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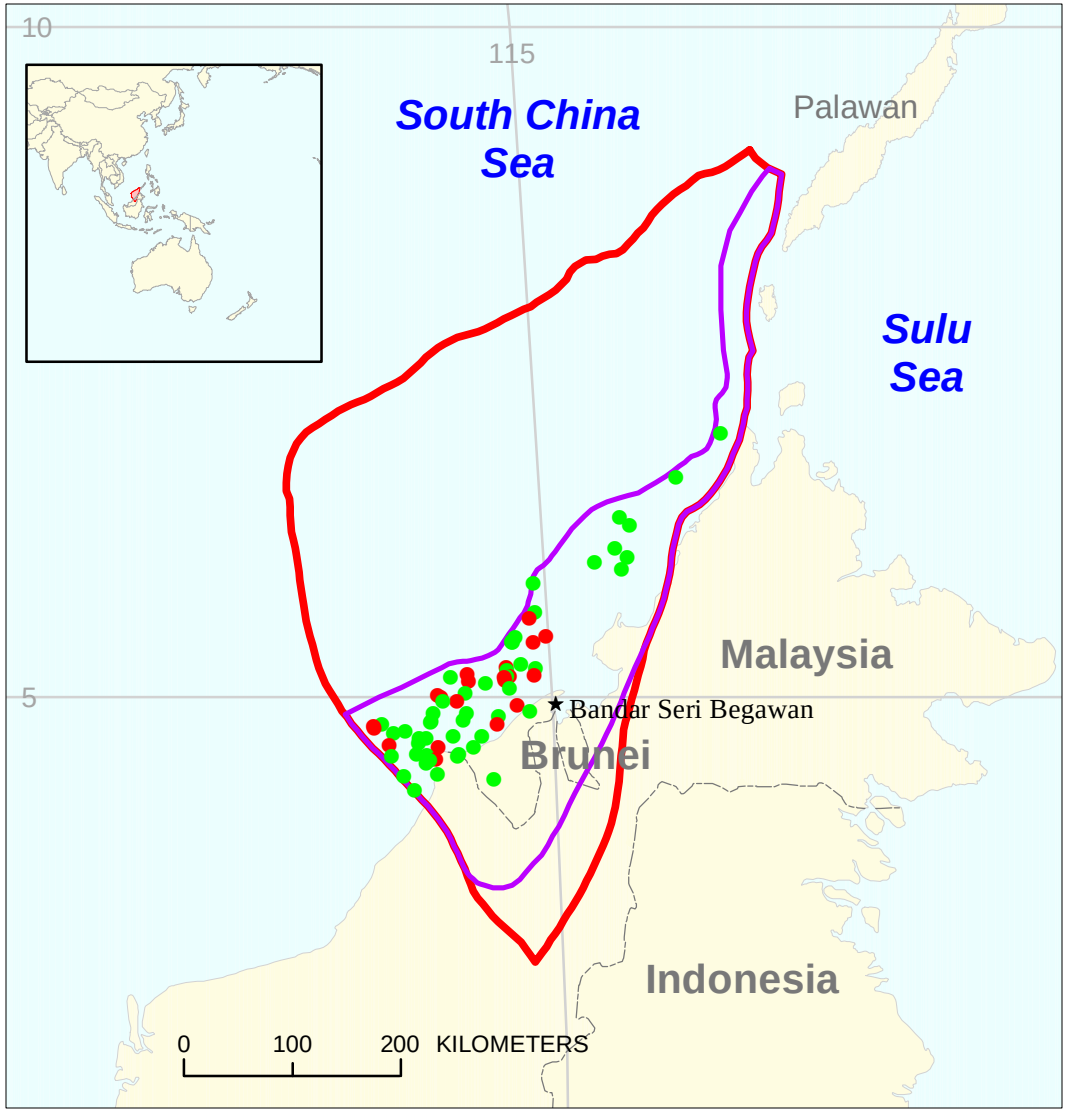
Brunei-Sabah Deltaics
Assessment Unit 37010101



Brunei-Sabah Deltaics Assessment Unit 370120101

Baram Delta/Brunei-Sabah Geologic Province 3701

Geologic Summary

Detailed map of this assessment unit

Exploration/Discovery-History Data

- Plots of Known Field Sizes
- Plots of Grown Resources
- Tables

Assessment Input Data

Assessment Results

- Assessment Unit Summary
- Detailed Assessment Results
- Undiscovered Field-Size Distributions

USGS PROVINCE: Baram Delta/Brunei-Sabah Basin (3701) **GEOLOGIST:** P.J. McCabe

TOTAL PETROLEUM SYSTEM: Brunei-Sabah (370101)

ASSESSMENT UNIT: Brunei-Sabah Deltaics (37010101)

DESCRIPTION: Miocene-Pliocene deltaics accumulated at a convergent margin.

