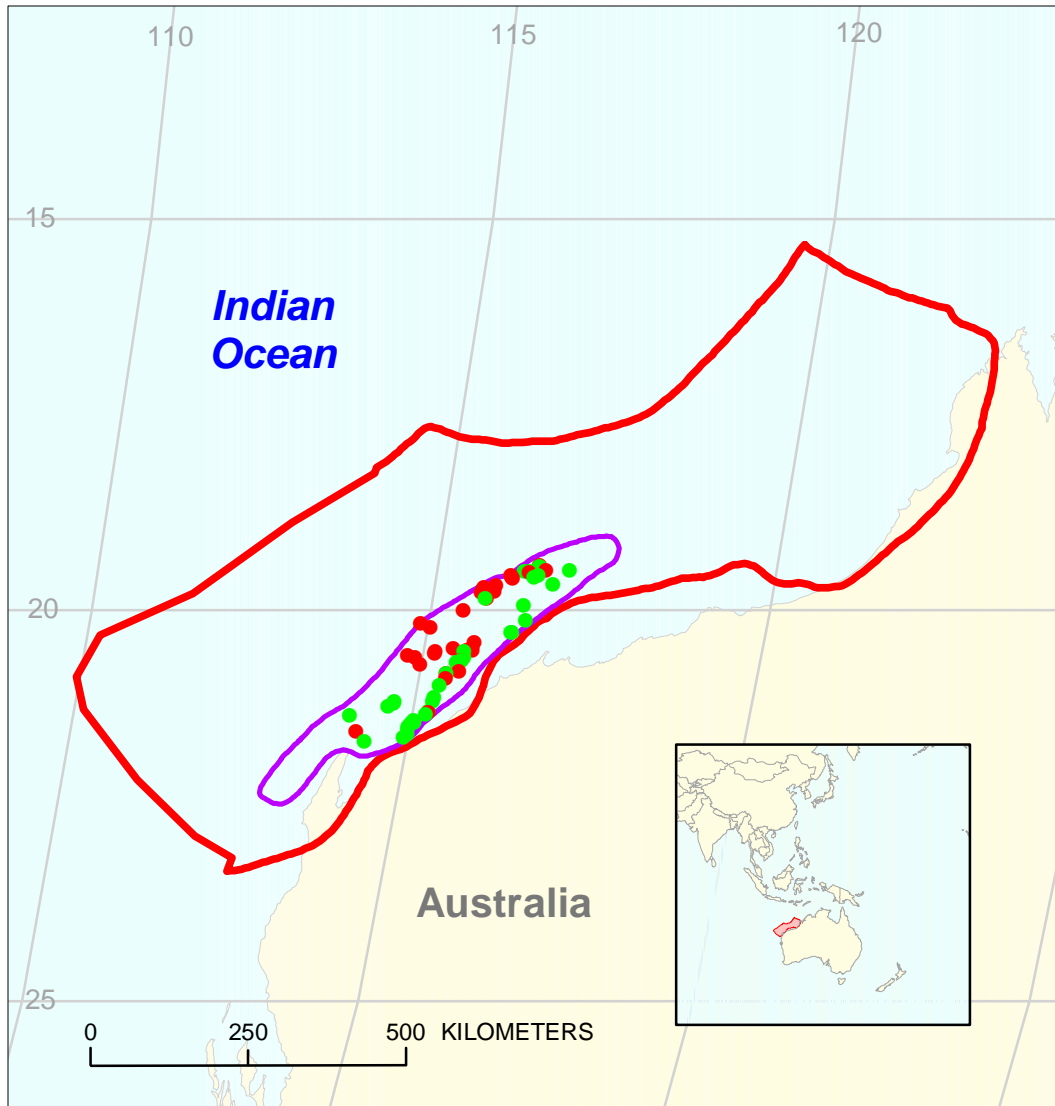




# Dingo-Mungaroo/Barrow Assessment Unit 39480101



-  Dingo-Mungaroo/Barrow Assessment Unit 39480101
-  Northwest Shelf Geologic Province 3948

**USGS PROVINCE:** Northwest Shelf (3948)

**GEOLOGIST:** M.G. Bishop

**TOTAL PETROLEUM SYSTEM:** Dingo-Mungaroo/Barrow (394801)

**ASSESSMENT UNIT:** Dingo-Mungaroo/Barrow (39480101)

**DESCRIPTION:** Mesozoic faulted basin trend offshore, the north coast of Australia. Rich, restricted-marine source rocks and quality interbedded, basin-margin, and overlying reservoir rocks resulting in oil and gas accumulations in traps filled to spill point.

