E&P Norway

Ormen Lange

Classific.: INTERNAL E&P

Title: WELL 6305/4-1
FINAL WELL REPORT
PL 209

No. : Click and type No.
Rev. : Click and type Rev.
Date : 2002-10-31

Title FINAL WELL REPORT WELL 6305/4-1, LICENCE 209				
Keywords				
Document category Report		Document ID 37-00-NH-G15-00092		Amendment no.
Area code	System code	Procurement ref./Package no.		
SCM reference		Tag no.		
Quadrant/Block/Well 6305/4/1		Licence no. 209	Project	
Pages/appendices/volume(s)		Replaces		

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Rev./ status	Date	Reason for issue	Author	Contr.	Disc. appr.	Proj. appr.	Hydro appr.

Final Well Report

6305/4-1

PL 209

Title: WELL 6305/4-1
FINAL WELL REPORT
PL 209

Rev. : 0
Page : 1 of 56
Date : 2002-10-30

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PREFACE:

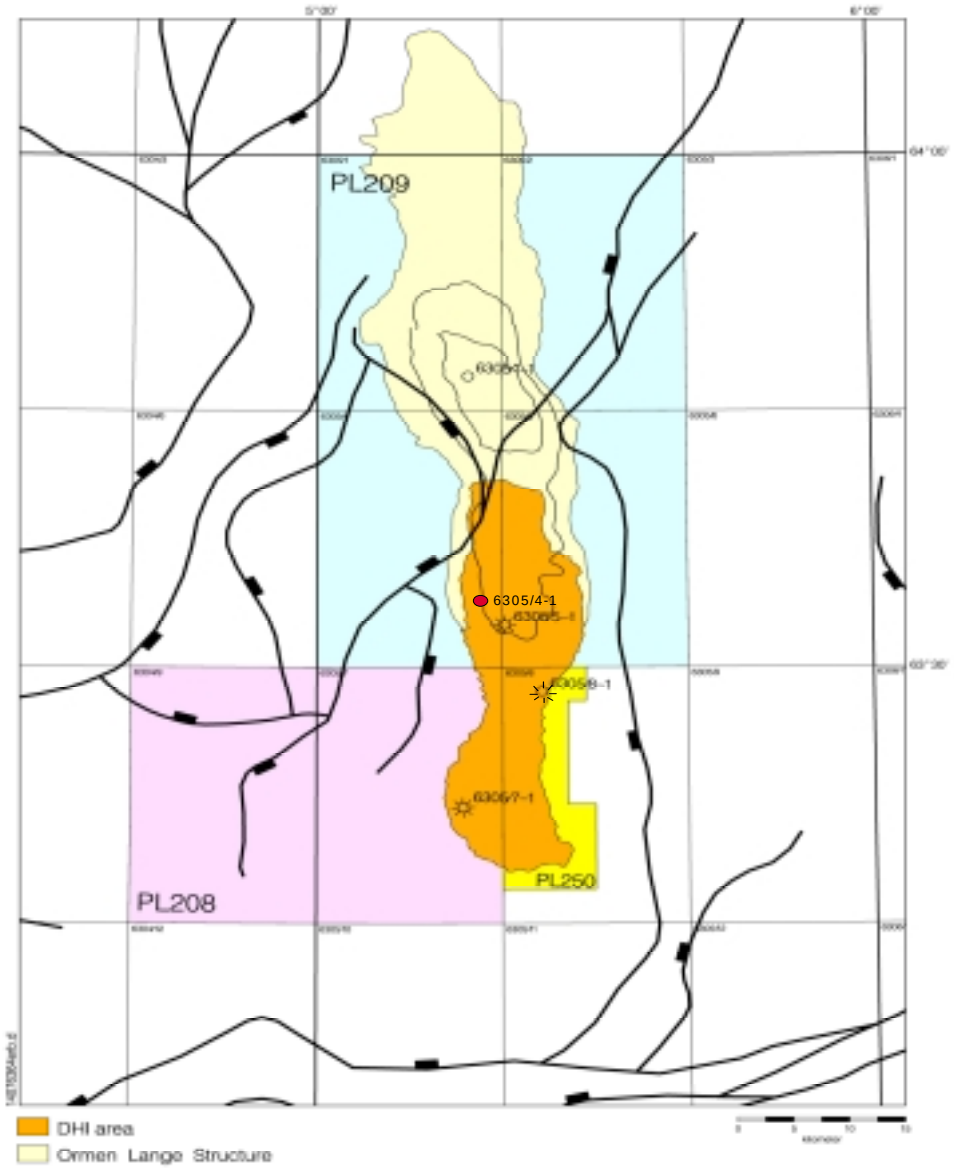
The well was drilled in the PL 209 area, and it was performed as a joint operation between PL 208, PL 209, and PL 250 The licensees' percentage share of the blocks is as follows:

PL 209:	
Norsk Hydro ASA (operator)	25.00 %
Exxon Mobil	10.00 %
A/S Norske Shell	15.00 %
Den Norske Stats Oljeselskap A/S	15.00 %
Petoro A/S	35.00 %
PL 250:	
Exxon Mobil	5.91 %
Den Norske Stats Oljeselskap A/S	8.87 %
BP Norge A/S	9.44 %
Norsk Hydro ASA	14.78 %
A/S Norske Shell (operator)	16.00 %
Petoro A/S	45.00 %
PL 208	
A/S Norske Shell	25.00 %
Petoro A/S	30.00 %
BP Norge A/S (operator)	45.00 %

The well was drilled and tested by Norsk Hydro ASA., on behalf of the group, during March and June 2002 (see Location Map, page 3).

