

Is There a Potentiality in the Turonian Source Rocks of the Eastern Cordillera Basin to Name Them Unconventional Reservoirs? How Can it Be Assessed?

Elvira Pureza Gomez, José Miguel De Armas, and Clara Elena Escobar

Nexen Colombia

elvira.gomez@nexencnooclt.com

Abstract

Assessment of the unconventional reservoir potentiality in the generally so-called source rock is highly influenced by the applied reservoir-source characterization methodologies/techniques and cannot be considered as a straight forward evaluation. Exploration program should be tailored to de-risk the area. Two real rock characterization cases are presented as an example of different methodologies leading towards the same objective, defining a shale gas play. The best approximation to a real answer might be found in the data integration of different scales and types of data.

In frontier areas, where there are no drilled wells, no seismic, and limited or lack of rock properties data, an initial step should be to characterize the complete sequence with outcrop work and basic rock lab analyses with systematic sampling to determine lithology, mineralogy and organic matter content (ideally mudstone, low clay and high organic content). Sweet spots are then localized to perform specific lab analyses such as geomechanical, geochemical, petrographic, biostratigraphical analyses, on those units or intervals.

In this initial exploratory phase in the Eastern Cordillera Basin, based on outcrop data, two units/intervals were chosen as unconventional reservoir sweet spots; the basal part of the Chipaque Fm, and Frontera-Simijaca Fms. The next step was to drill the sequences and get enough data to build a strong unconventional case for gas. Two exploratory wells were drilled and a systematic rock characterization was performed with cuttings, percussion, rotary side wall cores and full core samples, as in the outcrops. Results were integrated and put into the regional context to understand the potentiality of the Turonian mudstones as a product of the depositional environment and diagenesis.