MERGUI-NORTH SUMATRA BASIN

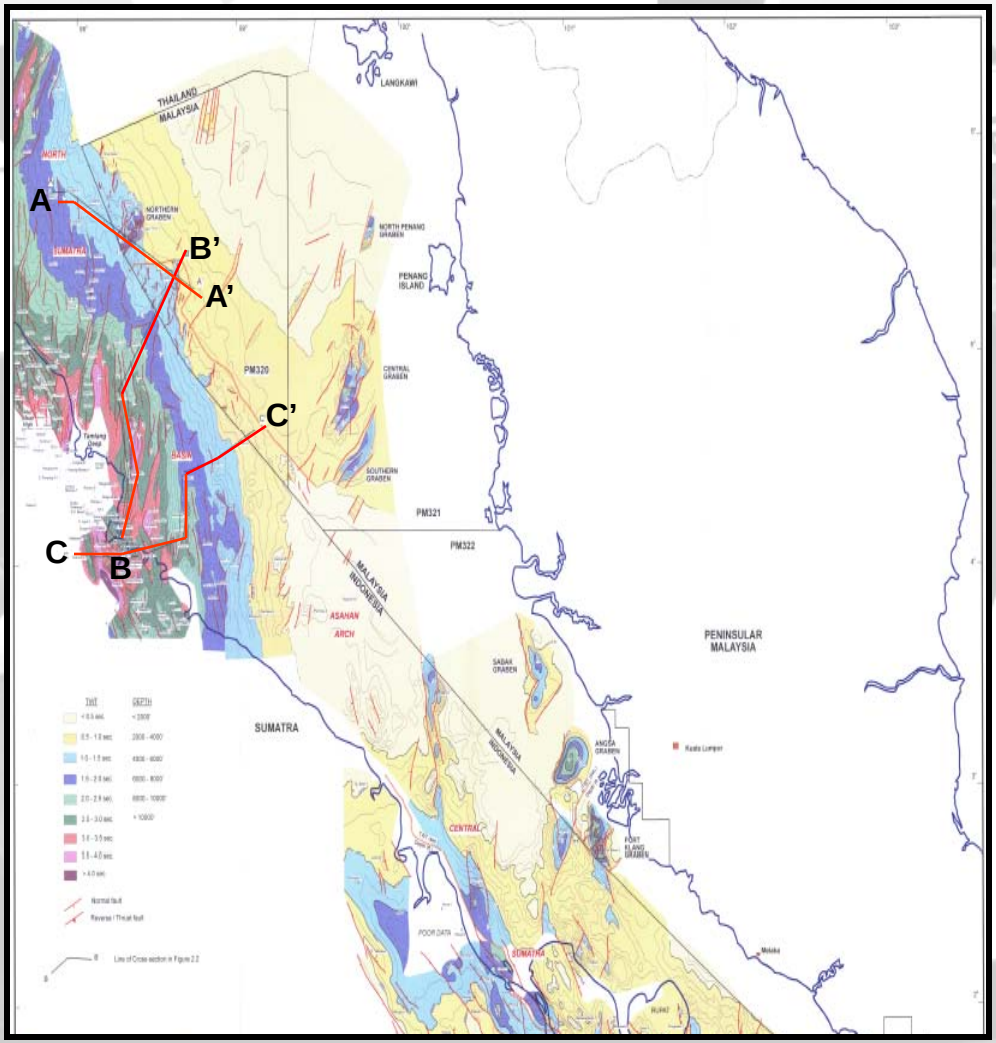
AN OVERVIEW

(Malaysian Side)

PRESENTATION OUTLINE

- Regional Geology Setting
- General Stratigraphy
- Exploration History
- Well Locations
- Summary of Exploration Well Results
- Summary of Petroleum Systems
- Database
- Conclusions

REGIONAL GEOLOGICAL SETTING



The geological setting of the study area is gently Northwest to Southwest dipping Malacca Platform, which forms the northeast flank of the NSB.