All depths in this report are mMD RKB unless otherwise stated

Location map:



Ormen Lange, Structural Closure and DHI Area

SUMMARY OF WELL DATA	
LOCATION:	Geo: 63° 34' 17.76" N 05° 17' 55.93" E UTM 7 051 501.9 mN 614 148.3 mE ED 50, UTM Zone 31, CM 03°E
OPERATOR:	Norsk Hydro
RIG:	Scarabeo 5
CONTRACTOR:	Saipem
KB ELEVATION (to MSL):	25m
WATER DEPTH (MSL):	1002m
START OF OPERATIONS:	10.03.2002 @ 22:00hrs
WELL SPUDDED:	14.03.2002 @ 04:15hrs (36" hole deviated >1,5°)
WELL RE-SPUDDED:	16.03.2002 @ 03:00hrs
REACHED TD ON:	26.04.2002 @ 15:00hrs
OFF LOCATION (OFF COST):	02.06.2002 @ 15:00hrs
STATUS:	Plugged and abandoned
FORMATION AT TD:	Kyrre
TD DRILLER (mRKB):	2975.5m MD
TD LOGGER (mRKB):	2975m MD
DRILLING DEPTHS:	36" to 1066.0 m 8½" pilot to 1751.0 m 36" to 1108.0 m 26" to 1756.0 m 12¼" to 2725.0 m 8½" to 2975.0 m
CASING DEPTHS:	30" to 1105.0 m 20" to 1749.0 m 9 5/8" to 2719.0 m

S E C T I O N A

G E O L O G Y

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APPENDICES

1 Objectives

The exploration well 6305/4-1 is located in the north western part of the direct hydrocarbon indicator (DHI) area of the Ormen Lange Field, in the eastern part of block 6305/4 in PL209. There were three main objectives for the well, all having equal priority. The first objective was to reduce the risk of the worst case scenario of reservoir compartmentalisation. The second objective was to address the potential slide risk due to reservoir drainage of the main production area, and the third objective was to reduce the risk of worst case GIIP through improved knowledge on the hydrocarbon distribution. Further important objectives were to test the reservoir quality closer to the NW margin of the gas field as well as to acquire a new check point for geophysical, geological and petrophysical interpretations.

2 Results

The well was spudded 16th March 2002 and reached a total depth of 2975 m MD RKB in the Kyrre Fm. the 26th. April 2002. All drilling objectives were met. All logging and well test objectives were met. The well was permanently plugged and abandoned as a gas discovery the 02nd June 2002.

The main results were as follows:

GROUP	FORMATION	m MD RKB	m TVD RKB	m MSL	Thickness m TVD
NORDLAND	Sea floor (Quaternary)	1027.00	1027.00	1002.00	
	Naust Fm	1027.00	1027.00	1002.00	635.00
	Kai Fm	1662.00	1662.00	1637.00	39.00
HORDALAND	Brygge Fm	1701.00	1701.00	1676.00	301.00
	Opal CT	1988.00	1987.00	1962.00	
	Green Clay (Base Oligocene)	2100.00	2099.00	2074.00	190.00
	Brown Clay Marker	2290.00	2289.00	2264.00	103.50
ROGALAND	Balder Fm	2393.50	2392.50	2367.50	135.50
	Sele Fm	2529.00	2528.00	2503.00	107.00
	Lista Fm	2636.00	2635.00	2610.00	119.50
	Våle Fm	2755.50	2754.50	2729.50	13.00
	Egga Member (Tight)	2768.50	2767.50	2742.50	1.50
	Egga Member (Reservoir Unit)	2770.00	2769.00	2744.00	41.50
	Våle Tight Member	2811.50	2810.50	2785.50	11.50
	Våle Heterolithic Member	2823.00	2822.00	2797.00	6.00
SHETLAND	Jorsalfare RU	2829.00	2828.00	2803.00	10.00
	Jorsalfare Isolated Sands	2839.00	2838.00	2813.00	21.00
	Base Jorsalfare Isolated Sands	2860	2859	2834	
	Kyrre Fm	2880.00	2879.00	2854.00	95.50
TD		2975.50	2974.50	2949.50	

Figure 2-1: Formation Tops

The well proved good reservoir quality in the Egga Reservoir Unit which was thinner than prognosed. A “Gas Down To” situation was encountered in the lowermost Egga Formation. Isolated, overpressured water filled sands were found in the underlying units. A single day production test indicates dynamic sealing for parts of 3 of the 4 seismically interpreted faults, which surround the well location

