Plays and New Hydrocarbon Potential in the Marañon Basin

December 2011
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1. Introduction
2. West Marañon Basin
3. Central Marañon Basin
4. East Marañon Basin
Peru is located within one of the most prolific hydrocarbon mega trends in South America: “The Sub Andean Megatrend”

1. Light oil areas in Western Marañon Basin
2. Heavy oil areas in Eastern Marañon Basin
3. Hydrocarbons Occurrence in Ucayali Basin
4. Camisea and Adjacent gas and condensate fields
5. Light oil areas in Tumbes and Talara Basins

Hydrocarbons producing areas with nearly 150 years of production history
<table>
<thead>
<tr>
<th>Basin</th>
<th>Cumulative</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCAYALI BASIN</td>
<td>31 MMBO</td>
<td>600 BOD</td>
</tr>
<tr>
<td></td>
<td>130 MMBO</td>
<td>82,000 BCD</td>
</tr>
<tr>
<td></td>
<td>0.8 TCFG</td>
<td>1,000 MMCFGD</td>
</tr>
<tr>
<td>TALARA BASIN</td>
<td>1,500 MMBO</td>
<td>40,000 BOD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 MMCFGD</td>
</tr>
<tr>
<td>MARAÑON BASIN</td>
<td>1,000 MMBO</td>
<td>30,000 BOD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30,000 BOD</td>
</tr>
</tbody>
</table>
9 Forearc, along the coast.
7 Foreland, on the jungle and the folded & thrust belt.
2 intermountain

83 MM ha (320.4 M sq miles):
- 42 MM ha (162.1 M sq miles) Under exploration
- 2.5 MM ha (9.6 M sq miles) Under exploitation
- 23.2 MM ha (89.5 M sq miles) Available
- 0.8 MM ha (3.0 M sq miles) Under TEA
- 8.3 MM ha (32.0 M sq miles) Intangible
- 5.8 MM ha (22.3 M sq miles) Blocks suspended
LAST YEARS HC DISCOVERIES

1. Situche
   Lote 64 - Talisman
   2005 Light oil

2. San Pedro
   L Z2B - Savia
   2005 Light oil

3. Buenavista
   L 39 - Repsol
   2005 Heavy oil

4. Raya 3X
   L 39 - Repsol
   2006 Heavy oil

5. Delfín 2X
   L 39 - Repsol
   2006 Heavy oil

6. Kinteroni
   L57 - Repsol
   2007 Gas/condensates

7. Esperanza
   L Z6 - Savia
   2007 Light oil

8. San Francisco
   L Z2B - Savia
   2008 Gas

9. Urubamba
   L58 - Petrobras
   2005 Gas/condensates

10. Santa Rosa
    L 31 E - Maple
    2009 None convencional gas

11. Picha - L 58
    L58 - Petrobras
    2010 Gas/condensates

12. Taini - L 58
    L58 - Petrobras
    2011 Gas/condensates

13. Mipaya
    L56 - Pluspetrol
    2011 1st. Gas/condensates in limestones

**Type of Hydrocarbons**

1. Light Oil
2. Heavy Oil
3. Gas / Condensate
4. None conventional Gas

**Total Count**

1. Light Oil: 3
2. Heavy Oil: 3
3. Gas / Condensate: 6
4. None conventional Gas: 1
1. Light Oil Trend and deep targets in West Marañon

2. Gentle structures and production in Central Marañon

3. Heavy Oil and Subsurface series of uplifts in East Marañon
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PRODUCTIVE AREAS IN MARAÑON BASIN

### Available Areas

<table>
<thead>
<tr>
<th>Type</th>
<th>West Marañon</th>
<th>Central Marañon</th>
<th>East Marañon</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Areas</td>
<td>2.0</td>
<td>4.8</td>
<td>0.1</td>
<td>15.9</td>
</tr>
<tr>
<td>MM ha</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M sq Miles</td>
<td>7.7</td>
<td>10.5</td>
<td>35.1</td>
<td>61.3</td>
</tr>
</tbody>
</table>

**Regions:**
- **SITUCHE CENTRAL 2X**
- **TANGUINTZA**
- **SHANUSI**

**Trends:**
- **Light Oil Trend** Blocks 1AB & 8
- **Heavy Oil Trend** ITT

**Map Details:**
- Scale: 100Km (62.1millas)

**Countries:**
- **ECUADOR**
- **COLOMBIA**
- **BRASIL**
THE WEST MARAÑON BASIN

Seismic Data (Km) 7,479.304
New Play Prospects 3

2005 Situche Light Oil Discovery
Tanguintza Gas & Cond Test
Shanusi 1X gas shows

Wells
- Seismic
- Pipeline
- Available Areas

100 Km
62.1 millas

ECUADOR

The National Agency of Hydrocarbons
REGIONAL CROSS SECTION IN MARAÑON BASIN

- Santiago Basin
- Marañon Basin
- Iquitos Arch
- Guyana Field

- Light Oil Trend
- Medium Oil Trend
- Heavy Oil Trend

Geology & Geophysics Group – Perupetro 2007 – Modified Section

Caterpiza 1X
Situche 2X/3X
Tambo Sur 1X
Piraña 1X
Raya 1X

Situche Complex
Three Untested Plays

- Tertiary Pozo Basal
- Cretaceous Vivian
- Cretaceous Chonta
- Jurassic Sarayaquillo
- Triass-Jurassic Pucará

New Play 1
New Play 2
New Play 3
Historic Play
The Situche Complex is a series of roll-over anticlines formed in a hemigraben, extensional setting, developed along listric normal faults during the late Cretaceous.
THE SITUCHE COMPLEX STRUCTURE

The National Agency of Hydrocarbons

TERTIARY CRETACEOUS

POZO

TD @ 9822' in Chambira Fm.