SOURCE ROCKS: The source rocks are assumed to be terrigenous organic matter and oils have high pristane/phytane ratios. No discrete, rich source rock layers are known but the organics are probably concentrated in marine condensed intervals. Coal beds underlie only a few of the reservoirs and are generally not buried deeply enough for oil maturation.

MATURATION: The timing of maturation varies from Middle Miocene to the present. Most of the area is still undergoing subsidence.

MIGRATION: Migration along faults is probably a major method of migration though many faults act as seals. Some migration through sedimentary facies has presumably occurred, especially in an updip direction from condensed intervals.

RESERVOIR ROCKS: Upper shoreface sandstones of regressive parasequence sets and fluvial and tidal sandstones filling incised valleys cut during lowstands.

TRAPS AND SEALS: Most producing reservoirs are anticlinal features: either rollover anticlines produced by growth faulting or anticlinal features associated with wrench faults. Some reservoirs are related entirely to sealing against faults. Within reservoirs, the seals are either marine flooding surfaces or faults. Presumably there are also stratigraphic traps unrelated to anticlinal features.

PETROLEUM INDUSTRY ACTIVITY: The first oil field was discovered at Miri in Sarawak in 1910 and the large Seria Field was discovered in 1929. Limited further exploration was done until the mid-1960s when exploration commenced offshore. There has been a trend to progressively deeper water drilling with time.

REFERENCES:

Hazebroek, H.P., and Tan, D.N.K., 1993, Tertiary tectonic evolution of the NW Sabah continental margin: Bulletin of the Geological Society of Malaysia, v. 33, p. 195-210.

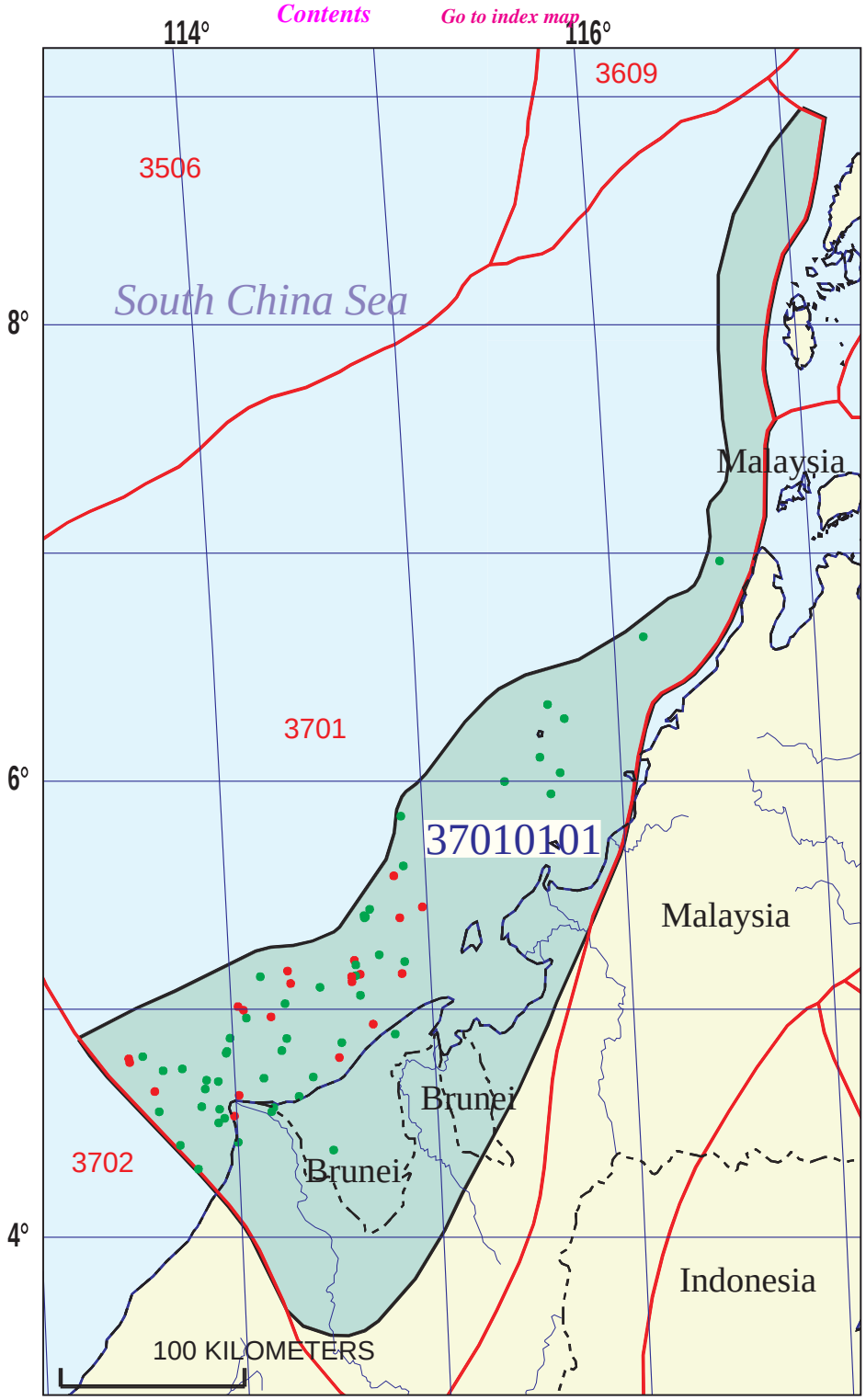
Jamil, A.S.A., Anwar, M.L., and Kiang, E.S.P., 1991, Geochemistry of selected crude oils from Sabah and Sarawak: Bulletin of the Geological Society of Malaysia, v. 28, p. 123-149.

