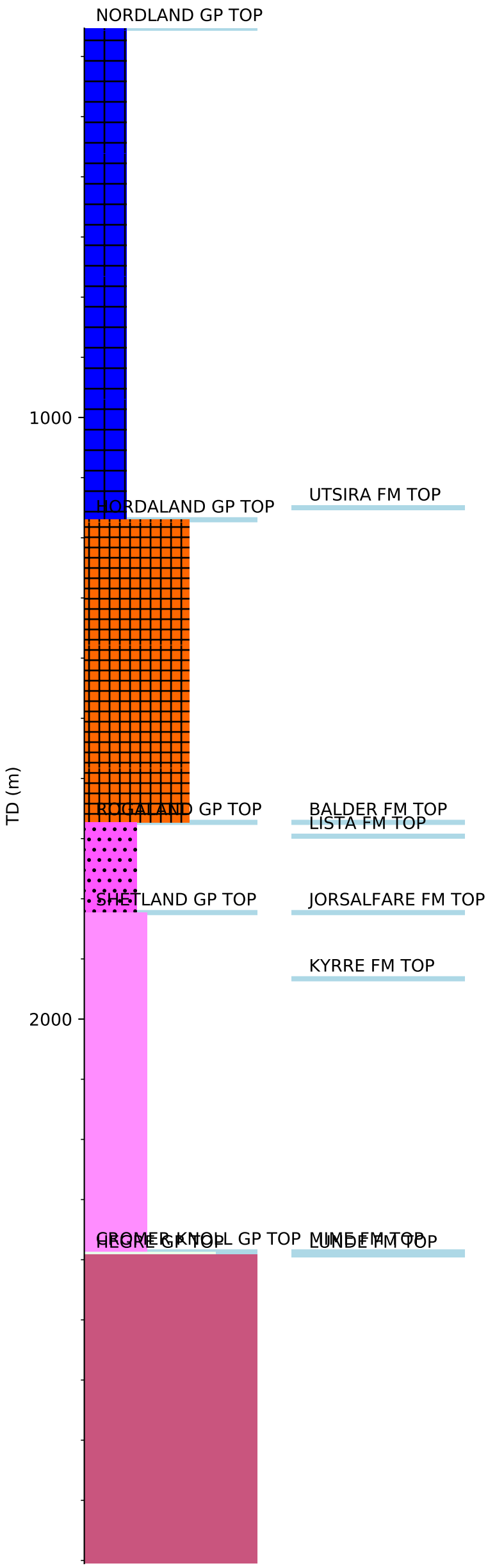
Groups

Formation Tops



LITHOSTRATIGRAPHY & HISTORY FOR WELL: 34/7-1

Wellbore History

GENERAL

The wildcat 34/7-1 was drilled on the E-structure northeast in block 34/7, on a location ca 9 km south-south west of the 34/4-1 Snorre Discovery well in the northern North Sea. The continuation of this structure was explored by well 34/4-4. The main objective of 34/7-1 was Late Triassic sandstones, which proved hydrocarbon bearing in 34/4-1 and 34/4-4.

OPERATIONS AND RESULTS

Well 34/7-1 was spudded with the semi-submersible installation Vildkat on 9 May 1984 and drilled to TD at 2905 m in the Late Triassic Lunde Formation. The 26" hole was drilled and logged first as a 17 1/2" pilot hole to 1106 m as a precaution against shallow gas then opened up to 26" by using underreamer. Tight spots occurred in the 26" hole section. In the 17 1/2" hole the string got stuck at 1274 m. The string had to be backed off and was fished out of the hole. Some tight spots occurred in this section too. When running the 9 5/8" casing, lost returns were experienced three times and the casing was pulled out of the hole. A velocity log was run, and the well was plugged back to 2640 m by setting two cement plugs and the 9 5/8" casing was landed at 2632 m. The well was drilled with seawater and bentonite down to 1106 m and with polymer/KCl mud from 1106 m to TD.

The Tertiary and Cretaceous sections were mainly composed of claystones, with sand development in lower the Pliocene and in the Late Miocene. The Triassic consisted of sandstones alternating with siltstones, claystones and minor marl.

A major unconformity is observed at 2392 m between the Late Triassic and the Lower Cretaceous. Apart from this, four other unconformities are observed in the well, one in Cretaceous, between Albian and Coniacian, one between the Latest Maastrichtian and Late Paleocene, one between Late Eocene and Early Oligocene and one between Late Oligocene and Late Miocene. Hydrocarbons were encountered in the Triassic sandstones (Lunde Formation) from 2392 down to an OWC at 2586 m. The reservoir comprised a number of sandstones with an average porosity of 23.2% and an average water saturation of 36%. The net pay thickness is 93 m.

The entire Triassic reservoir section from 2397 to 2623 m was cored in 10 cores with 97% recovery. Three RFT-chambers containing pressurized reservoir oil (2398 m, 2497 m and 2579 m) and one RFT-chamber containing water and mud filtrate (2593 m) were collected in the well.

The well was permanently abandoned on 24 July 1984 as an oil appraisal.

TESTING

Three drill stem tests were performed in the oil bearing section of the Lunde Formation. All three tests produced oil.

Three drill stem tests were carried out in the oil zone of this reservoir, intervals (DST1), (DST2) and (DST3).

DST1 produced from the interval 2574.0 - 2581.5 m. During the main flow period this test produced 897 Sm3/day through an 11 mm choke with a wellhead pressure of 186 bar. The GOR was measured to 84 Sm2/Sm3 at separator conditions of 44 bar and 43 deg C. During this flow the bottom hole temperature reached 96.1 deg C and the reservoir pressure was measured to 388.4 bar. The well produced clean oil with no water or sand after the initial clean up.

DST2 produced from the interval 2455.0 - 2567.0 m. During the main flow period the well produced 509 Sm3/day through a 9.5 mm choke, with a wellhead pressure of 167 bar. The GOR was measured to 80 Sm3 /Sm3 at separator conditions of 46 bar and31 deg C. During this flow the bottom hole temperature reached 92.8 deg C. The well produced clean oil with no water or sand after it had cleaned up.

DST3 produced from the interval 2409.7 - 2416.5 m. During the main flow period the well produced 1606 Sm3/day through a 17.5 mm choke, with a wellhead pressure of 146 bar. The GOR was measured to 60 Sm3/Sm3 at separator conditions of 72 bar and 63 deg C. During this flow the bottom hole temperature reached 91.7 deg C. The well produced clean oil with no water or sand after it had cleaned up.

The bubble point pressures ranged from 174 to 182 bar, representing