International Bidding Round No. PERUPETRO-003-2014

Hydrocarbon Opportunities in 7 Blocks Subandean Basins

December, 2014
AGENDA

1. GENERAL REMARKS
2. MARANON BASIN
3. UCAYALI BASIN
4. MADRE DE DIOS BASIN
# 1. Peru, An Underexplored Country

## Exploratory wells in 4 Basins

<table>
<thead>
<tr>
<th>BASINS</th>
<th>Exploratory wells</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talara</td>
<td>1,299</td>
<td>84.68</td>
</tr>
<tr>
<td>Marañón</td>
<td>115</td>
<td>7.50</td>
</tr>
<tr>
<td>Ucayali</td>
<td>59</td>
<td>3.85</td>
</tr>
<tr>
<td>Sechura</td>
<td>24</td>
<td>1.56</td>
</tr>
<tr>
<td>Tumbes-Progreso</td>
<td>13</td>
<td>0.85</td>
</tr>
<tr>
<td>Santiago</td>
<td>7</td>
<td>0.46</td>
</tr>
<tr>
<td>Madre de Dios</td>
<td>6</td>
<td>0.39</td>
</tr>
<tr>
<td>Trujillo</td>
<td>4</td>
<td>0.26</td>
</tr>
<tr>
<td>Titicaca</td>
<td>4</td>
<td>0.07</td>
</tr>
<tr>
<td>Pisco</td>
<td>1</td>
<td>0.07</td>
</tr>
<tr>
<td>Huallaga</td>
<td>1</td>
<td>0.00</td>
</tr>
<tr>
<td>Lima</td>
<td>1</td>
<td>0.00</td>
</tr>
<tr>
<td>Mollendo</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Salaverry</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Moquegua</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Bagua</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Ene</td>
<td>0</td>
<td>0.00</td>
</tr>
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**Total Exploratory wells:** 1,534  **% Total:** 100.00

**98% Exploratory wells in 4 Basins**

- Talara
- Marañón
- Ucayali
- Sechura
- Tumbes-Progreso
- Santiago
- Madre de Dios
- Trujillo
- Titicaca
- Pisco
- Huallaga
- Lima
- Mollendo
- Salaverry
- Moquegua
- Bagua
- Ene
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<thead>
<tr>
<th>№</th>
<th>Year</th>
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<tbody>
<tr>
<td>1</td>
<td>2004</td>
<td>Chimú</td>
<td>Gas</td>
</tr>
<tr>
<td>2</td>
<td>2004</td>
<td>Chavin</td>
<td>Gas</td>
</tr>
<tr>
<td>3</td>
<td>2004</td>
<td>Chira</td>
<td>Gas</td>
</tr>
<tr>
<td>4</td>
<td>2005</td>
<td>Situche C. 2X</td>
<td>Light oil</td>
</tr>
<tr>
<td>5</td>
<td>2005</td>
<td>San Pedro 1X</td>
<td>Light oil</td>
</tr>
<tr>
<td>6</td>
<td>2005</td>
<td>Buena Vista</td>
<td>Oil</td>
</tr>
<tr>
<td>7</td>
<td>2006</td>
<td>Raya 3X</td>
<td>Oil</td>
</tr>
<tr>
<td>8</td>
<td>2006</td>
<td>Delfín 2X</td>
<td>Oil</td>
</tr>
<tr>
<td>9</td>
<td>2007</td>
<td>La Isla</td>
<td>Light oil</td>
</tr>
<tr>
<td>10</td>
<td>2007</td>
<td>San Pedro Este</td>
<td>Gas</td>
</tr>
<tr>
<td>11</td>
<td>2007</td>
<td>Carmen Noreste</td>
<td>Oil</td>
</tr>
<tr>
<td>12</td>
<td>2007</td>
<td>Kinteroni</td>
<td>Gas &amp; Condensate</td>
</tr>
<tr>
<td>13</td>
<td>2008</td>
<td>Esperanza</td>
<td>Light oil</td>
</tr>
<tr>
<td>14</td>
<td>2008</td>
<td>San Francisco</td>
<td>Gas</td>
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<tr>
<td>15</td>
<td>2008</td>
<td>Urubamba</td>
<td>Gas &amp; Condensate</td>
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<tr>
<td>16</td>
<td>2009</td>
<td>Santa Rosa</td>
<td>Gas No Convencional</td>
</tr>
<tr>
<td>17</td>
<td>2010</td>
<td>Santa Teresa</td>
<td>Gas</td>
</tr>
<tr>
<td>18</td>
<td>2010</td>
<td>Picha</td>
<td>Gas &amp; Condensate</td>
</tr>
<tr>
<td>19</td>
<td>2011</td>
<td>Taini</td>
<td>Gas &amp; Condensate</td>
</tr>
<tr>
<td>20</td>
<td>2011</td>
<td>Mipaya</td>
<td>Gas &amp; Condensate</td>
</tr>
<tr>
<td>21</td>
<td>2012</td>
<td>Boa</td>
<td>Oil (21ºAPI)</td>
</tr>
<tr>
<td>22</td>
<td>2012</td>
<td>Sheshea</td>
<td>Light oil</td>
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<tr>
<td>23</td>
<td>2013</td>
<td>Bretaña Norte</td>
<td>Oil (18ºAPI)</td>
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<tr>
<td>24</td>
<td>2013</td>
<td>San Martín Este</td>
<td>Gas &amp; Condensate</td>
</tr>
<tr>
<td>25</td>
<td>2013</td>
<td>Los Ángeles</td>
<td>Light oil</td>
</tr>
</tbody>
</table>
Contract Blocks Map to November 2014 and Available Areas