Johnson, H.D., Chapman, J.W., and Ranggon, J., 1989, Structural and stratigraphic configuration of the later Miocene Stage IVC reservoirs in the St. Joseph field, offshore Sabah, NW Borneo: Bulletin of the Geological Society of Malaysia, v. 25, p. 79-118.

Johnson, H.D., Levell, S., and Mohamad, A.H., 1987, Depositional controls of reservoir thickness and quality distribution in Upper Miocene shallow marine sandstones (Stage IVD) of the Erb West Field, offshore Sabah, NW Borneo: Bulletin of the Geological Society of Malaysia, v. 21, p. 195-230.

Rice-Oxley, E., 1991, Palaeoenvironments of the Lower Miocene to Pliocene sediments in offshore NW Sabah area: Bulletin of the Geological Society of Malaysia, v. 28, p. 165-194

Sandal, S.T., ed., The geology and hydrocarbon resources of Negara Brunei Darussalam (2d ed.), 1996, Syabas–Brunei Shell Petroleum Company: Brunei Darussalam, 243 p.



Brunei/Sabah Deltaics
Assessment Unit - 37010101

EXPLANATION

- Hydrography
- Shoreline
- 3701 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 37010101 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

USGS science for a changing world

SEVENTH APPROXIMATION
NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS

Date:……..	7/2/99		
Assessment Geologist:……..	P.J. McCabe		
Region:……..	Asia Pacific	Number:	3
Province:……..	Baram Delta/Brunei-Sabah Basin	Number:	3701
Priority or Boutique……	Priority		
Total Petroleum System:……	Brunei-Sabah	Number:	370101
Assessment Unit:……..	Brunei-Sabah Deltaics	Number:	37010101
* Notes from Assessor	MMS growth function.		

CHARACTERISTICS OF ASSESSMENT UNIT

Oil (<20,000 cfg/bo overall) **or** Gas (≥20,000 cfg/bo overall):… Oil

What is the minimum field size?……. 1 mmboe grown (≥1mmboe)
(the smallest field that has potential to be added to reserves in the next 30 years)

Number of discovered fields exceeding minimum size:…… Oil: 47 Gas: 18
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 188 2nd 3rd 19 3rd 3rd 22
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 260 2nd 3rd 216 3rd 3rd 1589

Assessment-Unit Probabilities:

Attribute	Probability of occurrence (0-1.0)
1. **CHARGE:** Adequate petroleum charge for an undiscovered field ≥ minimum size……	1.0
2. **ROCKS:** Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size……	1.0
3. **TIMING OF GEOLOGIC EVENTS:** Favorable timing for an undiscovered field ≥ minimum size	1.0

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):……..…….....…. 1.0

4. **ACCESSIBILITY:** Adequate location to allow exploration for an undiscovered field ≥ minimum size……..……..…… 1.0

UNDISCOVERED FIELDS

Number of Undiscovered Fields: How many undiscovered fields exist that are ≥ minimum size?:
(uncertainty of fixed but unknown values)

Oil fields:……min. no. (>0)	20	median no.	150	max no.	350
Gas fields:……min. no. (>0)	15	median no.	80	max no.	200

Size of Undiscovered Fields: What are the anticipated sizes (**grown**) of the above fields?:
(variations in the sizes of undiscovered fields)

Oil in oil fields (mmbo)……..……min. size	1	median size	4	max. size	650
Gas in gas fields (bcfg):……min. size	6	median size	36	max. size	5000

Assessment Unit (name, no.)
Brunei-Sabah Deltaics, 37010101

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	1400	2800	4200
NGL/gas ratio (bngl/mmcfg)……	30	60	90

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	22	44	66
Oil/gas ratio (bo/mmcfg)……			

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

Oil Fields:	minimum	median	maximum
API gravity (degrees)……	25	39	53
Sulfur content of oil (%)……	0.05	0.08	0.14
Drilling Depth (m) ……	700	2500	6000
Depth (m) of water (if applicable)……	0	75	150

