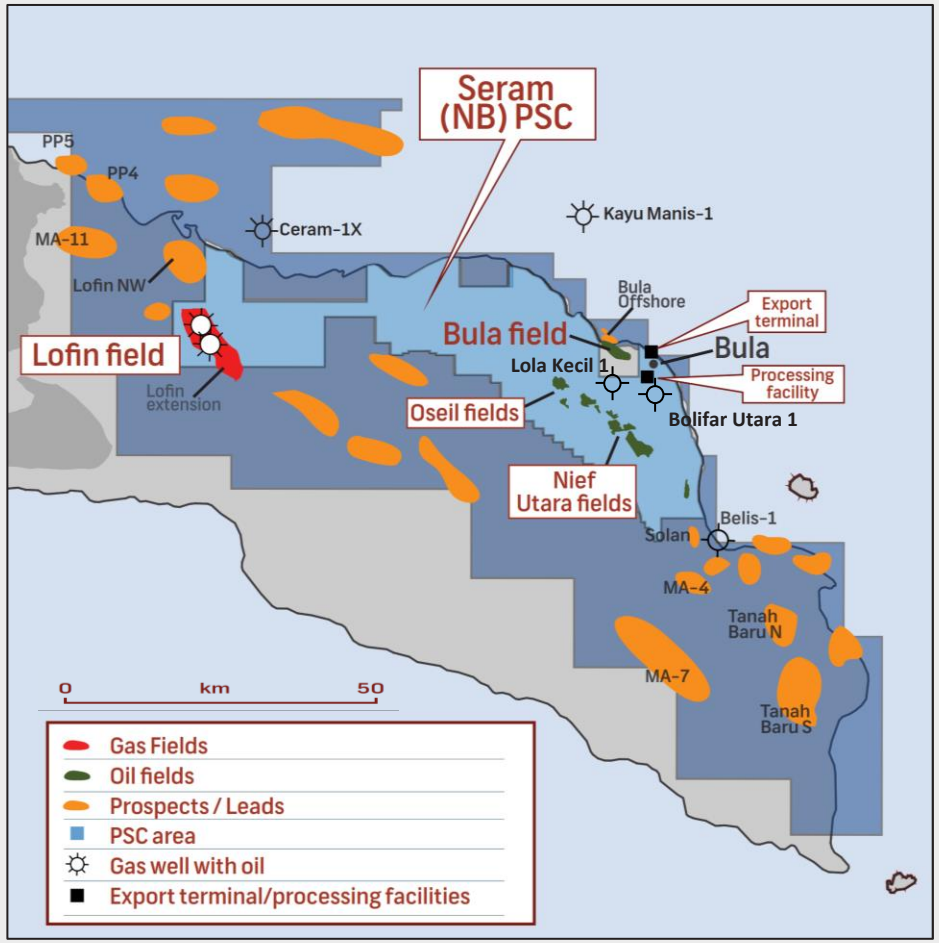
Present data HC flux/transformation due to impact of overthrusting from 5ma key to ongoing generation & migration

Manusela fractured carbonate: key objective

Over 2TCF gas & 60 mmbbl oil/condensate discovered to date from 6 discoveries

- Triassic/Jurassic Manusela reservoirs oil in Oseil area (with gas cap) & gas/cond. in Lofin Field
- 9 wells have tested fold belt play, 6 discoveries
  - **East Nief 1** (1988) TD 2012m: 6.2 mmbbl (OIP 89.2 mmbbl)
  - **Bolifar Utara 1** (1988) TD 3505m: Manusela not reached
  - **Oseil 1** (1993) Oil discovery TD 3475m: 17 mmbbl produced
  - **Kayu Manis 1** (2001) TD 3304m Manusela not reached
  - **Lola Kecil 1 ST2** (2002) TD 2012m, Manusela not reached
  - **Neif Utara A1** (2008) TD 2230m, 4.3 mmbbl (OIP 68 mmbbl)
  - **Neif Utara B1** (2011) TD 2390m 0.8 mmbbl (OIP 12 mmbbl)
  - **Oseil Selatan 1** (2011) TD 2238m: 3C 1.7 mmbbl
  - **Lofin 1 ST1** (2012) TD 4427m: 2C: 2.02 TCF/18mmbbl cond.
- Large leads/structures on trend with discoveries

All 6 exploration wells that reached the Manusela have been discoveries

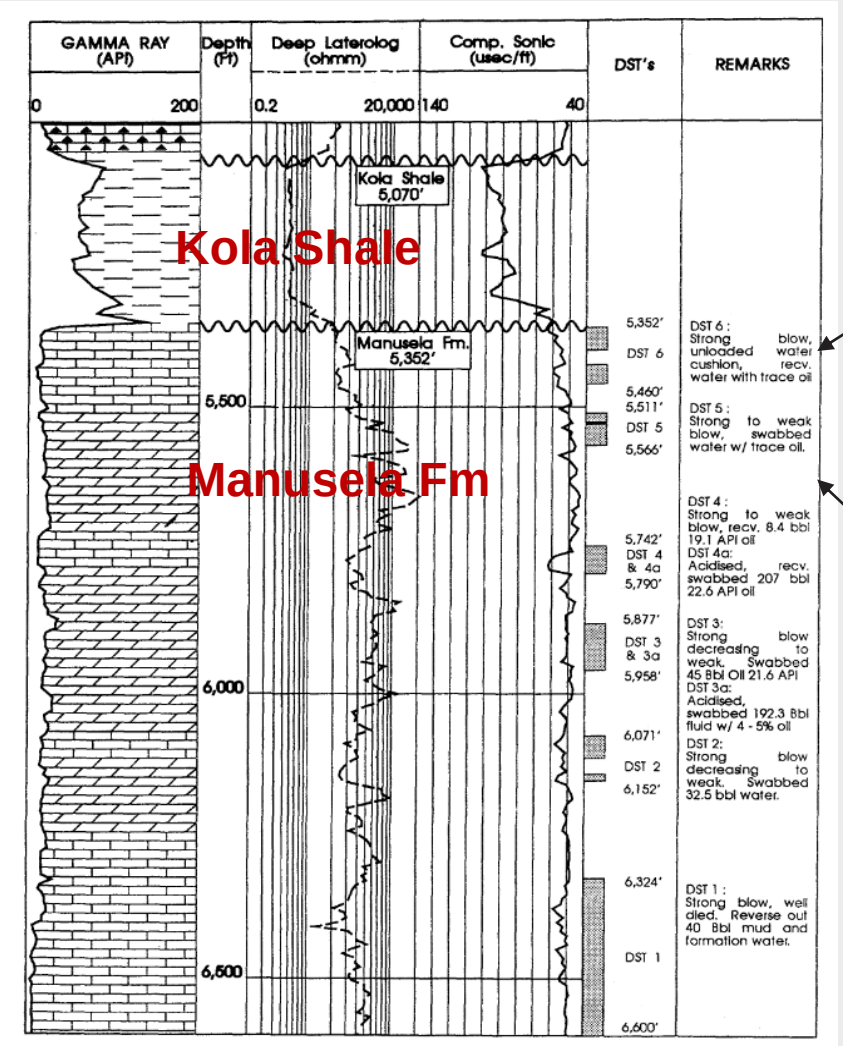


3C contingent resource numbers shown based on Degolyer & McNaughton Dec 31 2017 report on Oseil area
OIP=original oil in place

