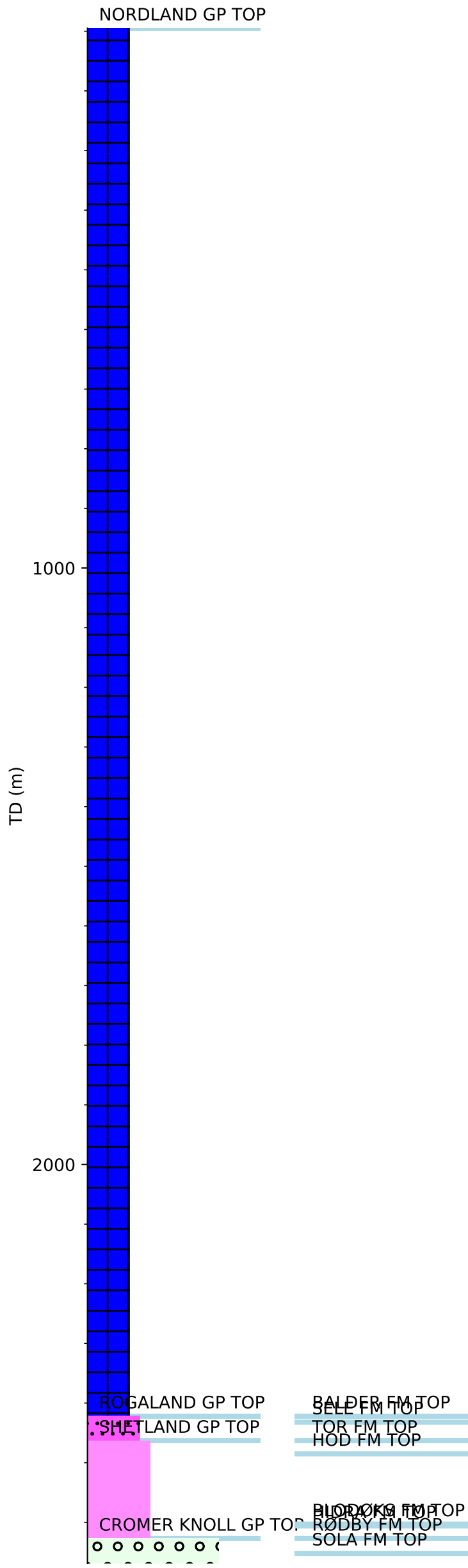
Groups

Formation Tops



Wellbore History

GENERAL

Well 2/8-6 was drilled to test the chalk approximately on the crest of the Valhall structure in the southern North Sea. The Valhall structure was mapped as a large northwest-southeast trending anticline at the Tertiary level covering approximately 65 km2 with a vertical relief of ca 490 m. The crestal portion of the Valhall structure, ca 26 km2 in area, was blanketed by a low velocity "bright spot" zone in the overlying Tertiary (Miocene). Such "bright spot" had been observed also over the Hod discovery, the Ekofisk and the Eldfisk. The 2/8-6 and 2/11-2 wells had confirmed that these "bright spot" anomalies were caused by oil and gas present in the younger Tertiary beds, creating extremely low velocities.

OPERATIONS AND RESULTS

Wildcat well 2/8-6 was spudded with the semi-submersible installation Waage Drill I on 7 April 1975 and drilled to TD at 2669 m in the Early Cretaceous Sola Formation. The well was drilled in 38 days. Of these a total of 9 days were lost due to drilling problems; 2 days cementing between the 20 and 13 3/8-inch casing to stop gas entry into the annulus, 1.5 days to repair BOP stack connector, and 5.5 days to combat gas kick and lost circulation while drilling at 2438 m. The well was drilled with seawater and hi-vis mud down to 155 m, with shale-Trol gel mud from 155 m to 1890 m, and with lignosulphonate mud from 1890 m to TD.

The chalk was encountered at 2463 m. Good oil shows were encountered in the intervals 2465 - 2472 m and 2526 - 2551 m with minor oil saturations occurring between the above intervals and down to approximately 2560 m resulting in a gross oil column thickness of 110 m. Log derived porosity in the oil column ranged between 27 and 43%, averaging 33 %. Core porosity ranged between 26 and 52%. The maximum horizontal core permeability was 18 mD; however, most values ranged between 0.1 and 1.0 mD. Water saturations within the two most promising intervals were generally less than 40%. Cores and ditch cuttings showed that the chalk within the upper 12 - 15 m has considerable horizontal and vertical fracturing.

Two core samples were taken from 2465.5 m to 2501.5 m, with 56% recovery. No wire line fluid samples were taken.

The well was permanently abandoned on 30 June 1975 as the oil discovery well on the Valhall Field.

TESTING

Five production tests were conducted over the chalk pay. Four mechanically successful tests were conducted over the lower sections. However, the fifth test, which was to test the uppermost pay in the well, failed due to split/collapsed casing.

Test No 1 tested the interval 2570 m to 2582.3 m. The test produced 95 Sm3 oil/day on open choke. GOR was 201 Sm3/Sm3, oil gravity was 34.0 deg API and the gas gravity was 0.665 (air = 1). The interval was supposed to be water saturated, so the oil flow was possibly due to poor cement bonding.

Test No 1A was a retest of Test No 1, after acidizing. This test produced only small amounts of oil and gas together with bottom sediments and water.

Test No 2 tested the interval 2525.9 m to 2553.3 m. Prior to acidizing the test flowed 89 Sm3 oil/day on a 4/64" choke. GOR was 810 Sm3/Sm3, oil gravity was 33.0 deg API and the gas gravity was 0.69 (air = 1). After acidizing the test produced 175 Sm3 oil/day on a 48/64" choke. The GOR was 134, the oil gravity was 34.0, and the gas gravity was 0.68.

Test No 3 tested the interval 2502.4 m to 2511.6 m. Prior to acidizing the test flowed 24 Sm3 oil/day on open choke. After acidizing the test produced surges of oil, gas, acid water, emulsions and solids with open choke. Oil gravity was 35.6 deg API.

Test No 4 tested the interval 2478 m to 2488.7 m. No acid stimulation was applied. The test produced 135 Sm3 oil/day on a 32/64" choke. GOR was 223 Sm3/Sm3, oil gravity was 38.2 deg API and the gas gravity was 0.714 (air = 1). A maximum temperature of 92.2 degC was measured at gauge depth 2471.3 m in this test.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 2/8-6