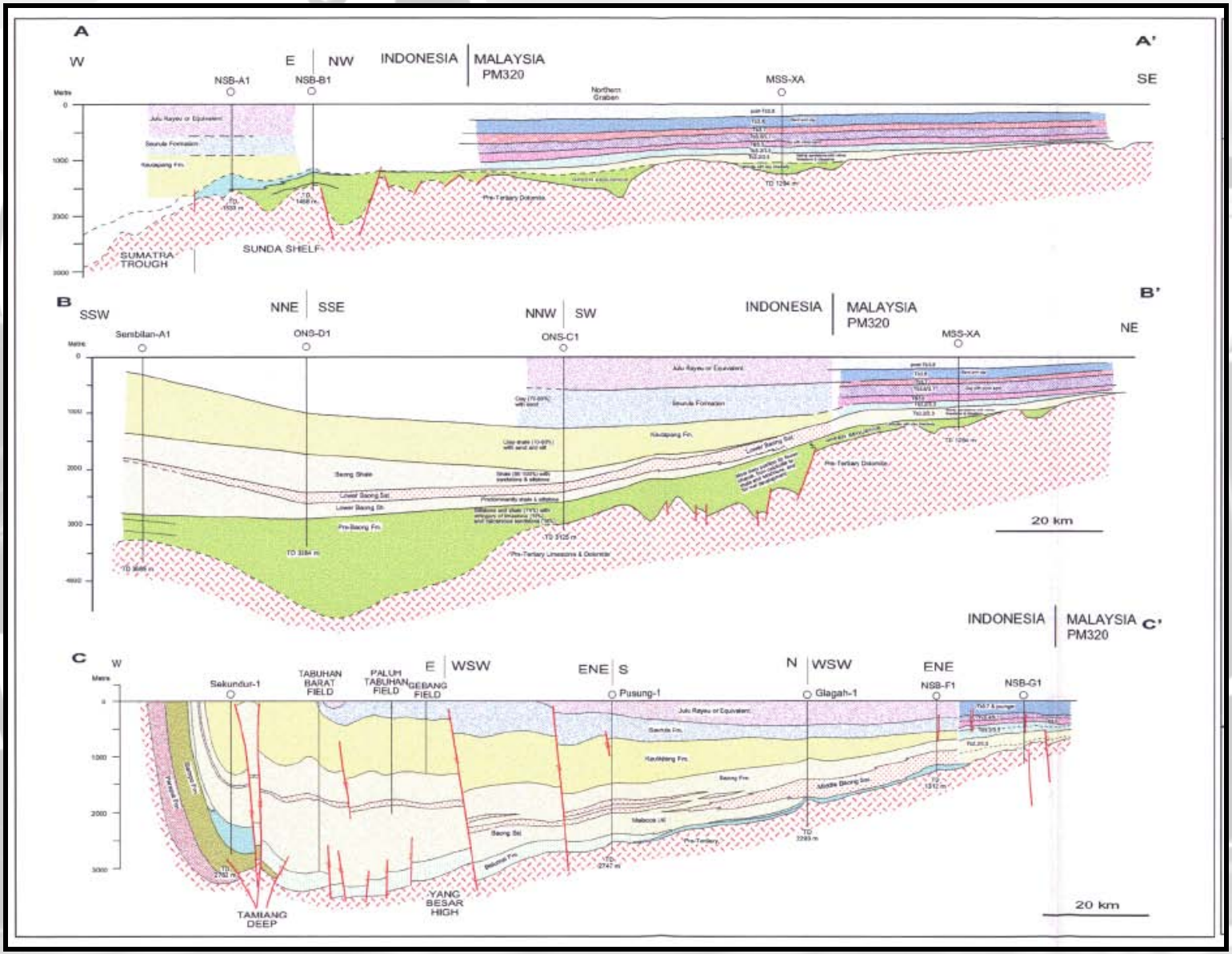
To the north, it extends into the Mergui basin in the Andaman Sea.

Over most of the block, the shallow pre-tertiary rocks are overlain by an on lapping upper tertiary sequence of clays and sand that thins progressively towards the coastline of Peninsular Malaysia.