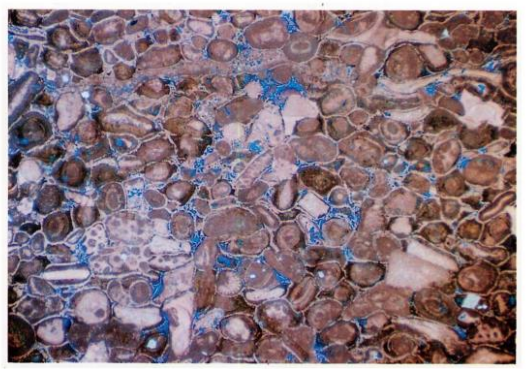
Manusela Fm reservoir

Late Triassic to Middle Jurassic carbonate, up to 2000m thick

- Oolitic grainstone, grainstone, packstone and wackestones
- High energy oolitic sand shoals or barrier bars to lower energy tidal flat or offshore environments
- Abundant cross bedding
- Age dating difficult
- Samples in East Neif 1 assigned lowermost Oxfordian or Bathonian to Pliensbachian or older
- Porosity generally <10%, fractures give good deliverability



Manusela Limestone East Nief 1



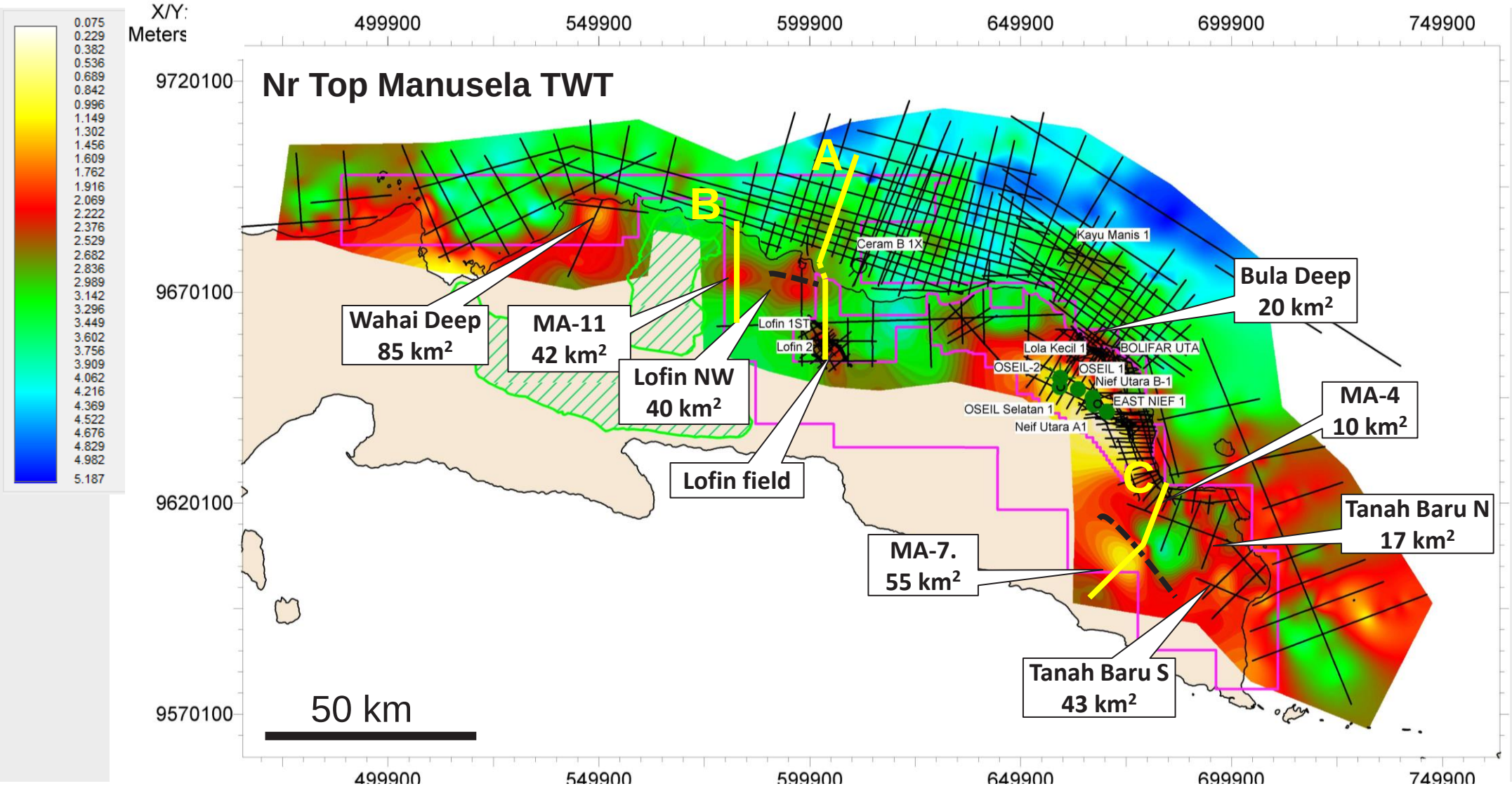
Oolitic & skeletal grainstone

Dolomite replacement of grainstone

Source: Kemp and Mogg, 1992

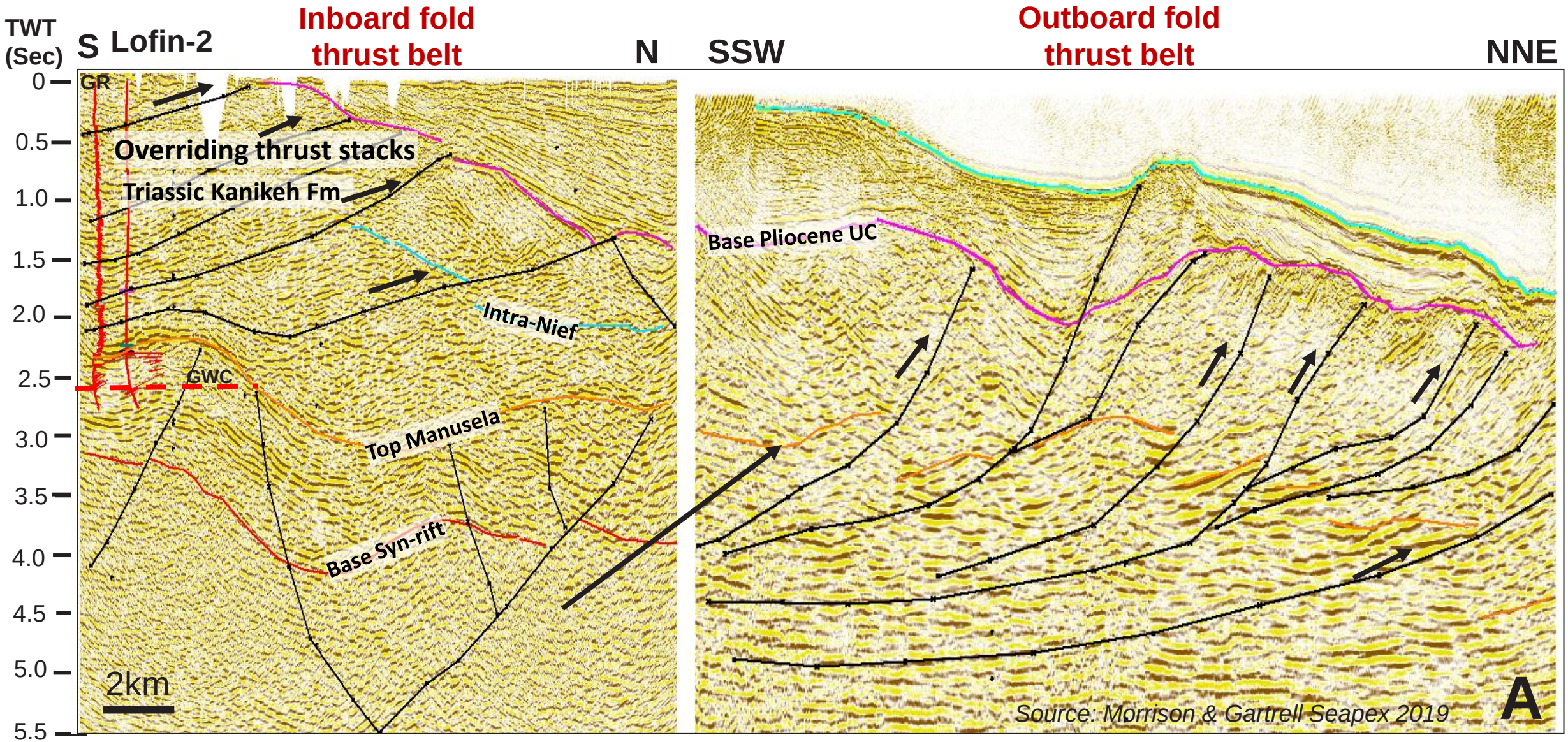
Mapping of top Manusela event shows highly attractive targets