3 Biostratigraphy

The biostratigraphical evaluation (1780m - 2973m) of well 6305/4-1 was carried out by Robertson Research Int. Ltd. Micropalaeontological and palynological analyses have formed the basis for the biostratigraphical interpretation of the well. The analyses were carried out on a combination of ditch cuttings, sidewall cores and core samples. 112 samples were analysed for micropalaeontology and 159 samples were analysed for palynology. The results are documented in Robertson's report "Norsk Hydro 6305/4-1 Norwegian Sea Well, Biostratigraphy of the interval 1780m - 2973mTD" and these results have been interpreted and zoned to the Norsk Hydro standard stratigraphy.
Table 3.1 shows a summary of the well chronostratigraphy in accordance with the Norsk Hydro standard zonation for the area. All depths quoted are m MD below RKB.

3.1 Major points

- The youngest sediments analysed at 1780m are Late Oligocene age and confirm the interpretation of Brygge sediments from this depth.

- The Opal CT level at 1988m typically (for the area) lies within the Early Oligocene section of the Brygge Formation.

- The top of the informal 'Green Clay Formation' coincides with the Oligocene / Eocene at 2100m.

- The informal 'Brown Clay Marker' developed between 2290m – 2393.5m (above the Balder Formation) is Early Eocene age.

- The top of the Rogaland Group and Balder Formation is typically dated as intra – Early Eocene age at 2393.5m.

- A fault was prognosed at the Balder / Sele Formations boundary at 2529m. Any apparent missing section at this intra – Early Eocene level is beyond the limit of biostratigraphic resolution and must be relatively minor i.e. below subzonal level.

- The Early Eocene / Late Paleocene boundary typically lies within the lowermost part of the Sele Formation at 2630m ditch cuttings sample and the top of the Lista Formation at 2636m characteristically is associated with a major benthic microfossil extinction event.

- The top of the Våle Formation at 2755.5m is dated as being within the oldest part of the Late Paleocene. The Early / Late Paleocene boundary typically lies within a thin high gamma claystone within the uppermost part of the Våle Formation which in this well was identified at 2759.6m swc. The age of the various reservoir units identified within the Våle Formation including the Egga Reservoir Unit are discussed in detail in the following section on the biostratigraphic summary of the sand units but in general are of mainly Early Paleocene age.

- The Jorsalfare Formation is of Late Cretaceous, late – early Maastrichtian age, with the Jorsalfare sandstones developed in the upper part between 2829m – 2847m having a more restricted i.e. late Maastrichtian age.

- The Kyrre Formation, identified between 2880m to 2875.5m at the well TD is dated as being Late Cretaceous, early Maastrichtian – early Campanian age.

- The oldest sediments studied at 2973m are of Late Cretaceous, early Campanian age and support the interpretation that the well TD was within the Kyrre Formation. Robertson's interpretation that the well TD is at a slightly older i.e. late Santonian level is considered to be result of reworking of microfossils based on correlation and the record of these microfossils with the first positive evidence for an early Campanian age at 2937m.

3.2 Stratigraphic Breaks

Over the studied interval 1780m- 2973m (Late Oligocene – Late Cretaceous, early Campanian) the well succession is considered to be remarkably complete with no stratigraphic breaks detected. Condensed sections are, however, present within the Early Eocene interval, towards the base of the Lista Formation and at the top of the Kyrre Formation. The Cretaceous/Tertiary boundary is considered to be conformable.

3.3 Biostratigraphic summary of the sand units

The main interval of sandstones are developed at an Early Tertiary – Late Cretaceous level.
The Egga Sandstone Member, comprising the Egga Tight and Egga Reservoir Unit is restricted to the Early Paleocene. A series of biostratigraphic time lines through this interval provides a detailed correlation with the similar and time synchronous unit developed in the nearby 6305/5-1 well.
The Våle Heterolithic Unit developed at the base of the Tertiary Rogaland Group is dated, at least in the lower part from 2826m ditch cuttings sample, as being of an Late Cretaceous, 'latest' Maastrictian age. Regionally this unit spans the K/T boundary.
The Jorsalfare Sandstone reservoir unit, developed between 2829.5m – 2847m, appears to be restricted to a late Maastrictian age.

AGE		m MD RKB
Late Oligocene		1780 cu (top not seen)
Early Oligocene		1930 cu
Late Eocene		2100 cu
Middle Eocene		2120 cu
Early Eocene		2290 cu
Late Paleocene		2630 cu
Early Paleocene		2759.6 swc
Late Cretaceous	late Maastrictian	2826 cu
	early Maastrictian	2865 cu
	late Campanian	2889 cu
	?middle Campanian	2931 cu
	early Campanian	2937 cu
		- 2973 cu (base not seen)

Figure 3-1 Stratigraphic summary, Well 6305/4-1

KEY TO SAMPLE TYPES: cu: ditch cuttings; swc: sidewall core; core: core sample.

4 Lithostratigraphy

All depths are in mMD RKB (RKB elevation is 25 m).

