

## **Paleo Residual Gas in Columbus Basin: TSP Examples**

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### **Abstract**

One of the main problems in volume of hydrocarbon estimation in Columbus basin is the uncertainty of the seismic and petrophysical data when there is presence of Paleo Residual Gas (PRG) in the formations. Several examples in TSP's oil and gas producing fields that Repsol currently operates will be presented in order to show the difference of prediction of hydrocarbon accumulations and real results after drilling a well when there is presence of PRG.

In this paper PRG is defined as the low gas saturation (approx 15-35 %) that remains in water when paleo-traps leak. It is very important to identify this type of gas because it may result in erroneous hydrocarbon fluid determination or contacts in the reservoir. This study will show how seismic data can lead to error in the prediction of fluid contacts. Gas saturation greater than 5% all look the same on seismic data.

Several inconsistencies have been observed between proposed and actual hydrocarbon distribution. Seismic anomalies that did not match with fluid contacts were identified by drilling. Understanding the limitation of the use of seismic /well data in the estimation of OOIP/OGIP is crucial to reduce the risk and uncertainty when prospects are evaluated. The extraction of different seismic attributes will help to predict a more accurate depth for fluid contacts. In addition, a more integrated petrophysical analysis will be used to define the fluid type and contact. Formation pore pressure measurements have been the key tool to validate the type and depth of the fluids in the reservoir.

The analysis of PRG is crucial because it will affect directly in the economics of a project and ultimately its success or failure.