
Architecture, Lithofacies, and Depositional Processes in the Deepwater Lower Cretaceous (Albian) Tamabra Formation, Poza Rica Field Area, Mexico

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ABSTRACT

Carbonates in Poza Rica Field are mass-transport deposits formed by gravity-flow and suspension processes in a deepwater basinal setting (as great as 1,000 m) in front of a bypass margin associated with the shallow-water Tuxpan Platform. Reefal and grain-rich debris formed on the platform and was transported into the basin. The carbonate debris wedge extends more than 20 km into the basin. Internal architecture of the debris wedge shows an orderly pattern of depositional units reflecting control of relative sea-level changes on availability of source material. Debris and mud flows composed of platform and slope carbonate mud, sand, and clasts were generally deposited during sea-level lowstands and transgressions or during early highstands when the platform was rapidly aggrading, whereas hyperconcentrated to concentrated density-flow and turbidite deposits composed of carbonate sand and lesser mud were generally deposited when the platform was flooded and shedding during highstands of sea level. The lower section of the debris wedge is predominately debris and mud-flow deposits, totaling over 100 m in thickness, whereas the middle to upper section is composed mainly of hyperconcentrated to concentrated densityflow deposits totaling over 100 m in thickness. The uppermost section changes from debris flows updip to hyperconcentrated to concentrated density flows downdip. The field is approximately 30 km by 5 km, covering a 120-km² area. With original oil in place of about 5 billion barrels, it is the largest deepwater carbonate gravity-flow reservoir in the world.