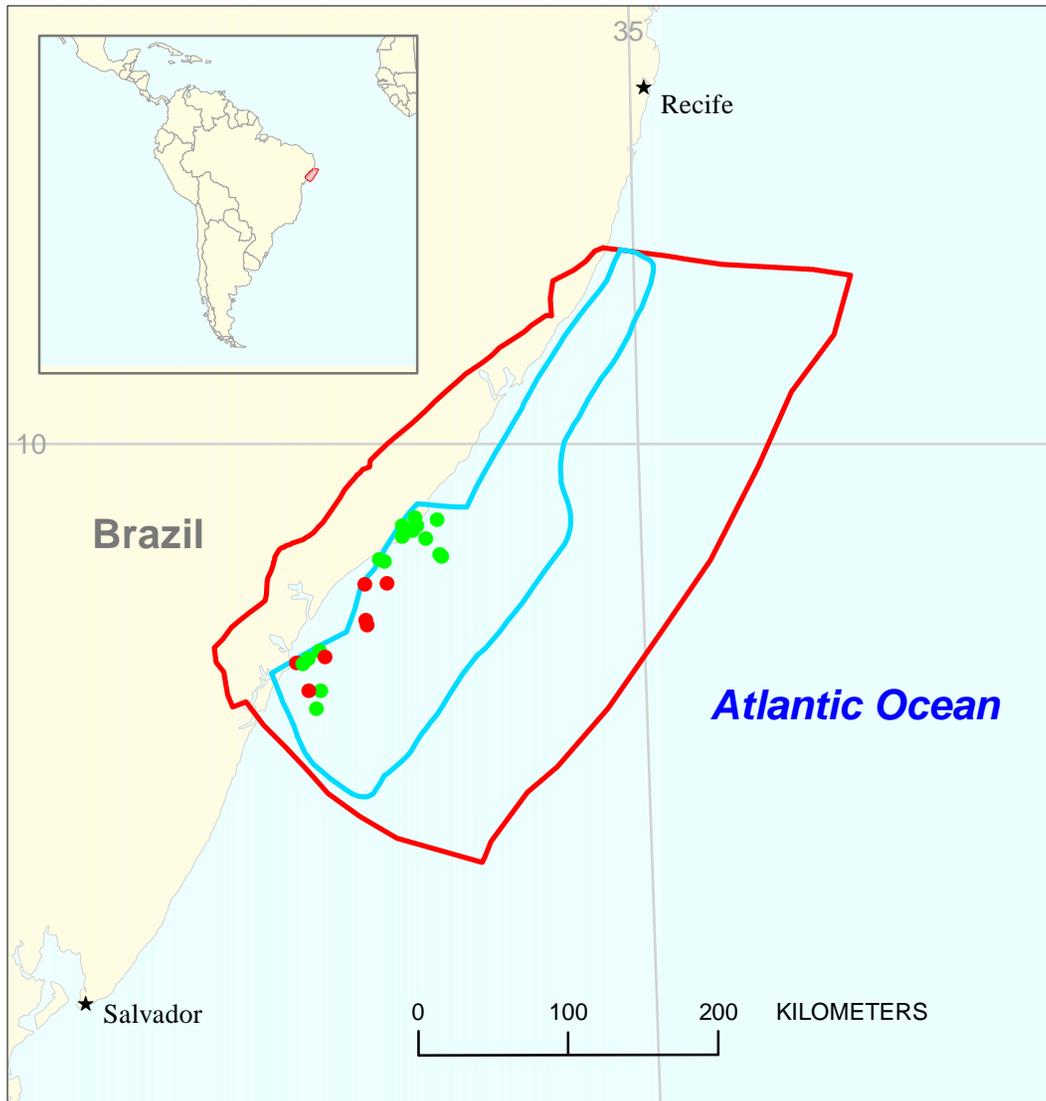


Late Cretaceous-Tertiary Deep-Water Sandstones Assessment Unit 60290102



 Late Cretaceous-Tertiary Deep-Water Sandstones Assessment Unit 60290102

 Sergipe-Alagoas Basin Geologic Province 6029

USGS PROVINCE: Sergipe-Alagoas Basin (6029)

GEOLOGIST: C.J. Schenk

TOTAL PETROLEUM SYSTEM: Neocomian to Turonian Composite (602901)

ASSESSMENT UNIT: Late Cretaceous-Tertiary Deep Water Sandstones (60290102)

DESCRIPTION: This assessment unit is defined by sandstone reservoirs deposited as turbidites in the deeper portion of the Sergipe-Alagoas Basin. The unit extends to the 3000 m isobath in the Sergipe, and to the 2000 m isobath in the Alagoas. The updip boundary is the Aptian hingeline.