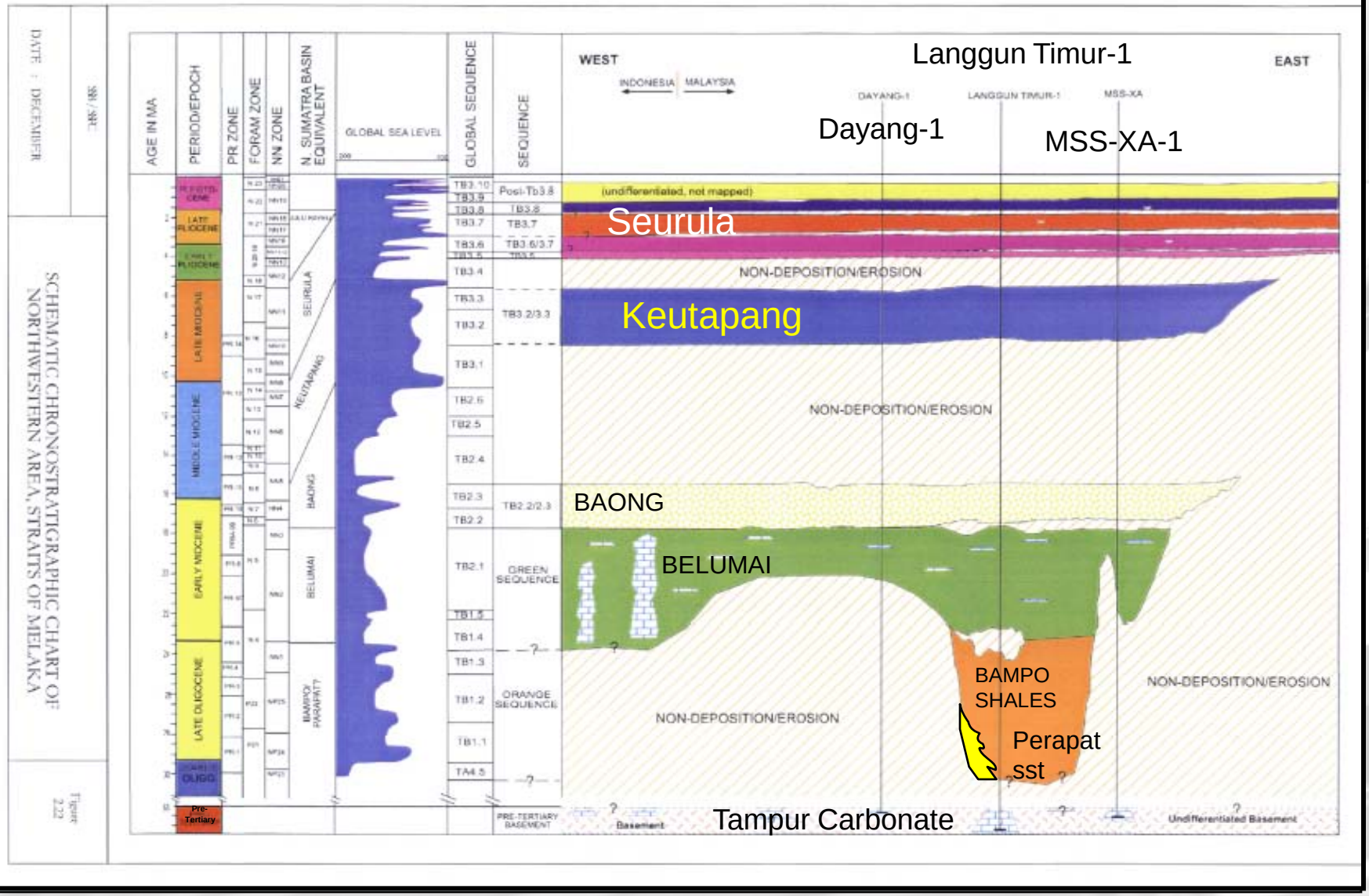
This sedimentary sequence shows very little structural deformation.

Miocene carbonates, with local reefal buildups, are present in the NW part of the study area.

A series of NNE-SSW trending grabens occur in the south-central part, incised into the broad and flat shelfal area and filled with a mainly Early Tertiary continental sequence.


