



Wellbore History

GENERAL

The objectives of exploration well 16/1-4 were to test Paleocene sandstones (Heimdal Formation) in prospect C and Eocene sandstones (Grid Formation) in prospect D. Prospect C was the main target. Oil was the prognosed hydrocarbon type. It was expected to penetrate a pre-Cretaceous sedimentary sequence, although the well location was not optimal for a test of the pre-Cretaceous.

OPERATIONS AND RESULTS

Wildcat well 16/1-4 was spudded with the semi-submersible installation "Deepsea Bergen" on 17 March 1993 and drilled to TD at 2010 m, 146 m into basement rocks. The well was drilled with spud mud / hi-vis pills down to 324 m and with "ANCO 2000" mud from 324 m to TD. Well 16/1-4 penetrated sedimentary rocks of Quaternary, Tertiary, and Cretaceous ages, in addition to basement rocks of unknown age. No pre-Cretaceous sediments were present in the well. In the Tertiary, reservoir quality sandstones were present in the Miocene and the Oligocene (Utsira and Skade Formations) and in the Eocene Grid Formation. The Grid sandstones were thinner than expected. No sandstones were developed in the Paleocene (Rogaland Group) at the well location. The carbonates in the Shetland Group were dated to be of Early Paleocene, Danian age. The lower Cretaceous sediments in well 16/1-4 are 4 m thick (1860 m -1864 m) and consist of clay stone/marls and immature sandstones with grains of igneous rocks similar to the basement rocks below. These sediments are dated to be of Early Aptian age and have been identified as the Sola Formation of the Cromer Knoll Group. The basement rocks consist mainly of brecciated igneous rocks. No hydrocarbon shows were observed in the Grid Formation sandstones. Gas-condensate was encountered in the upper part of the drilled basement section. Cores were cut in the Eocene Grid Formation and in the Hordaland Group shales between upper and lower Grid Formation (cores 1-3), in the Paleocene Balder- and Sele Formations (cores 4-6), and in basement rocks (core 7).

The cores show well-developed clean sandstones in the Grid Formation. The boundary between the Balder- and the Sele Formations is present in core 4. The basement core generally consists of a mafic plutonic rock (gabbro/diorite) with intrusions of a felsic rock (syenite). The rocks are strongly brecciated. Petrologic analysis indicates that the plutonic igneous rocks are hydrothermally altered. FMT samples from 1867.5 m and 1867.4 m in the Basement contained wet gas / condensate. Onshore geochemical analyses indicated low maturity for both the gas and the condensate components. The well was permanently abandoned as a minor gas/condensate discovery on 13 April 1993.

TESTING

No drill stem test was performed.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 16/1-4