This summary is compiled predominantly from ditch cuttings and core descriptions. A total of 4 conventional core was cut in the well, see Table 5.1.1 and 5.1.2.

Wireline and MWD logs were used to aid lithological interpretation and the placement of formation boundaries.

The well was drilled with returns to seabed from the sea floor at 1027m to 1756,5m before setting 20" casing at 1749m. In this drilling phase cuttings samples were collected by the use of a ROV (Remote Operated Vessel) at the seabed (wellhead) at each drillpipe connection approximately every 29m. Lag calculations were performed by Geoservices. For details on sampling depths see attached Composite log. The sampling method must be taken into account when interpreting the lithology.
The lithology interpretation is based on MWD logs, cuttings and core descriptions.

4.1 Nordland Group (1027,0 - 1701,0m MD)

4.1.1 Naust Formation (1027,0 - 1662,0m MD)

1027,0-1280,0m MD: From MWD logs and ROV collected cuttings.
Clay with rare Sand beds.

Claystones:	m gry-m lt gry, sft, stky, calc, micromic, slty, gen sdy: Clr trnsl Qtz, vf-m, occ crs, ang-sbrndd, Shl frag, occ rock frg.
Age:	No biostratigraphic analysis.

1280,0-1375,0m MD: From MWD logs and ROV collected cuttings.
Claystones with rare Sand beds. Boulders reported when drilling at 1293m.

Claystones:	m gry, sft, stky, amor, calc, micromic, slty, sdy, I.P. pbly Qtz (Gns). gen more sdy.
Sand:	Clr trnsl Qtz, f, Tr m, Tr crs, incr sbndd-rndd.
Age.:	No biostratigraphic analysis.

1375,0-1425,0m MD: From MWD logs and ROV collected cuttings.
Claystones with rare Sand beds. Boulders reported when drilling at 1293m.

Claystones:	m gry, sft, stky, amor, calc, micromic, slty, gen incr sdy, pred f-m, I.P.pbly Qtz(Gns), md clasts, sbang-sbrndd, Tr Shl Frag.
Age.:	No biostratigraphic analysis.

1425,0-1525,0m MD: From MWD logs and ROV collected cuttings.
Claystones with rare Sand beds. Increasing shell fragm from 1475m

Claystones:	m gry, dissem, calc, micromic, slty.
Sand:	lt gry, gen clr trnsl Qtz, f-m, Tr crs, sbang-sbrndd, mod srt, lse, arg Mtrx?, Tr Shl Frag.
Age.:	No biostratigraphic analysis.

1525,0-1625,0m MD: From MWD logs and ROV collected cuttings.
Claystones with sand beds.

Claystones:	m gry, dissem, calc, micromic, slty.
Sand1:	lt gry, gen clr trnsl Qtz, r rose Qtz, f-m, com Rk Frag (Qtz), sbrndd, mod-pr srt, lse, arg Mtrx?, Tr blk min.
Sand2:	lt gry, gen clr trnsl Qtz, Tr rose Qtz, gen m, sbang, mod srt, fri, wk sil cmt, Tr blk min.
Age.:	No biostratigraphic analysis.

1625,0-1662,0m MD: From MWD logs and ROV collected cuttings.
Claystones with sand beds.

Claystones:	m gry, dissem, calc, micromic, slty.
Sand:	lt gry, gen clr trnsl Qtz, r rose Qtz, f-m, sbang-sbrndd, mod srt, lse, arg Mtrx?, Tr Shl Frag.
Age.:	No biostratigraphic analysis.

4.1.2 Kai Formation (1662,0 - 1701,0 m MD)

1662-1701m MD: From MWD logs and ROV collected cuttings.
Claystones with sand beds.

Claystones:	m gry, dissem, calc, micromic, slty.
Sand:	lt gry, gen clr trnsl Qtz, r rose Qtz, f-m, sbang-sbrndd, mod srt, lse, arg Mtrx?, Tr Shl Frag.
Age:	No biostratigraphic analysis.

4.2 Hordaland Group (1701,0 - 2393,5m MD)

4.2.1 Brygge Formation (1701,0 - 2100,0m MD)

The interval comprises ooze with Claystone and sand lenses.
Ooze interval with high porosity.

Claystones:	m gry-olv gry & brnsh gry, sft-stky, amor, calc, slty-vf sdy,micromic, micropyr, r Tr Glauc.
Sandstones:	clr-trnsl Qtz, f-m, Tr crs, sbang-sbrndd, Tr ang, mod srt, lse.

One 90ft core was cut in the interval 1761m to 1780m. The ooze section appeared as siltstone rather than claystone.

Siltstone (Ooze):	olv gry-dk gnsh gry, frm-hd, non calc-slily calc, arg, vf sdy, micromic, Tr micropyr, r Tr Glau, gd Tr sponge spic.
Age:	Oligocene

4.2.2 Green Clay Formation (2100,0 - 2290,0m MD)

This interval comprises claystone with limestone stringers.

