



Reservoir Architecture of Deep-Water Deposits in the Northern Trinidad Region

Author: ¹Rene Winter, Nordine Sabaou and Alexander KostinWells

¹rene.winter@bp.com -presenter, bptt

Theme: CG:Stratigraphic and sedimentological principles

Key Words: sedimentology. stratigraphy. deepwater reservoirs

Over the last decade, renewed activity in the Trinidad deep-water region has resulted in the drilling of several new exploration wells. As part of this activity, over 450ft of conventional cores were acquired over multiple subsurface reservoir intervals in the basin, providing for the first time a detailed view of the depositional architecture of reservoirs in the region.

Four facies associations (FAs) have been interpreted based on lithotype abundance and vertical assemblage trends. They include: FA1: meter-scale amalgamated, structureless, high-density turbidites, with occasional dewatering structures, parallel lamination and siderite clasts; FA2: centimeter-scale mudclast conglomeratic zones in association with sharp/erosive boundaries; FA3: decimeter-scale low-density turbidites, commonly in association with linked debrites; and FA:4 meter-scale, bioturbated, deformed and poorly sorted mudstones with floating quartz granules.

These FAs represent the building blocks of the sedimentary system, from which three architectural elements can be interpreted. FA1 is most abundant, and is predictably overlain and underlain by FA3, interpreted to represent the initiation, build, and abandonment phases of sandstone-prone lobes. The transition from these lobes to sub-seismic, poorly confined channel elements are interpreted to occur via the presence of FA2, overlain by FA1, which represent erosive/bypass channel bases overlain by high-sedimentation channel fill respectively. The background non-reservoir sedimentation is dominated by FA4, interpreted to represent mudstone-prone debrites and mass transport deposits, similar to reported fine-grained deposits characterized in shallow drop-cores in the region.

The presence and character of these sedimentary deposits and resultant architectural elements indicate a depositional system closely controlled by syn-kinematic tectonic conditions, common in the region at the plate boundary zone between the Caribbean and Atlantic plates. Slope