



Wellbore History

GENERAL

Well 35/8-5 Swas drilled on a location ca 15 km west of the Gjoa Field on the western margin of the Maloy Slope in the northern North Sea. The main objective was to test the presence and type of hydrocarbons in Oxfordian turbidites in the J10 Prospect. A secondary objective of the well was to test the hydrocarbon potential of the Brent Group Sandstones. The well was targeted in the W-segment of the prospect, close to the eastern boundary fault, in order to enable a possible sidetrack towards east and into the C-segment. To meet these criteria, the well was designed as a deviation well to follow the dip of the eastern boundary fault plane of the W-segment in a proper distance from the fault. Sidetracking was only to be performed in case of discovery in either the primary or the secondary target.

OPERATIONS AND RESULTS

Wildcat well 35/8-5 S was spudded with the semi-submersible installation Deepsea Delta on June 1 2003 and drilled to TD at 4000 m (3831.8 m TVD) in the Middle Jurassic Rannoch Formation. It was discovered after spud that the spud position of the well was placed 105 m east of the planned spud location. The deviation was adjusted during drilling and the reservoir was penetrated within the planned target tolerance. The resulting well path was vertical down to 2315 m, and then deviated with variable inclination down to ca 3300 m, then keeping a fairly constant inclination of 36 deg throughout the last 700 m to TD. A drilling hazard was given due to possible water flow from over-pressured sand interval in the Skade Formation at 673.5 - 794 m. This sand was considerably thicker than prognosed. There was no overpressure in the interval, but two thinner sands above, at 570 m and 590 m, where water flow occurred, were over-pressured. As a result, the 20" casing was set at 550 m instead of at 1100 m as planned for, and this in turn led to a revision of the casing programme in general. As no commercial discovery was made, no sidetrack of the well into the C-segment was performed and the wire line logging programme was reduced by not including the CMR, MSCT, OBMI-DSI and VSP logs in the 8 1/2" section. There is a large difference (6.5 - 9 m) between drillers (LWD) depth and logger's depth in this well. The LWD depth is used as reference for lithostratigraphic tops. The well was drilled with spud mud down to 412 m, with NaCl Polymer mud from 412 m to 682 m, with KCl mud from 682 m to 1331 m, and with Versavert oil based mud from 1331 m to TD.

Several sand units were penetrated above the Jurassic target reservoirs. Within the Hordaland Group the Skade Formation (673.5 - 845 m), the Grid Formation (845 - 1091 m), and the Frigg Formation (1091 - 1338 m) were encountered. Within the Rogaland Group the Ty sand (1658 -1716.5 m) was encountered. The prognosed Oxfordian reservoir (Intra Heather Formation Sandstone) was encountered at 3326 m, but the reservoir quality was much poorer than expected. An about 20 m thick Callovian intra-Heather Formation turbidite sequence was encountered at 3570 m. This was not prognosed. The Brent Group reservoir was found as prognosed with the better reservoir sands found in the Tarbert (3830 - 3882 m) and Etive (3916 - 3964 m) Formations. The well did not prove any commercial hydrocarbons. The Oxfordian sandstone seemed to be oil filled, but due to tight reservoir it was not considered a discovery. The Brent Group reservoir zones were proven water filled with a clear water gradient from pressure data. Good oil shows were obtained in both the Oxfordian sandstone and in the Tarbert Formation.

There were taken 6 conventional cores, 4 in the Oxfordian sandstone and 2 in the Brent Group sandstone. Cores of the Oxfordian reservoir showed very poor reservoir quality, according to both grain size and cementation. No wire line fluid samples were taken.

The well was permanently abandoned on 20 July 2003 as a dry well.

TESTING

No drill stem test was performed.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 35/8-5 S