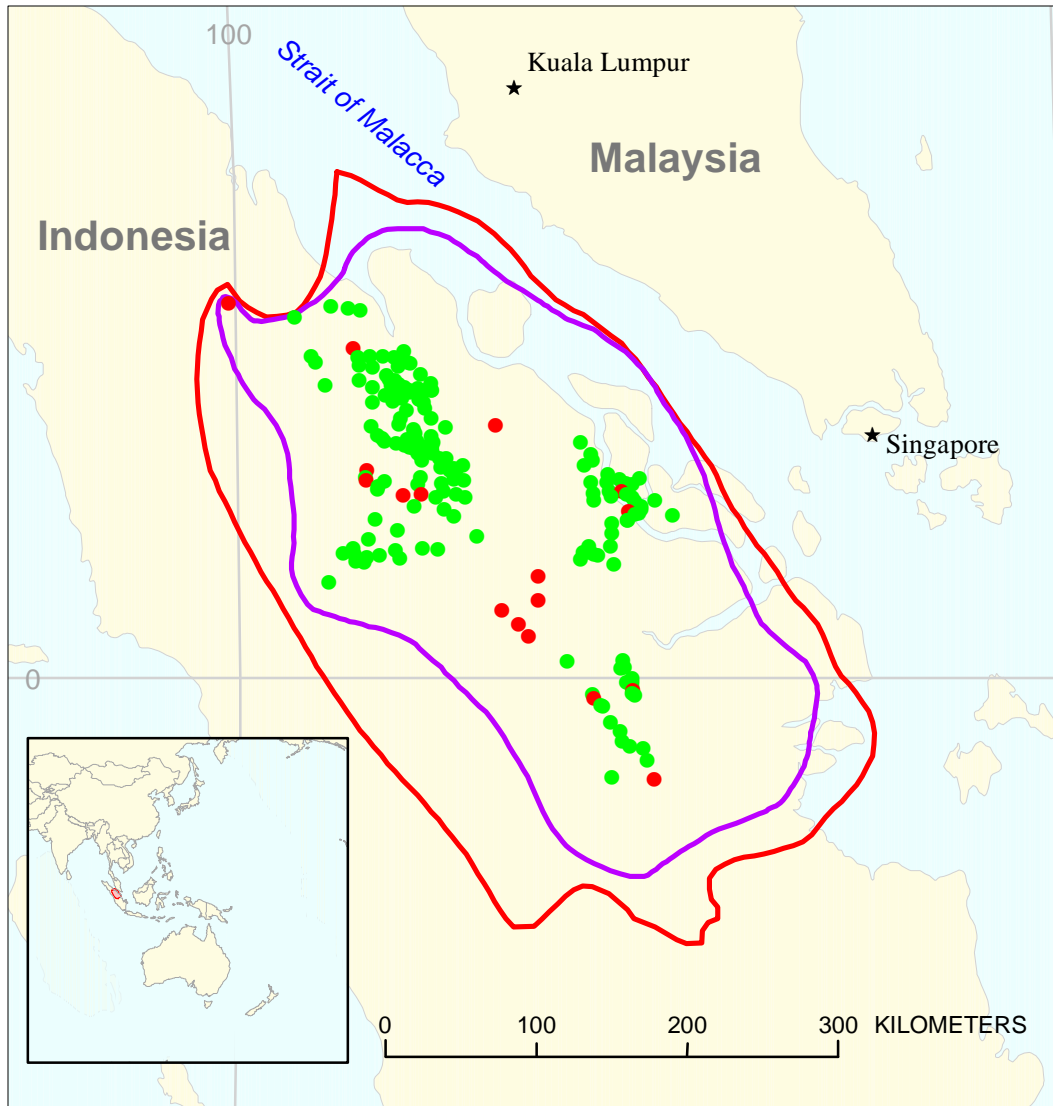




Pematang/Sihapas Siliciclastics Assessment Unit 38080101



-  Pematang/Sihapas Siliciclastics Assessment Unit 38080101
-  Central Sumatra Basin Geologic Province 3808

USGS PROVINCE: Central Sumatra Basin (3808)

GEOLOGIST: L.S. Smith-Rouch

TOTAL PETROLEUM SYSTEM: Brown Shale-Sihapas (380801)

ASSESSMENT UNIT: Pematang/Sihapas Siliciclastics (38080101)

DESCRIPTION: The assessment unit describes oil and minor gas fields from Eocene and lower Oligocene syn-rift lacustrine sequences that are rich in organic matter. Siliciclastic reservoirs consist of alluvial fan deposits along graben-bounding faults and post-rift deltaic and fluvial sandstones. Late Miocene to Pliocene compression formed anticlinal traps for the oil and gas accumulations. Probable biogenic gas accumulations in the upper Miocene Petani Formation are included with this assessment unit.

