PETROLEUM GEOLOGY OF THE EASTERN EDGE OF THE ORIENTE BASIN

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The eastern edge of the Oriente Basin, corresponds to the Capirón-Tiputini System defined by Baby et al (1997), characterized by a right strike-slip faulted System, that in-depth is connected at a detached level, defined previously by Balkwill et al. (1995). The mentioned faults limit the half-grabens of possible Permo-Triassic age.

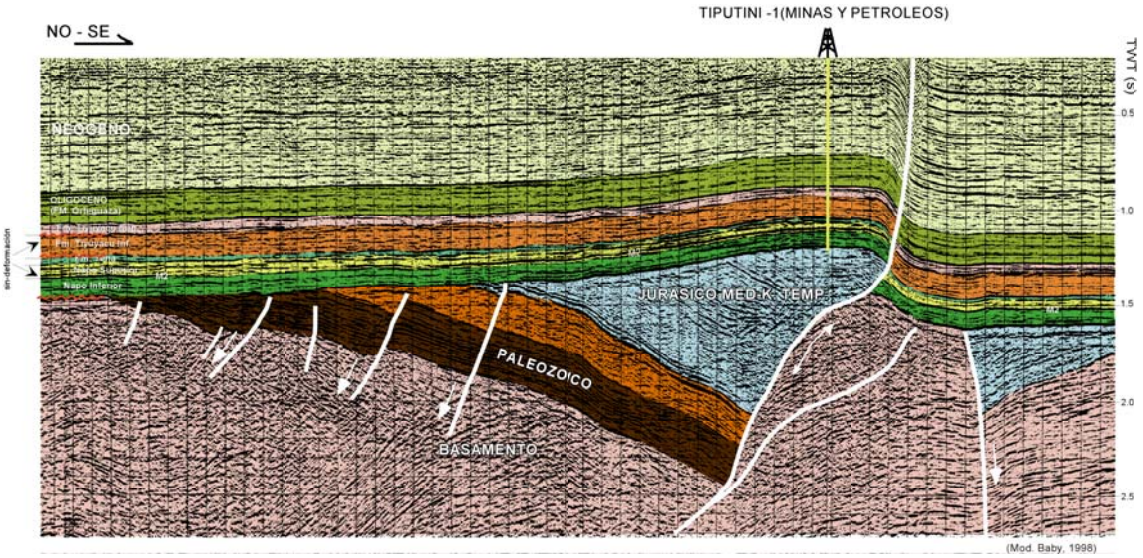

Fig. 1. Seismic section, showing the Tiputini structure

Tiputini it is one of the most impressive structures of the Oriente basin (fig. 1 and 4), in it develops an spectacular half-graben and associated faulted anticline, which contains the oil field of the same name, related with the Yasuní fault, developed as a result of the tectonic inversions. The oil productive anticlines were formed mainly in the first two inversion stages: 1) late turonian-paleocenic and 2) lower eocenic. The Ishpingo, Tambococha and Tiputini structures located in the part most eastern of the eastern border of the basin (fig. 4), are being affected by the last tectonic inversion, which continues at the present time as evidence the current topography.

The stratigraphy is characterized by the progressive decrease of the cretaceous and tertiary formations thickness to the east until disappearing as in the case of the Albian Hollin formation, in the area of the Ishpingo-Tambococha-Tiputini fields (fig.2). The marker fossils, show that the basal sediments correspond to the lower part of the Napo Formation (middle Albian), what demonstrates that the oriental basin edge was presenting rising

relief since the lower cretaceous time, cut by rivers that were carrying their sediments westward, without remain sedimentary records, and it is only from the middle Albian, that the basin border begun to receive sediments.

Under the post –aptian sequence, are found Paleozoic sedimentary patches, preserved of the late Jurassic erosion within the half-grabens, between the Precambrian terrains, related to the Guyana shield. Over the Paleozoic deposits the landfill of the half-grabens is constituted by detritic sediments

of the jurassic age, represented possibly by equivalent continental facies of the marine Santiago formation, known as Sacha formation (Rivadeneira M., 1989), by deposits of the Chapiza formation and by marine upper jurassic sediments, defined as new Tambococha Formation (Díaz M. 2000).