**SOURCE ROCK:** Dingo Claystone was deposited in restricted marine conditions during Jurassic subsidence of the Exmouth, Barrow, and Dampier sub-basins. Total thickness, estimated from seismic data, is 3 to 4 km. Reported TOC is 1 to 5 wt. % and HI 100 to 400 for U Dingo Claystone, and TOC 0.2 to 3 wt. % and HI 100 to 250 for M Dingo Claystone.

**MATURATION:** Upper Jurassic rocks are currently within the zone of peak hydrocarbon generation in the assessment unit. The Lower Dingo Formation entered the oil window in Middle Jurassic, the Upper Dingo in earliest Late Cretaceous.

**MIGRATION:** Vertically along faults into overlying traps and laterally into reservoirs within or adjacent to the source rocks. Older reservoirs juxtaposed by normal faulting to younger source rock are "face fed" along and across the fault. Structures filled to spill point, hundreds of meters of residual oil column and shows in virtually all porous rocks indicate plentiful hydrocarbons. Remigration and mixing are also indicated.

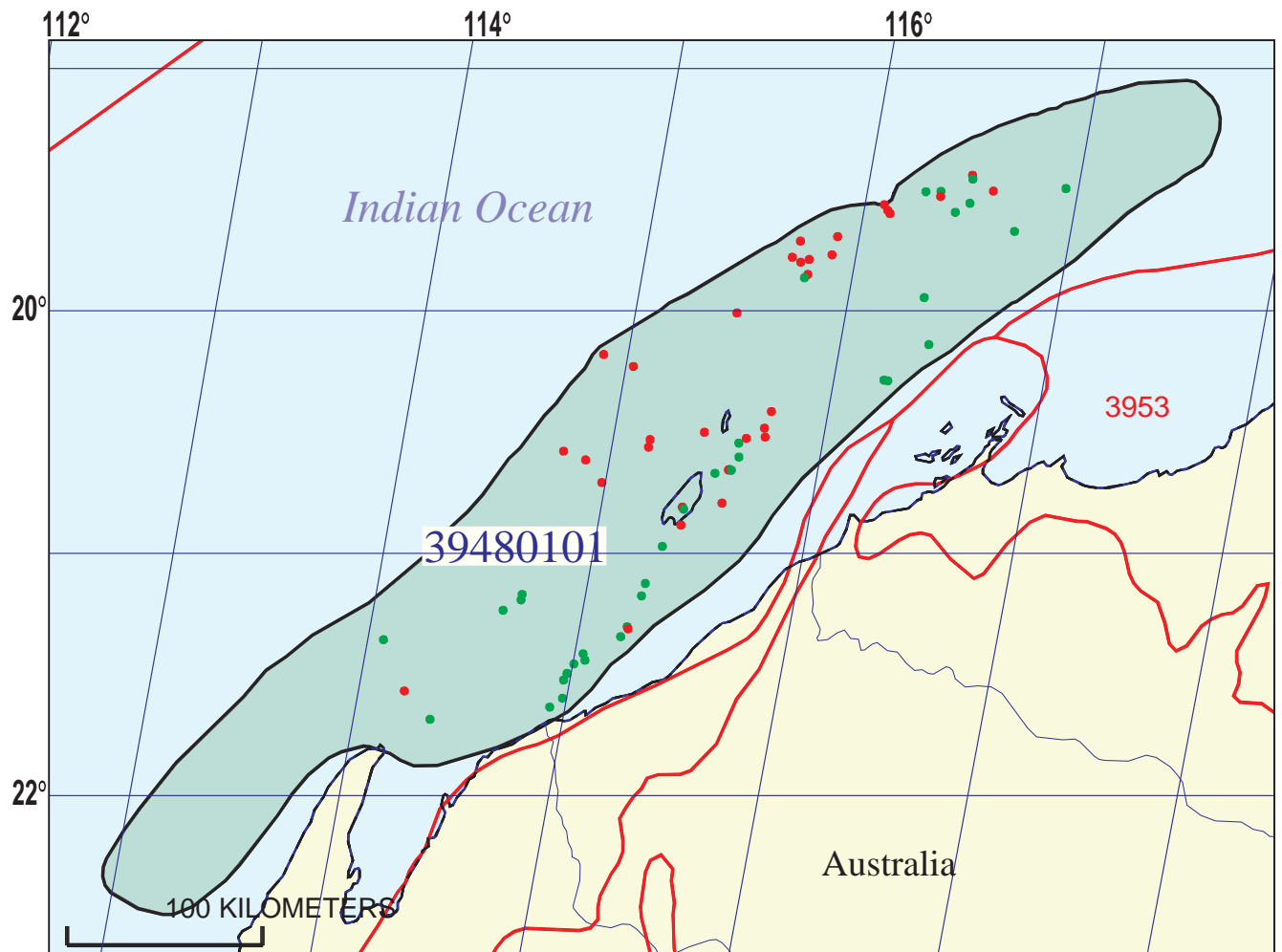
**RESERVOIR ROCKS:** Jurassic and Cretaceous reservoir rocks are of deep-water, proximal and distal deltaic, marginal marine, and alluvial origin and range in porosity from 16 to 35 percent and permeability from 27 to 3000 mD. Minor quartz overgrowths, authigenic clay, and feldspar dissolution are reported. Upper Triassic, non-marine sandstones have average porosity of 28 percent with highs of 34 percent and permeability as high as 1000 mD. Burial depth and marine carbonate cementation decrease these values.