SOURCE ROCKS: The Eocene-lower Oligocene Brown Shale is the main source rock. In the grabens, the thickness of the source rock interval is 220 m or more. The total organic carbon (TOC) values of the Brown Shale average 5 percent and may be as high as 20 percent. The kerogen consists of >96 percent amorphous freshwater algae of high molecular weight paraffin with hydrogen index (HI) values higher than 300. The middle and upper parts of the Brown Shale are oil prone whereas the lower part of the Brown Shale is more gas prone.

MATURATION: The main phase of hydrocarbon generation occurred in latest Miocene to early Pliocene time. The oil window in the Aman basin is located at depths between 2000 and 3200 m. The geothermal gradient (~50°C/km) in the Central Sumatra basin is higher than in other Sumatra basins.

MIGRATION: Migration occurred in the latest Miocene and continues into the present. Dominant vertical migration and local lateral migration is restricted to the pods of mature source rocks in the grabens.

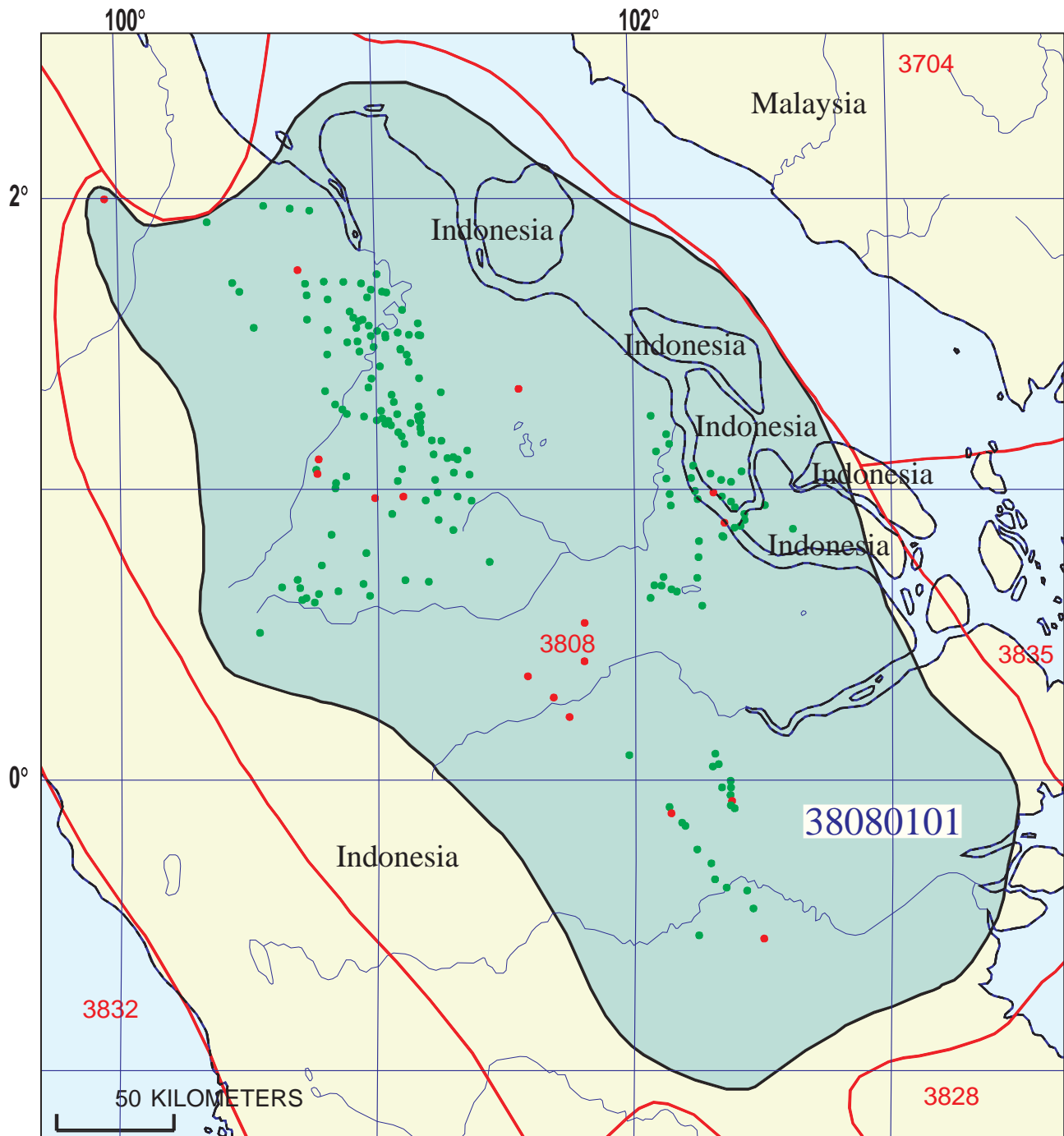
RESERVOIR ROCK: The main reservoir rocks are fluvial, deltaic, and tidal flat sandstones in the late Oligocene and early Miocene Sihapas Group. The sandstone reservoir sequence ranges from 150 to 450 m thick. Also, Eocene and lower Oligocene Pematang Group alluvial fan siliciclastics are good reservoirs.