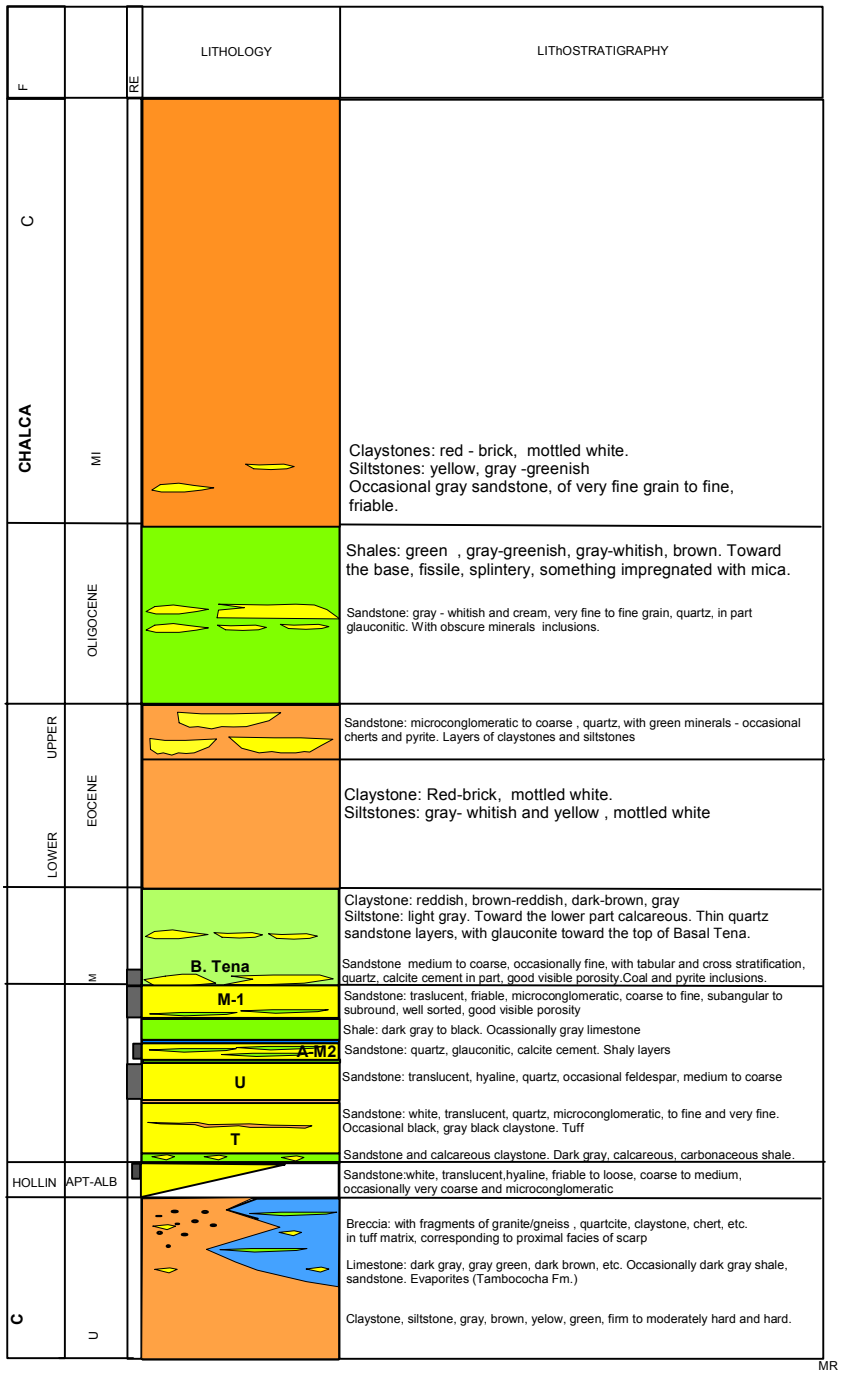

Fig. 2. Stratigraphic column of the eastern border of the Oriente Basin

The Napo deposits in this part of the Oriente Ecuadorian basin are characterized by the great sandy development of the “T” and “U” sequences, whose individualization is difficult by the absence of clayey and calcareous markers (fig. 3). The “A” and lower “M2” turonian limestone are absent, and in their place is developed a sandy/clayey sequence. The radioactive marker “L” of

the coniacian “M1” limestone, together to the top of the M2 limestone, are the best markers of the basin and could be easily recognized even in this part of the basin, specially the M2 top is an excellent seismic marker. The “M2” and “M1” sandstones of the turonian and campanian ages respectively, have a tectonic-stratigraphic control, being restricted their development to the Eastern Corridor of the basin (fig. 3).

