

## **Tecto-Sedimentary Characterization of the Frio Marino Formation (Middle Oligocene) in the Burgos Basin, Based on Analysis of Oil-Base Mud Micro-Electrical Borehole Images and Conventional Core Samples**

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The sedimentary sequences of Oligocene age are some of the main exploration targets in the eastern region of the Burgos Basin, located in northeastern Mexico. In five our exploration wells drilled in the Oligocene strata of the Frio Marino Formation, The implementation of oil-base mud micro--electrical images (OBMI) with a vertical resolution of 3 cm, in four exploration wells drilled in the Oligocene strata of the Frio Marino Fm, together with and the sedimentological analysis of conventional core samples, have shown lithofacies that belong to a flood-generated delta-front sandstone lobe. The few cross-stratified sandstone lithofacies interpreted on the OBMI mud microimages gave show a paleoflow (basinward) direction of sand transportation to the east-northeast. The multi-episodic and catastrophic flooding events printed on the Oligocene sedimentation have been recognized are recognizable by the dominant lithofacies of massive, parallel-laminated, and hummocky cross-stratification structures in litho-feldspathic sandstones and commonly inter-bedded with bioturbated shales. The cross-stratified sandstone lithofacies interpreted on the oil-base mud micro-images show a paleoflow (basinward) direction of sand transportation to the east-northeast. These lithofacies are considered as the distal sedimentary expression of the post post-Laramide tectonic phases (after the Middle Eocene epoch). During the Oligocene epoch, the syn-sedimentary extensional tectonic [JS: Tectonic what? Noun missing?] has been was as involved in the creation of subsidence and the accumulation of flood-generated sandstone lobes in the footwall block of the normal lystric faulting, with a dominant coarsening-up vertical cyclic stacking pattern. The proposed trap mechanism is proposed to be a combination of roll-over structures and the relatively short-distance lateral lithofacies changes.

Characterization and differentiation from the delta sequences deposited under normal conditions are critical for properly evaluating the position and geometry of the potential reservoir rocks in the Frio Marino Formation.

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