



LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6507/7-2

Wellbore History

GENERAL

The well 6507/7-2 was drilled in the northern part of the Haltenbanken area, some 190 km west of the Norwegian coast. It was drilled to evaluate the "B" prospect in the intensely faulted zone that lies at the intersection of the Nordland Ridge in the northeast and the Halten Terrace in the south. The prospect was in a southward plunging horst block formed by a Late Jurassic tensional fault system. The main reservoir interval was anticipated to be the Lower Jurassic sandstone of the Aldra (Tilje) Formation.

OPERATIONS AND RESULTS

Wildcat well 6507/7-2 was spudded with the semi-submersible installation Nortrym on 25 February 1985 and drilled to TD at 3262 m in Late Triassic sediments of the Åre Formation. No significant problems occurred during drilling operations, which went very much according to schedule. The seven-test program was however delayed approximately two weeks due to a premature firing of the Baker Tubing-Conveyed Perforating Guns while running in for DST 4. This necessitated the running of a protective string of 7" casing to cover the perforations (1062.5m to 1072.5m) and enable the testing program to be completed. Additional time was lost due to pulling and repairing the BOP stack after running the protective casing string. The well was drilled with sea water down to 1030 m and with gypsum mud from 1030 m to TD.

Shetland Group sediments were resting directly on the Fangst Group, confirming heavy erosion at the crest of the structure as prognosed. The oldest dating of the Shetland Group was Santonian age, in sediments ca 5 m above top Fangst Group, while the youngest Fangst Group sediments were dated Toarcian-?Aalenian. At 2198 meters gas levels rose, indicating the top of the Jurassic sediments. Associated with the gas show was a rare dull-gold fluorescence on cuttings; however, no cut or staining was evident. The MWD gave little indication of sand through the Fangst Group and very little sand was seen in samples. The Ror Formation claystones separated the Fangst Group from the underlying Tilje formation.

The Fangst and Båt groups were found hydrocarbon-bearing. Using gradients established from electric logs, RFT data, and fluid analysis the gas/oil contact was estimated to be at 2317.5 m. The oil/water contact was not as clear-cut. From logs it was placed at 2455, while the RFT data indicated an OWC between 2476 and 2482 m.

Fourteen cores were cut in the Tilje Formation from 2283.5m to 2448.5m with an 84% recovery. The coring point was picked on the basis of prognosed depths, two earlier drilling breaks in claystones having been circulated out. Good oil shows were observed. There was good fluorescence to 2317m though little or no visible staining and cut was apparent. Visible oil with a good cut was apparent to 2439 meters, but the quality of show declined from this depth, with no fluorescence recorded below 2470 meters. Analysis of cores and logs indicated very good sandstone porosities and permeabilities throughout the interval. The low gas values through the reservoir were thought to reflect an overbalance of 3.5 - 4.5ppg which combined with increasing permeability caused flushing of the formation ahead of the bit.

Four segregated RFT samples were taken at 2220.5 m (gas + water, mud and small amount of light coloured oil/condensate), 2303 m (gas + water, mud and small amount of light coloured oil/condensate), 2331.5 m (2.5 litres 29.8 deg API gravity oil with some gas) and 2382.7 m (9 litres of 22 deg API gravity oil with some water and gas).

The well was permanently abandoned on 10 June 1985 as an oil and gas discovery.

TESTING

Seven drill stem tests were undertaken. DST 1 was performed in the water zone within the Tilje Formation from 2521 to 2529 m. Four further tests were performed in the reservoir interval: 2 (2217 - 2439 m), 3 (2356.5 - 2376 m) and 4A (2330 - 2340 m) flowing oil and DST 5 (2290 - 2310 m) gas/condensate. DST 6 (2232 - 2245 m) in the Ror Formation produced gas/condensate, and DST 7 in the Fangst Group, 2203 to 2222 m, produced predominantly gas. At stabilized conditions using various chokes sizes the cumulative peak production of oil was 2095 Sm3/day. Oil gravity ranged from 0.922 g/cm3 (22 deg API) to 0.876 g/cm3 (30 deg API). Cumulative peak gas production was 21100000 Sm3/day. Average gas gravity with respect to air was 0.65. Condensate produced in conjunction