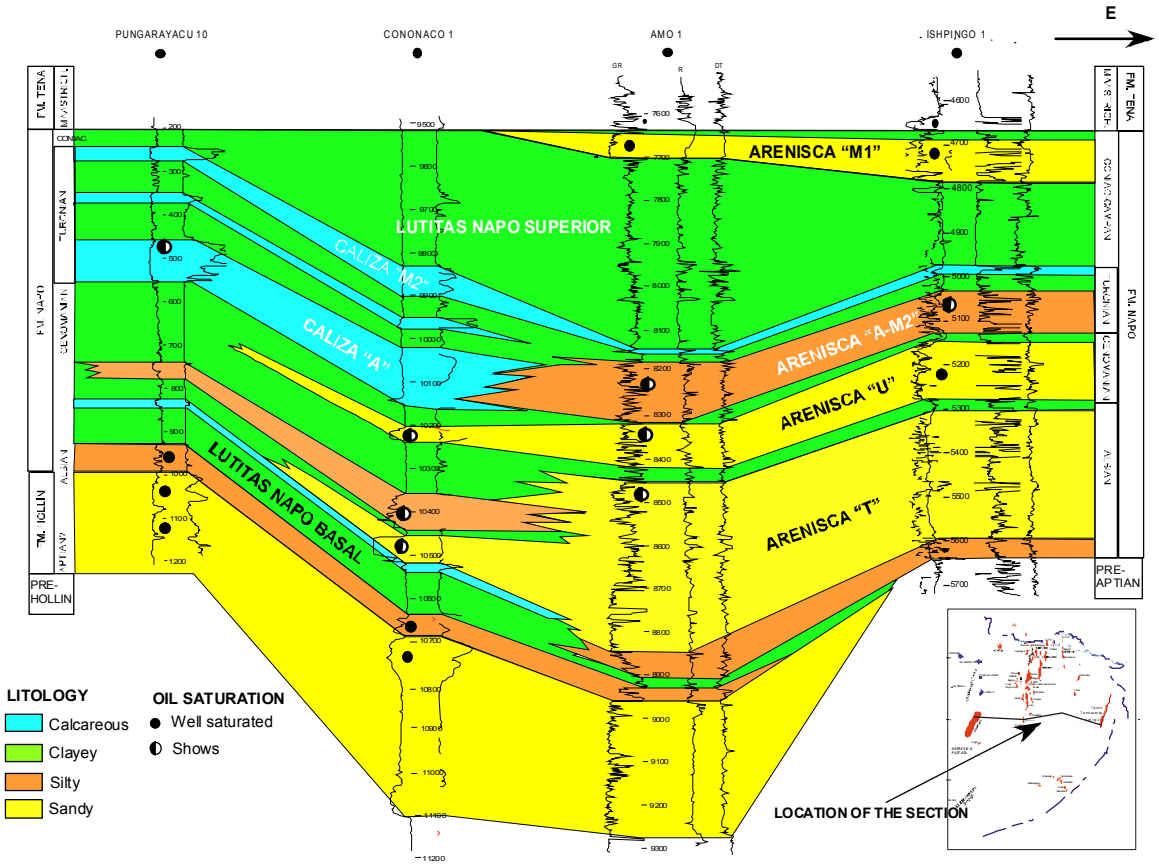

Fig. 3. E-W stratigraphic correlation between wells of the Ecuadorian Oriente Basin

The Tertiary sequence, shows a strong thick nesses decrease, however, are maintained the characteristics of the same, with the following particularities: -Exist difficulty in defining the Tena formation top, since the detritic deposits of the lower Tiyuyacu formation frequently disappear (fig. 2). -The conglomeratic Tiyuyacu bodies are replaced in this part of the basin by sandy facies (fig. 2), product of the greater maturity of the sediments due to the long distance to the Andean source of deposits. -Toward surface, outcrops the Curaray formation, that would be reflecting the raising of this edge, before the absence of deposits more youths, solely restricted to the current river valleys.

