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Guarico Sub-Basin
Assessment Unit 60980102

Guarico Sub-Basin Assessment Unit 60980102

East Venezuela Basin Geologic Province 6098

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USGS PROVINCE: East Venezuela Basin (6098) **GEOLOGIST:** C.J. Schenk

TOTAL PETROLEUM SYSTEM: Querecual (609801)

ASSESSMENT UNIT: Guarico Sub-Basin (60980102)

DESCRIPTION: This assessment unit encompasses the westernmost basin of East Venezuela, south of the fold and thrust belt. Much of the area is underlain by the Jurassic Espino Graben.

SOURCE ROCKS: The main source rocks are mudstones of the Upper Cretaceous Querecual Formation, a stratigraphic equivalent of the La Luna Formation.

MATURATION: Maturation of Querecual mudstones occurred in the Oligocene to Miocene to the north, and migration was to the south.

MIGRATION: Migration of Querecual hydrocarbons was mainly through sandstones and by-passed this area, but some hydrocarbons migrated up faults into Oligocene-Miocene reservoirs.

RESERVOIR ROCKS: Reservoirs are mainly fluvial-deltaic sandstones of the Oligocene and Miocene. Some reservoirs may be present in the fill of the Espino Graben.

TRAPS AND SEALS: Traps are mainly structural, and were formed as earlier structures were inverted during the fold and thrust events as collision took place to the north.

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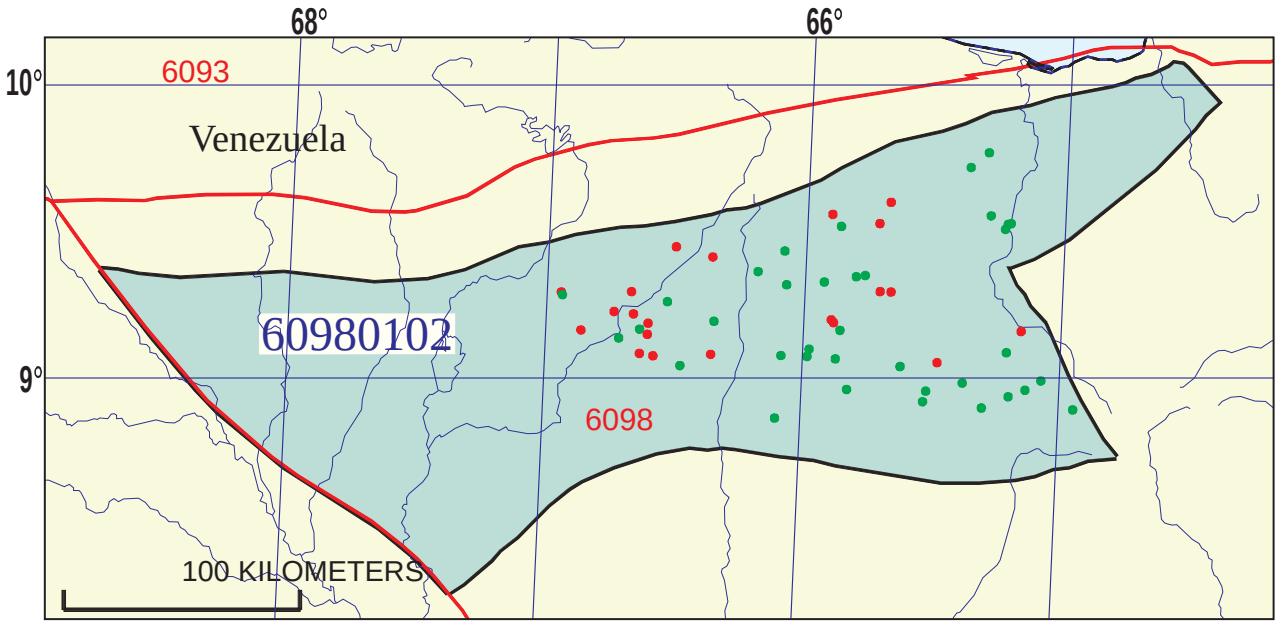
Erlich, R.N., and Barrett, S.F., 1992, Petroleum geology of the eastern Venezuela foreland basin, *in* Macqueen, R.W., and Leckie, D.A., eds., Foreland basins and fold belts: American Association of Petroleum Geologists Memoir 55, p. 341-362.

Lugo, J., and Audemard, F., 1997, Petroleum geology of Venezuela: American Association of Petroleum Geologists Short Course, Dallas, Texas, April 5-6, 1997, unpaginated.

Parnaud, F., Gou, Y., Pascual, J-C., Truskowski, I., Gallango, O., Passalacqua, H., and Roure, F., 1995, Petroleum geology of the central part of the eastern Venezuelan basin, *in* Tankard, A.J., Suarez S., R., and Welsink, H.J., eds., Petroleum basins of South America: American Association of Petroleum Geologists Memoir 62, p. 741-756.