Claystones:	pred olv gry-lt gn gry-dk grn gry, sft-loc frm, sbblky, non calc, sl slty, sl micromic, Tr Glau, r micropyr-Pyr.
Limestones:	dusky-dk yel brn-dk yel orng, v hd, blky-ang, microxln-xln & v lt gry, mod hd-hd, ang, crptoxln.
Age:	Eocene

4.2.3 Brown Clay Marker (2290,0 - 2393,5m MD)

This interval comprises claystones with limestone stringers.

Claystones:	brnsh gry, dusky yel brn & varicol grnsh, slily slty, non calc, sbfis, micromic, occ Tr Pyr nod.
Limestones:	dk yel orng & v lt gry, frm-hd, blky, brit, arg, crptoxln.
Age:	Early Eocene

4.3 Rogaland Group (2393,5 - 2829,0m MD)

4.3.1 Balder Formation (2393,5 - 2529,0m MD)

The interval comprises claystones with minor tuff and limestone stringers.

Claystones:	olv gry-olv blk, dk grn gry, blky, frm, non calc, slty, Tr Glauc, r pyr, tr-abd micromic.
Tuff:	m dk gry, sbblky, sft, tr Mic, slty, sdy, tr Glauc, tr pyr, r blk spk.
Limestones:	lt gry-v lt gry, wh, dk yel or, sft-hd, blky, arg, microxln.
Age:	Early Eocene

4.3.2 Sele Formation (2529,0 - 2636,0m MD)

The interval comprises claystones with minor tuff and limestone stringers.

Claystones:	pred dusky yel brn-dk yel brn, tr brn gry, mnr m dk gry-dk gry, blky, non calc, slily micromic, r micropyr, slily carb.
Tuff:	m dk gry-m lt gry-lt bl gry, sbblky, sft, tr Mic, tr Glauc, tr pyr, r blk spk.
Limestones:	wh-v lt gry & yel gry, frm-hd, sbblky,non-slily arg, crptxln.
Age:	Early Eocene / Paleocene

4.3.3 Lista Formation (2636,0 - 2755,0m MD)

The interval comprises claystones with minor tuff (possibly cavings) and limestone stringers. Below 9 5/8" shoe there is abundant cement in the samples down to 2751m.

Claystones:	lt grn gry-dk grn gry, mnr lt gry-lt olv gry, frm, blky, tr micromic, non calc.
Tuff:	m dk gry-m lt gry-lt bl gry, sbblky, sft, tr Mic, slty, r blk spk
Limestones:	m gry-lt gry, tr wh, mnr yel gry, hd, blky, brit, sl arg, crptxln
Age:	Late Paleocene

4.3.4 Våle Formation (2755,5 - 2768,5m MD)

The interval comprises claystone with thin sandstone and limestone stringers

Claystones:	pred m gry-m lt gry, gn gry, mod hd, sbfis-fis, non calc, slty, micromic, Tr micropyr. mnr olv gry-brn gry, amor, frm, calc-v calc, sli slty, r glauc, Tr micromic
Limestones:	lt gry, off wh, blky, frm-hd, occ dol, slily arg, crptxln.
Sandstones:	lt gry, mod hd, clr Qtz, gen f, tr m, sbrnd, mod srt, calc cmt
Age:	Paleocene

4.3.5 Egga Tight (2768,5 - 2770,0m MD)

The interval comprises sandstones grading from moderately hard at the top to friable at base due to decreasing calcite cementation.

Sandstones:	lt gry, gen clr trnsl Qtz, v f-f, pred f, sbang-sbrndd, mod-wl srt, mod hd-fri, wk-mod calc cmt, Mica, Tr Glauc, r Carb, no-pr vis por.
Age:	Early Paleocene

4.3.6 Egga Reservoir Unit (2770,0 - 2811,5m MD)

The interval comprises sandstone

Sandstones:	lt gry, occ lt brn gry, pred clr trnsl Qtz, mnr mlky wh Qtz, r rose Qtz, v f-m, occ crs-v crs, pred f-crs, sbang-sbrndd, gen lse, occ fri, mod-wl srt, Tr Glauc, Tr Mica, r arg, r Carb mat, occ tr Ls / wk calc cmt, gen pr-fr vis por.
Age:	Early Paleocene

4.3.7 Våle Tight (2811,5 - 2823,0m MD

The interval comprises claystones, sandstones and limestone stringers.

Claystone:	dk grn gry, brn blk-olv blk, blky, frm-hd, slty, micromic, occ slick, non calc.
Sandstone:	lt gry, clr Qtz, vf-m, pred f, sbrnd, lse, Tr Glau, r Mica.
Age:	Early Paleocene

4.3.8 Våle Heterolithic (2823,0-2829,5m MD)

Sandstone:	lt gry, clr Qtz, vf-m, pred f, sbrnd, lse, Tr Glau, r Mica.
Claystone:	brn blk-olv blk, blky, frm-hd, slty, micromic, occ slick, non calc
Age:	Early Paleocene? – Late Cretaceous, late Maastrichtian

4.4 Shetland Group (2829,5 - 2975,0m MD)

4.4.1 Jorsalfare Formation (2829,0 - 2880,0m MD)

The interval comprises of Sandstones, Claystones and Limestone.