Potential structures up to 90 km², Manusela limestone targets from 1500m to 5000m



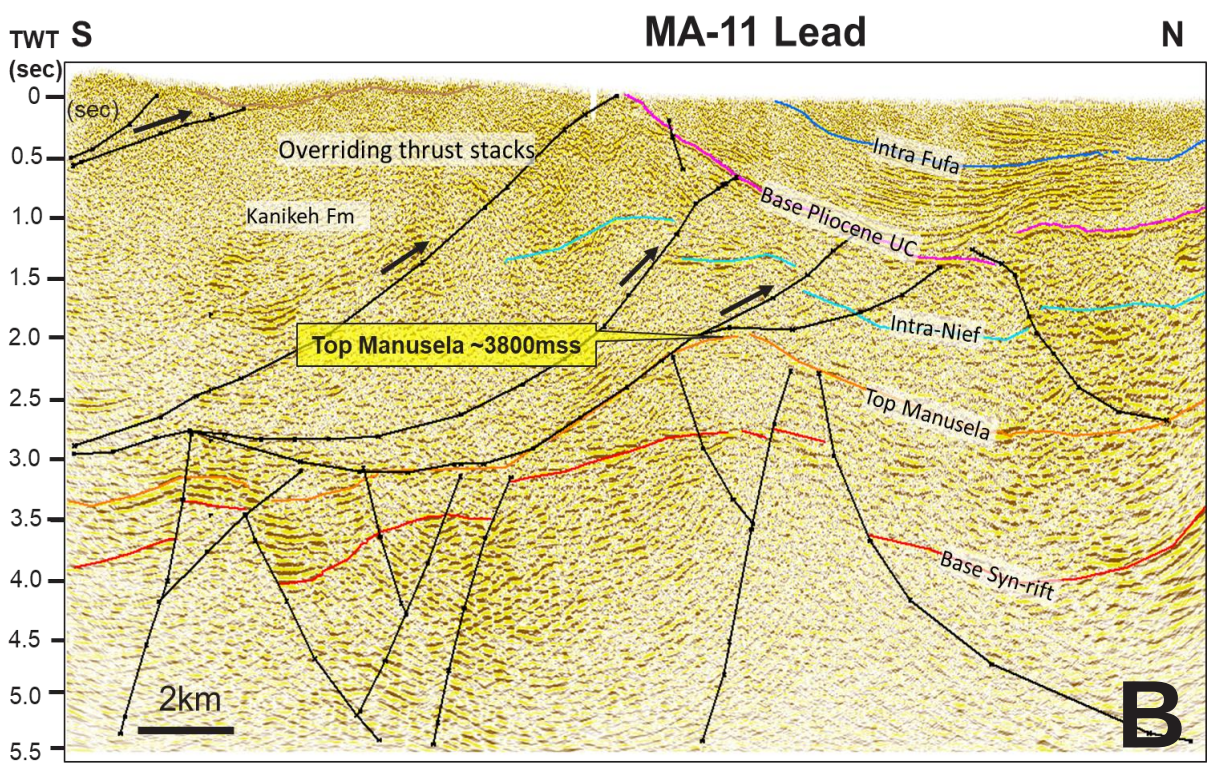
Composite line showing inboard & outboard fold-thrust belt

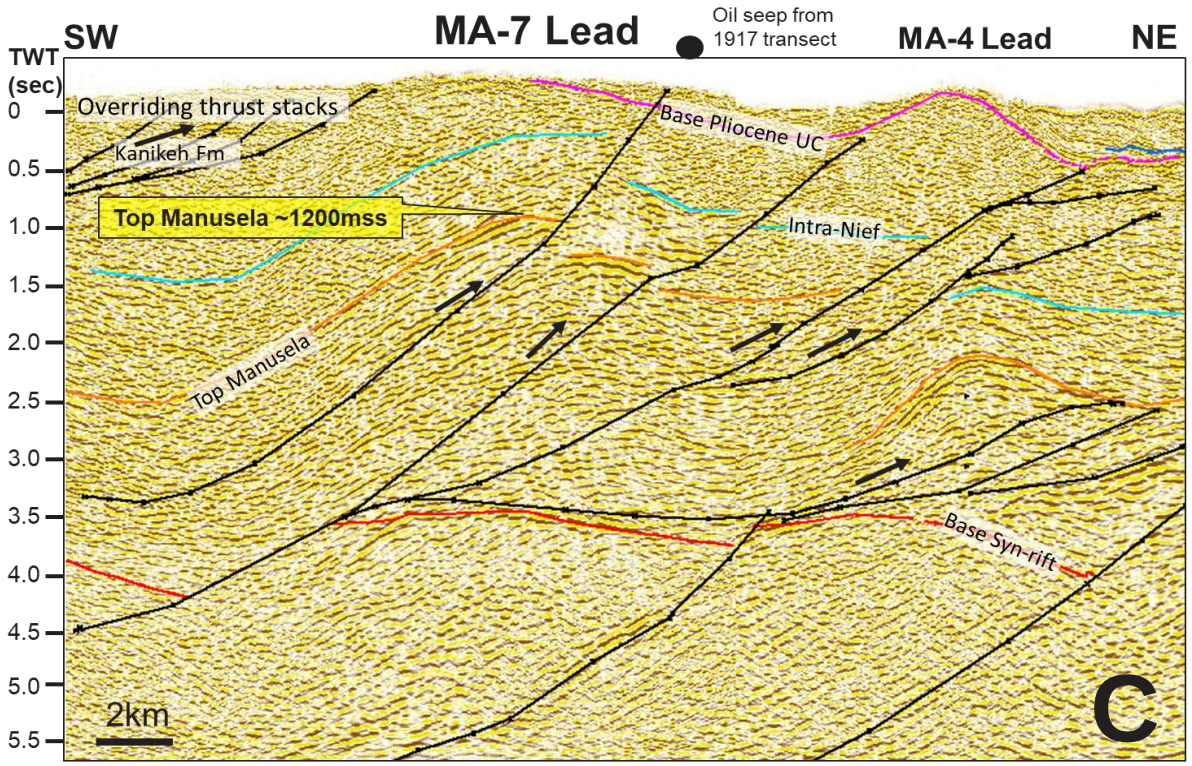
Imaging of Manusela event challenging, especially in low angle thrust fault setting



Seram fold-thrust belt play: impressive undrilled structures

Late 2021/2022 seismic program to cover key leads





MA-11 Lead – up to 42 km² (+)

Prospective resource[1] 143 - 520 mmboe[2]

Gravity high, seeps in area

MA-7 lead – up to 55 km² (+)

Prospective resource[1] 45 – 1006 mmboe[2]