46 Exploration Contracts
24 Exploitation Contracts
International Bidding Round 2014: 7 Blocks

2 Blocks Marañón basin
4 Blocks Ucayali basin
1 Block Madre de Dios basin
## Size of the Blocks

<table>
<thead>
<tr>
<th>N°</th>
<th>N° Block</th>
<th>Basin</th>
<th>Region</th>
<th>Extension (ha)</th>
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<tbody>
<tr>
<td>1</td>
<td>164</td>
<td>Marañón</td>
<td>Loreto</td>
<td>638,651.76</td>
</tr>
<tr>
<td>2</td>
<td>199</td>
<td>Marañón</td>
<td>Loreto</td>
<td>474,129.66</td>
</tr>
<tr>
<td>3</td>
<td>169</td>
<td>Ucayali</td>
<td>Ucayali</td>
<td>491,892.24</td>
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<tr>
<td>4</td>
<td>189</td>
<td>Ucayali</td>
<td>Ucayali</td>
<td>681,821.78</td>
</tr>
<tr>
<td>5</td>
<td>175</td>
<td>Ucayali</td>
<td>Ucayali - Junín</td>
<td>514,800.75</td>
</tr>
<tr>
<td>6</td>
<td>195</td>
<td>Ucayali</td>
<td>- Huánuco -</td>
<td>340,703.42</td>
</tr>
<tr>
<td>7</td>
<td>187</td>
<td>Madre de Dios</td>
<td>Madre de Dios</td>
<td>408,116.45</td>
</tr>
</tbody>
</table>

**Total**: 3’550,116.06

**Average**: 507,159.44
<table>
<thead>
<tr>
<th>AGEND</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. GENERAL REMARKS</td>
<td></td>
</tr>
<tr>
<td>2. MARANON BASIN</td>
<td></td>
</tr>
<tr>
<td>3. UCAYALI BASIN</td>
<td></td>
</tr>
<tr>
<td>4. MADRE DE DIOS BASIN</td>
<td></td>
</tr>
</tbody>
</table>
Blocks for Bidding in Marañón Basin

Blocks 164 and 199
Petroleum Trends in Marañón Basin

- **Heavy oil**
- **Light oil Discovery in 2005 - Situche**
- **Gas & condens. Test in Tanguintza**
- **Gas & cond shows in Shanusi**

**Map Details:**
- ECUADOR
- COLOMBIA
- BRASIL
- Petroleum trends highlighted in specific blocks.

**Markings:**
- **ITT**
- **Oil Production Block 1AB & 8**

**Distances:**
- 0 km, 250 km, 350 km markers.
Historic Play

New Play 3

New Play 2

New Play 1
Regional Settings Marañón Basin

Lote 164  Lote 199
Petroleum System in the Maranon Basin
Seismic lines in Blocks 164 and 199
Seismic line 128-002, over the Iquitos Arch

- PEBAS
- CHAMBIRA (256 m)
- POZO (628 m)
- VIVIAN (802 m)
- BASEMENT (990 m)

Layers:
- Tertiary
- Cretaceous
- Basement
Camello West and Camello East non drilled Prospects located in the medium oil gravity production trend of the Marañón Basin in Block 164
The main objectives are **Cushabatay, Agua Caliente, Chonta and the Vivian formation**.

The regional seals are **Raya and Chonta** formation. The **Yahuarango** formation is a seal proven for the Maranon basin, and **Pozo Shale** formation provides an additional seal for the Pozo Sand formation.