**TRAPS AND SEALS:** Traps include faulted three-way dip, compactional four-way closure, drape anticlines, combined structural-stratigraphic traps, and tilted fault blocks. Seals are intraformational Dingo Claystone and regional Lower Cretaceous Muderong Shale.

#### **REFERENCES:**

- Barber, P.M., 1994, Sequence stratigraphy and petroleum potential of Upper Jurassic--Lower Cretaceous depositional systems in the Dampier sub-basin, North West Shelf, Australia, *in* Purcell, P.G., and Purcell, R.R., eds., *The sedimentary basins of Western Australia: Proceedings of Petroleum Exploration Society of Australia Symposium*, Perth, 1994, p. 525-542.
- Bishop M.G., 1999, Total petroleum systems of the Northwest Shelf, Australia--the Dingo-Mungaroo/Barrow and the Locker-Mungaroo/Barrow: U.S. Geological Survey Open-File Report 99-50-E; <http://energy.cr.usgs.gov/energy/WorldEnergy/OF99-50E/index.html>.

Scott, J., 1994, Source rocks of west Australian basins—distribution, character and models, *in* Purcell, P.G., and Purcell, R.R., eds., The sedimentary basins of Western Australia: Proceedings of Petroleum Exploration Society of Australia Symposium, Perth, 1994, p. 141-158.



**Dingo-Mungaroo/Barrow  
Assessment Unit - 39480101**

EXPLANATION

- Hydrography
- Shoreline
- 3948 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 39480101 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:.....	<u>11/24/98</u>		
Assessment Geologist:.....	<u>T.S. Ahlbrandt</u>		
Region:.....	<u>Asia Pacific</u>	Number:	<u>3</u>
Province:.....	<u>Northwest Shelf</u>	Number:	<u>3948</u>
Priority or Boutique:.....	<u>Priority</u>		
Total Petroleum System:.....	<u>Dingo-Mungaroo/Barrow</u>	Number:	<u>394801</u>
Assessment Unit:.....	<u>Dingo-Mungaroo/Barrow</u>	Number:	<u>39480101</u>
* Notes from Assessor	<u>Five percent islands in allocation.</u>		

**CHARACTERISTICS OF ASSESSMENT UNIT**

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

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:	<u>33</u>	Gas:	<u>30</u>
Established (>13 fields) <u>X</u>	Frontier (1-13 fields)	<u>          </u>	Hypothetical (no fields)	<u>          </u>

Median size (grown) of discovered oil fields (mmboe):

1st 3rd	<u>5</u>	2nd 3rd	<u>27</u>	3rd 3rd	<u>15</u>
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Median size (grown) of discovered gas fields (bcfg):

1st 3rd	<u>533</u>	2nd 3rd	<u>202</u>	3rd 3rd	<u>360</u>
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**Assessment-Unit Probabilities:**

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

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

4. <b>ACCESSIBILITY:</b> Adequate location to allow exploration for an undiscovered field ≥ minimum size.....	<u>1.0</u>
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**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)	<u>10</u>	median no.	<u>80</u>	max no.	<u>150</u>
Gas fields:.....min. no. (>0)	<u>10</u>	median no.	<u>120</u>	max no.	<u>200</u>

**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	<u>1</u>	median size	<u>14</u>	max. size	<u>600</u>
Gas in gas fields (bcfg):.....	min. size	<u>6</u>	median size	<u>200</u>	max. size	<u>10000</u>

**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).....	2000	3000	4000
NGL/gas ratio (bngl/mmcf).....	30	50	70
<u>Gas fields:</u>	minimum	median	maximum
Liquids/gas ratio (bngl/mmcf).....	40	60	80
Oil/gas ratio (bo/mmcf).....			

