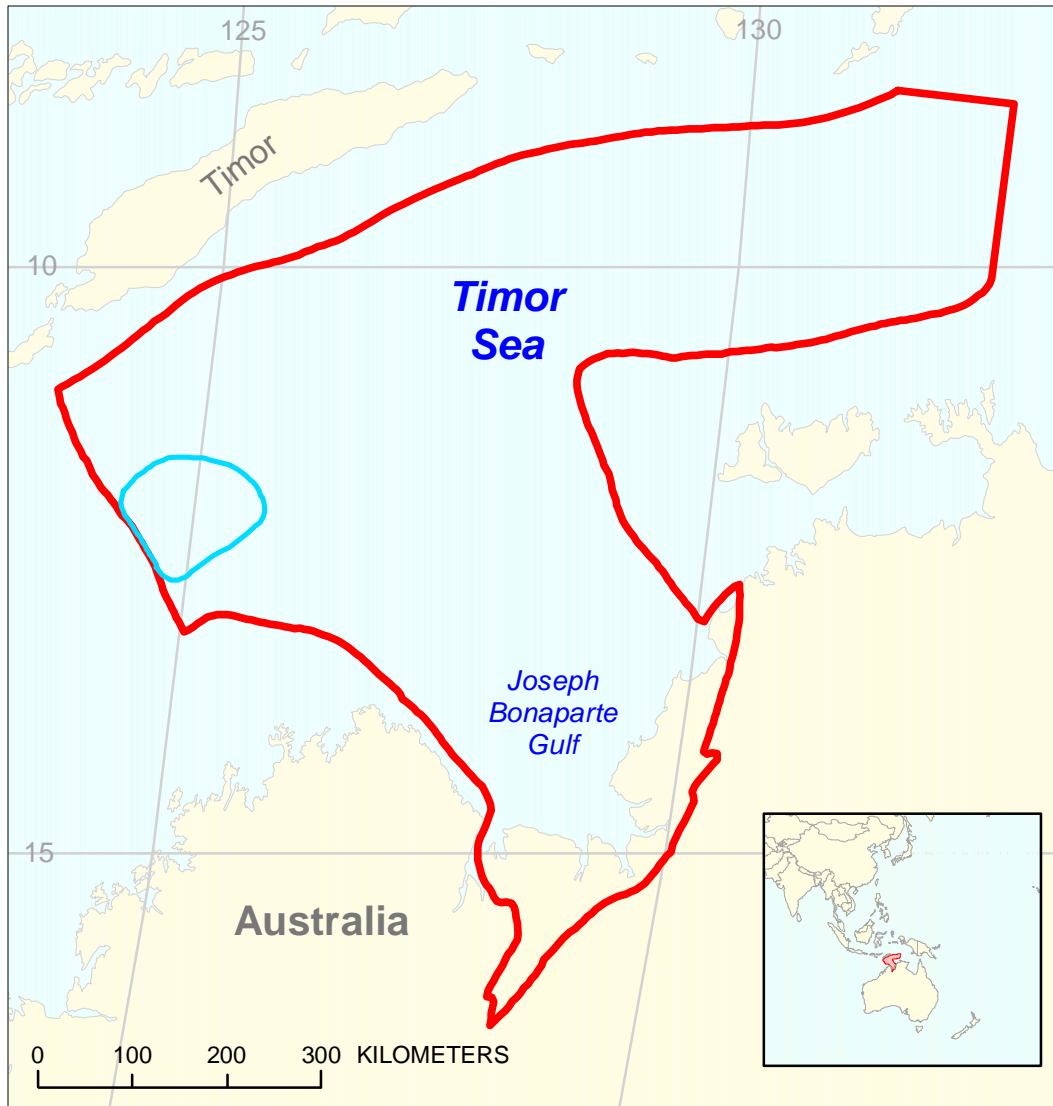




Vulcan Graben

Assessment Unit 39100202



-  Vulcan Graben Assessment Unit 39100202
-  Bonaparte Gulf Basin Geologic Province 3910

USGS PROVINCE: Bonaparte Gulf Basin (3910)

GEOLOGIST: M.G. Bishop

TOTAL PETROLEUM SYSTEM: Keyling/Hyland Bay-Permian (391002)

ASSESSMENT UNIT: Vulcan Graben (39100202)

DESCRIPTION: Hypothetical assessment unit of Permian source rocks under Mesozoic basin trend, offshore Australia.