Sandstones:	v lt gry-lt gry-lt grn gry, clr trnsl-mlky wh Qtz, f-crs, pred f-m, sbang-sbrndd, mod srt, slily-occ v calc cmt, Tr Glauc, Tr Micromic, occ slily arg, no-pr vis por.
Limestones:	wh-v lt gry, sbblky-blky, sft-mod hd, occ slily arg, crptxln
Claystones:	med gry-dk gn gry, occ grn blk, sbblky, occ lam, frm, non-pred v calc, slily slty, Tr Micromic
Age:	Maastrichtian

4.4.2 Kyrre Formation (2880,0 - 2795,0 m MD)

The interval comprises of Claystones with Traces of Limestones and Sandstones

Claystones:	pred m gry-dk gn gry, v f blk spt, sbblky, sft-frm, slily stky, non calc-calc, pred non-slily calc, occ v slty, Tr Glauc, Tr v f Carb Frag, r micromic, Tr Pyr mnr brn gry, sft, sbblky-blky, pred non calc, occ mod calc.
Sandstones:	clr trnsl Qtz, f-crs, pred m, sbang-rndd, pred sbrndd, lse, occ calc cmt, arg, n.v.p
Limestones:	v lt gry-lt gry, occ wh, blky, sft-frm, occ arg, crptxln
Age:	Late Cretaceous, early Maastrichtian – early Campanian.

5 Hydrocarbon Shows

The evaluation of hydrocarbon shows at the wellsite was carried out in a conventional manner. A standard (Geoservice) hydrocarbon total gas detector system (Geoservices Gaslogger) together with a gas chromatograph for automatic and continuous gas analysis, recorded as ppm by volume of C1 through nC5, were operational below 1745m down to the TD of the well (Ref attached Lithology log sect. C).

Hydrocarbon shows on ditch cuttings and cores were evaluated according to procedures described in Norsk Hydro's "Wellsite Geologist's Manual".

5.1 Gas Record

1022 - 1749m MD: This interval was drilled with returns to sea bed. No gas detection possible.
For gas chromatograph record in the well, see Lithology Log attached in Section C, and End of Well Report from Geoservices, Well 6305/4-1.

5.2 Oil stain and Fluorescence

A summary of the observed shows is given in Table 4.7.1 below. See also standard core descriptions in Appendix I and Sidewall core descriptions in Appendix II.

INTERVAL (mRKB)	SOURCE	LITHOLOGY	SHOWS DESCRIPTION
2769-2809	Core	Sandstone	wk-Fair pet od,no O stn,no dir Fluor,no vis cut,v wk fast-inst strmg pl wh Fluor cut & slo strmg wh-yel wh Fluor Fluor cut,no vis Res,wh-yel wh Fluor Res.
2813	Core	Sandstone	wk-Fair pet od,no O stn,no dir Fluor,no vis cut,v wk fast-inst strmg pl wh Fluor cut & slo strmg wh-yel wh Fluor Fluor cut,no vis Res,wh-yel wh Fluor Res.

Figure 5-1: Shows Summary 6305/4-1

6 Coring

6.1 Conventional Cores

One 60 ft core was cut in the Ooze section of the Brygge Formation (Core #1). Additional 3 x 60 ft cores were cut in the reservoir section.
When Core # 3 was at rig floor it started to expand due to trapped gas. Approximately 1,5 - 2m of core came out of the inner barrel and partly disintegrated on rig floor. The upper part of the inner barrel contained therefore gaps between core pieces. As a result, the measured depths does not fit the actual depth of the reservoir for core # 3.
The cores was cut in 1 m lengths and gypsum was injected to preserve the core before being shipped to shore. A summary of the core is presented in Table 5.1.1 and 5.1.2 below and the core description can be found in Appendix I.

Core No	C: Cut(m) R: Recovery(m)	Rec. %	Lithology	Formations
1	C: 1761.0 - 1780.0 R: 1761.0 - 1778.9	94.3	Ooze	Brygge

Figure 6-1: Conventional Core in the Ooze section, Brygge Fm 6305/4-1

Core No	C: Cut(m) R: Recovery(m)	Rec. %	Lithology	Formations
2	C: 2769 - 2788 R: 2769 - 2787,85	99.2	Sandstone	Egga
3	C: 2788 - 2807 R: 2788 - 2807	100	Sandstone	Egga
4	C: 2807 - 2817,5 R: 2807 - 2817.3	98.1	Sandstone / Claystone	Egga / Vaale Tight

Figure 6-2: Conventional Cores in the Reservoir Section 6305/4-1

Sidewall Cores
Using the MSCT 27 sidewall cores were drilled and 26 sidewall cores were recovered. Table 5.2.1 show a summary of the recovered sidewall cores. For detailed description, see Appendix II.

