



LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7120/1-2

Wellbore History

GENERAL

Block 7120/1 is situated on the southern margin of the Loppa High and is bisected by the east-west trending Southern Loppa High boundary fault, which separates the Loppa High from the Hammerfest Basin to the south. The main objective of well 7120/1-2 was two seismostratigraphically defined wedges (of inferred Aptian age) in a large fault-bound closure against the Loppa High. Additional objectives were provided by a lower wedge of inferred Hauterivian age and Early Jurassic/Late Triassic elastics truncated beneath the Base Cretaceous unconformity, both down dip from the structural culmination.

OPERATIONS AND RESULTS

The well spudded with the semi-submersible installation Ross Rig on 1 January 1989 and drilled to a total depth of 2630 m in Late Triassic sediments of the Fruholmen Formation. No shallow gas was encountered at any depth. The rig had to be moved three times due to problems with boulders that increased the hole inclination too much. Rough weather conditions, with waves exceeding 16 m, delayed drilling with several days. The well was drilled with seawater and spud mud down to 617 m and with KCl /Polymer mud from 617 m to TD.

Well 7120/1-2 penetrated two seismically defined "wedges" which contained three distinct clastic packages. The uppermost wedge (Wedge I from 1585 m to 1826 m) was dated as Early to Middle Albian in age, whilst the lower hydrocarbon-bearing wedge contains two units of latest Ryazanian / Early Valanginian (Wedge IIa from 1878 m to 1984 m) and Early Volgian age (Wedge IIb from 1984 m to 2138 m) respectively. These units had not previously been penetrated on the Barents Shelf.

Oil shows (direct fluorescence) was recorded on cuttings and cores in several intervals below 1931 m. Based on DST, logs, cores and RFT pressure measurements it was concluded that an oil column in excess of 90 m was encountered in Wedge IIa. Hydrocarbon saturations were considered reliable and although averaging only 50 %, could be as high as 65 % in both the upper and lower reservoir intervals (corresponding to Production Tests 3A and 3B respectively). Reservoir properties in the hydrocarbon-bearing interval were in general very poor and the intercalation of thin sand-shale beds made it impossible to pick an oil-water contact with any confidence. All other interpreted hydrocarbons, with the exception of an isolated sand in the Hekkingen Formation, were considered to be immovable. A segregated RFT sample was recovered from 1888.5 m (within the Production Test 3A interval in the Lower Cretaceous reservoirs of Wedge IIa). Both sample chambers were opened on the rig and found to contain oil, water and gas. A total of 0.0012 m³ of 31 deg API (0.871 g/cm³) oil was recovered along with 0.074 m³ of gas. A second RFT sample was recovered from 2153.5 m (a two to five meter thick isolated sand in the Upper Jurassic Hekkingen Formation). The lower sampling chamber from this interval was opened on the rig; it contained 0.0023 m³ of 41°API (0.820 g/cm³) oil and 0.3706 m³ of gas. Attempts to recover RFT samples and pressures from the interval 2506 m to 2543 m failed due to tight Formation. Four conventional cores were cut. In addition, a 10 cm core was recovered from the junk basket tool run to retrieve lost bullets prior to drilling ahead at the 7" liner depth. Core 1 was cut from 1815 m to 1825 m in Wedge I, core 2 was cut from 1957 m to 1969 m in Wedge IIa, core 3 (from junk basket: black fissile claystone with strong smell of H₂S) was retrieved from 2147 m in the Hekkingen Formation, core 4 was cut from 2581 m to 2583 m, and the fifth core was cut from 2583 m to 2585.5 m. Cores 4 and 5 were cut in the Fruholmen Formation, and both jammed off.

The well was permanently abandoned on 28 March 1989 as an oil discovery

TESTING

Two hydrocarbon production tests were planned for well 7120/1-2. The planned test intervals were 2506 m to 2543 m (Production Test #1 in the Fruholmen Formation) and 1879 m to 1896 m / 1944 m to 1971 m (Production Test #2 in the Hekkingen Formation). During Production Test 2, the tubing conveyed perforating guns parted from the bottom hole assembly and perforated the water-bearing sands below the proposed test interval. This incident led to a repeat of the test over the interval 1879 m to 1971 m as Production Test 3. Test 1 gave no flow, but bottom hole samples and bottoms up contained minute traces of oil. Test 2 produced water, while the final, oil zone test in Wedge IIa (Test 3A and Test 3B) proved moveable oil. However the oil came very slowly with alternating gas and slugs of emulsified oil, and only after displacement of the