SOURCE ROCKS: Source rocks are dominated by the proto-marine shales of the Aptian Ibura Formation (Sergipe sub-basin) and marine shales of the Albian-Turonian interval. Sources may be more mature areally in the Sergipe sub-basin.

MATURATION: Maturation is estimated to have peaked in the offshore area in the Miocene-Pliocene, given the thickness of section on seismic sections.

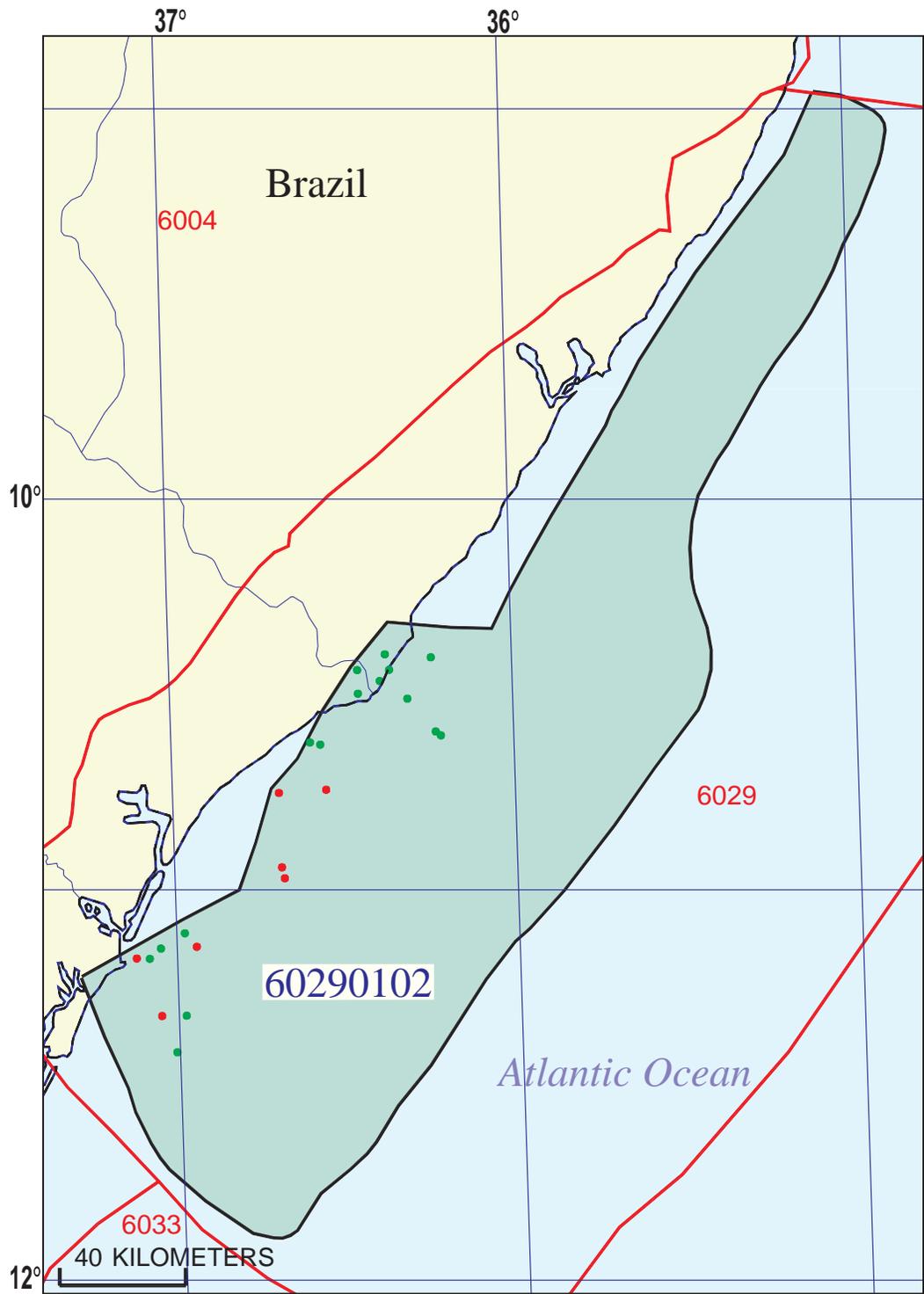
MIGRATION: Migration is estimated to be mainly vertical along listric faults and into the sandstone reservoirs, and locally into stratigraphically trapped reservoirs.

