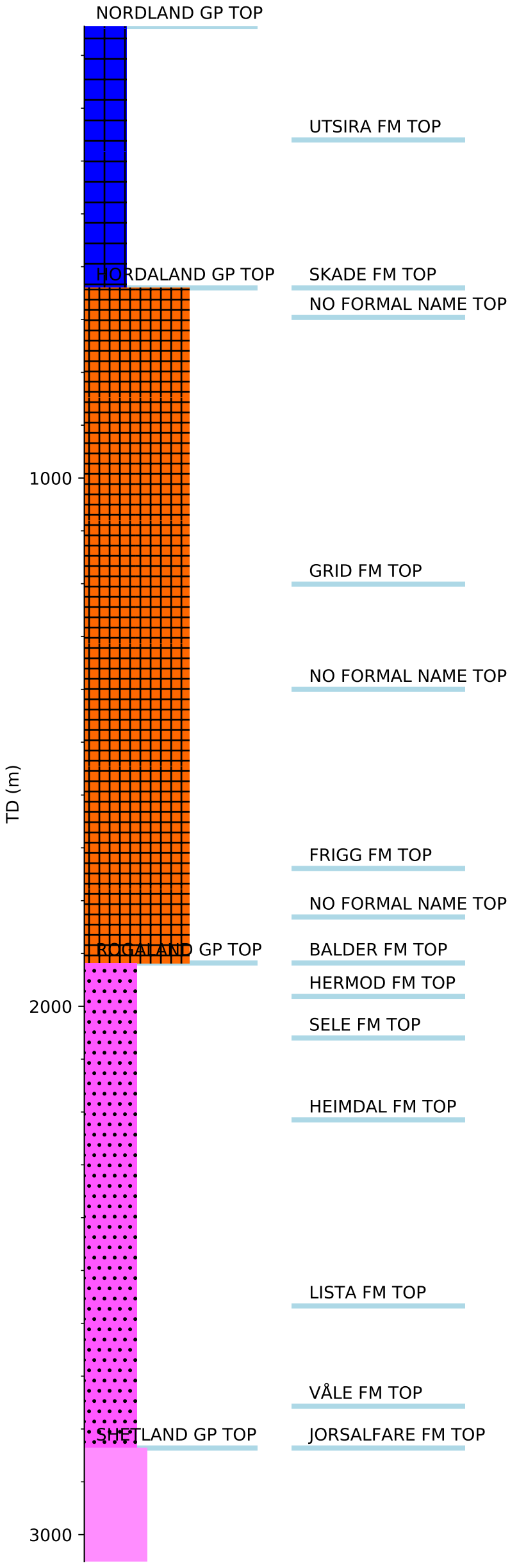
Groups

Formation Tops



Wellbore History

GENERAL

Exploration well 24/9-3 was drilled by Conoco for the Conoco/Statoil/Norsk Hydro/Hudbay PL 039 partnership. The well lies in the west-central part of block 24/9, close to the Norway/UK median line. The location was chosen to test an apparent sand build-up, observable on seismic lines, in the Lower Tertiary part of the section. The sand build-up was thought to correspond to the Lower Eocene Frigg Sand Formation, which forms the reservoir in the Frigg Field.

OPERATIONS AND RESULTS

Well 24/9-3 was spudded with the semi-submersible installation SEDCO 704 on 28 January 1981 and drilled to TD at 3051 m in the Late Cretaceous Jorsalfare Formation. The duration of the well was 81 days, 20 of which were spent testing. A 36" hole was drilled to 207.6 m / 681 ft and 30" casing set to same depth. A 17 1/2" pilot hole was drilled to 518.2 m, logged, and then opened to 26". 20" x-56 casing was set at 503.2 m. A 17 1/2" hole was drilled to 1600.2 m, logged, and 13 3/8" N-80 casing was set at 1587.1 m. A 12 1/4" hole was drilled and cored to 2049.8 m, logged, and 9 5/8" N-80 casing was set then drilled to TD and logged. The well was drilled with spud mud to 518 m, with Dextrid/gel from 518 m to 853 m, with gel/lime from 853 m to 1067 m, with seawater/gel/Dextrid from 1067 m to 1600 m, and with seawater/lime/Dextrid mud from 1600 m to TD.

The Lower Eocene sands (Frigg Formation) were encountered 141 m high to prognosis at 1739 m. This shows that the sands correspond to a higher and less distinct build-up on the seismic. The build-up originally mapped corresponded to the Paleocene Tuff level and contained shales and water-wet Paleocene Sands. A gross interval of 92 m of Early Eocene Sands was penetrated. The uppermost 70 m, from 1739 m, were hydrocarbon bearing down to an OWC at 1809 m, while the lowermost 22 m (1809-1831m) were water bearing. Patchy oil shows were observed down to 1870 m, no shows were recorded below this depth. Core analysis carried out by Geco indicated residual oil saturations of 13.4 % - 32.4 % and that the sands, where present, were of excellent reservoir quality with porosities of up to 39% and permeabilities in the 2-4 Darcy range.

A single RFT result and the results of DST3 in the upper part of the Frigg Formation reservoir (1739.5 m û1747 m) combine to indicate the possibility that a gas zone existed in the interval 1739 m (Top Sand) - 1765m. There is, however, no indication of gas on the logs and the poor results from DST3 suggested that the zone tested was essentially tight.

Bubble point measurements carried out at well site and subsequently confirmed in the laboratory by Flopetrol showed that the crude in the proven oil zone is under saturated. It therefore follows that the gas zone, if present, represents a separate accumulation and is not in pressure contact with the oil zone.

Five cores were cut in the interval 1777.9 m to 1797.7 m in the Early Eocene sands. The core depths were generally ca 5 m deep to logger's depth. Geochemical samples were taken at 30 m intervals from 13 3/8" casing to TD.

The well was permanently abandoned as an oil discovery on 15 April 1981.

TESTING

After logging at TD the well was plugged back to 1995.5 m and three zones were tested using prepacked screens and a coiled tubing nitrogen unit for artificial lift. Three drill-stem tests were carried out on the hydrocarbon interval. Tests 1 (1797 m to 1805 m) and 2 (1765.4 m to 1773 m) in the lower part of the reservoir produced 21.5 - 23¦ API oil at rates 39 Sm3 oil/day and 86 Sm3 oil/day, respectively. Test 3 in the uppermost part of the reservoir gave only a small trickle of gas.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 24/9-3