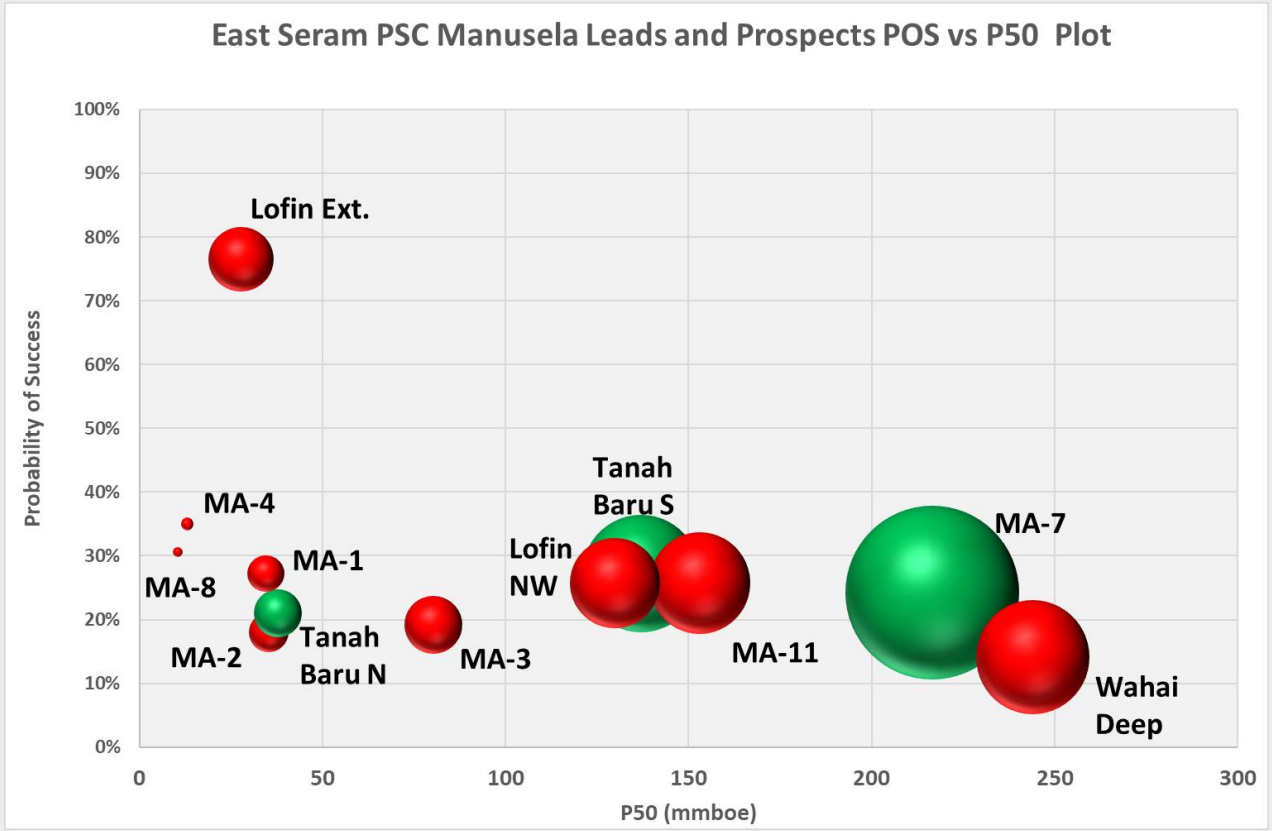
Gravity & topographic high, seeps in area

[1]Prospective Resource: 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. P90-P10 range given. [2] Conversion for gas factor of 6mcf=1boe used to convert gas to barrels of oil equivalent

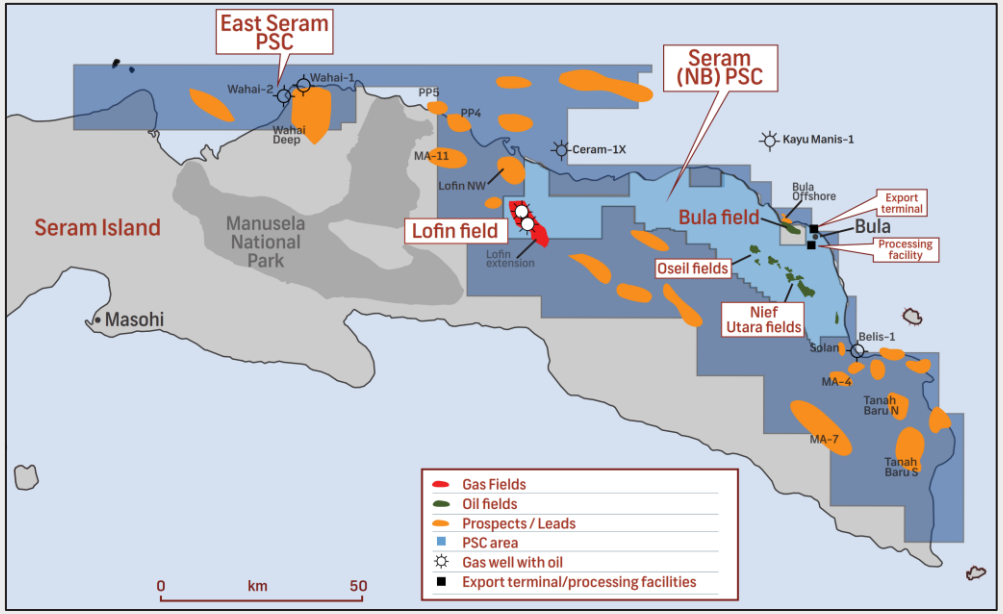
Source: Morrison & Gartrell Seapex 2019

Fold belt emerging prospect and lead portfolio

Underexplored play world-class potential requiring more seismic



- 12 leads (to date) in East Seram PSC, combined P50 Prospective Resource[1] 1.15 bboe[2]
- Av. POS 23%, ~50% gas estimated
- Structures observed on gravity, field mapping and topography without seismic not yet characterised



[1]Prospective Resource: 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.