CUSHABATAY

LOWER VIVIAN

TD @ 19,343' in Cushabatay Fm

Situche Central

Situche Norte

Prog. TD @ 17,717' in Chonta Lst.

VIVIAN INFERIOR

CUSHABATAY

POZO
Oil Discovery in 2005

Situche Central 2X well
2,400 BOPD, restricted rate, 35° Api to 4,500 BOPD fluent to surface, Vivian Fm.

Situche Central 3X well
5,200 Bpd, restricted rate, 36° Api to 7,600 BOPD fluent to surface, Lower Vivian Fm., with 6,860 psi reservoir pressure.

Shanusi 1X well (4487 m)
17 m Gas & Condensate shows, top Jurassic Pucará (scPS)
Seismic line PK-2005 shows a lead in the Cretaceous and Pre-Cretaceous sections.
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The National Agency of Hydrocarbons

Seismic data (Km) 19,815
Number of Exploratory Wells 22
Magnetometry-Gravimetry (Km) 34,654

THE CENTRAL MARAÑON BASIN

- Wells
- Seismic Pipeline
- Undrilled structure
- Available Areas

50Km
31.5millas
These structures were drilled by the Chambira-1X and Tigrillo wells respectively. The Chambira 1X well drilled to the Agua Caliente Formation, the Cushabatay remains Untested. The Tigrillo-1X well drilled to the Cushabatay Formation, oil shows while drilling and a Net pay interval where identified in the logs of the Cushabatay Formation, but the Cushabatay was not tested because of operational problems.
Seismic Line PE-01-12, Guineayacu Prospect

The Guineayacu structure is the southernmost closure of the Chambira-Tigrillo-Guineayacu trend. The anticline was drilled by the Guineayacu-1X well to the Cushabatay Formation. A DST in the Cushabatay Formation recovered light oil. According to petrophysical evaluations the well structure has 18 meters of oil column.
The Urituyacu structure is a 10 kilometers long anticline partially defined by five 2D seismic lines. It has an area of more than 50 km² and a vertical closure of more than 24 meters. The Uritoyacu is downdip to the oil bearing Guineayacu structure.
Seismic Line GT-V, Ungumayo Prospect

The Ungumayo structure has been mapped with 8 2D seismic lines. Ungumayo is located along the migration pathway from the Marañon Basin depocenter kitchen to the Tigrillo closure. The structure, seem to have been formed before Pliocene times.
Seismic Line PHI-19
the Cuinico North Prospect

- “A” structure: 14.8 KM2 4-way dip closure in the Chonta
- “B” structure: 16.5 KM2 4-way dip closure in the Chonta
- Regional seals proven (Pozo, Yahuarango)
- Excellent reservoir quality proven in the area (Corrientes, Chambira, Pavayacu Fields)
Seismic Line SU-89-07, showing the Sungaruyacu Prospect
Diana Mae Prospect in the Seismic Line PP10608-37

4.1 km² of 4-way dip closure in the Chonta; minor 4-way in the Vivian. Regional seal proven (Pozo)
Excellent reservoir quality proven in the area (Corrientes, Chambira, Pavayacu Fields)
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### The East Marañón Basin

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<th>Survey Type</th>
<th>Distance (Km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluvial 2D Seismic Data</td>
<td>596.9</td>
</tr>
<tr>
<td>Aerogravimetry, Gradiometry &amp; Magnetometry (Km)</td>
<td>16578.7</td>
</tr>
</tbody>
</table>

The map illustrates the geographic extent of the East Marañón Basin, with markers indicating the locations of wells, seismic data, and available areas. The boundary of the basin is delineated by COLOMBIA, ECUADOR, and BRASIL, with a scale of 100Km and 62.1 millas for navigation.
THE EAST MARAÑON BASIN

Satellite Gravimetric map (Source: SAGP).
Aerogradiometry Map (Aero Gravimetry - Source Petrobras). Note the best resolution than in the Regional Bouguer Gravimetric map to define the structural grain.
Bouger Gravity Map (gD). In red color (dash lines) possible intrusive from magnetic map. In green color (continue lines) alignment interpreted from gravity maps.
THE EAST MARAÑON BASIN

BLOCK 39 - REPSOL

[Map of the East Marañon Basin showing the location of Block 39 and Repsol's activities, including markers for drilling sites, seismic operations, and other geological features.]
The more than 25 km long structure defined by the seismic in block 39 is an excellent project for heavy oils.
Connection in real time
1. All seismic, well data and logs and technical reports available

2. To be downloaded immediately

3. Information and data free of cost

Thank you very much