C02

Reservoir Characteristics of Four Key Turbidite Depositional Facies

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SUMMARY

Short Abstract: “Reservoir Characteristics of Four Key Turbidite Depositional Facies”. John R. Dribus, Deposition of turbidite sediments can be divided into four distinct depositional members: the Upper Fan is comprised of a proximal canyon geometry, filled with highly amalgamated channels with little to no levee development. The Middle Fan develops at the toe of slope and is characterized by extensive aggrading channel levee systems which may be amalgamated at the central channel axis, but grade outward from the proximal levee to distal layered overbank facies. The Lower Fan member is comprised of unconfined massive to channelized amalgamated to layered sheets comprising the basin floor fan complex. These sheets are often comprised of numerous Bouma ab sequences forming a massive reservoir unit with excellent lateral continuity and rock volume. The fourth member of the system is the Mass Transport Complex (MTC) which forms along the slope away from the incised canyon systems and present a series of geometries ranging from slides and rafts, to slumps, to debris flows. These four depositional members comprise the laterally emplaced members of the turbidite system, and are often intercalated with very to ultra-fine-grained ductile pelagic mud condensed section.
Introduction

Deposition of clastic sediments by turbidite processes can be divided into four distinct depositional members, each with its own distinct external geometries, internal architectural elements, and specific rock properties. The Upper Fan member is comprised of a proximal incised erosional canyon geometry on the slope, filled with highly amalgamated channels with little to no levee development due to the confined accommodation space. Reservoirs in this member tend to have excellent rock properties, but are very restricted in lateral extent and ultimate pore volume. The Middle Fan member develops on the basin floor at the toe of slope and is characterized by extensive aggrading channel levee systems which may be amalgamated at the central channel axis, but typically grade outward from the proximal levee to distal layered overbank facies. Rock properties may be excellent within the channels of the Middle Fan, and good to fair in proximal levees, but degrade quickly away from the proximal levee out into the laminated overbank. As in the Upper Fan, the Middle Fan channel facies tend to be small in volume, whereas associated levee volumes are often several times larger than the rock volumes of the channels. The Lower or Outer Fan member is comprised of unconfined massive to channelized amalgamated to layered sheets comprising the basin floor fan complex. These sheets are often comprised of numerous Bouma ab sequences forming a massive reservoir unit with excellent lateral continuity and rock volume. The fourth member of the system is the Mass Transport Complex (MTC) or Deposit (MTD) which forms along the slope away from the incised canyon systems. MTD’s present a series of geometries ranging from slides and rafts, to slumps, to debris flows each decreasing in coherency and rock property quality. These four depositional members comprise the laterally emplaced members of the turbidite system, and are often intercalated with very to ultra-fine-grained ductile pelagic mud condensed section.