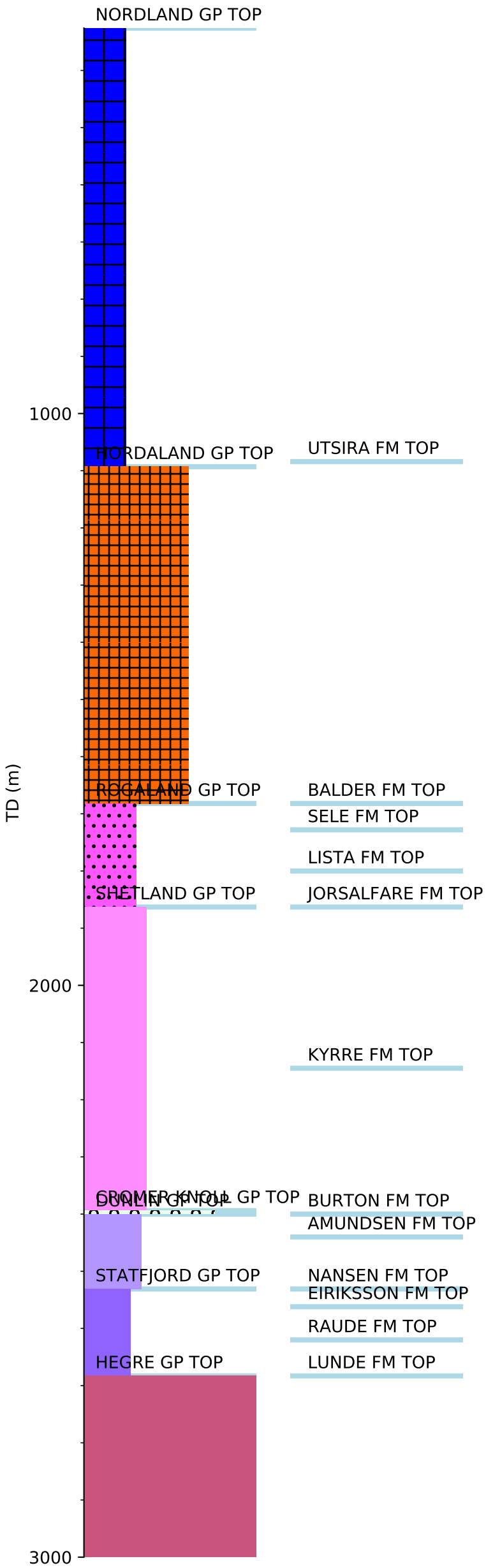

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 34/7-10

Wellbore History

GENERAL

Well 34/7-10 was drilled on the southern end of the Snorre Field. The primary purpose of well 34/7-10 was to prove Statfjord Group reserves in the south-east Snorre. Further objectives were to test the Statfjord Group thickness and sand distribution, to test the extent and quality of the middle Statfjord member and to establish a Statfjord Group OWC and reservoir parameters of the Statfjord Group and underlying upper Lunde Formation.

OPERATIONS AND RESULTS

Appraisal well 34/7-10 was spudded with the semi-submersible installation Treasure Saga on 26 August 1986 and drilled to TD at 3000 m in the Late Triassic Lunde Formation. Drilling proceeded without significant problems. The well was drilled with spud mud down to 430 m, with gel mud from 430 m to 918 m, with gypsum/polymer mud from 918 m to 2413 m, and with KCl mud from 2413 m to TD.

Apart from the sandy Utsira Formation of Late Miocene age, a Late Oligocene (1314 - 1324 m) and a Late Eocene (1377 - 1387 m) sandstone unit within the Hordaland Group, the upper section down to Jurassic proved mainly claystones. The Jurassic consists of a silty Dunlin Group and a sandy Statfjord Formation. The Triassic consists of claystones with minor sandstones in the upper part and alternating sandstones/ claystones from 2800 m and down to TD. First traces of shows were seen at 2120 m in silty laminas of the Shetland Group. These are described as weak dark yellow fluorescence with slowly streaming light yellow cut. From 2250 m and down to top Statfjord Group oil reservoir at 2531.5 m silt and sandstone show weak to moderate dull yellow to bright yellow fluorescence and slowly streaming blue white to milky white cut. The residue is yellow to light brown in colour. Below the OWC at 2621 m shows continued down to 2635 m where both shows and cut became poorer.

The Statfjord Group was encountered at 2531.5 m with a gross thickness of 105 m. It was hydrocarbon-bearing down to the OWC at 2621 m. The average log porosity in the oil zone was 22.1%, the net/gross was 0.33 and the average water saturation was 32%. The OWC was established from pressure gradients and from well logs. However, low oil rates were obtained also in DST1 in the interval 2632.7 - 2636.7 m. It is probable that this is an isolated body of sand.

A total of 14 cores were cut and recovered during drilling of the well. The cores were cut in the interval 2522 - 2663 m. A total of 122.3 m of cores were recovered, corresponding to an average recovery of 86.7%. The core to log depth shifts varied between + 1.0 m to – 0.5 m. FMT fluid samples were taken at 2532.5 m (8.8 l oil and 2.8 l mud filtrate in 2 3/4 gallon chamber), 2601.0 m (mud filtrate and a little oil), and at 2634.5 m (mud filtrate with trace oil)

The well was permanently abandoned on 29 October 1986 as an oil appraisal well.

TESTING

Four drill stem tests were performed.

DST 1 tested the interval 2632.7 - 2636.7 m, 20 m below the observed OWC as seen from well logs and pressure data. It produced 2.7 to 5.4 Sm3 oil/day through a 6.4 mm choke in the main flow period. The maximum bottom hole temperature in the test was 81.8 °C.

DST 2 tested the interval 2609.4 - 2614.9 m. It produced 222 Sm3 oil through a 12.7 mm choke. The GOR was 77.1 Sm3/Sm3 and the stock tank oil density was 0.8278 g/cm3. The maximum bottom hole temperature in the test was 96.8 °C.

DST 3 tested the interval 2561.0 - 2570.5 m. It produced 961 Sm3 oil/day through a 12.7 mm choke. The GOR was 48 Sm3/Sm3 and the stock tank oil density was 0.8277 g/cm3. The maximum bottom hole temperature in the test was 95.4 °C.

DST 4 tested the interval 2548.4 - 2551.9 m. It produced 273 Sm3 oil/day through a 6.4 mm choke. The GOR was 69 Sm3/Sm3. The maximum bottom hole temperature in the test was 95 °C.