



Wellbore History

GENERAL

Well 2/12-1 is located in the Feda Graben n the southern North Sea, ca 1.5 m north of the Danish/Norwegian border. The main objective of the well was to prove the extension of the Danish "Gert" discovery into block 2/12. The primary target was Middle Jurassic sandstones, prognosed at 4826 m. Possible secondary targets were Early Jurassic and Triassic sandstones. Structural closure was not defined at Top Shetland or Base Cretaceous levels, but minor stratigraphic trapping was considered possible in this area. Prognosed TD was 5125 m.

OPERATIONS AND RESULTS

Wildcat well 2/12-1 was spudded with the semi-submersible installation Treasure Scout on 14 October 1986 and drilled to TD at 4795 m in volcanic breccia of the Early Permian Rotliegend Group. Drilling proceeded without significant problems down to 3970 m where gas problems were experienced. The hole was cleaned up, and dual induction/sonic log was run. Due to increasing gas recordings 9 5/8" casing was set at 3978 m. The remaining logging program in this section was therefore not run, and sidewall cores were not taken. At 4705 m a drill- break was experienced. The hole was circulated, tested, and drilled to 4714 m. During logging the tool got stuck and the string was cut. The fish was stuck at 3842 m, and loosening was unsuccessful. 7" liner was set at 3826 m and cemented. During circulation hydrocarbons started to flow in between 9 5/8" shoe and 7" liner. The well was closed and heavy mud was squeezed into the formation. After 3 weeks the fish was pulled out of the hole. The well was drilled with spud mud down to 1015 m, with KCl/polymer mud from 1015 m to 4050 m, and with Lignosulphonate mud from 4050 m to TD

Well 2/12-1 encountered 71 m of oil bearing Late Jurassic Ula Formation sandstone from 4597 - 4668 m. The top of the reservoir was 229 m shallower than originally prognosed. The gross sand interval of 71 m contained 56.6 m net sand. The sandstone was generally clean, very fine to fine grained and well sorted. No Free Water level (FWL) was observed down to the sandstone/shale lower reservoir boundary at 4668 m. The oil gradient is the same as for the Gert-1 well.

Oil shows were reported from carbonates in the Late Cretaceous (at the base of the Hydra Formation) from 3895 to 3917 m, the Early Cretaceous (Åsgard Formation) from 3955 to 3988 m, and the Late Permian Zechstein Group from 4674.5 to 4684.5 m. Petrophysical analysis showed no net pay intervals in the Cretaceous sections but for the Permian limestones, out of a gross total interval of 6.5 m carbonate section a net reservoir interval of 4 m with a net pay of 1.1 m was defined. For this net pay interval an average porosity of 7.8 % and a water saturation of 35 % were calculated. Shows were also reported on claystones, dolomites, limestones, siltstones, and thin sandstone stringers at 3988 - 4610 m in the Farsund and Haugesund Formations.

Three conventional cores were cut over the interval 4633 m to 4673.5 m (driller's depth). Coring started in the Ula Formation consisting of sandstone with basal coal, shale and conglomerate. It continued through 2.5 m of ?Triassic claystone and stopped in late Permian claystones and limestones at 4673.5 m. RFT wire line fluid samples were taken at 4645.4 m (gas and water/mud filtrate) and at 4610.1 (gas, oil, and water/mud filtrate) .

The well was permanently abandoned on 12 March 1987as an oil and gas discovery.

TESTING

Two DST tests were performed in the Ula Formation.

DST 1 was performed from the interval 4630 - 4647 m. It produced 1051 Sm3 oil and 176400 Sm3 gas /day on a 9.54 mm choke. The GOR was 168 Sm3/Sm3, the oil density was 0.828 and the gas gravity was 0.835 (air = 1) with 1.5 % CO2 and 0 ppm H2S. The bottom hole temperature, measured at 4642.3 m, was 147.5 deg C.

DST 2 was performed from the interval 4600 - 4612 m. It produced 1629 Sm3 oil and 213600 Sm3 gas /day on a 14.29 mm choke. The GOR was 131 Sm3/Sm3, the oil density was 0.828 and the gas gravity was 0.828 (air = 1) with 1.5 % CO2 and 0 ppm H2S. The bottom hole temperature, measured at 4581.92 m, was 148.1 deg C.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 2/12-1