Guarico Sub-Basin
Assessment Unit 60980102

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: East Venezuela Basin (6098) 

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 bypassed 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.

REFERENCES:
Guarico Sub-Basin
Assessment Unit - 60980102

EXPLANATION

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

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) X Frontier (1-13 fields) Hypothetical (no fields)

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 39 2nd 3rd 4.8 3rd 3rd 3.5
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 47 2nd 3rd 62 3rd 3rd 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
### AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

<table>
<thead>
<tr>
<th>Oil Fields:</th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas/oil ratio (cfg/bo)</td>
<td>1000</td>
<td>2000</td>
<td>3000</td>
</tr>
<tr>
<td>NGL/gas ratio (bngl/mmcfg)</td>
<td>30</td>
<td>60</td>
<td>90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gas fields:</th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquids/gas ratio (bngl/mmcfg)</td>
<td>22</td>
<td>44</td>
<td>66</td>
</tr>
<tr>
<td>Oil/gas ratio (bo/mmcfg)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

<table>
<thead>
<tr>
<th>Oil Fields:</th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>API gravity (degrees)</td>
<td>25</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>Sulfur content of oil (%)</td>
<td>0.1</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Drilling Depth (m)</td>
<td>1000</td>
<td>2500</td>
<td>4500</td>
</tr>
<tr>
<td>Depth (m) of water (if applicable)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gas Fields:</th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inert gas content (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO₂ content (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen-sulfide content (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drilling Depth (m)</td>
<td>1000</td>
<td>3000</td>
<td>5500</td>
</tr>
<tr>
<td>Depth (m) of water (if applicable)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th></th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oil in Oil Fields:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Richness factor (unitless multiplier):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume % in parcel (areal % x richness factor):</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Portion of volume % that is offshore (0-100%):</td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas in Gas Fields:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Richness factor (unitless multiplier):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume % in parcel (areal % x richness factor):</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Portion of volume % that is offshore (0-100%):</td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
Guarico Sub-Basin, AU 60980102
Undiscovered Field-Size Distribution

Minimum field size: 1 MMBO
Mean number of undiscovered fields: 57.2
Guarico Sub-Basin, AU 60980102
Undiscovered Field-Size Distribution

Minimum field size: 6 BCFG
Mean number of undiscovered fields: 104.3