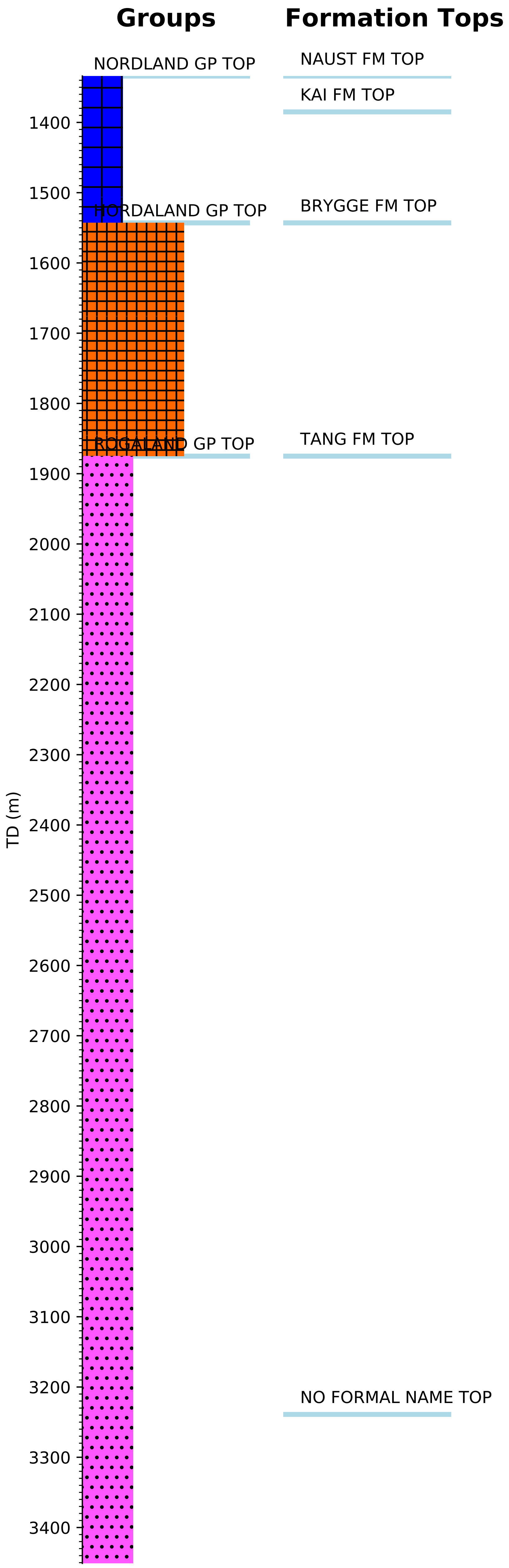
LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6706/6-1



Wellbore History

GENERAL

Wildcat well 6706/6-1 is a true frontier well. It was drilled to test the hydrocarbon potential of the Cretaceous Hvitveis prospect at the Naglfar Dome in the Vøring Basin. The objective for Well 6706/6-1 was to test a seismically defined reservoir interval, interpreted to be a Nise Formation Equivalent.

OPERATIONS AND RESULTS

Wildcat well 6706/6-1 was spudded with the dynamically positioned vessel West Navigator in 1298 m water depth on 2 May 2003 and drilled to TD at 3451 m in Paleocene sediments. Drilling started with a 9 7/8" pilot hole to 2050 m with MWD logging. High-risk shallow gas anomaly had been mapped 490 m east of the location. No shallow gas or boulder problems were encountered in the pilot hole. The main hole was drilled from a location ca 100 m south of the pilot hole. A hard crust about 1.5 m below the sea floor caused the bit to skid ca 40 m from the planned position in the first spud. In the second attempt the bit skidded 6 m before it entered the crust. This was within acceptable limits and drilling of the main hole could commence without significant problems. The well was drilled with seawater and hi-vis pills down to 2050 m and with KCl/Glydril mud from 2050 m to TD. First returns were at 2060 m.

Biostratigraphic analyses showed that the entire section from 2060 m (first returns) to 3451 m (TD) was deposited during the _Alisocysta margarita_ dinoflagellate zone, representing approximately 4 million years of sedimentation in the late Danian and early Selandian. The two uppermost cuttings samples (2060 m and 2080 m) show well-preserved _Alisocysta margarita_ and _Palaeocystodinium bulliforme_, together with reworked Late Cretaceous dinoflagellates. The conventional core and sidewall cores in the lowermost 170 metres of the well contain sparse and very poorly preserved _A. margarita, P. bulliforme, Deflandrea_ spp., and _Senoniasphaera inornata_. The contrast in preservation quality of these Danian - Selandian dinoflagellates in the lower part of the well compared to those at the level of first returns indicate that the lowermost occurrences are _in situ_, since caved specimens would show pristine preservation. Microplankton assemblages in the conventional core and sidewall cores are totally dominated by reworking, mainly Late Cretaceous with some Early Cretaceous and older sources. Mixing of Late Cretaceous bioevents and absence of certain regional Late Cretaceous bioevents is further indication that this well penetrates approximately 1400 metres of a Danian - Selandian mass transport deposit sourced from Late and Early Cretaceous sediments.

Four intervals in the well had higher gas readings ("gas shows") than the general background of 0.7- 1 %: 2340 m to 2360 m (maximum 6 %), 3014 m to 3020 m (maximum 6 %), 3260 m to 3280 m (maximum 8 %), and 3360 m to 3450 m (maximum 2.5 %). A weak oil show was described in a single cuttings sample from 2368 m. A second, weak oil show was described on the core at 3283.55 m. The well discovered a close to normally pressured dry gas accumulation in a reservoir section picked at 3239 m, beginning with thin sandstone stringers interbedded with shale, overlying more massive sandstones at 3251 m. Gas was found down to a free water level at 3266 m.

Geochemical analyses showed that much of the shaley sequences penetrated by the well had good TOC, but with low potential for petroleum generation, probably only gas prone at best. Thermal maturity reaches beginning of the oil window %Ro = 0.5) at around 2700 m which is quite shallow considering the 1298 m water depth. At TD vitrinite reflectance is ca 0.75%. Headspace gas analyses largely confirmed the interval with gas shows recorded on the rig. In addition, some possibly migrated condensate-range hydrocarbons were found in cuttings in the interval 3100 m to 3250 m.

One conventional core was cut with 82 % recovery in the interval 3277 m to 3285.5 m. Fluid sampling was done at 3265.5 m with the RCI wire line tool. The samples contained gas and mud filtrate with a thin film of condensate. All samples had dew points higher than the reservoir pressure and were thus not representative for the formation fluid. The reason for this was probably pressure draw down due to a relatively tight formation.

The well was permanently abandoned on 18 June 2003 as a gas discovery.

TESTING