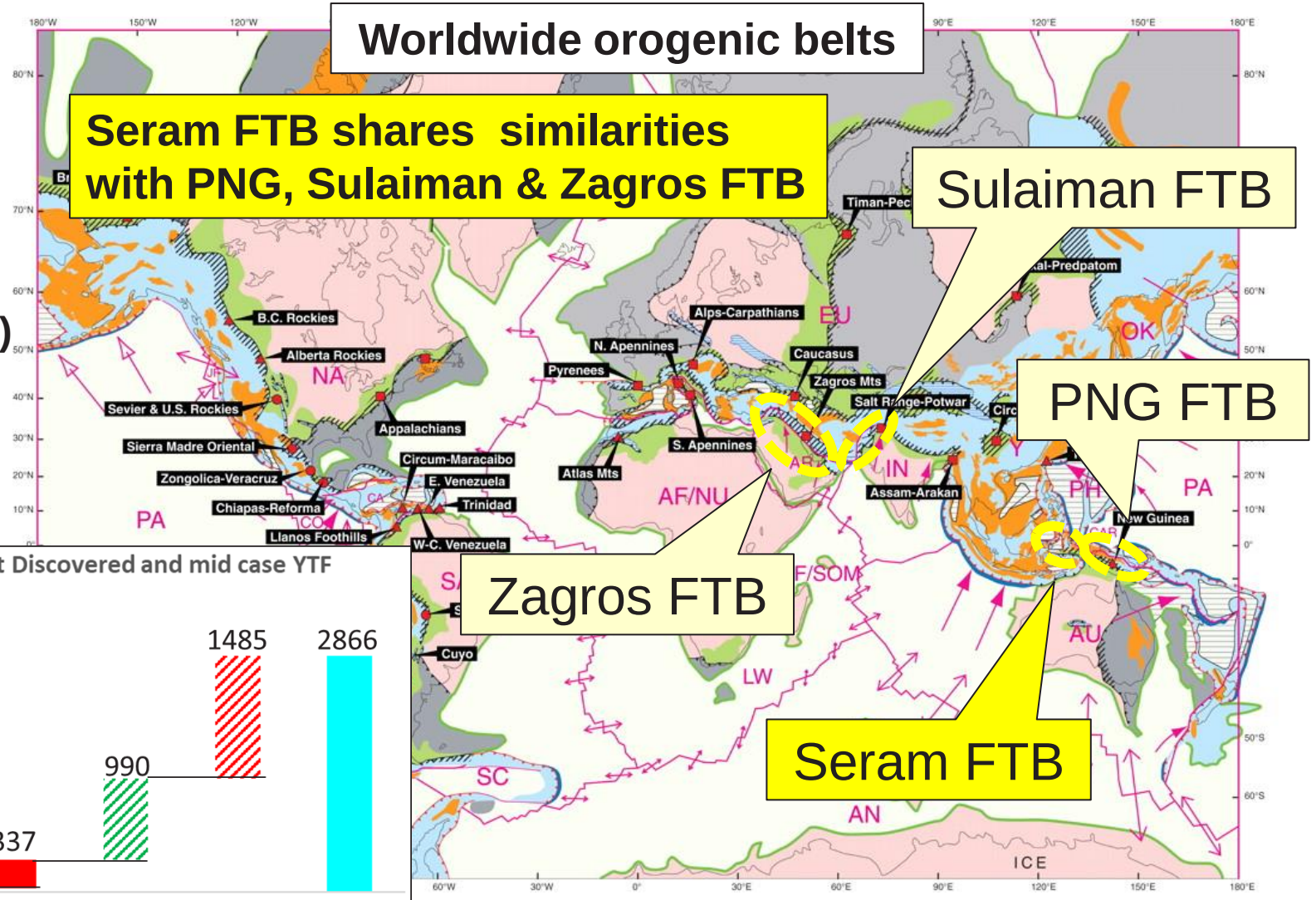
[2] Conversion for gas factor of 6mcf=1boe used to convert gas to barrels of oil equivalent

Global statistics for fold-thrust belts (FTB)

Globally host around 25% of total discovered reserves

- >700 bboe discovered
- ~520 bboe in Zagros FTB
- ~180 bboe in ~30 other FTB's (av 6 bboe)
- Source rock richness key success factor (marine oil prone source typical)
- ~40% reservoirs shelf carbonates
- ~60% reservoirs are fractured

Source: Goffey et al, 2010



Seram FTB ~400 mmboe discovered

Mid case YTF estimate ~2.5 bboe

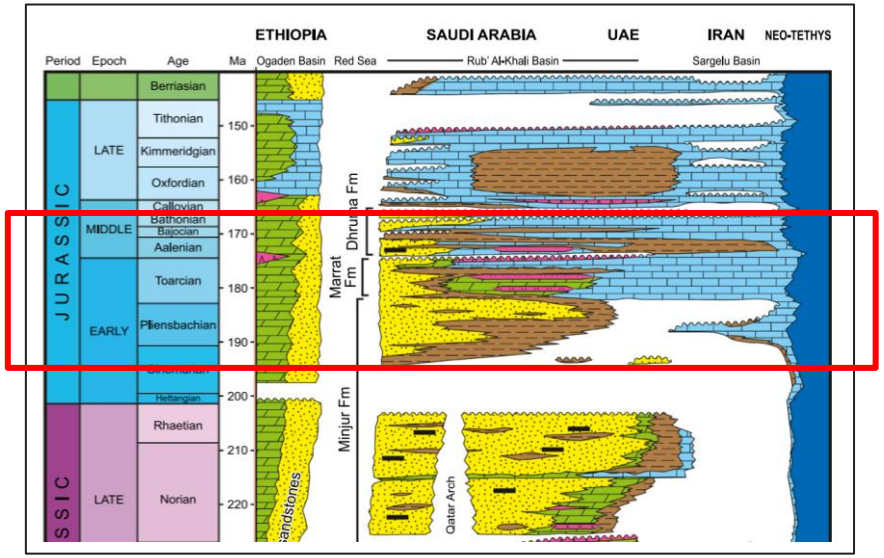
Conversion for gas factor of 6mcf=1boe used to convert gas to barrels of oil equivalent

From Goffey et al, 2010 (map credited to Albert Bally)

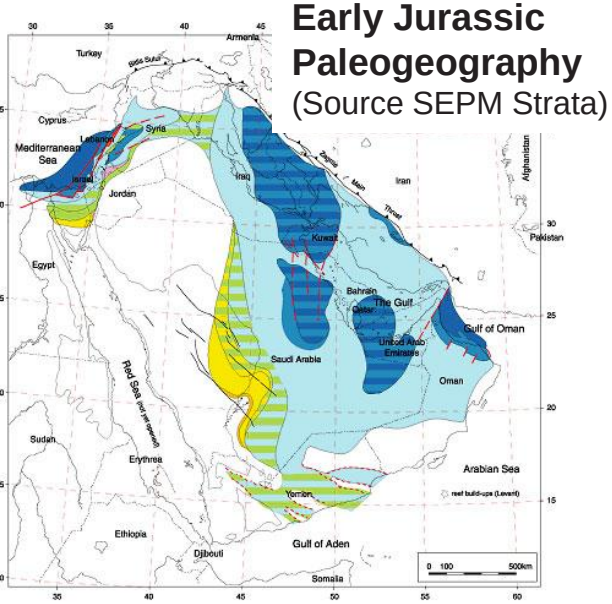
Seram has similar Early-Mid Jurassic paleo-geography to Arabian plate which hosts major accumulations

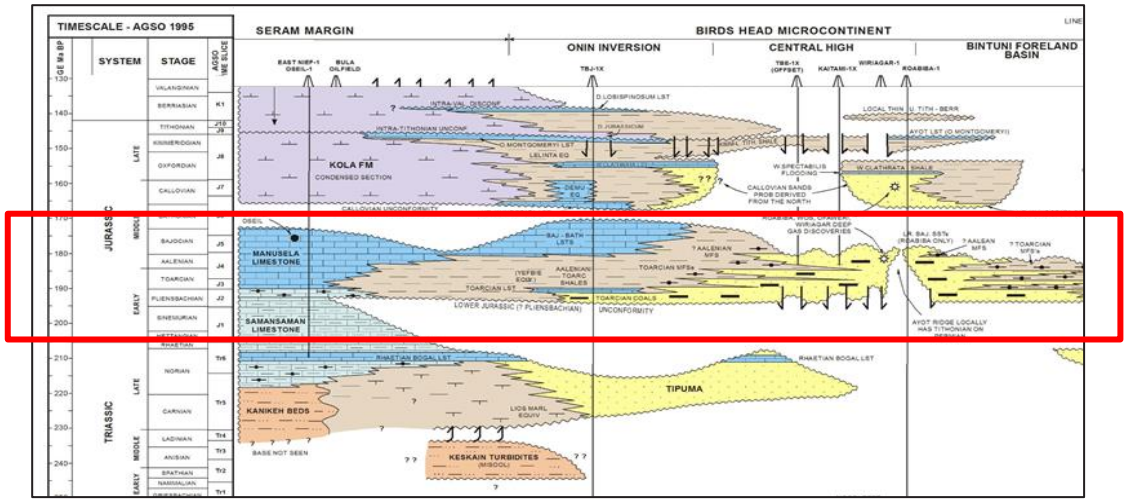
Widespread Jurassic carbonate deposition outboard of fluvio-deltaic clastics

Middle Jurassic (~166 Ma) Perspective
(modified from Scotese et al 1988. presented in Wandrey et al (USGS) 2004)



