



LITHOSTRATIGRAPHY & HISTORY FOR WELL: 33/12-2

Wellbore History

GENERAL

Well 33/12-2 was drilled in the Tampen Spur area as one of the first wells in the Statfjord Field area. Primary target of the well was the Early Jurassic Statfjord Group, which was known to be productive in Brent Field located about 20 km to the southwest in the U.K. offshore. The Statfjord Formation was water wet in the 33/12-1 and 33/9-1 tests. The 33/12-2 wildcat was located to encounter the Statfjord Formation approximately 200 m high to the 33/12-1 well. The Middle Jurassic Brent Formation was prognosed to be erosionally thin or absent. Triassic, Permian and Devonian reservoirs were secondary targets. Planned total depth was 4572 m (15000 ft.), believed to be sufficient to reach Devonian age rocks or "Petroleum Basement". The well was one of the three deep tests called for by the License 037 work obligation.

The well is type well for the Alke and Lunde formations of the Hegre Group and the Raude and Eiriksson formations of the Statfjord Group. It is reference well for the Nansen Formation.

OPERATIONS AND RESULTS

Wildcat well 33/12-2 was spudded with the semi-submersible installation Nordskald on 6 June 1974. Drilling proceeded to 4354 m in Early Triassic sediments of the Lomvi Formation. At this depth the drill string twisted off leaving a fish with top at 4157 m. Attempts to remove the fish were unsuccessful so 4354 m became TD of the well. No wire line logs were run below 4145 m. The well was drilled with water-based mud. Below 2716 m the mud contained from 2% to 8% oil.

As predicted, the Middle Jurassic Brent Group was thin (17.5 m) and oil bearing (12 m net). Test data and log correlation indicated that the upper reservoir in the 33/12-2 well is a section of the Brent sand and is in communication with the Brent Formation in the 33/12-1 and 33/9-1 wells. The Statfjord Formation top was found at 2700 m, which was 100 m lower than prognosed. The sand was oil bearing through a 126 m gross section with 87 m of net pay sand above an oil/shale contact at 2827 m. The next sand at 2836 m was definitely water bearing from log data. Log analysis indicated an average porosity of 25 percent and an average water saturation of 20 percent. Measured porosities from the cores range from 20 to 30 percent, with an average of 25 percent. Measured permeabilities from the cores range from 200 to as high as 15000 mD; average about 2500 mD. The reservoir sands are fine to coarse grained, occasionally conglomeratic, sub-rounded, poorly sorted, intercalated with carbonaceous laminae and contain kaolinite as matrix material.

Three cores were cut in the well. Core 1 was cut from 2637 m to 2652 m with 84 percent recovery. Cores 2 and 3 were cut in the top of the Statfjord Formation from 2704 m to 2725 m with 63% and 50% recovery. No wire line fluid samples were taken.

The well was permanently abandoned on 23 August 1974 as an oil appraisal well on the Statfjord Field.

TESTING

Five drill stem tests were conducted in the Brent, Dunlin and Statfjord groups.

DST1 tested the interval 2813.3 to 2817 m in the Raude Formation. It produced 877 Sm3 oil and 82120 Sm3 gas per day through a 44/64" choke. The GOR was 92 Sm3/Sm3, oil gravity was 38.5 °API, and gas gravity was 0.692 (air = 1). Bottom hole temperature during the test was 96.4 °C.

DST2 tested the interval 2780.4 to 2784 m in the Eiriksson Formation. It produced 1939 Sm3 oil and 142720 Sm3 gas per day through a 44/64" choke. The GOR was 74 Sm3/Sm3, oil gravity was 39.5 °API, and gas gravity was 0.720 (air = 1). Bottom hole temperature during the test was 96.7 °C.

DST3 tested the interval 2700.8 to 2703.8 m in the Nansen Formation. It produced 27 Sm3 oil and 319 Sm3 gas per day through a 16/64" choke. The GOR was 131 Sm3/Sm3, oil gravity was 41.2 °API, and gas gravity was 0.723 (air = 1). Bottom hole temperature during the test was 93.9 °C.

DST4 tested the interval 2526.5 to 2533.5 m in the Dunlin Group. The test produced slugs of oil, gas and mud. Bottom hole temperature during the test was 88.9 °C.

DST5 tested the interval 2485.4 to 2488.4 m in an upper Brent Group