A
W
E
NW
INDONESIA
MALAYSIA
PM320
A'
SE
NSB-A1
NSB-B1
MSS-XA
Northern Graben
Pre-Tertiary Dolomite
SUMATRA TROUGH
SUNDA SHELF
B
SSW
NNE
SSE
NNW
SW
INDONESIA
MALAYSIA
PM320
B'
NE
Sembilan-A1
ONS-D1
ONS-C1
MSS-XA
20 km
INDONESIA
MALAYSIA
PM320
C'
C
W
E
WSW
ENE
S
N
WSW
ENE
Sekundur-1
TABUHAN BARAT FIELD
PALUM TABUHAN FIELD
GEBANG FIELD
Pusung-1
Glagah-1
NSB-F1
NSB-G1
TAMIANG DEEP
YANG BESAR HIGH
20 km

GENERAL STRATIGRAPHY



MOBIL (1971-1975)

- Acquired 5500 km of 2D seismic and drilled 2 wells – MSS-AX and MG-AX.
- Both wells tested potential Pre-Tertiary Tampur Carbonate basement plays.
- Good reservoirs were encountered at both wells but failed due to lack of top seal.

PETRONAS (1983)

- Acquired 2000 km of 2D seismic data in 1983.

SUN MALAYSIA PETROLEUM (1987-1992)

- Acquired 5657 km 2D seismic and drilled 3 exploration wells in the Western most part of the block.
- Singa Besar-1 and Langgun Timur-1 had minor gas shows and the third well, Dayang-1 was dry.
- The acreage was relinquished in December 1992 upon the expiry of the exploration period.

SHELL (1999 – 2001)

- Acquired and processed 1053 line-km 2D seismic data.
- Re-processed 1000 line-km vintage 2D seismic data.
- Conducted a regional study of the Straits of Melaka comprising evaluation of the hydrocarbon habitat and tectonic framework.

2002 onwards-no exploration activities.

SUMMARY OF EXPLORATION WELL RESULTS

Well	Operator	Year	TD (m)	Objectives	Results
MSS-XA	**Mobil**	**1972**	**1294**	**Calcarenites and sandstones below Baong Shale**	**Dry**
MG-XA	**Mobil**	**1974**	**1651**	**Synrift graben fill reservoirs**	**Dry**
Dayang-1	**Sun**	**1989**	**1142**	**Melaka carbonate/ Bampo Formation**	**Dry. Trace Gas/oil shows**
Singa Besar-1	**Sun**	**1989**	**844**	**Melaka Carbonate on top of basement**	**3.3m NGS, Flowing at 3.7MMSCF/day**
Langgun Timur-1	**Sun**	**1989**	**2028**	**Tampur Carbonate and Middle Graben Fill clastics**	**Minor gas shows TD in Tampur carbonates**

- **Well data** drilled for Singa Besar-1, Dayang-1, Langgun Timur-1 and Mss-XA. Digital log data available for all wells accept MSS-XA that only has a hard copy of the well log. T-Z and temperature data also available and the data quality is fair to good.

