



Wellbore History

GENERAL

Well 3/4-1 was the first well drilled in block 3/4 and was designed to penetrate and evaluate all potential hydrocarbon bearing formations above the Permian Zechstein Salt. The trap that was evaluated is a four way structural closure defined at Base Cretaceous level, formed by salt induced basin inversion, producing the present anticlinal configuration. The structure was identified using 2D seismic data in 1992, but, at that time, the structural configuration of the prospect and the composition of the clastic package could not be defined. Further geophysical, geological and geochemical studies were undertaken to better define the structure and Well 3/4-1 was drilled to help define the nature of the clastic package found in this part of block 3/4.

The primary reservoir objective was the Upper Jurassic, shallow marine sandstone deposits contained in the hanging wall clastic package of the Coffee Soil Fault. Middle Jurassic sandstones were regarded as secondary objectives.

OPERATIONS AND RESULTS

Exploration well 3/4-1 was spudded with the jack-up installation Maersk Gallant on 11 January 1994 and drilled to TD at 3107 m, 18 m into the Permian Zechstein Salt Group. The well was drilled with seawater and bentonite sweeps down to 506 m and with "ANCO 2000" (ca 3% "ANCO 208" glycol additive) from 506 m to TD.

The top of the Hordaland at 1103 m and top of the Rogaland at 2317 m were 17 m shallow and 16 m deep respectively, in relationship to prognosed tops. The top of the Chalk (Shetland Group) 2415 m was 10 m shallower than prognosed, and was 252.5 m thick, 52.5 m thicker than prognosed. No hydrocarbon bearing intervals were found in the Chalk section as had been anticipated. A total of 295 m of Jurassic section was penetrated, versus a prognosed 450m, with 184m of reservoir quality sandstones (versus a prognosed 80m). The Upper Jurassic Ula Sandstone was 184 m thick, 104 m thicker than prognosed, and was dominantly clean sand. There were no free oil shows in the Jurassic section; however, the lower 20 m of the Ula Sandstone contained some bitumen. The Triassic Smith Bank Formation, not prognosed, was penetrated at 3013 m. The top of the Permian (Zechstein) at 3077 m was 58 m shallower than prognosed.

An 18 m core was cut from 2740 m to 2758 m in the Ula Formation Sand. A FMT sample was taken at 2758.5 m. It recovered 9.4 litres (upper chamber) and 4.1 litres (lower chamber) of formation water. Analyses on the water from the lower chamber, carried out by Geco-Prakla in Stavanger, gave results that closely matched those found at the rig site, but Geco-Prakla also found 29.2 mg/1 of nitrates. Its presence, plus an ionic imbalance and the presence of potassium and sulphate, indicated that this chamber contained formation water mixed with a little mud filtrate.

The well was permanently abandoned on 26 February 1994 as a dry hole with only rare bitumen shows.

TESTING

No drill stem test was performed.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 3/4-1