RESERVOIR ROCKS: Major reservoirs are Late Cretaceous and Lower Tertiary turbidite sandstones that were deposited as part of the San Francisco fluvial-deltaic-slope system in the Sergipe area.

TRAPS AND SEALS: Traps are mainly combination, as turbidite sandstones are juxtaposed along listric faults, and stratigraphic as turbidite sandstones are sealed by intraformational mudstones. Some salt structures are present in the updip part of the assessment unit.

REFERENCES:

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- Mello, M.R., Mohriak, W.U., Koutsoukos, E.A.M., and Bacoccoli, G., 1994, Selected petroleum systems in Brazil, *in* Magoon, L.B., and Dow, W.G., eds., The petroleum system—from source to trap: American Association of Petroleum Geologists Memoir 60, p. 499-512.
- Mohriak, W.U., Mello, M.R., Bassetto, M., Vieira, I.S., and Koutsoukos, E.A.M., 1997, Crustal structure, sedimentation, and petroleum systems in the Sergipe/Alagoas Basin, northeastern Brazil, *in* Mello, M., and Katz, B., eds., Petroleum Systems of the South Atlantic Margin: Hedberg Research Symposium, Extended Abstracts Volume, 5 p.



Lower Cretaceous-Tertiary Deep Water Sandstones Assessment Unit - 60290102

EXPLANATION

- Hydrography
- Shoreline
- 6029 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60290102 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:..... 11/23/99
 Assessment Geologist:..... C.J. Schenk
 Region:..... Central and South America Number: 6
 Province:..... Sergipe-Alagoas Basin Number: 6029
 Priority or Boutique:..... Boutique
 Total Petroleum System:..... Neocomian to Turonian Composite Number: 602901
 Assessment Unit:..... Late Cretaceous-Tertiary Deep-Water Sandstones Number: 60290102
 * 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?..... 4 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: 4 Gas: 1
 Established (>13 fields) Frontier (1-13 fields) X Hypothetical (no fields)

Median size (grown) of discovered oil fields (mmboe):
 1st 3rd 35.9 2nd 3rd 52.6 3rd 3rd
 Median size (grown) of discovered gas fields (bcfg):
 1st 3rd 35.9 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.....	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)	1	median no.	25	max no.	75
Gas fields:.....min. no. (>0)	1	median no.	15	max no.	35

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	4	median size	20	max. size	1800
Gas in gas fields (bcfg):.....min. size	24	median size	120	max. size	10800

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).....	<u>1100</u>	<u>2200</u>	<u>3300</u>
NGL/gas ratio (bngl/mmcf).....	<u>30</u>	<u>60</u>	<u>90</u>
<u>Gas fields:</u>	minimum	median	maximum
Liquids/gas ratio (bngl/mmcf).....	<u>22</u>	<u>44</u>	<u>66</u>
Oil/gas ratio (bo/mmcf).....	<u> </u>	<u> </u>	<u> </u>

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

<u>Oil Fields:</u>	minimum	median	maximum
API gravity (degrees).....	<u>25</u>	<u>40</u>	<u>50</u>
Sulfur content of oil (%).....	<u> </u>	<u> </u>	<u> </u>
Drilling Depth (m)	<u>1000</u>	<u>3000</u>	<u>6500</u>
Depth (m) of water (if applicable).....	<u>50</u>	<u>1000</u>	<u>3000</u>
<u>Gas Fields:</u>	minimum	median	maximum
Inert gas content (%).....	<u> </u>	<u> </u>	<u> </u>
CO ₂ content (%).....	<u> </u>	<u> </u>	<u> </u>
Hydrogen-sulfide content (%).....	<u>1500</u>	<u>3500</u>	<u>7000</u>
Drilling Depth (m).....	<u>50</u>	<u>1000</u>	<u>3000</u>
Depth (m) of water (if applicable).....	<u> </u>	<u> </u>	<u> </u>