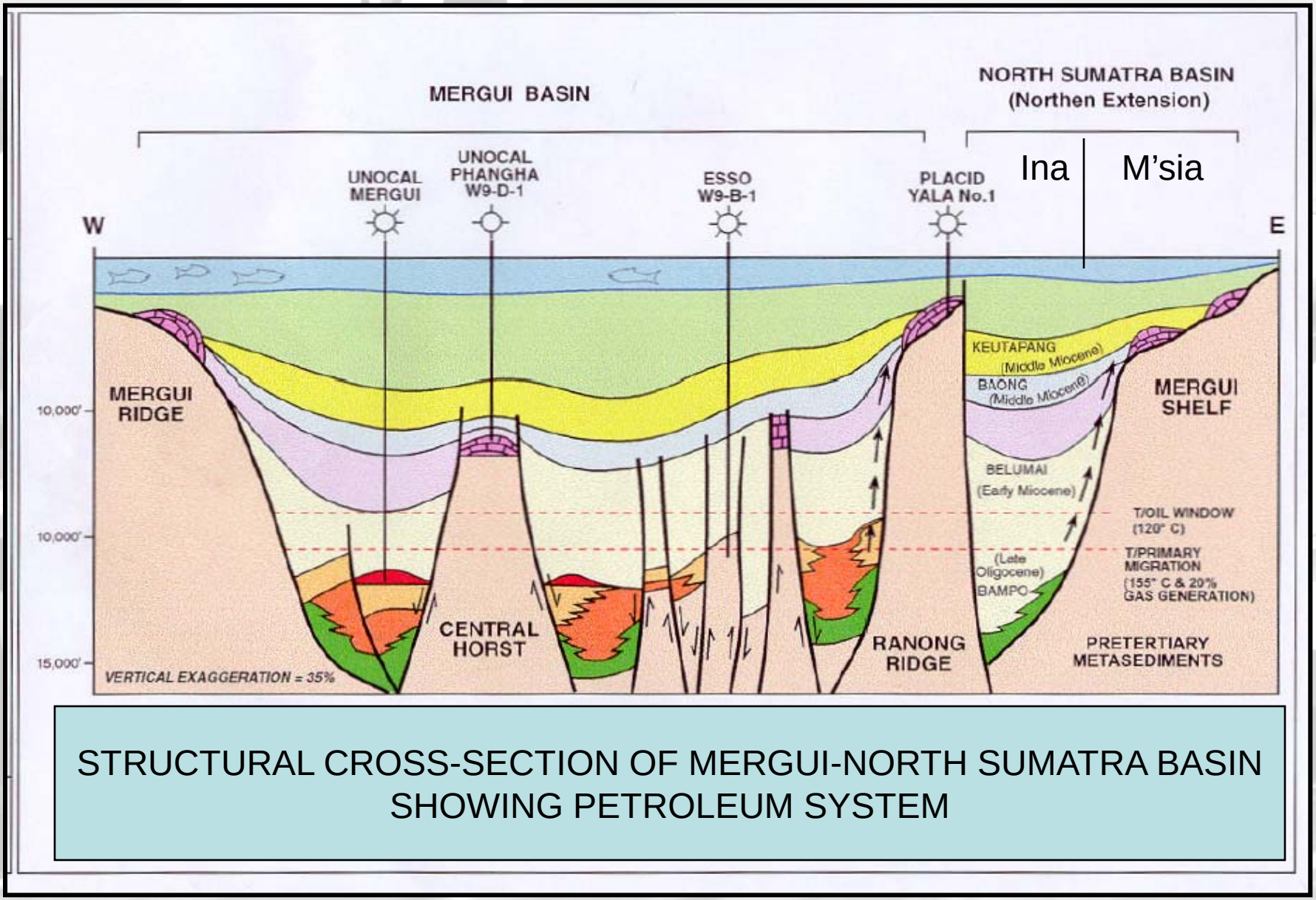
- **Regional and semi regional lines**. The overall seismic lines range from fair to good.

- **Biostratigraphic charts** from 4 Malaysian wells. The data is generally good for Dayang-1, Langgun Timur-1 and Singa Besar-1 but poor in MSS-XA.

- **Geochemical data** such as TOC, Rock Eval Pyrolisis, biomarkers in raw and interpreted forms from published literatures and from well reports.

- **Geochemical analysis** from well samples have been utilized for the geochemical study.

- **Regional horizon maps** of Top Basement, Top Sequences Tb2.2/2.3 (Baong Formation) and Top Sequences Tb3.5 and Tb3.6/3.7 (Seurula Formation) compiled from the various existing reports.



STRUCTURAL CROSS-SECTION OF MERGUI-NORTH SUMATRA BASIN SHOWING PETROLEUM SYSTEM

CONCLUSIONS

- The oil potential is encouraging. The best chance of finding commercial quantities of oil appears to be in large up dip stratigraphic traps in the Lower Baong Sandstone where oil might have preferentially accumulated by long distance migration from the mature basinal areas of the North Sumatra Basin/Mergui Basin.

- Further evaluation has to be conducted of the conceptual Tb2.2/2.3 (Baong Formation) and Tb3.2/3/3 (Keutapang Formation) stratigraphic onlap trap.

- Detailed mapping to identify the potential stratigraphic traps.