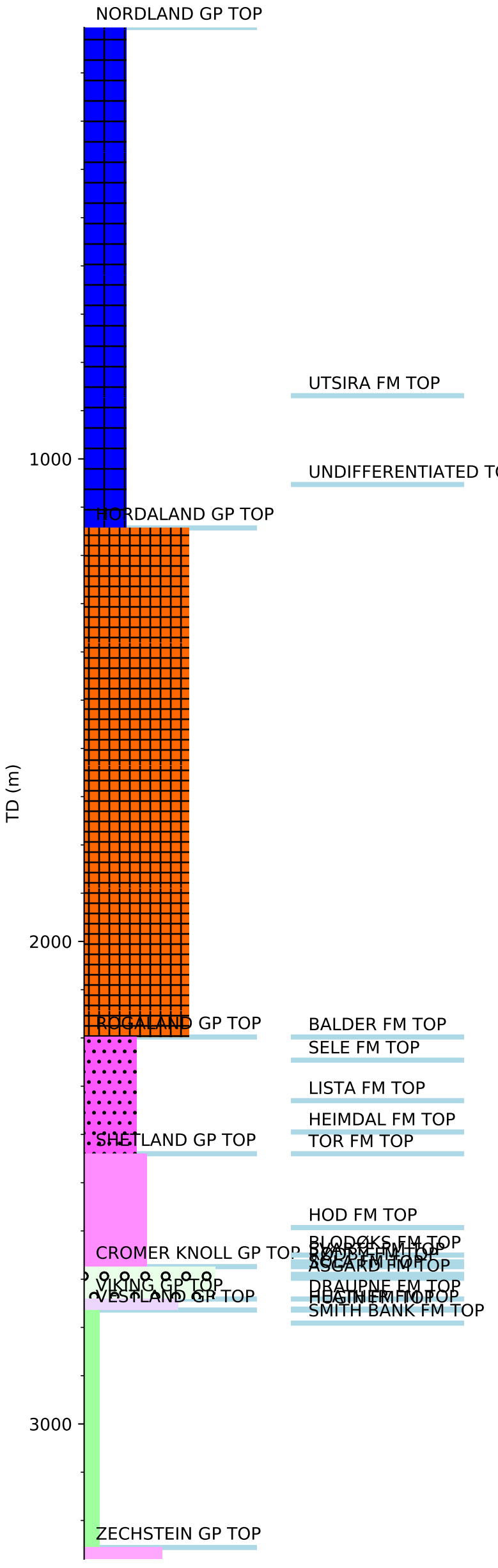
Groups

Formation Tops



Wellbore History

GENERAL

Well 15/9-13 was drilled on the Sleipner East Field in the Viking Graben in the North Sea. The objective was to delineate the hydrocarbon accumulation found in the Heimdal Formation of the 15/9 Gamma structure. Secondary objectives were to test possible hydrocarbons in sandstones of Jurassic - Triassic age. The well is reference well for the Utsira and Skade formations.

OPERATIONS AND RESULTS

Appraisal well 15/9-13 was spudded with the semi-submersible installation Ross Rig on 21 March 1982 and drilled to TD at 3280 m in the Permian Zechstein Group. No significant problem was encountered in the operations. The well was drilled with seawater and hi-vis slugs down to 518 m, with gel/lignosulphonate mud from 518 m to 1165 m, gypsum/lignosulphonate mud from 1165 m to 2642 m, and gel/lignosulphonate mud from 2642 m to TD.

The well proved gas and condensate in the Heimdal Formation. Shows on cores indicate that all sandstones in the Heimdal Formation are gas filled to a probable down-to contact in top Shetland Group at 2440 m. Gas and condensate were also encountered in a Jurassic sandstone from 2763 to a probable down-to contact at 2791 m. No hydrocarbons were found in Triassic sandstones. No shows were recorded outside of the hydrocarbon-bearing sections in the well.

Seven cores were cut. Cores 1 - 3 were cut from 2404 m in the Heimdal Formation to 2453.5 m in the Tor Formation with 84 to 100% recovery. Cores 4 - 7 were cut from 2763 m to 2801.6 m in the Hugin Formation with 90 to 100% recovery. Segregated RFT fluid samples were taken at 2400 m, 2437 m, 2765.8 m, and 2766.5 m.

The well was permanently abandoned on 27 May 1984 as a gas/condensate appraisal well.

TESTING

Two DST's were performed on this well.

DST 1 tested gas and condensate from 2765 to 2769 m in the Jurassic sand through the 7" liner. During the main flow on a 64/64” choke, the test produced on average 804500 Sm3 gas and 388 Sm3 condensate /day. The GOR was 2073 Sm3/Sm3, the condensate density was 0.783 g/cm3 and the gas gravity was 0.742 (air = 1). The gas contained 0.8 ppm H2S and 1.0 % CO2. The gauge temperature at final build-up was 98.3 °C.

DST 2 tested gas and condensate from 2422 to 2427 m in the Heimdal sand through the 9 5/8" casing. During the clean-up period on a 64/64” choke, the test produced on average 758600 Sm3 gas and 401 Sm3 condensate /day. The GOR was 1891 Sm3/Sm3, the condensate density was 0.76 g/cm3 and the gas gravity was 0.702 (air=1). The gas contained 0.4 ppm H2S and 0.3 % CO2. The gauge temperature at final build-up was 90.3 °C.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 15/9-13