It is a heavy oil zone of great economic importance since accumulates about 7.6 billion of barrels, that equal to the 28% of the on-site original oil of all the basin.

Shows a great oil concentration since 34% of the on-site oil discovered in this "petroleum play", is located in the Ishpingo field (fig. 4). This "play" shows a certain areal distribution for quality of the crudes, prevailing toward the NNO the medium quality crudes, while toward the center and east, is extended the

dominance of the heavy crudes. Southward, about the frontier with Peru, are found several fields with heavy and medium gravity oils.

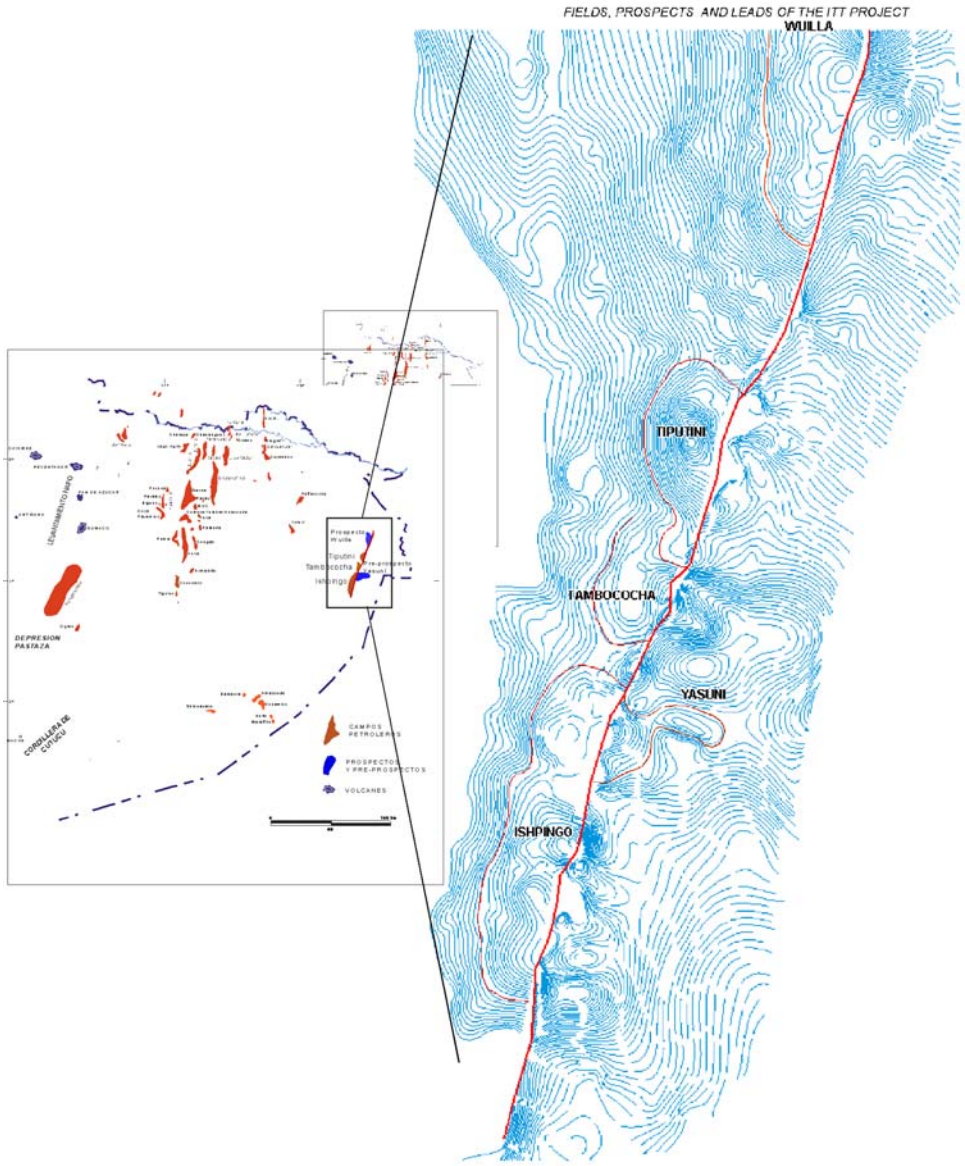

Fig. 4. Structural seismic map showing the biggest structure of the eastern border of the Oriente basin

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