



Wellbore History

GENERAL

Wildcat well 6407/1-3 was drilled in the Haltenbanken area off shore Mid Norway. It is situated on a separate but related structure to 6407/1-2, which found gas-condensate in the Middle Jurassic Garn Formation. The primary target of well 6407/1-3 was Middle Jurassic sandstones. Secondary target was Early Jurassic sandstones. Other zones of interest were the Late and Early Cretaceous and the coal unit in the Early Jurassic.

The well is Type Well for the Brygge Formation and Reference Well for the Hordaland Group, it is Type Well for the Garn Formation, and it is Reference Well for the Ile and Not Formations.

OPERATIONS AND RESULTS

Wildcat well 6407/1-3 was spudded with the semi-submersible installation Dyvi Delta on 17 September 1983 and drilled to TD at 4469 m in Late Triassic sediments of the Åre Formation. Hole problems occurred when running back in the hole after a period of bad weather. The hole had collapsed and had to be reamed back to bottom at 3136 M. A drilling break occurred at 3746 to 3748 m. All in all, there was a total of 16 days downtime caused by bad weather. Still, the well was drilled 22 days faster than prognosed. This was mainly due to fast penetration in the 17 1/2" and 6" hole, an efficient coring operation and favourable weather conditions compared to well 6407/1-2. The well was drilled with seawater/gel down to 948 m, with lignosulphonate/gypsum from 948 m to 3608 m, and with bentonite gel from 3608 m to TD.

Hydrocarbon bearing Middle Jurassic sandstones (Garn Formation) were encountered at 3600 m. A gas cap extended to 3687.5 m followed by an oil zone down to 3709 m. At this point the sand grades rapidly into the underlying silt and clay of the Not Formation at 3709.5 m. This makes it difficult to conclude on an OWC for the discovery. The Nise Formation from 2448 m to 2601 m had good gas shows whilst drilling and oil contamination of drilling mud. Mud log data suggested a possible light oil accumulation with associated gas and an oil water contact at approximately 2560 m. Reservoir properties were however poor with a lithology consisting of siltstone grading to very fine sandstone interbedded with claystone. Hydrocarbon shows were also recorded in zones in the Early Cretaceous and in the lower parts of the "Coal Unit". None of these zones were of good reservoir quality. The Early Jurassic sandstones showed only traces of hydrocarbons. No good source rocks were found above base Cretaceous. Late Jurassic shales from 3521 m to 3545 m had excellent source potential with type II/III kerogen and TOC in the range 3 -7%. Hydrogen Index was typically 400 - 500 mg HC/g TOC and the shales had reached early oil window maturity. Also Early Jurassic shales and coals has potential for light oils and gas.

Seven cores were cut in the Middle Jurassic sandstones from 3619 m to 3717 m and from 3748 m to 3758 m. RFT pressure points were sampled over the Middle to Early Jurassic sandstone sequences. Three RFT fluid samples were taken at 3695 m, 3692 m, and at 3676.2 m.

The well was permanently abandoned on 16 January 1984 as an oil and gas discovery.

TESTING

Two drill stem tests were performed in the Middle Jurassic sandstone in the oil zone from 3697.5 - 3702.5 m and in the gas zone from 3665 - 3670 m. DST1 produced 396.1 Sm3 oil and 58430 Sm3 gas per day, with a gas/oil ratio of 148 Sm3/Sm3. DST2 produced 191.8 Sm3 oil and 725400 gas per day, with a gas/oil ratio of 3782 Sm3/Sm3.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6407/1-3