The Maranon basin has two proven petroleum systems **Chonta / Chonta-Vivian** in the north, and **Pucará / Chonta-Vivian** in the south, which generated and entrapped important oil accumulations. Other two potential petroleum systems are the **Pozo Shale/ Pozo Sand** and **Pucara / Sarayaquillo**, which could extend from the Santiago basin to the Maranon basin.

The Marañón basin has three production trends NW-SE: a **light oil** to the **West**, a **medium oil** in the **central part** of the Basin and a **heavy oil** to the **east of the basin**. All these areas have excellent opportunities for hydrocarbons exploration. There are undrilled prospects and leads identified in each production trend.
AGEND

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Blocks 169, 175 & 189 in the foreland, Eastern flank of the basin.

Block 195, close to the TFB, in the inner part of the basin
Source rocks in the Ucayali Basin

**Pucara Source:** (Jurassic-Triassic)

Very good oil source rock: oil prone
T.O.C. values as high as 14%
Mostly over mature in outcrops.
Source of the oil from Block 8, Maquia and Pacaya fields.

**Ene Source:** (Permian)

Excellent oil source rock: oil prone
Lacustine – kerogen type II & III
Common T.O.C. values: 3 – 6%
Source of Agua Caliente field.

**Ambo Source:** (Mississippian)

Excellent gas source rock with locally some minor oil potential
Common T.O.C. values >10%
Source of Camisea and probable Aguaytia gas fields.
Potential Reservoirs in Ucayali Basin
Gas & Condensate Discoveries in South Ucayali Basin

<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
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<tbody>
<tr>
<td>KINTERONI</td>
<td>2007</td>
</tr>
<tr>
<td>URUBAMBA</td>
<td>2009</td>
</tr>
<tr>
<td>PICHA</td>
<td>2010</td>
</tr>
<tr>
<td>TAINI - SAGARI</td>
<td>2011-2012</td>
</tr>
</tbody>
</table>
Hydrocarbon Discoveries Ucayali Basin

- **Aguaytia 1X**
- **Agua Caliente 1X**
- **Los Angeles 1X**
- **Sheshea 1X**
- **San Martín 1X**
- **Urubamba 1X**
- **Cashiriari 1X**
- **Kinteroni 1X**
- **Mipaya 1X**

**Petróleo y gas en Fm Cushabatay y Shows en las Ars, Verdes**

**Fm. Chonta, 1430 Bls, 53° API. Fm. Agua Caliente, 80 Bbs, 42° API. Show in Copacabana.**

**Producción Inicial 2181 BOPD, 45°API Fm. Cushabatay.**

**Gas y Condensados en Reservorios Cretácicos.**

**Gas y Condensados en Reservorios Cretácicos.**

**Gas y Condensados en Reservorios Cretácicos.**

**Gas y Condensados en Reservorios Cretácicos.**

**Gas y Condensados en Reservorios Cretácicos.**
Recent Discovery near Blocks 169, 175 y 189

New Field Well Sheshea. Fm. Chonta, 1430 BOPD, 53° API. Fm. Agua Caliente, 80 BOPD, 42° API. Shows in Copacabana.
Recent Discovery near Block 195

New Field  Well Los Ángeles. Initial Production 2181 BOPD, 45° API Fm. Cushabatay.
Structural Traps in the Ucayali Basin

Lateral Ramps Block 195

San Matías Thrust

Base Cretaceous Unconformity

Triangle Zone

Lateral Ramp

San Matías Thrust

Intra-Oriente Gp

Hanging Wall

Sarayaquillo

Mitú

LK

Copacabana

Cabanillas

Late Nevadan Thrust System

Linea sísmica 1070724 (Gran Tierra, 2011)
Pre Cretaceous Play in the Ucayali Basin

Pre Cretaceous Play Block 195
Seismic sections showing the structural configuration of W-E Seismic Line Rep-02-05 that shows the **Chipani Prospect Block 175**.

Seismic Line Rep-02-09 that shows the **Chipani South Prospects Block 175**.
Seismic sections showing the structural configuration of Cohengo Prospect.

Base map showing the location of 34 REP 99-114 seismic line.

Source: Repsol
• The eastern side of the Ucayali Basin presents a high potential associated to the "inverted eastern Corridor", where structural and stratigraphic traps are developed.

• The western side of the Ucayali Basin present many possibilities for hydrocarbon exploration with structural traps type Camisea.

• Exploration targets correspond mainly to Cretaceous sandstones and also the Permian sandstone, an the Green Sandstone of Tarma Formation.

