



## Wellbore History

### GENERAL

Well 6604/10-1 was drilled to appraise the 6603/12-1 Gro gas discovery in the Vigrid Syncline in the Vøring Basin of the Norwegian Sea. Before 6604/10-1 was drilled, resource estimates for the discovery were between 10 and 100 billion standard cubic metres (Sm<sup>3</sup>) of recoverable gas.

### OPERATIONS AND RESULTS

Appraisal well 6604/10-1 was spudded with the semi-submersible installation Aker Barents on 26 May 2010 and drilled to TD at 3715 m in the Late Cretaceous Springar Formation. No pilot hole was drilled and no shallow gas or shallow water flow was encountered in this well, as predicted. When running the BOP a leak in the mini connector on choke line was discovered. The well was suspended for seven days while this was repaired. The well was drilled with seawater and hi-vis pills down to 2320 m, with Glydril mud from 2320 m to 2848 m, and with Paratherm oil based mud from 2848 m to TD.

The well penetrated rocks of Quaternary, Tertiary and Cretaceous age. Top Maastrichtian Springar reservoir came in at 3597.2 m, 36.8 m shallower than the pre-drill prediction. Based on poor MDT pressure data it appears that the upper reservoir unit (3597 - 3616 m) and the middle reservoir unit (3616 - 3626 m) are different pressure regimes. No valid pressures were obtained in the lower unit (3626 - 3648 m). After analysing the acquired data it was concluded that the upper interval of the Springar reservoir was gas bearing. The reservoir quality was in general very poor, apart from a short section near the very top. No staining or fluorescence on cuttings was detected throughout the 6604/10-1 well. The hydrocarbon core scanner detected "heavy oil" between 3601 and 3621, but this is not confirmed by other data. The well was re-classified as a wildcat well, as it proved two minor deposits which are not in communication with 6603/12-1 Gro gas discovery.

One 54 m core was taken from the reservoir interval 3601.4 to 3655.4 m (3598.8 to 3652.8 m wire line depth) with 100% recovery. An extensive wire line program was successfully carried out after reaching TD. Two MDT runs were made and only two valid and three slightly supercharged pressure points out of 35 tests were obtained. MDT fluid samples were taken at 3601.8 m (gas), 3613.0 m (gas/water), and at 3617 m (gas/water/filtrate). PVT analyses of the gas samples show a higher liquid content than in the 6603/12-1 gas, but it is not possible to exclude OBM contamination as the cause of this difference.

The well was permanently abandoned on 3 September as a gas discovery.

### TESTING

No drill stem test was performed.

## LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6604/10-1