

## **The Sequence Stratigraphic Architecture and Petroleum Accumulations in the Paleogene Saline Lacustrine Biyang Basin, Eastern China**

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The Biyang Basin of eastern China is a Paleogene half-graben that is filled with thick lacustrine deposits. Extensive exploration activity has focused on stratigraphic and combination traps. The purpose of this study is to evaluate the distribution of subtle stratigraphic and structural traps, and summarize the petroleum accumulations within sequence stratigraphic framework. Outcrop, 3D seismic, well logs, cores and geochemical data were integrated to study the sequence stratigraphy.

The results show that the episodic movement along the southern steep boundary fault affected the development of the sequences. In deep lake setting of Hetaoyuan3 sequence, the vertical succession evolved from turbidites at the base, overlain successively by dolomitic shale, interbedded salt and dolomite through trona. The saline deposits in shallow lake setting of Hetaoyuan2 sequences developed upward from interbedded shale and sandstone, silty shale to dolomite, salty dolomite and trona. The development of the closed environment for saline deposits was caused by the progradation of sandy systems from the basin's edge towards its center. Reservoirs developed in lowstand and highstand delta and fan-delta fronts, turbidites, and basinal fractured dolomite.

Integrated basin modeling indicates that petroleum was generated from shale and carbonate source rocks in basin's center, and migrated laterally to lowstand and highstand sandstone bodies via low dipping carrier beds; some of the petroleum then migrated vertically along faults and sequence boundaries to charge shallow reservoirs. The distribution of the fields is controlled by faults that ring the basins' center. Future exploration will focus on prospects with (a) turbidite and fractured dolomite reservoirs in saline lacustrine strata, (b) lowstand delta front strata deposited within saline lake facies to the north, (c) the updip pinchout of fan delta reservoirs to the south, (d) subtle faulted blocks to the north, and (e) shallow sub-truncation traps to the north. Recent drilling has proven these as potential reservoirs.