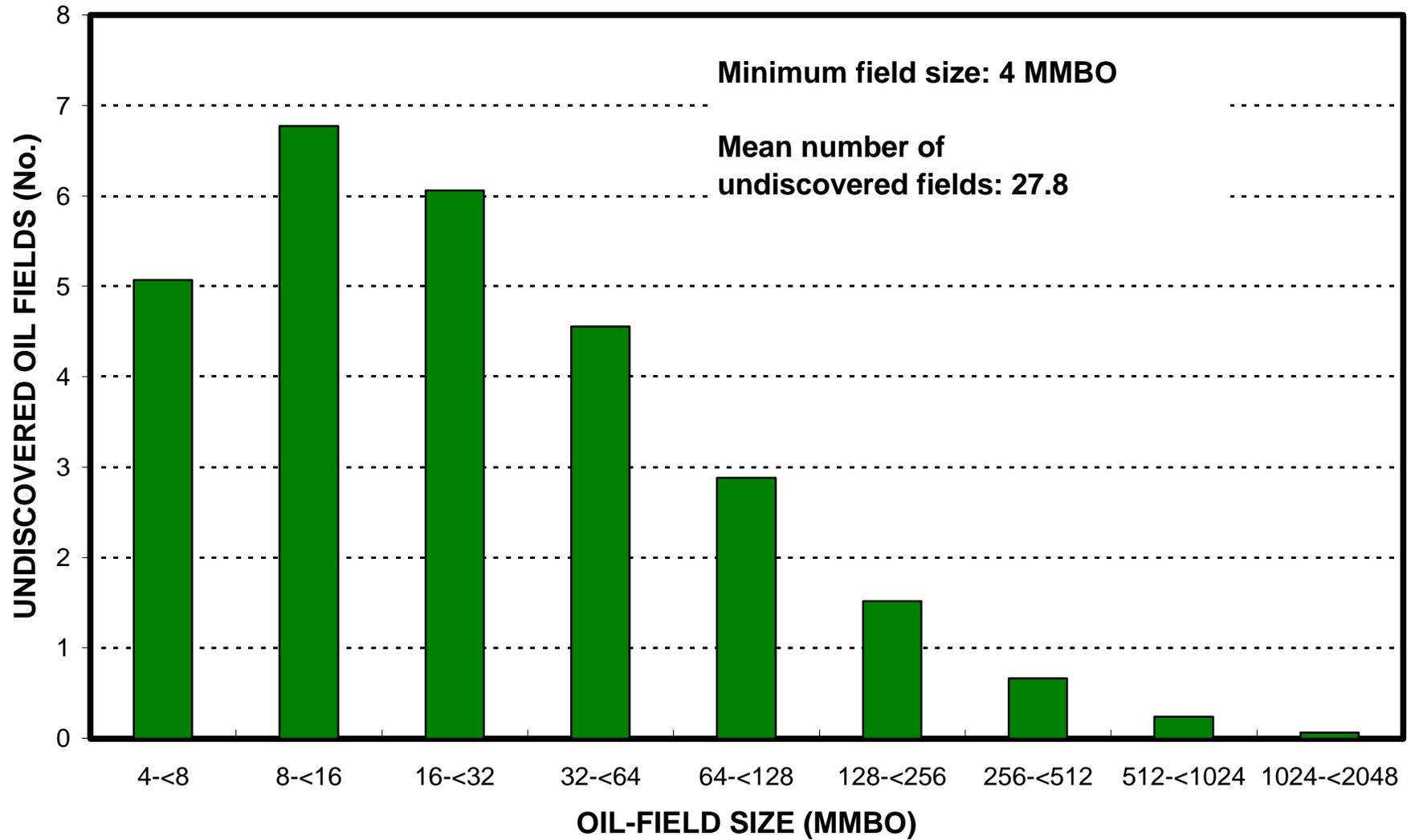
**ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT
 TO COUNTRIES OR OTHER LAND PARCELS** (uncertainty of fixed but unknown values)

1. Brazil 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):...	_____	<u>100</u>	_____
Portion of volume % that is offshore (0-100%):.....	_____	<u>100</u>	_____
<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>	_____

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Undiscovered Field-Size Distribution



Late Cretaceous-Tertiary Deep-Water Sandstones, AU 60290102

Undiscovered Field-Size Distribution