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**SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS**

(variations in the properties of undiscovered fields)

<u>Oil Fields:</u>	minimum	median	maximum
API gravity (degrees).....	16	43	55
Sulfur content of oil (%).....	0	0.1	0.32
Drilling Depth (m) .....	500	2000	4000
Depth (m) of water (if applicable).....	0	500	2000
<u>Gas Fields:</u>	minimum	median	maximum
Inert gas content (%).....			
CO <sub>2</sub> content (%).....			
Hydrogen-sulfide content (%).....			
Drilling Depth (m).....	900	2800	4500
Depth (m) of water (if applicable).....	0	500	2000

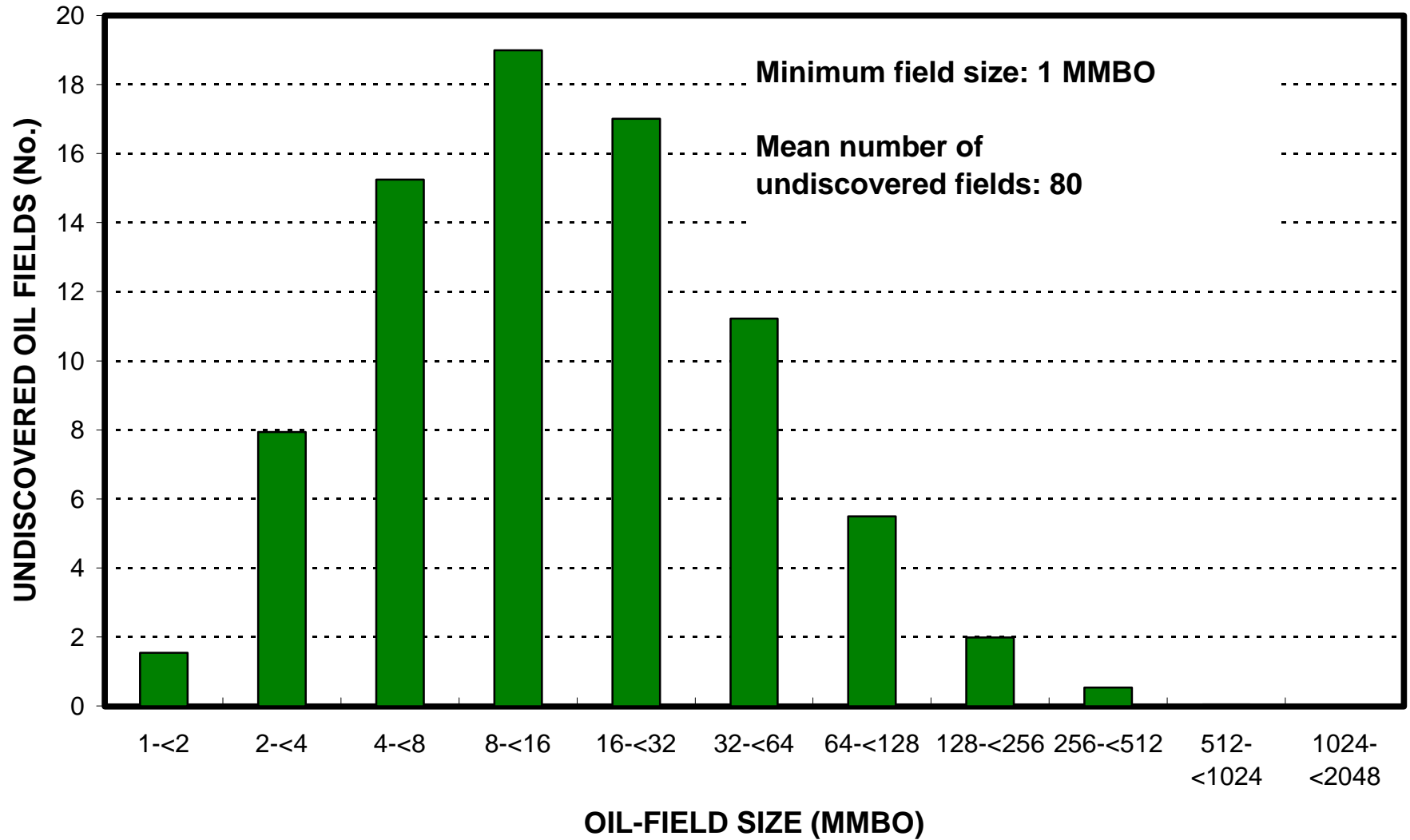
**ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT  
 TO COUNTRIES OR OTHER LAND PARCELS** (uncertainty of fixed but unknown values)

1. Australia 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%):.....	_____	95	_____
 <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%):.....	_____	95	_____

# Dingo-Mungaroo/Barrow, AU 39480101

## Undiscovered Field-Size Distribution





# Dingo-Mungaroo/Barrow, AU 39480101

## Undiscovered Field-Size Distribution

