



Wellbore History

GENERAL

Well 7/7-2 is located ca 8 km east of the UK border on the Jæren High in the North Sea. It was the second commitment well within the licence PL-148 and was designed to test the A-prospect, interpreted as a Late Jurassic channel sandstone. Planned TD was in Permian sediments or 3500 m, whichever came first.

OPERATIONS AND RESULTS

Wildcat well 7/7-2 was spudded with the semi-submersible installation Deepsea Bergen on 20 January 1992 and drilled to TD at 3430 m in the Permian Zechstein Group. The well took 100 days to drill and test, 20 days more than planned. This was mainly due to a 25% higher pore pressure than prognosed in the reservoir, resulting in a plug-back and 9 5/8" casing above reservoir, and not at TD as programmed. Other contributing factors were re-spud after lost stinger in 30" casing, two occasions of pulling BOP due to leakage and leak on swivel stem on top drive. The DSTs experienced severe difficulties with leakage and operation of down hole valves resulting in two mis-runs with testing string and a shortened DST no. 2. The well was drilled with CMC EHV and seawater down to 904 m, with KCl/PHPA/PAC from 904 m to 2744 m, and with ANCOTEMP mud from 2744 m to TD.

The greater part of the prospect, the Late Jurassic Ula sandstone was encountered at 3327 m, and proved to be sandy. The Jurassic reservoir lithology consisted primarily of fine, well-sorted silica-cemented sandstone with poor visual porosity. Subsequent testing from 3348 - 3350 m showed a very tight formation, however testing from 3333 - 3342 m yielded oil. No oil-water contact was encountered, but organic geochemical analyses detected oil saturation in two intervals from the top of the reservoirs down to 3341, and from 3345 down to 3347 m.

Four and a half m of shaley core was recovered in two cores from 3242 m to 3247 in the Mandal Formation. Good oil shows were observed in these cores. Organic geochemical analyses proved them to be excellent oil-prone source rock and with a maturity well within the oil window. Three cores were cut from 3338 m to 3363 m in the lower part of the Ula Formation and 17 m into the Triassic Smith Bank Formation. FMT pressures indicated a 0.766 g/cm³ oil gradient over the reservoir interval. Two FMT fluid samples were taken. Sample 4B at 3334 m recovered only mud filtrate. Sample 4C at 3335.4 m recovered 18.6 l mud filtrate and 200 ml of HC film.

The well was permanently abandoned on 25 April 1992 as an oil discovery.

TESTING

Two drill stem tests were performed in the well, DST 1 in Triassic sandstones and DST 2 in sandstones of Late Jurassic age. In DST 1 a two-metre interval from 3348 m to 3350 m was perforated. No reservoir fluid was produced to surface, but oil was trapped between two valves in the test string and the string content was also reversed out and directed to tank. Approximately 15 litres of oil were recovered from the test.

The well was perforated from 3333 m to 3342 m in DST 2. It produced 784 Sm³/d of oil through a 24/64" (9.53 mm) choke, with a wellhead pressure of 15218 kPa and a temperature of 80 °C. The gas-oil ratio was measured to 20 Sm³/Sm³ with a separator pressure of 2032 - 2150 kPa and a separator temperature of 65 - 71 °C. Maximum down hole temperature was 144 deg C.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7/7-2