SOURCE ROCKS: Basin-margin and marine source rocks equivalent to the Keyling and Hyland Bay formations; TOC 1 to 3 wt. %, HI 55 to 240.

MATURATION: Triassic maturation as area is buried under Mesozoic basin.

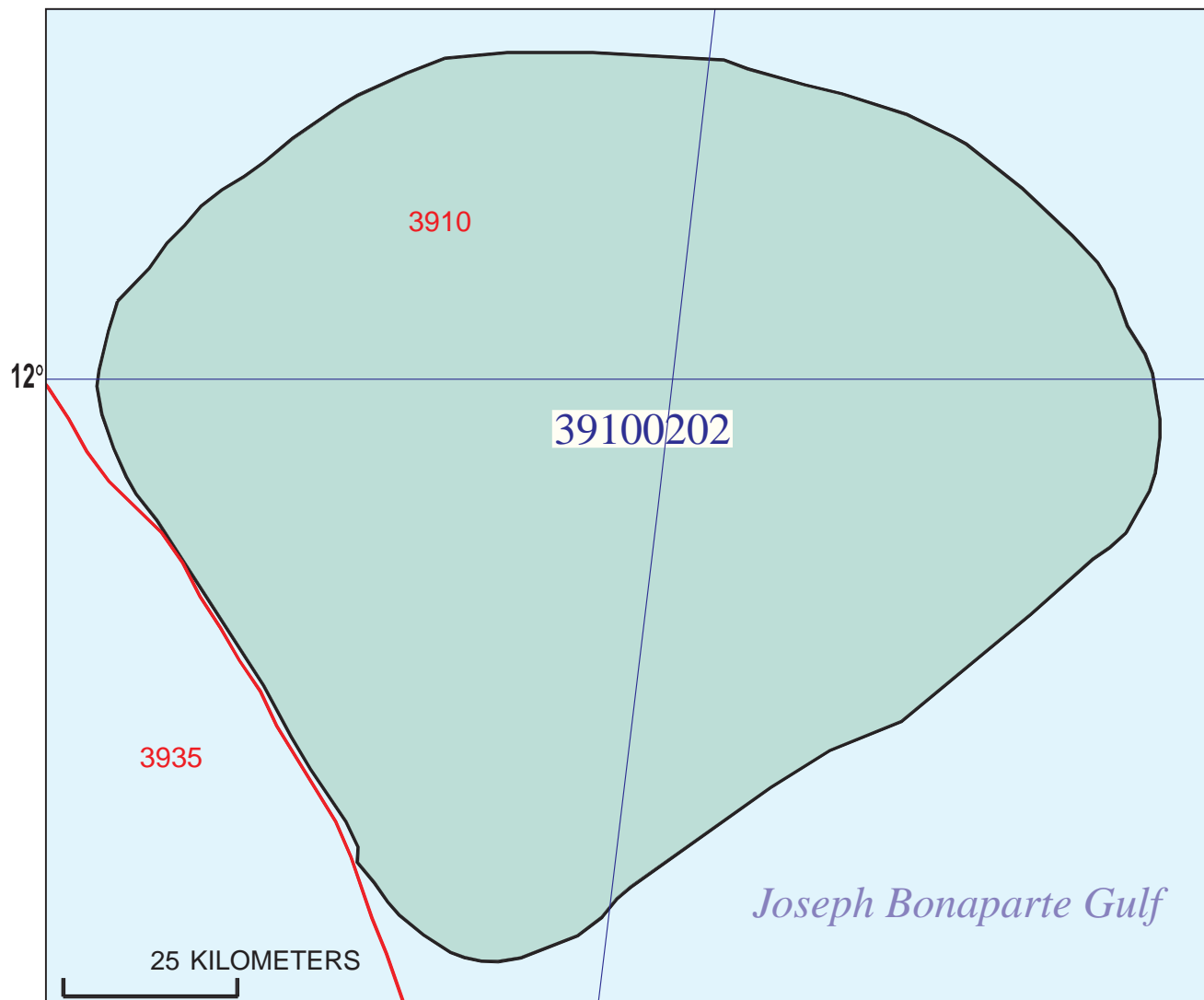
MIGRATION: Triassic and Cretaceous vertical migration along fault paths and with salt movement.

