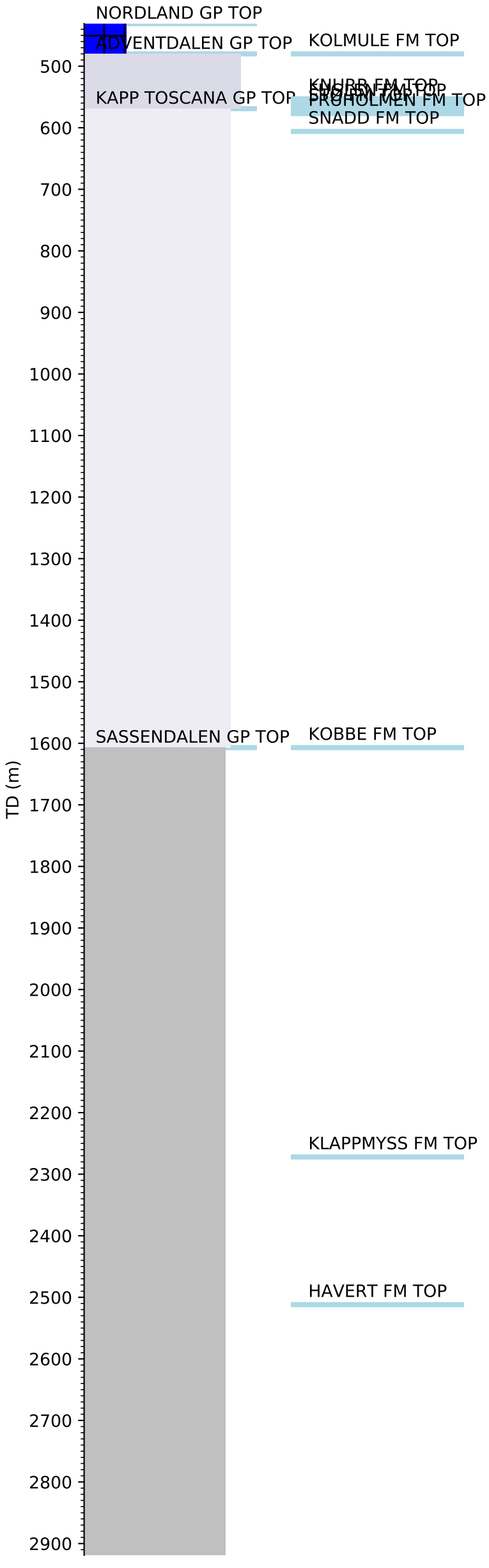
Groups

Formation Tops



Wellbore History

GENERAL

Well 7324/10-1 was drilled on the Alpha structure in the Maud Basin on the Bjarmeland Platform. The main objective was to test the hydrocarbon potential in a prospect at the Base Anisian level (Top Klappmyss Formation). The secondary objective was to test sandstones below the Base Smithian level (Top Havert Formation). In addition the well should test the source rock potential in the Triassic, Base Snadd, and Base Kobbe Formations. Possible sand layers at 575 - and 695 m justified a shallow gas warning at these levels. Planned TD was at 3400 m in Late Permian.

OPERATIONS AND RESULTS

Wildcat well 7324/10-1 was spudded with the semi-submersible rig Ross Rig 3 June 1989 and drilled to TD at 2919 m in the Early Triassic Havert Formation. TD was set approximately 500 m higher than prognosed due to lost circulation problems in the interval 1800 m to 2626 m. The well was drilled with seawater down to 558 m, with gypsum / polymer from 558 m to 2289 m, and with gel / lignosulphonate from 2289 m to TD. No shallow gas was encountered.

Minor gas was encountered in the Kobbe Formation at 1607 m but the sandstones had very poor permeability and no RFT samples were collected. The main target at Base Anisian/Klappmyss Formation at 1767 m in the prognosis, proved to be an intra Anisian seismic marker encountered at 1822 m. At this level there was no reservoir developed, neither was there any reservoir developed at the new Anisian seismic marker on 2272 m. The secondary objective at top Havert Formation encountered at 2512 m had a limited reservoir developed. Shows were recorded in the Snadd Formation from 617 m to 692 m and 1150 m to 1186 m. Organic rich shales were encountered in Snadd, Kobbe, and Klappmyss Formations, but from organic geochemistry only a thin sequences in the Snadd Formation could be classified as good, possibly oil-prone source rocks. These were: a carbonaceous shale at 989 m and a thin clay stone sequence at 1603 m to 1607 m. At 2267 m at the base of the Kobbe Formation a third organic-rich sequence (TOC typically 2 ? 4 %) is encountered, but hydrogen index in this sequence indicate only gas prone kerogen at best, possibly due to advanced maturity. The well reaches oil-window maturity at ca 1000 m, the wet gas window is reached at ca 2200 m, and dry gas maturity is reached at ca 2700 m. Temperatures measured during well-logging indicate an average thermal gradient, from surface to TD, of ca 46 °C/km. Pore pressure is normal down to ca 1270 m. From 1270 m down to the organic rich shales at 2267 the pore pressure is abnormal. Below 2500 m the pressure starts to decrease. A total of five cores were cut in the well, and 450 sidewall cores were attempted but only 384 was recovered. One RFT fluid sample was taken at 570 m. The sample contained mud filtrate and formation water with no associated gas.

The well was permanently abandoned 19 August 1989 as a dry well with shows.

TESTING

No drill stem test was performed

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7324/10-1