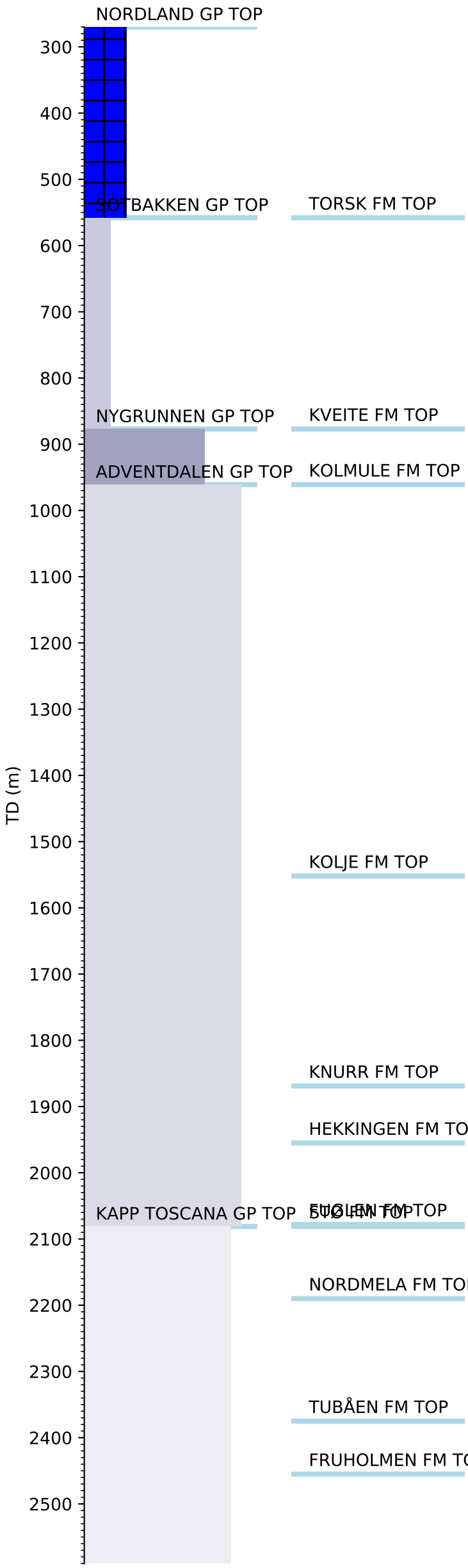
Groups

Formation Tops



Wellbore History

GENERAL

The 7120/8-2 well was drilled on the Alpha-South structure in the Western part of the Hammerfest Basin. The first well in the block, well 7120/8-1, was drilled on the Alpha North closure in 1981, north of the major east - west fault splitting the two closures/structures. This well found gas-bearing sandstones in the Middle to Early Jurassic. The primary objective of well 7120/8-2 was to test possible hydrocarbon accumulations in sandstones of Middle to Early Jurassic age (Stø Formation) in the Alpha-South structure.

OPERATIONS AND RESULTS

Well 7120/8-2 was spudded with the semi-submersible installation Neptuno Nordraug on 15 April 1982 and drilled to TD at 2590 m in Late Triassic sediments (Fruholmen Formation). The drilling of the 36" and 26" hole went forth without any problems. After this several problems occurred and 78 days were used to reach TD, 29 days more than programmed. The main hang-ups were: broken 20" csg, partly collapsed 13-3/8" csg, pulled BOP stack, roller system, and stucked stabilizer at 2156 m. The well was drilled with gel/spud mud down to 333 m, with gel/seawater from 333 m to 752 m, and with gel/lignosulphonate/seawater from 752 m to TD.

Hydrocarbon accumulations were discovered in sandstone sequences between 2081-2161 m in the Stø Formaton. The reservoir sandstones showed good to excellent reservoir properties. Gas composition from the DST was almost identical to the gas composition of the DSTs performed in the 7120/8-1 well. This was also indicated by gas gradients established from the RFT pressure points taken in the two wells. RFT pressure points from the two wells also indicated that the water zone most likely is in communication. Organic geochemical analyses show TOC in the range 0.7 % to 2.8 % TOC in mudstones from the Early Cretaceous. The kerogen in these samples are Type IV / III with a poor potential, increasing to fair at the base, for gas. Olive black claystones of the Late Jurassic Hekkingen Formation has TOC from 2 % to 12 % with Type III kerogen on top grading to Type II at the base. With a large terrestrial input these source rocks have rich potential for gas, condensate and waxy crude oil. The Jurassic and Late Triassic sequences below the Hekkingen and Fuglen Formations are mainly sandstones interbedded with shale, and in the Early Jurassic and Late Triassic also coal seams appear. The shale interbeds here are classified as poor sources for gas (Type III), while the coals have excellent hydrocarbon potential and may be oil-prone. However, theses shales and coals do not constitute a significant volume of source rock in the well position, compared to the Hekkingen Formation. The maturity parameters show an immature well down to ca 2000 m where vitrinite reflection reaches 0.5 %Ro. From here the maturity increases to early oil window/peak oil window at TD, however the coals penetrated by the well are probably all immature in well position. Analyses of shows and a DST condensate from the Early Jurassic sandstones indicate a common source for the shows and the DST condensate. This source is most probably the Hekkingen Formation, but deeper coal seams cannot be excluded as a possibility.

Eight cores were cut in succession from 2085 m in the Stø Formation to 2218 m, 28 meters into the Nordmela Formation. Two RFT samples were taken: one at 2083 m (gas, mud filtrate, formation water) and one at 2150.5 m (mud filtrate, formation water, small volume of gas).

The well was permanently abandoned as a gas appraisal on 29 July 1982.

TESTING

One DST was carried out in the interval from 2092-2097 m in the Stø Formation reservoir. The test flowed gas with a small amount of condensate. Condensate density was 0.778 g/cm3 and gas gravity was 0.679 (air = 1) with 4-5% CO2. No H2S was detected. Sand production was not observed and water production was limited to mud filtrate and water associated with the gas. The well was initially flowed for 840 min. before being shut in for 1350 min. The well was then opened for a multi - rate flow, which lasted 900 min. before being shut in for 300 min.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7120/8-2