



Wellbore History

GENERAL

Well 30/9-4 S was drilled on the B-structure on the southeast flank of the Oseberg Field in the North Sea. The structure is an elongated rotated fault block bounded by faults in all directions. The Brent Group is truncated by the Base Cretaceous unconformity, and this well was expected to go directly from Cretaceous to the Ness formation. The objectives of the well were to find hydrocarbon accumulations in the Brent Group, secondary in the Statfjord Group. The well was designed to penetrate the Brent Group in a position where the sand in the Ness Formation is preserved. The well was deviated westwards at an angle of approxi-mately 40°.

OPERATIONS AND RESULTS

Wildcat well 30/9-4 S was spudded with the semi-submersible installation Treasure Seeker on 22 November 1984 and drilled to TD at 4303 m (3577 m TVD) in the Early Jurassic Eiriksson Formation. No significant problems were encountered during operations. The well was drilled with spud mud down to 222 m, with seawater/gel from 222 m to 630 m, with oil based Safemul mud from 630 m to 3297 m, with NaCl/polymer mud from 3297 m to 3680 m, and with oil based Safemul mud from 3680 m to TD.

The well 30/9-4 encountered two separate hydrocarbon reservoirs in the Middle Jurassic Brent Group. Pressure data indicated no communication between the two hydrocarbon columns. The Tarbert Formation and uppermost Ness Formation (3295-3379 m, 2773-2841 m TVD) sandstones were found to be gas bearing, but no definite gas/fluid contacts were evident. Net pay in the gas zone was calculated to be 27.6 m (22.1 m TVD), average porosity 18.6%, and the average water saturation 20.9%. The Ness Formation (3379-3551 m, 2841-2979 m TVD) proved to be oil bearing, but again no OWC could be discerned. Net pay in the oil zone was calculated to be 10.9 m (8.8 m TVD), average porosity to 22.2% and the average water saturation to 33.2%. The Statfjord Group was water bearing. No oil shows were reported above or below the hydrocarbon bearing Brent reservoir sands.

Thirteen conventional cores were cut in the well. Cores no. 1-3 (3332 - 3381 m) and 4-11 (3432-3500 m) were cut in the gas bearing and oil bearing Brent Group sections, respectively. Core no. 12 (3580-3598.1 m) was cut in the Oseberg Formation and core no. 13 (4268-4277 m) was cut in the Eiriksson Formation. RFT fluid samples were taken in the Brent Group at 3319.5 m (oil and gas), 3421 m (condensate and gas), and in the top of the water bearing Statfjord Group at 4207.2 m.

The well was permanently abandoned on 30 March 1985 as an oil and gas discovery.

TESTING

Two drill stem tests were performed in the Brent Group.

DST 1 tested the interval 3416.9 to 3422.9 m (2871.4 m to 2876.1 m TVD) in the oil bearing part of the Ness Formation. The well produced 783.2 Sm3 oil and 158600 Sm3 gas/day through a 72/64" choke. The GOR was 202.5 Sm3/Sm3. The oil gravity was 41.8 °API and the gas gravity was 0.8 (air=l). The bottom hole temperature was 111.1°C. The test produced 2.2% CO2 and no H2S.

DST 2 tested the interval 3311.3 to 3324.3 m (2787 to 2797.7 m TVD) in the gas bearing Tarbert Formation. It produced 1130000 Sm3 gas and 333.9 Sm3 condensate/day through a 64/64" choke. The GOR was 3384.3 Sm3/Sm3. The oil gravity was 55.7 °API and the gas gravity was 0.7 (air=l). The bottom hole temperature was 108.3°C. The test produced 1.5% CO2 and 0.8 ppm H2S.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 30/9-4 S