Gas Fields:	minimum	median	maximum
Inert gas content (%)……			
CO_2 content (%)……			
Hydrogen-sulfide content (%)……	0	0	0
Drilling Depth (m)……	700	2500	6000
Depth (m) of water (if applicable)……	0	75	150

Assessment Unit (name, no.)
Brunei-Sabah Deltaics, 37010101

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

1. Brunei represents 27 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		55	
Portion of volume % that is offshore (0-100%).....		95	

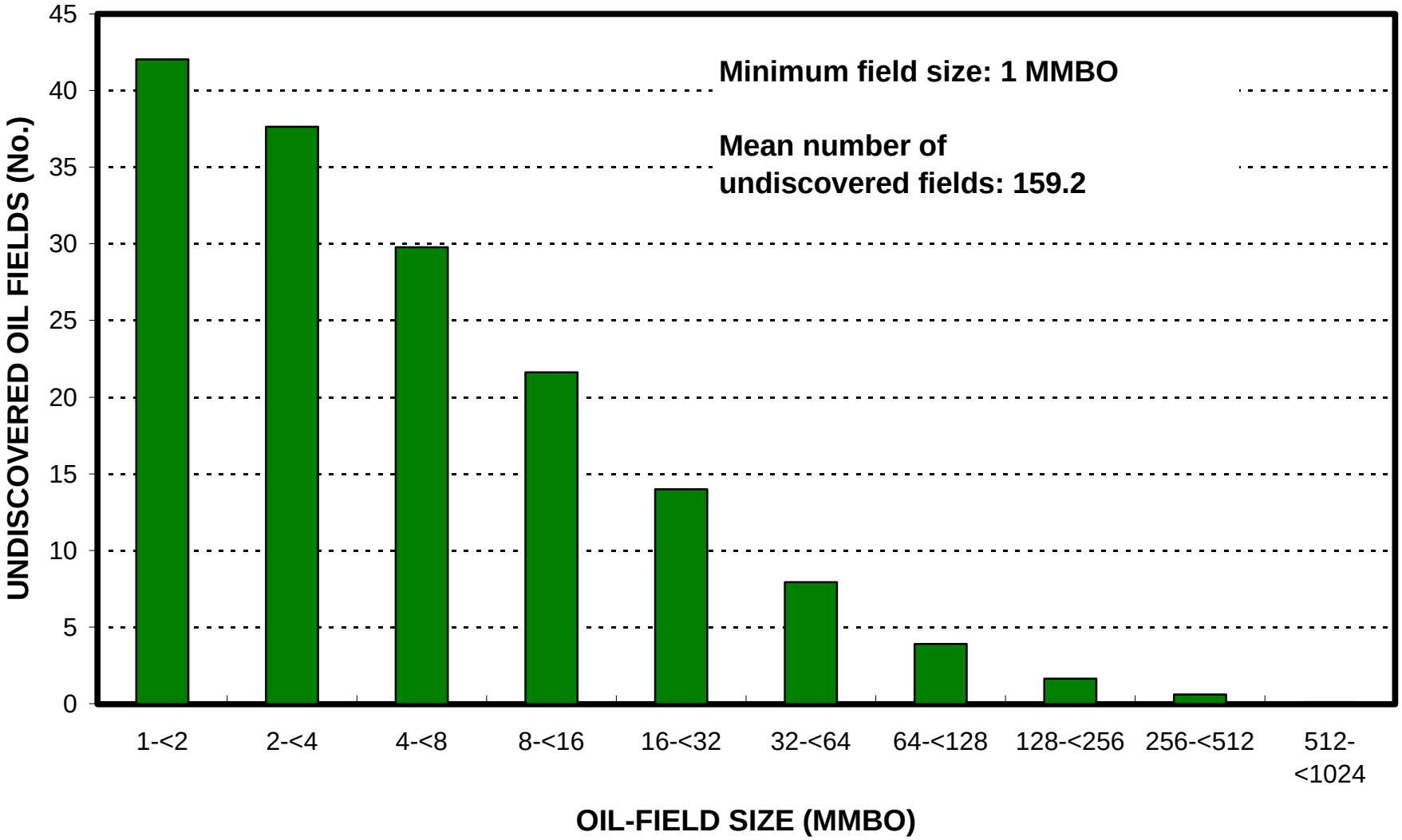
Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		55	
Portion of volume % that is offshore (0-100%).....		95	

2. Malaysia represents 73 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		45	
Portion of volume % that is offshore (0-100%).....		95	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		45	
Portion of volume % that is offshore (0-100%).....		95	

Brunei-Sabah Deltaics, AU 37010101
Undiscovered Field-Size Distribution



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Undiscovered Field-Size Distribution