No	Depth m RKB	Recovered cm	Lithology	Formation/Reservoir Unit
1	2847.0	4.6	Sandstone	Jorsalfare Isolated sands
2	2840.0	4.8	Claystone	Jorsalfare Isolated Sands
3	2838.0	4.4	Sandstone	Jorsalfare RU
4	2835.5	3.6	Claystone	Jorsalfare RU
5	2833.2	4.0	Claystone	Jorsalfare RU
6	2832.5	4.4	Sandstone	Jorsalfare RU
7	2831.5	4.5	Sandstone	Jorsalfare RU
8	2830.0	4.7	Sandstone	Jorsalfare RU
9	2828.0	4,6	Sandstone	Våle Heterolithic
10	2827.3	4.3	Sandstone	Våle Heterolithic
11	2826.0	4.6	Sandstone	Våle Heterolithic
12	2825.2	4.5	Sandstone	Våle Heterolithic
13	2823.5	4.5	Sandstone	Våle Heterolithic
14	2821.5	4.4	Claystone	Våle Tight
15	2820.4	4.6	Claystone	Våle Tight
16	2819.0	4.0	Claystone	Våle Tight
17	2767.5	4.6	Claystone	Våle Shale
18	2765.5	4.6	Claystone	Våle Shale
19	2764.5	4.4	Claystone	Våle Shale
20	2761.2	0.0	Claystone	Våle Shale
21	2760.0	4.5	Claystone	Våle Shale
22	2759.6	6.0	Claystone / Breccia	Våle Shale
23	2759.0	5.0	Claystone	Våle Shale
24	2758.7	4.6	Siltstone	Våle Shale
25	2758.0	4.7	Siltstone	Våle Shale
26	2757.0	4.7	Claystone	Våle Shale
27	2755.5	4.9	Claystone	Lista Fm.

Figure 6-3: Sidewall Core Summary

7 Logging

7.1 MWD Logs

A MWD service (Schlumberger Anadrill) yielding gamma ray, resistivity, density, neutron, sonic and survey measurements was run in the following sections:

Run #	Section	Sensors	Drilled from	Drilled to	Logged from	Logged to	Comments
1	36"	Anderdrift	1026.0	1066.0	1026.0	1066.0	Directional only
2	8½"	PowerPulse-ADN-ARC-GVR-ISONIC	1066.0	1751.0	1026.0	1751.0	
3	36"	PowerPulse	1026.0	1108.0	1026.0	1092.0	
4	36"	PowerPulse	1026.0	1108.0	1026.0	1108.0	
5	26"	PowerPulse-CDR	1105.0	1756.0	1105.0	1749.0	
6	12¼"	PowerPulse-CDR-RAB-ADN-ISONIC	1756.0	2696.0	1749.0	2686.0	
7	12¼"	PowerPulse-CDR-RAB	2650.0	2725.0	2650.0	2723.0	
8	8½"	PowerPulse-VISION675-RAB					Run#8 failed to drill out float & cement.
9	8½"	PowerPulse-VISION675-RAB	2725.0	2768.0	2719.0	2768.0	Image data missing.
10	8½"	PowerPulse-ARC5-RAB	2817.5	2975.5	2719.0	2975.5	Reamed cored section, relogged for image data above reservoir.

Figure 7-1: MWD/LWD-runs

More detailed MWD results can be found in the report "End of Well Report"/Logs, (Schlumberger/Geoservices) Well 6305/4-1.

7.2 Wireline Logs

The following table is a summary of wireline logs run in the well and shows run number, log type, date run and logged intervals for each log.

Run #	Tool string	Logged from	Logged to	Tot hrs	Comments
1A	PEX-HALS-SP	2692.0	996.0	9.5	HALS failed
1A	DSI-VSP-GPIT-EMS	2674.0	1765.0	39.5	DSI Logeg down. Tool stuck at 2674. Further logging was cancelled (VSP-GPIT-EM
2B	SP-HRLA-PEX	2975.0	2569.0	6.5	Good efficient log run
2A	CMR+ -HNGS	2900.0	2740.0	10.5	Good efficient log run. Sticky at one station with 45min sampling.
2A	VSP	2960.0	1100.0	12.5	2 x CSAT, 10m level spacing. Good data up to 2000m. Dubious quality checkshot data above 1749m.
2A	MSCT	2847,0	2755.5	8	Efficient run. Recovered 26 out of 27 cores.
2A	MDT	2854.3	2828.0	43	Pressure and fluid sampling. Some points needed repeating. Good pressure profile and good quality samples
2B	FMI-DSI	2964.0	2713.0	10.5	Some computer crashes due to FMI logging down. Very good quality FMI log. DSI log quality very good in open hole. Ringing effect in cased hole resulted in only a short useful log

Figure 7-2: Wireline Logs 6305/4-1

MDT logging
One run with the MDT was performed, including 56 pretests, eight gas samples, one water sample and several fluid logging depths to investigate the fluid type by using the optical fluid analyser. An overview of the sampling and fluid logging operation is given in figure 8-2.

For results and details on sampling see attachment IV.

