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**Integrated Sequence Stratigraphic Reservoir Characterization, Cerro Negro Field, Venezuela: A Genetic Foundation for Reservoir Quality Prediction in Heavy Oil Reservoirs**

The Cerro Negro field produces heavy oil from reservoirs of the Miocene age Morichal Member of the Oficina Formation. An integrated sequence stratigraphic study of the Cerro Negro field was undertaken to provide a basis for optimization of reservoir management processes. The database used in this study included a total of 225 vertical, slant, and horizontal wells, over 4000 feet of cores from 8 cored wells, biostratigraphic data from 2 wells, and 300 sqkm of 3-D seismic data.

Morichal's strata were deposited in a diverse number of depositional settings ranging from fluvial-estuarine and associated tide-dominated shoreline to shelf environments. Stratal succession is marked by a distinctive transgressive pattern or upward deepening of facies association by repeated higher frequency marine incursions.

Integrated chronostratigraphic correlations resulted in a 3-way genetic subdivision of the Morichal member into the Lower, Middle, and Upper intervals. The resulting framework is also distinguished by stratal onlap of the basal Lower Morichal on the underlying basement in a southerly or land ward direction.

Integrated sequence stratigraphic interpretations resulted in characterization of the Morichal intervals as mostly lowstand sequence sets that are, internally, divisible into smaller higher frequency sequences. Mapping of these lowstand sequences resulted in field wide delineation of a complex network of channel complexes filled with stacked fluvial to estuarine reservoir sandstones.

The resulting sequence framework was then used to construct a 3-D geologic model. The results have provided a foundation for prediction of occurrence and distribution of reservoir units, optimization of production strategies, reservoir surveillance, and field development planning.