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Example of Facies and 2D Geometrical Relationships Between Turbidite Channel Fill and Levees: The Tertiary Champsaur Sandstones, SE France Basin

The Tertiary Champsaur Sandstone Formation, located in SE France, belongs to the Perialpine Foredeep Basin. This study focuses on four major channel complexes that represent the 'Middle Pelitic Member'. The channels, 30 to 100m thick and 500 to 1000m wide, have developed in two phases: (1) erosive, (2) constructive. They are filled with amalgamated turbidites (1 to 15m thick) comprising F1 to F5 facies according to Mutti's classification. By pass facies (F6) also occur. The levees are heterogeneous: they include thin bedded turbidites (F9) comprising muddy or silty rippled intervals and Tbc Bouma's sequences, as well as coarser and thicker sandy horizons of F4 to F5 facies. These horizons are either unconfined overbank deposits, or crevasse splays as suggested by their lenticular shape and the obliquity of palaeocurrents regarding the channel. Despite a conspicuous erosive surface between channel fill and channel margin, the presence of lateral facies variations from proximal amalgamated sandstones to more individualized distal beds in the levees support their genetic relationships with the channel. This interpretation is also supported by a decreasing sand/shale ratio in the TBT from proximal to distal channel margin, the pinch out of thicker beds away from the channels and the lack of hemipelagic drapes. This example provides a good outcrop reservoir analogue for deep water fields. It shows: (1) a significant amount of sand in the levees, (2) a good connectivity between channel fill and these levees. Both observations are of paramount importance in term of in place hydrocarbon evaluation and recovery.