

## **The Geological Evaluation of the Middle Miocene Herrera Deepwater Turbidite Sandstones within the Overthrust Limb of the WSW Plunging Penal/Barrackpore Anticline, Southern Sub-Basin Trinidad**

**Josanne Mc. Millan**

*Petrotrin: Exploration & Geophysics Department, 1 South Street, Petrotrin Camp, Pointe-a-Pierre, Trinidad and Tobago*

### **Abstract**

The Middle Miocene Herrera sandstones of the Cipero Formation serve as the primary producing reservoir of the Penal/Barrackpore Field. These syn-tectonic deep water turbidites are encased within the Cipero shales and have been severely folded and faulted within the WSW-plunging Penal Barrackpore Anticline. Integration of surface geology, sub-regional SBC 2D seismic, and well data from the Southern Basin reveals that the Herrera sands occur broadly within three structural levels – the overthrust (Shallow Herrera), intermediate or overturned limb, and the sub-thrust (Deep Herrera).

Regional data suggest that the Penal Barrackpore Anticline plunges toward the NW-SE trending Los Bajos Fault. Exploratory drilling encountered and produced oil from Shallow Herrera sandstones, generating significant exploration potential along this structural trend of the Penal field. With the absence of 3D seismic data, careful integration of biostratigraphic markers, vintage well logs and regional analogues were used to unravel the stratigraphic complexity of this reservoir to de-risk exploration prospects.