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Sedimentary characteristics of tidal-dominated estuary in slope belt of Andean foreland basin—Taking the M1 member, Napo formation, T block in Oriente basin as example

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Oriente basin, a typical Andean foreland basin, has several oil discoveries in Cretaceous Napo formation M1 member in slope belt in recent years. While due to the poor understanding of the reservoir plane distribution, the further favorable targets are hard to propose, so it's necessary to carry out sedimentary study and analysis the favorable reservoir distribution to optimize the favorable targets.

Through core description, logging/mud logging and seismic data analysis, the paper makes several accomplishments: 1) The slope belt of the Oriente basin is gentle in Cretaceous sediment period with dip angle smaller than 1 degree. Seawater intruded into Oriente basin from northern part of the basin which resulted in epicontinental sea development in large area of the basin, especially in slope belt. In consequence, the slope belt is tidal dominated in Cretaceous, which favorable for the development of tidal flat, tidal dominated delta and tidal dominated estuary; 2)The Cretaceous Napo formation M1 member develops upward fining rhythm, lacking foreset depositional phenomena which is the typical feature of delta; well develop diversity bedding structures with tidal bedding structures dominated, including tabular bedding, cross-bedding (represents river), ripple mark (represents wave) and tidal rhythmic bedding, bi-directional cross-bedding, Herringbone cross bedding (represents tidal), based on all these certifications the Napo formation M1 member is classified as tidal dominated estuary sedimentary formation; 3) Based on core description, five typical tidal dominated estuary sedimentary facies are recognized, including mud flat, mix flat, sand flat, tidal channel and sand bar. The logging feature plate for different sedimentary facies also is established; 4) There is a NE-SE extended mud flat which separated the T block into two areas according to the sedimentary facies : the NE up dip direction area mainly develops structural reservoir and the SW down dip direction mainly develop str-lithological complex reservoirs.