TRAPS AND SEALS: Traps are formed by late Miocene and Pliocene compressional tectonism accompanying uplift of the Barisan Mountains. The compressional stresses continue to the present day. Structural trap styles are faulted anticlines, wrench-faulted anticlines (flower structures), and graben-bounding rollover anticlines. Locally, facies-change and truncation stratigraphic traps are present. The lower and middle Miocene Telisa Shale of marine origin, equivalent to and overlying the Sihapas Group, is the regional seal. A 25-m thick paleosol in the Pematang Group is a good seal in some grabens as are thin marine shales within the Sihapas Group.

REFERENCES:

Katz, B.J., 1995, A survey of rift basin source rocks, *in* Lambiase, J.J., ed., Hydrocarbon habitat in rift basins: Geological Society of London Special Publication 80, p. 213-240.

- Lambiase, J.J., 1990, A model for tectonic control of lacustrine stratigraphic sequences in continental rift basins, *in* Lambiase, J.J., ed., Lacustrine basin exploration—Case studies and modern analogues: American Association of Petroleum Geologists Memoir 50, p. 265-286.
- Longley, I.M., Barraclough, R., Bridden, M. A., and Brown, S., 1990, Pematang lacustrine petroleum source rocks from the Malacca Strait PSC, central Sumatra, Indonesia, *in* Proceedings of the 19th Annual Convention of the Indonesian Petroleum Association: p. 270-288.
- Williams, H. H., Kelly, P.A., Janks, J.S., and Christiansen, R.M., 1985, The Paleogene rift basin source rocks of central Sumatra, *in*, Proceedings of the 14th Annual Convention of the Indonesian Petroleum Association: p. 57-90.



Pematang/Sihapas Siliciclastics Assessment Unit - 38080101

EXPLANATION

- Hydrography
- Shoreline
- 3808 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 38080101 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

<u>Oil Fields:</u>	minimum	median	maximum
Gas/oil ratio (cfg/bo).....	300	600	900
NGL/gas ratio (bnl/mmcf).....	12	24	36
<u>Gas fields:</u>	minimum	median	maximum
Liquids/gas ratio (bnl/mmcf).....	10	20	30
Oil/gas ratio (bo/mmcf).....			

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

<u>Oil Fields:</u>	minimum	median	maximum
API gravity (degrees).....	19	35	55
Sulfur content of oil (%).....	0	0.01	0.1
Drilling Depth (m)	500	2000	3500
Depth (m) of water (if applicable).....			
<u>Gas Fields:</u>	minimum	median	maximum
Inert gas content (%).....	1	6	10
CO ₂ content (%).....	2	15	30
Hydrogen-sulfide content (%).....	0	0	0
Drilling Depth (m).....	500	2000	3500
Depth (m) of water (if applicable).....			