Arabian Plate Chronostratigraphic Chart (Stewart et al, 2016)





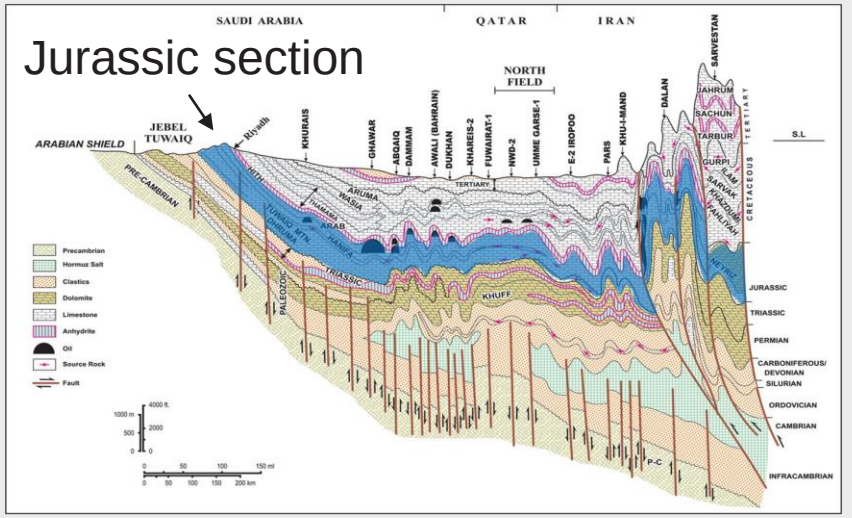
Chronostratigraphic section Irian Jay to Seram (Norvick, 2001)

Zagros – Seram fold-thrust belt similarities

E-M Jurassic transition from fluvio-deltaics (Saudi Arabia) to shelf carbonates (UAE/Iran)

- Jurassic carbonates (i.e. Marratt Fm in Kuwait), similar thickness facies/ deposition environment as Manusela
- Jurassic reservoirs have laterally equivalent anoxic marine carbonate source beds (i.e. Iran Surmeh & Sargelu)
- Carbonates generally poor primary reservoir quality, production dependent on fracturing
- Late Miocene-Pliocene collision

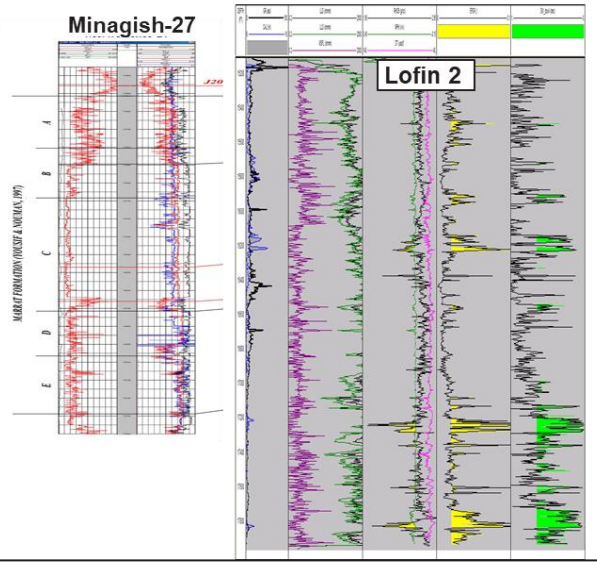
Source: Ala, 1982



Lwr Jurassic Marrat Fm Kuwait

- Oolites, mixed high energy grainstone facies and biostromal algal accumulations,
- Aggrading and prograding shoreface/shoal environments separating a lagoon, tidal flats and sabkha from an open shelf.
- Typical production 5,500 bopd & 15 MMSCFGD

Al-Eidan et al, 2009



U Trias –M. Jur Manusela Fm

- Oolitic grainstone, grainstone, packstone & wackestones
- High energy oolitic sand shoals or barrier bars to lower energy tidal flat or offshore environments
- Production up to 5000 bopd (+) possible although limited to 500-1000 bopd so not to produce water from fractures. Lofin gas rates 15-18 mscfg/d, AOF ~40 mmscf/d

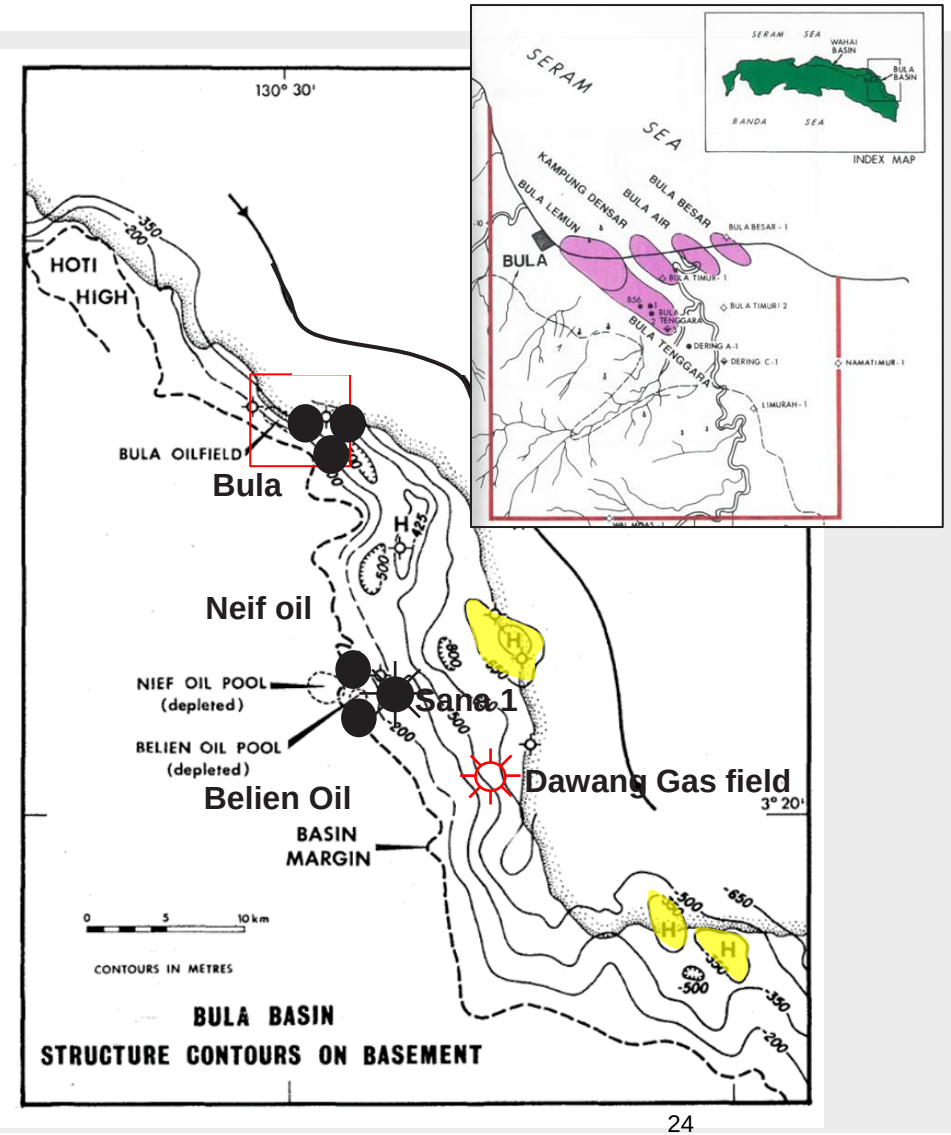
SW–NE structural-stratigraphic cross-section Arabian Shelf, Arabian Gulf & Zagros Fold Belt
(in Alsharhan 2014, modified from Peterson & Wilson 1986).