RESERVOIR ROCKS: Hypothetical reservoir rocks of shoreline, deltaic, shallow marine and possible deep marine of Permian age and younger. Possible overlying Mesozoic reservoirs.

TRAPS AND SEALS: Mostly fault-block traps formed by Mesozoic graben trend. Intraformational and post Permian regional seals expected. High risk of Mesozoic reactivation of previous traps. Perhaps unrecognized mixing with overlying Mesozoic petroleum system. Salt diapir traps possible.

REFERENCES:

- Pattillo, J. and Nicholls, P.J., 1990, Tectonostratigraphic framework for the Vulcan Graben, Timor Sea region: APEA Journal, v. 30, pt. 1, p. 27-51.
- Smith, P.M., and Sutherland, N.D., 1991, Discovery of salt in the Vulcan Graben—a geophysical and geological evaluation: APEA Journal, v. 31, pt. 1, p. 229-243.
- Woods, E.P., 1994, A salt-related detachment model for the development of the Vulcan sub-basin, *in* Purcell, P.G. and Purcell, R.R., eds., The sedimentary basins of Western Australia: Proceedings West Australian Basins Symposium, Perth, p. 259-274.



Vulcan Graben Assessment Unit - 39100202

EXPLANATION

- Hydrography
- Shoreline
- 3910 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 39100202 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:..... 3/25/99
 Assessment Geologist:..... T.S. Ahlbrandt
 Region:..... Asia Pacific Number: 3
 Province:..... Bonaparte Gulf Basin Number: 3910
 Priority or Boutique..... Priority
 Total Petroleum System:..... Keyling/Hyland Bay-Permian Number: 391002
 Assessment Unit:..... Vulcan Graben Number: 39100202
 * Notes from Assessor MMS growth factor.

CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?..... 10 mmmboe 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: 0 Gas: 0
 Established (>13 fields) _____ Frontier (1-13 fields) _____ Hypothetical (no fields) X

Median size (grown) of discovered oil fields (mmboe):
 1st 3rd _____ 2nd 3rd _____ 3rd 3rd _____
 Median size (grown) of discovered gas fields (bcfg):
 1st 3rd _____ 2nd 3rd _____ 3rd 3rd _____

Assessment-Unit Probabilities:

<u>Attribute</u>	<u>Probability of occurrence (0-1.0)</u>
1. CHARGE: Adequate petroleum charge for an undiscovered field ≥ minimum size.....	<u>1.0</u>
2. ROCKS: Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size.....	<u>0.9</u>
3. TIMING OF GEOLOGIC EVENTS: Favorable timing for an undiscovered field ≥ minimum size	<u>1.0</u>

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):..... 0.90

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) _____ median no. _____ max no. _____
 Gas fields:.....min. no. (>0) 1 median no. 7 max no. 20

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 _____ median size _____ max. size _____
 Gas in gas fields (bcfg):..... min. size 60 median size 250 max. size 5000

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).....	_____	_____	_____
NGL/gas ratio (bnl/mmcf).....	_____	_____	_____
 <u>Gas fields:</u>	 minimum	 median	 maximum
Liquids/gas ratio (bnl/mmcf).....	22	44	66
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).....	_____	_____	_____
Sulfur content of oil (%).....	_____	_____	_____
Drilling Depth (m)	_____	_____	_____
Depth (m) of water (if applicable).....	_____	_____	_____
 <u>Gas Fields:</u>	 minimum	 median	 maximum
Inert gas content (%).....	_____	_____	_____
CO ₂ content (%).....	_____	_____	_____
Hydrogen-sulfide content (%).....	_____	_____	_____
Drilling Depth (m).....	3300	3900	4500
Depth (m) of water (if applicable).....	90	110	130

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

Vulcan Graben, AU 39100202

Undiscovered Field-Size Distribution

