



Wellbore History

GENERAL

Well 2/3-4 was drilled by Gulf Oil Corporation - Norway Branch as a non-obligatory well on behalf of the participants in Production Licence 022. All obligatory work had been previously been done. The well is situated 275 km SSW of Stavanger. Geologically, the location was chosen on the "Ula Trend" on the NE flank of the Central Graben in the southern Norwegian North Sea. The principal objective of the well was to test structural closure of Upper Jurassic Ula Formation sandstone. This formation was believed to exist within 100 m below the nearest representative mappable seismic reflection, the Base Cretaceous Unconformity. The well was also planned to penetrate an Oligocene sand down-dip from a very small gas accumulation defined by a seismic flat spot anomaly, and which was therefore believed to be water wet at the location. The chalk reservoir was not predicted to be hydrocarbon bearing, nor was the well located within its mapped closure.

OPERATIONS AND RESULTS

Exploration well 2/3-4 was spudded with the jack-up installation Glomar Moray Firth I on 28 may 1984 and drilled to a total depth of 3386.3 m in Permian (Zechstein) evaporites. The well was drilled with seawater and gel down to 651 m and with Safemul oil based mud from 651 m to TD. Some swelling of the Miocene clay occurred during drilling of the 17 1/2" hole, otherwise no major problems occurred. Well 2/3-4 was the first exploration well for which NPD approved that conventional wire line logs was replaced with a suite of MWD logs.

The primary objective, Ula Formation sands, was penetrated at 3006 m and was 207 m thick. The porosity of particularly the uppermost 170 m was excellent, generally between 25% and 30%. Electric logs, and a formation fluid sample (from FMT), indicated that the reservoir was water bearing throughout. Shows detection was made difficult due to the mud used. However, spectrofluorometric analyses on cuttings samples while drilling indicated that real shows could be present in the interval between 3045 m and 3006 m. The formation pressure gradient of 1.51 psi/m (0.46 psi/ft) within the reservoir further confirmed that the pore fluid was water, and that no vertical permeability barriers were present. Two segregated FMT samples were taken at 3011.5 m and 3073 m, both contained water. One core was cut from 3125.3 m to 3144.3 m in the Ula Formation sandstone. An anomalous high gamma ray peak was observed at 3030.6 m. The well was permanently abandoned as a dry well on 24 July 1984.

TESTING

No drill stem test was performed

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 2/3-4