



Wellbore History

GENERAL

Exploration well 2/11-1 is located on the southern periphery of the Valhall Field in the North Sea. The objective of this early wildcat was to test all horizons down to the Rotliegende, estimated at 14100 ft (4298 m). Top Permian was expected at 10300 ft (3139 m). Planned TD was at 15000 ft (4572 m).

The well is Reference Well for the Åsgard, Sola, and Rødby Formations.

OPERATIONS AND RESULTS

Well was spudded with the semi-submersible installation on and drilled to TD at 4691 m in the Late Jurassic Tyne Group. The well started to build angle from below ca 3500 m with maximum 11 deg deviation at 4444 m. Otherwise no significant drilling problems were reported from this deep well. The well was drilled water based down to 3432 m and with an invert oil mud (Vertoil) from 3432 m to TD.

Top Paleocene, Balder Formation, was encountered at 2590 m. Top chalks of the Shetland Group (Tor Formation) was encountered at 2635 m. In addition to shows from the gas detector, free oil was seen floating on the mud pits and samples showed good fluorescence and cut through the interval 2585 m to 2633 m (Balder, Sele, and Lista Formations). Post-well geochemical analyses reported significant oil staining down to 2776 m. By testing live oil was confirmed in the uppermost Tor Formation. The tests were inconclusive with regard to an OWC, but the logs indicated that the contact was at 2655 m. Base Cretaceous was at 3555 m. The well did not reach Permian sediments; in stead the well drilled 1136 m in Late Jurassic shale (Mandal, Farsund and Haugesund Formations) before final TD was set. One conventional core was cut from 3864 to 3878 m in the Farsund formation.No wire line fluid samples were taken.

The well was permanently abandoned on 3 October 1969 as a minor discovery. After the 2/8-6 Valhall Discovery well was drilled 6 years later well 2/11-1 was re-classified to oil appraisal well for the Valhall Field.

TESTING

Five drill-stem tests were conducted. DST 1 from 2632 m to 2638.3 m (Lista and topmost Tor Formations) gave some oil to the surface, but rates declined rapidly to no flow, so no viable measurements were obtained. DST 2 and 3 from 2593.8 m to 2604.5 m (Balder - Sele Formations) gave no flow to surface. DST 4 from 2628.6 - 2640.8 m plus 2645.7 - 2650.5 m (Tor Formation) gave gas and oil to the surface at rates of 12686 Sm³ gas and 146 Sm³ oil/day in the final, 4 hours and 42 min flow. The GOR was 87 Sm³/Sm³. Flow rates decreased during the test and the figures were derived from the last readings. DST 5 from 2645.7 - 2650.5 m (Tor Formation) gave no flow to the surface, but 274 m fluid was reversed out after the test and the fluid contained ca 20% oil.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 2/11-1