



Wellbore History

GENERAL

Well 6406/3-5 was designed to explore the Lambda structure and was the first well on the structure. The Lambda structure is a flat-lying horst situated in the NE corner of the block.

The primary purpose of the well was to find hydrocarbon accumulations of significant amounts in the Middle and Lower Jurassic sandstones of the Fangst Group and Tilje Formation. Secondary objectives were to verify the interpretation regarding the structural closure towards north, and to verify the geophysical and structural interpretation and improve the geological, paleontological and geochemical understanding of the area. The well was planned to TD in the Åre Formation.

OPERATIONS AND RESULTS

Wildcat well 6406/3-5 was spudded with Smedvig Drilling semi-submersible rig West Delta on 3 April 1988 and drilled to a total depth of 4283 m in the Early Jurassic Tilje Formation. Shallow gas was registered at 570 m. After pulling out to cement this zone, it was impossible to get back into the hole again. After a new spud 3 May, the 30" was set at 418 m, and 20" at 538 m. A new shallow gas zone was registered at 813 m, and the mud was weighted to 1.35 g/cm. The circulation was lost at 1116 m, and the section was cemented. After this drilling progressed with a mud weight of 1.25 g/cm³. This resulted in lost circulation at 1340 m. Both times it was assumed that the circulation was lost in the zone around 562 m. The hole was cemented back and drilled to 607 m where a new leak-off test up to 1.34 g/cm was performed. This time there were no problems with the drilling to 1749 m (setting depth of 9 5/8" casing) with mud weight of 1.25 g/cm³. Further drilling to TD proceeded without significant problems. The well was drilled with spud mud down to 545 m, with gypsum/polymer mud from 545 m to 3841 m, and with gel/lignite/lignosulphonate mud from 3841 m to TD.

Top Fangst was encountered at 3817 m. There were weak shows in the top ten meters of the Garn Formation down to 3825 m, with increased resistivity on MWD down to approx. 3828 m. One run was done using Western Atlas FMT with HP and strain gauge. A total of 25 pre test points were measured. By drawing a line through pressure points in the Garn Formation, it gave a gradient of 0.99 g/cc. A normal water gradient of 1.02 g/cc was not achieved due to unstable pressure points in the lower Garn Formation. A pressure shift in the Ile Formation of approximately 75 psi (0.52 Mpa) was observed in the data. It was not possible to draw a gradient line due to few points in the Ile Formation, but a water gradient was interpreted. The Tilje Formation was found to be tight and interpreted as water bearing. One sample was taken in the upper Garn Formation at 3821 m. The sample contained a mixture of formation water and mud filtrate with traces of oil and gas. The chloride concentration of 9100 mg/l was found to be approximately three times higher than the chloride concentration from the mud filtrate (3000 mg/l). One core was cut in the interval 3815 m to 3837 m in the Garn Formation. As the well was not obligatory, and after it was observed that the Tilje Formation sandstones did not contain any hydrocarbons, the TD of the well was revised to TD in the lower part of the Tilje Formation instead of in the Åre Formation. The well was permanently abandoned on 1 June 1988 as a well with shows.

TESTING

No drill stem test was performed

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6406/3-5