• After Camisea discovery and the eolian sandstone reservoirs producing, the occurrence of a correlationable section can be interpreted in the area.
AGEND

1. GENERAL REMARKS
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4. MADRE DE DIOS BASIN
Regional Section in Madre de Dios Basin

- **Blocks under contract**
- **Blocks under bidding**
- **Wells**

Cord. Oriental
- **Azulmayo thrust**
- **Nusiniscato Syncline**
- **Punquiri Syncline**

Subandean zone
- **Inambari thrust**

Foreland basin
- **Tambopata thrust**

Subandean zone
- **Punquiri Syncline**

- **Block 187**

**Figure 1** Generalized section of Madre de Dios basin. View located in Figure 1

**Figure 2** Generalized section of Madre de Dios basin. View located in Figure 1

- **01 block in Exploration (76 operated by HUNT OIL)**
Seismic lines in Block 187
Rio Cariyacu 1X well: evidenced fluorescence in Vivian formation and Copacabana group.

Los Amigos 2X well: evidenced 35° API in Ambo and Tarma (Green SS) groups.

Camisea Field: reservoirs in sandstones of Permian and Cretaceous age.

Quebrada Petróleo: evidenced 35° API in Vivian formation

Alto Manu river

Alto Pinquen stream

Gallinazos stream

Pongo de Coñec

Espirene stream

Pando 1X well: evidenced 34° API in Upper devonian.

Puerto Primo 2X well: evidenced 45° API in Cabanillas Group.

Pariamanu 1X well: evidenced 53° API in Tarma group.

Karene 3X well: hanged

Candamo Field: Discovered of gas / condensates of the Lower Nia formation.
<table>
<thead>
<tr>
<th>Age</th>
<th>Lithology</th>
<th>Group/Formation</th>
<th>Tectono / Stratigraphic</th>
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<tbody>
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<td>Cenozoic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quaternary</td>
<td></td>
<td>Pagorene aprox 0-300m</td>
<td>Foreland and Piggyback basin fill</td>
</tr>
<tr>
<td>Pliocene</td>
<td></td>
<td>“Upper” Ipururo Gp aprox 1200m</td>
<td></td>
</tr>
<tr>
<td>Miocene</td>
<td></td>
<td>“Lower” Ipururo Gp aprox 1400m</td>
<td>Upper structural competent unit</td>
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<tr>
<td>Oligocene</td>
<td></td>
<td>Chambira Fm. aprox 1600m</td>
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<tr>
<td>Eocene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paleocene</td>
<td></td>
<td>Huayabamba Fm. aprox 1000-1500m</td>
<td>Zone of detachment tectonics and duplexing</td>
</tr>
<tr>
<td>Cretaceous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permian</td>
<td></td>
<td>Ene Fm. aprox 100m</td>
<td>Cretaceous - Upper Paleozoic zone of low Angle thrust faults and local duplexing</td>
</tr>
<tr>
<td>Carboniferous</td>
<td></td>
<td>Copacabana Gp. aprox 600m</td>
<td>Detachment zone</td>
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<tr>
<td>Devonian</td>
<td></td>
<td>“Upper” Cabanillas Gp aprox 1100m</td>
<td>Lower Middle Paleozoic structural unit with medium angle thrust faults</td>
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<tr>
<td>Silurian</td>
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<td>“Lower” Cabanillas Gp aprox 900m</td>
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<td>Ordovician</td>
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<td>Carabaya, San José Fms. aprox 1500m</td>
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<td>Cambrian</td>
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<tr>
<td>PreCambrian</td>
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<td>Basement</td>
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Reservoir Rock (Hunt Oil, 2010)
Source Rock

Vivian Formation in the Inambari river area
Copacabana Group (Pongo de Coñec canyon)
Lower Cabanillas Group (Pongo de Coñec canyon).
NW-SE stratigraphic section. It shows how the Copacabana group gets thicker to the East and Cretaceous thinner.
Legend

- 0.50: Vitrinite reflectance value in Devonian
- Oil from well is typed to Devonian
- Outcrop or measured section
- Wells that have been modeled

Cabanillas Source Rock Maturity Madre de Dios Basin

Oil from well is typed to Devonian
Outcrop or measured section
Wells that have been modeled
Seismic section SAP07-04. Observed discordance (DBK) between Paleozoic and late Cretaceous sequences.
1. **Petroleum System - Paleozoic.**
   - Some wells in the foreland have oil and gas shows.
   - Presence of oil seeps in some outcrops in subandean, the kitchen located in the FTB in Madre de Dios basin.

2. **Source rocks:** good potential in
   - Cabanillas Group. (Devonian age).
   - Ambo Group. (Carboniferous).
   - Ene Fm. (Permian).

3. **Reservoirs:** Devonian/Carboniferous age in the wells of the foreland.

4. The block 187 area present many possibilities for hydrocarbon exploration.
¡Muchas gracias por su atención!