Guarico Sub-Basin
Assessment Unit - 60980102

EXPLANATION

- Hydrography
- Shoreline
- 6098 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60980102 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:……..	7/6/99		
Assessment Geologist:……..	C.J. Schenk		
Region:……..	Central and South America	Number:	6
Province:……..	East Venezuela Basin	Number:	6098
Priority or Boutique……	Priority		
Total Petroleum System:……	Querecual	Number:	609801
Assessment Unit:……	Guarico Sub-Basin	Number:	60980102
* Notes from Assessor	Lower 48 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?……. 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: 17 Gas: 14

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
39	4.8	3.5

Median size (grown) of discovered gas fields (bcfg):

1st 3rd	2nd 3rd	3rd 3rd
47	62	16

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)	5	median no.	55	max no.	120
Gas fields:……min. no. (>0)	10	median no.	100	max no.	220

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	3	max. size	200
Gas in gas fields (bcfg):……min. size	6	median size	60	max. size	5000

Assessment Unit (name, no.)
Guarico Sub-Basin, 60980102

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	1000	2000	3000
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	35	50
Sulfur content of oil (%)……	0.1	0.5	1
Drilling Depth (m) ……	1000	2500	4500
Depth (m) of water (if applicable)……			

Gas Fields:	minimum	median	maximum
Inert gas content (%)……			
CO_2 content (%)……			
Hydrogen-sulfide content (%)……			
Drilling Depth (m)……	1000	3000	5500
Depth (m) of water (if applicable)……			

Assessment Unit (name, no.)
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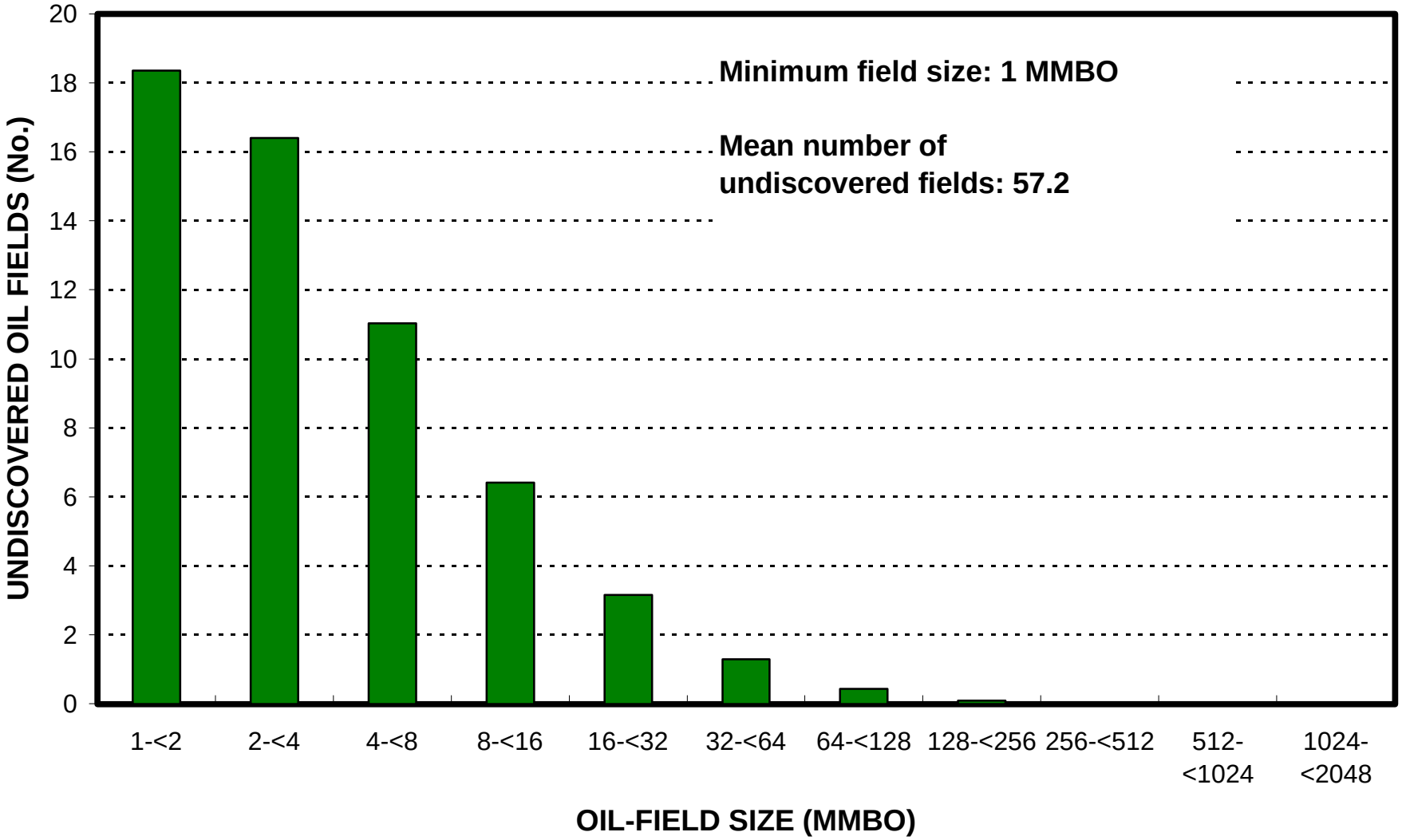
ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

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

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

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

Guarico Sub-Basin, AU 60980102
Undiscovered Field-Size Distribution



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Undiscovered Field-Size Distribution