Plio-Pleistocene discoveries

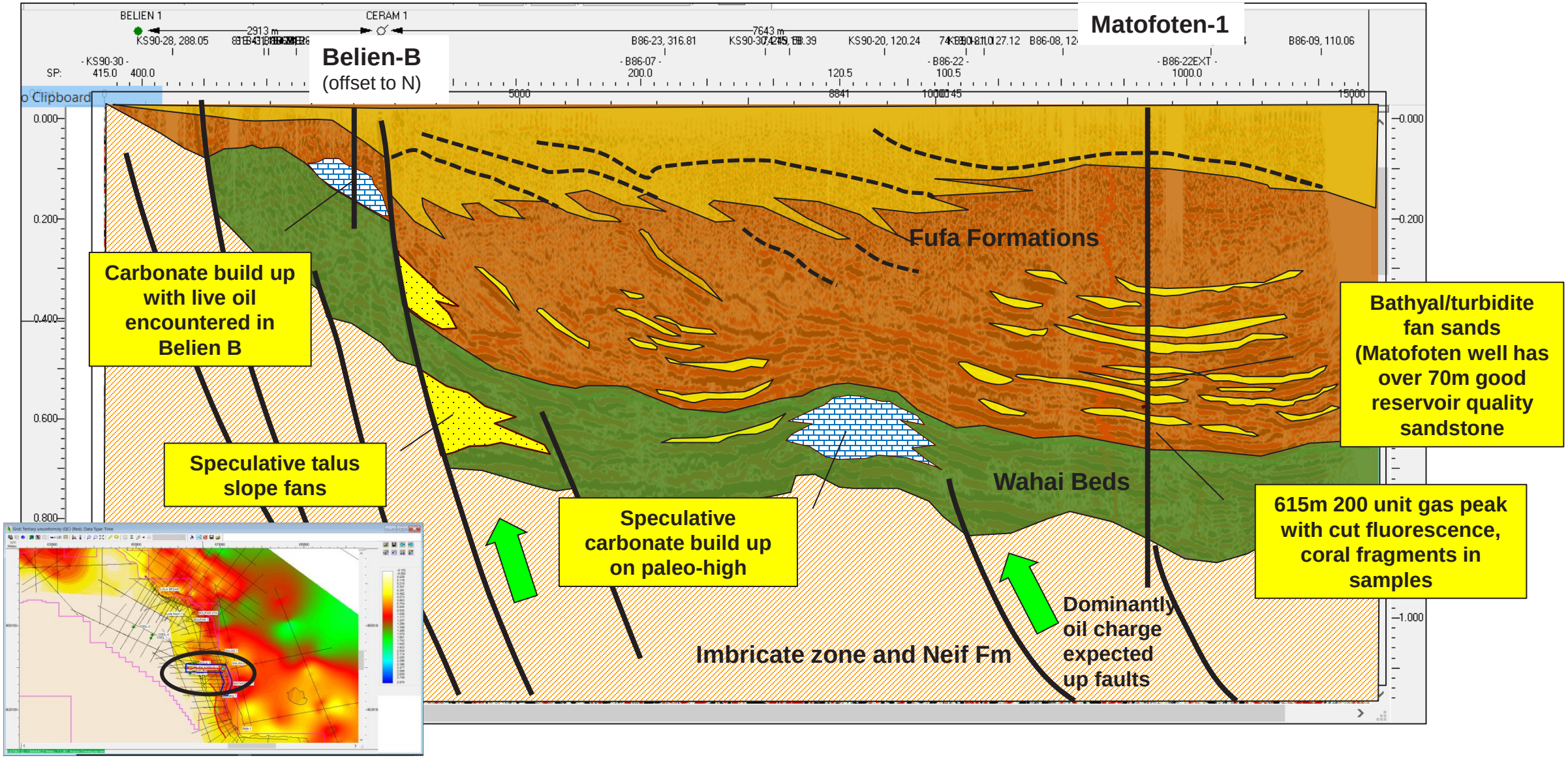
Over 19 mmbbl oil produced to date

- Low relief anticlines, faulted traps, stratigraphic pinchout & reefal plays
- ~30 exploration wells have been drilled. Key discoveries/ wells:
  - **Bula 2** (1897) Oil discovery 200bopd. Original resource 25mmbbl[1], 19 mmbbl produced
  - **Bula Lemun 1** (1925) Offshore (tidal) part of Bula developed in 1930 with significant increase in production
  - **57X-1 well** (1971) G&W 55' porous oil filled Pleistocene reef carbonate reservoirs of the Lemun Oilfield
  - **Sana 1** (1983): Swabbed oil on test (Resource est. 0.01 mmbbl)
  - **Kampung Denser Field*** (1987) Small field (12,000 bbl from 1989-2001). inferred fault separation from Bula field
  - **8S-18 Bula Air Field*** (1989) unfaulted anticline first identfied on 1981 seismic, minor gas cap
  - **Dawang -1** (2008) TD 2390m ,10 bcf gas discovery (3C, D&M)

[1] Resource estimate includes Bula, Bula Tengarra (Fufa sst), Bula Lemun (sst & lmst, Kampung Denser and Bula Air fields

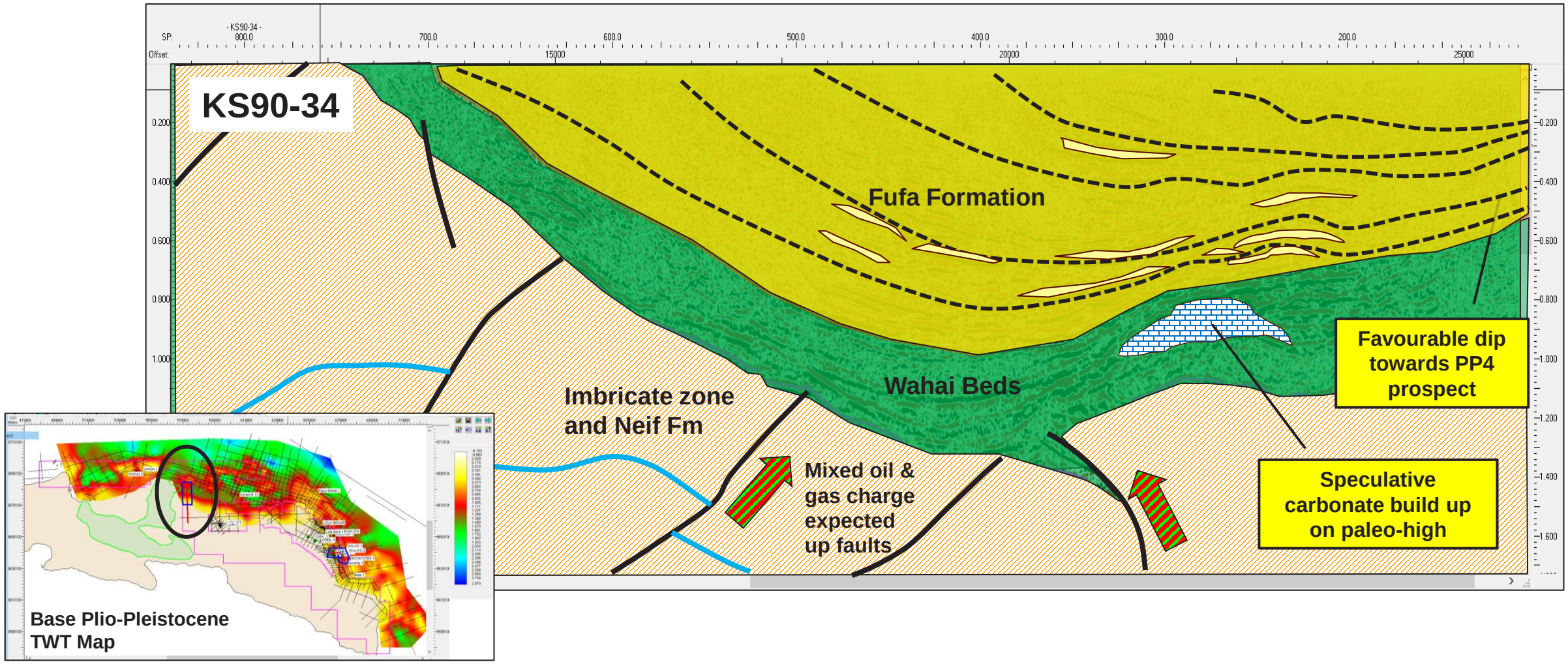


SE area composite line: clear Fufa Fm progradation, delta front, bathyal turbidite sands and actual/speculative carbonate build ups