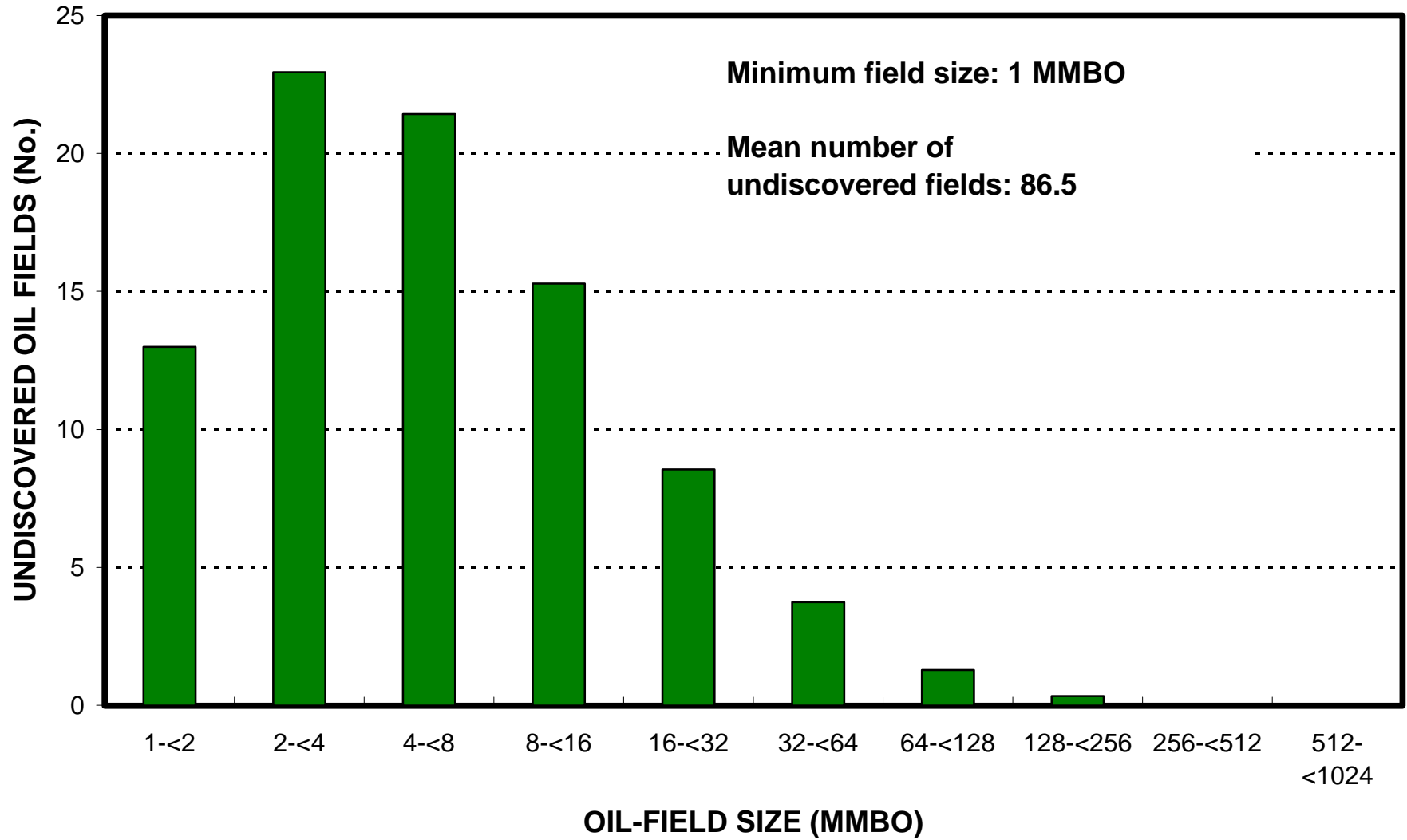
**ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT
TO COUNTRIES OR OTHER LAND PARCELS** (uncertainty of fixed but unknown values)

1. Indonesia represents 100 areal % of the total assessment unit

<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	100	_____
Portion of volume % that is offshore (0-100%):.....	_____	0	_____
 <u>Gas in Gas Fields:</u>	 minimum	 median	 maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	100	_____
Portion of volume % that is offshore (0-100%):.....	_____	0	_____

Pematang/Sihapas Siliciclastics, AU 38080101

Undiscovered Field-Size Distribution



Pematang/Sihapas Siliciclastics, AU 38080101

Undiscovered Field-Size Distribution

