XIII LATIN AMERICAN CONGRESS ON ORGANIC GEOCHEMISTRY
"between the Sierra and the sear"
Santa Marta, Colombia from 12 to 15 November of 2012

# Preliminary Unconventional Gas Shale Assessment of La Luna Formation, Middle Magdalena Valley Basin, Colombia.

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**Introduction and Aim.**

The La Luna formation, part of the South American upper cretaceous sequence, has been recognized as one of the most important hydrocarbon source rocks in Colombian basins. This formation is described as calcareous shale and limestone, black in color, with high foraminifera content and limestone concretions. An outcrop study was made in the southern part of the Middle Magdalena Valley basin to assess the shale gas potential. This formation has been sub-divided by previous authors (Garner, 1926; Hubach, 1957; Morales, 1958) into three members: the upper, middle and lower, named respectively as Galembo (calcareous shales with limestone layers and nodules), Pujamana (claystone, mudstone, gray shale and cherts) and Salada (black shales, black mudstones, black calcareous claystone, black limestone layers and concretions with pyrite).

**Materials and Method.**

Sequence stratigraphy biomarkers with gas chromatography and mass spectrometry. TOC and Rock Eval Pyrolysis

**Results.**

Three stratigraphic section were measured, two of the Galembo member and one of the Salada member. The principal recognized lithologies on outcrops were black siliceous and calcareous shales, in planar and thin strata with foraminifera lamina and calcareous concretions; also limestone is prominent in these members, principally black mudstone and pyritized calcareous concretions. The averge thickness for Galembo member is 220m (722ft) and the Salada member was 150 m (493ft). The organic matter content (TOC) is from 3% to 10% for the Salada member and from 2% to 8% for the Galembo member, and the maturity indicates that both members have reached the oil window for hydrocarbon generation. SEM images revealed a relatively high porosity due to an abundance of floccules (Slatt and O'Brien, 2010).

**Conclusions.**

The observed facies association allowed identifying the depositional environment as a shallow marine, middle to outer shelf, in a transgressing sea. Characterizing this formation with outcrop samples, a primary assessment indicates a good potential for a shale gas system, where good organic matter content is present, the formation has reached maturity levels and has relatively high porosity for oil and/or gas storage. Key words: La Luna, Galembo, Salada, TOC, maturity, floccules.