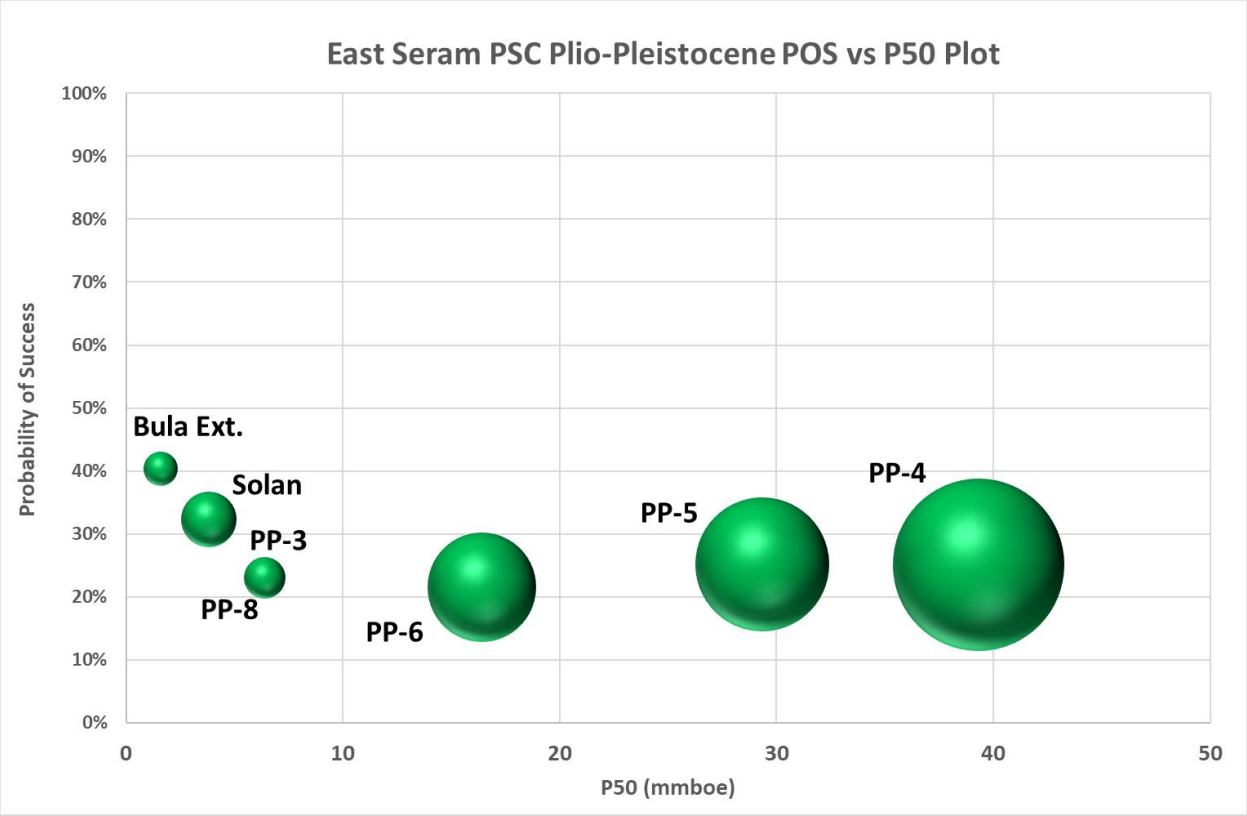
Plio-Pleistocene section in NW area of East Seram PSC

Oil seeps recorded in area with showing interesting structure, potential (?) carbonate build-up and favourable dip for offshore prospect PP4

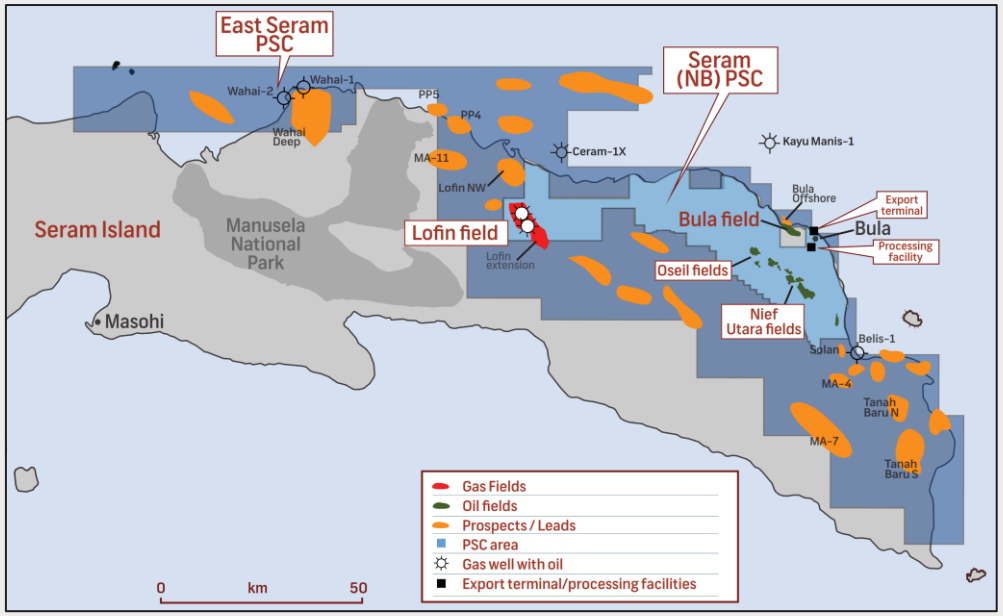


Plio-Pleistocene prospect and lead inventory

Will be updated following interpretation of new seismic



- 7 leads (to date) in East Seram PSC, combined P50 Prospective Resource[1] 95 mmboe[2]
- Av. POS 24%, 95% Oil
- New seismic will significantly impact portfolio and new prospects expected



[1]Prospective Resource: 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.

[2] Conversion for gas factor of 6mcf=1boe used to convert gas to barrels of oil equivalent

Seram Basin - proven yet underexplored province

East Seram PSC covers some of the most prospective areas

- Fold thrust belt play
  - Significant oil (Oseil area) and gas (Lofin) discoveries
  - Similarities to world-class FTB provinces (fractured carbonate, anoxic source)
  - Onshore seismic planned to explore structures up to 60 km^2
- Plio-Pleistocene play
  - Stratigraphically complex (sequence stratigraphic analysis ongoing)
  - Well developed shelf sandstones
  - Reefal buildups – developed on paleo-highs or more subtle patch reef features
  - Turbidites – clear evidence on seismic and in some wells. Eroded overthrust Middle Triassic (Kanikeh Fm outer shelf/turbidite deposits) provide provenance
  - Amplitude supported pay
- New 664km marine seismic being interpreted

Thank you

For more information please contact:

Tom Soulsby
Executive Chairman
Email: tsoulsby@lionenergy.com.au
Phone: +62 812 1065956