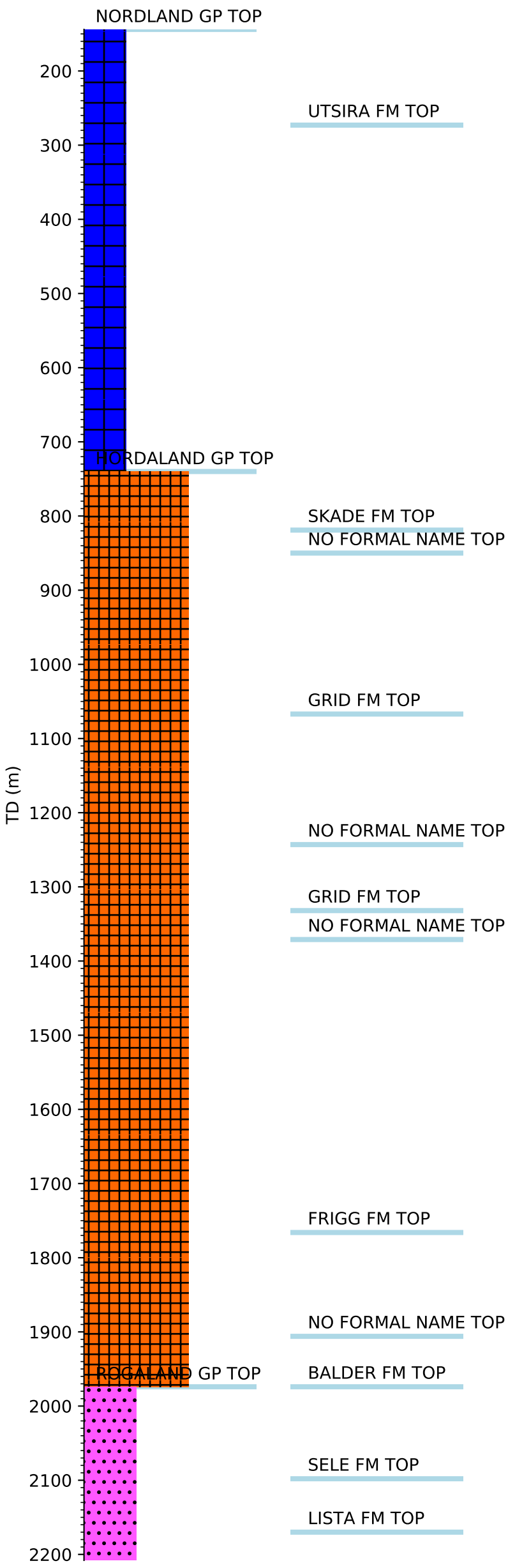

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 24/9-4

Wellbore History

GENERAL

Well 24/9-4 is located 1 km East of the border to British sector, on the northern outskirts of the 24/9-3 Discovery. The main objective of the well was to test the Early Eocene Frigg Formation forming a stratigraphic play in the western part of the block, where the reservoir was interpreted to result from a submarine fan deposition. The primary risk of the prospect was the presence of the reservoir. The prognosed gross thickness of the reservoir sequence was 230 metres with a net/gross ratio of 0.50 at the well location. No secondary targets were identified.

OPERATIONS AND RESULTS

Well 24/9-4 was spudded with the semi-submersible installation Byford Dolphin on 17 April 1991 and drilled to TD at 2208 m in the Late Paleocene Lista Formation. Here, a wiper trip was performed. When back reaming the string stuck at 1864 m. It was not possible to circulate since the hole had packed off. Several fishing attempts were made, but all were unsuccessful, leaving an MWD tool and a CDR tool in the hole. The hole was then cemented to 1733 m. The sidetrack vas kicked off from 1753 m to an angle of four degrees before pulling out at 1842 m. A conventional packed hole assembly vas then run to try to drill to section TD. Drilling continued to 2021m where a viper trip vas performed to ream tight hole sections. Drilling resumed without incident to 2164 m where bottoms up vas circulated before tripping out. The string became differentially stuck whilst pulling out of the hole. After spotting a pill and jarring for several hours a back-off charge vas run leaving a 30 m fish in the hole, which included an MWD tool. Several unsuccessful fishing runs were attempted before running a VSP and E-logs. The well vas then plugged and abandoned at 2164 m.

Well 24/9-4 penetrated the top of the Frigg Formation sands at 1766 m, which was 51 metres deeper than prognosed. It consisted of very fine to fine grained well-sorted very argillaceous sandstone stringers commonly less than one metre thick. One major massive sand was seen from 1864.5 to 1906 m. The majority of the Frigg interval was grey claystone with occasional pyrite and glauconite grains. Thin limestone stringers were also seen.

The first shows observed in the well occurred at 1759 m with traces of an orange direct fluorescence with a fast white cut fluorescence and a white residue fluorescence. Gas levels increased sharply at 1766 m to 0.36% C1, 0.017% C2 with traces of C3 and C4, with an average reading of 0.123 % C1, 0.025% C2 and traces of C3 and C4 down to 1815 m. Below this depth levels fell to 0.07-0.10% C1, with traces of C2 and C3. Shows were good in the sandstone stringers encountered from 1766 to 1815 m with oil staining, direct and cut fluorescence. Below 1815 m, the shows diminished until below 1840 m, where only traces of cut fluorescence could be detected. The main sand interval between 1864.5 and 1906.0 m was water bearing. Only traces of light brown and occasional black residual oil were encountered in this interval.

Three cores were cut in the Lower Eocene section at the top of the Frigg Formation sands. A total of 22.0 metres were cored between 1773.0 and 1795.0 m, with a total recovery of 11.75 metres (53.4 %). The cores consist mainly of claystone and only three very thin sand stringers were present. Black oil was bleeding from these stringers. RFT points were taken throughout the four reservoir sections. The overall quality of the data is poor due to the type of reservoir (unconsolidated sandstone), the hole conditions (caliper log indicates values from 6.5 to 14 inches) and large drilling fluid invasion in the reservoir sections. Four attempts were made to collect representative reservoir fluid samples. On each run, a 2 3/4 and a one-gallon RFT chamber were used. The 23/4 chambers were full of mud/mud filtrate. Some oil shows were found but could not be used for laboratory analysis. Wire line logs in run no 4, the MWD/LWD logs in runs no 8 and 9, CST's, and RFT's were taken in the sidetrack. The conventional cores and all other logs were acquired in the first hole. Based on the analysis of the ditch cuttings, conventional cores and logs it was decided not to test the well. The well was plugged and abandoned as a dry well with oil shows on 18 June 1991.

TESTING

No drill stem test was performed