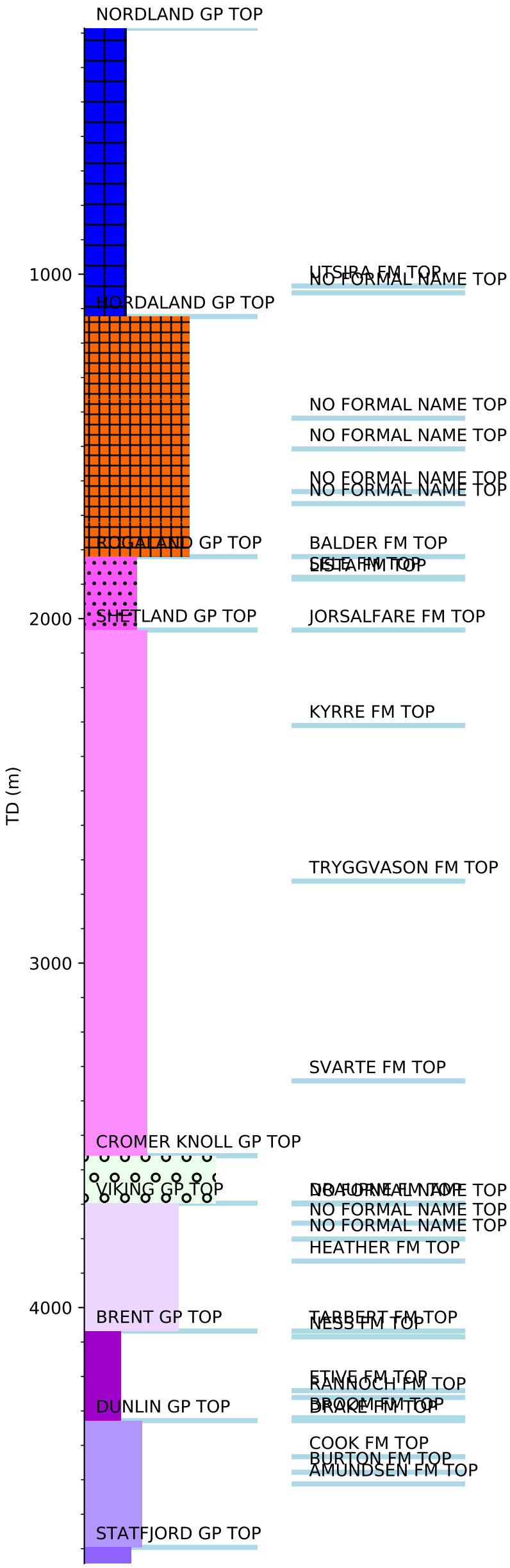

LITHOSTRATIGRAPHY & HISTORY FOR WELL 34/11-2 S

Wellbore History

GENERAL

Well 34/11-2 S was drilled on the Tjalve Terrace east of the Gullfaks Field in the northern North Sea. The main objective was to explore the hydrocarbon potential of the Middle Jurassic Brent Group reservoirs within the Beta structure. The secondary objective was to test for hydrocarbons in the Lower Jurassic/Triassic Statfjord Formation.

OPERATIONS AND RESULTS

Wildcat well 34/11-2 S was spudded with the semi-submersible installation Vildcat Explorer on 16 January 1996 and drilled to TD at 4743 m in the Early Jurassic Statfjord Formation. The well was drilled practically vertical down to ca 3139 m, ca 140 m below the 13 3/8" casing shoe, and deviated from this point. The drilling of the well was not performed within the plan due to lost time as a consequence of bad weather, steering and building angle in 12 1/4" hole section, extended logging, extended well and equipment failure. The well was drilled with pre-hydrated bentonite, seawater and bentonite sweeps down to 1170 m, with ANCO 2000 mud with 3.4 to 5.2% glycol from 1170 m to 3766 m, and with a KCl/polymer mud system from 3766 m to TD.

Oil was proven by MDT fluid sampling in a thin sand bed at 3797.5 m (3756.2 m TVD) above the main Brent Group reservoir. The Bathonian age of these sand beds imply that they belong to the upper part of the Brent Group. Sliding or faulting of huge blocks along the foot wall of the main fault could explain the presence of this Allochtonous "Brent Group" above the Heather Formation. Top of the main objective the Brent Group was penetrated at 4068.0 m

(3422.1 m TVD), 252 m deeper than the prognosis. Pressure measurements indicated hydrocarbon fluids present in the entire reservoir section, with one pressure regime in Tarbert and Upper Ness Formations and another some 20 bar higher in Lower Ness and Etive Formations. The DST tests confirm that the fluid systems are different with the lower Brent having the richest condensate. A shale layer at 4145 to 4175 m in the Ness Formation appears to be the pressure barrier. Due to poor quality pressure data (low permeability in reservoir) no conclusive hydrocarbon gradients were established. No fluid contacts could be derived from the MDT data. The log evaluation showed 100 % water saturation in the Rannoch Formation below 4288 m.

Acetone was used for oil shows extraction and poor shows were described from the whole well below 1170 m.

A total of 173.5 m core was recovered in 9 cores. All core depths are corrected to logger's depth. Core 1 was cut in the allochtonous Brent Group from 3846 m to 4478 m. Cores 2 to 5 were cut from 4083 to 4154 m in the upper reservoir compartment of the main Brent Group. Cores 6 to 8 were cut from 4209 m to 4294 m in the lower reservoir compartment of the main Brent Group. Core 9 was cut from 4460 m to 4478 m in the Early Jurassic Cook Formation. Fluid samples were taken with Schlumberger's MDT with Dual Packer tool. An oil sample was taken in Allochtonous Brent Group/Heather Formation at 3797.5 m and gas/condensate samples were taken in the in Ness Formation at 4178.0 m and in the Etive Formation at 4248.5 m.

The well was suspended on 16 January as a gas/condensate discovery.

TESTING

Three tests were performed in the Brent Group.

Test 1A tested 4240 - 4260 m in the Etive formation. It produced only some mud to the surface and was aborted due to a failure during the clean up flow.

Test 1B tested the intervals 4240 - 4260 m interval in Etive plus 4185-4229 m in the Ness Formation. It produced 125 Sm3 condensate and 126100 Sm3 gas /day through a 36/64" choke. The GOR was 1000 Sm3/Sm3, the oil density was 0.795 g/cm3 at 15 deg C, and the gas gravity was 0.750 (air = 1). The bottom hole flowing temperature was 133 deg C.

Test 2 tested the interval 4068 - 4142.5 m in the Tarbert and Ness formations. It produced 75 Sm3 condensate and 172200 Sm3 gas /day through a 32/64" choke. The GOR was 2300 Sm3/Sm3, the oil density was 0.800 g/cm3 at 15 deg C, and the gas gravity was 0.690 (air = 1). The bottom hole flowing temperature was 125 deg C.