7.2.1 Velocity Surveys

A zero offset VSP was aquired and processed by Schlumberger. No problems occurred during the acquisition, and the data quality is good up to 2000m MD. From 2000m some noise where experienced which increased inside dual casings (9 5/8" and 20"). Hence the sampling program was reduced in dual casing to 100m check shots.
20" casing shoe; 1749,0m MD
9 5/8" casing shoe; 2718,5m MD

For further information see the separate VSP report (ref chapter 11).

7.2.2 Bottom Hole Temperatures From Wireline Logs

The tables below gives a summary of the bottom hole temperatures measured from wireline logs.

Intermediate wireline logging in 12¼" section:

Log suite	Run #	Depth (mRKB)	Temp ° C	Time since circ. (hrs)
PEX-HALS-SP	1A	2678.00	58	47
DSI-VSP-GPIT-EMS	1A	2640.00	68	80

Figure 7-3: Bottom Hole Temperatures 6305/4-4-1 Run1

When entered into a Horner plot, this gave a static formation temperature estimate (BHST) of 80 ° C at 2659 m MD / 2658m TVD RKB.

Wireline logging in 8½" Section:

Log suite	Run #	Depth (mRKB)	Temp ° C	Time since circ. (hrs)
HRLA-PEX-SP	2B	2975.00	69	47
CMR-HNGS	2A	2900.00	68	80
VSP	2A	2960.00		
MSCT	2A			
MDT	2A			
FMI-DSI	2B			

Figure 7-4: Bottom Hole Temperatures 6305/4-1 Run2

When entered into a Horner plot, this gave a static formation temperature estimate (BHST) of 84 ° C at 2975m MD (2974m TVD RKB).

8 Petrophysical Results

8.1 Log Quality

Both the 12.25" and 8.5" hole section were drilled using 1.3 s.g. KCl Polymer Glycol water based mud.
In the 12.25" hole section the density and neutron logs were of good quality, while the HALS log failed. The LWD resistivity was however of good quality. The DSI-VSP_GPIT_EMS was stuck near bottom of the 12.25" hole section and the down log was therefore used in the further evaluation. The log quality of the DSI log was good. Due to hole problems (swelling clay?) near the bottom of the hole section and the GPIT and EMS logging were cancelled, while the VSP was run inside the 9 5/8" casing during logging of the 8.5" reservoir section.

In the reservoir section the hole condition was very good, resulting with good quality logs. Both a high resolution density log and the enhanced resolution density log were successfully recorded. The DSI was run twice over the main Egga reservoir unit.

The composite log was constructed by Logtek and reported into Petrobank.

8.2 Core Data

1.5" plugs conventional were drilled out due to unconsolidated core material and based on experience from the previous well 6305/8-1 drilled in the Ormen Lange Field.
Conventional helium core porosity, air permeability and grain size were measurement every 25cm were possible. The conventional core plugs have been cleaned by soxhlet extraction flooding of toluene and methanol. The clean samples have been dried until constant weight was reached in a humidity oven at 60 degrees and with a relative humidity of 40%. From 2800m MD RKB the plugs were critical point dried due to increasing smectite content.

Core depth shifts were determined by comparison of core gamma ray logs to reference wireline gamma ray logs and by comparing of core and log porosities. The recovered interval and depth shifts are summarized in Figure 8.1.

Core No.	Formation/ reservoir zone	Recovered cored interval Drillers depth mRKB	Recovery (m)	Shift to log depth (m)	Recovery Interval (m) Log depth mRKB
1	Brygge				
2	Egga Ru Egga Tight	2769.0-2788.0	19.2	-0.2	2768.8-2787.8
3	Egga Ru	2788.0-2806.4	18.4	-0.2	2787.8-2606.2
4	Egga RU Våle Tight	2807.0-2817.3	10.3	-0.7	2806.3-2816.6

Figure 8-1 Cored intervals and depth shift well 6305/4-1

8.3 Formation Pressure measurements

One run with the MDT was performed, including 56 pretests, eight gas samples, one water sample and several fluid logging depths to investigate the fluid type by using the optical fluid analyser. An overview of the sampling and fluid logging operation is given in figure 8-2. The detailed MDT tables are presented in attachment IV and in ref chapt. 12 “Standard and Special studies”, “Formation Evaluation Report, Well 6305/4-1” a comprehensive evaluation of the formation testing (logging and DST) can be found.
The EggaReservoir Unit is gas filled down to a shale layer at the base of EggaRU. A thin sand of approximately1.5-2 meter at the base of EggaRU is water filled and a water sample was encountered. The isolated sand has a pressure in the order 1.5 to 2 bar higher than the EggaRU gaszone. Above the isolated sand a shale layer of 0.5 meters is encountered both from the core and thewirelinelogs, see figure 8-2. The formation pressures in the EggaRU gas zone are on the same gasgradient as the other wells on the OrmenLange.

The Våle Heterolitic and Jorsalfare reservoir units are water filled with a pressure approximately 16 bar higher than the water pressure in well 6305/7-1. The absolute pressures in the bottom part of the Jorsalfare are increasing versus depth and confirm the observation from formation pressure seen in the other wells.

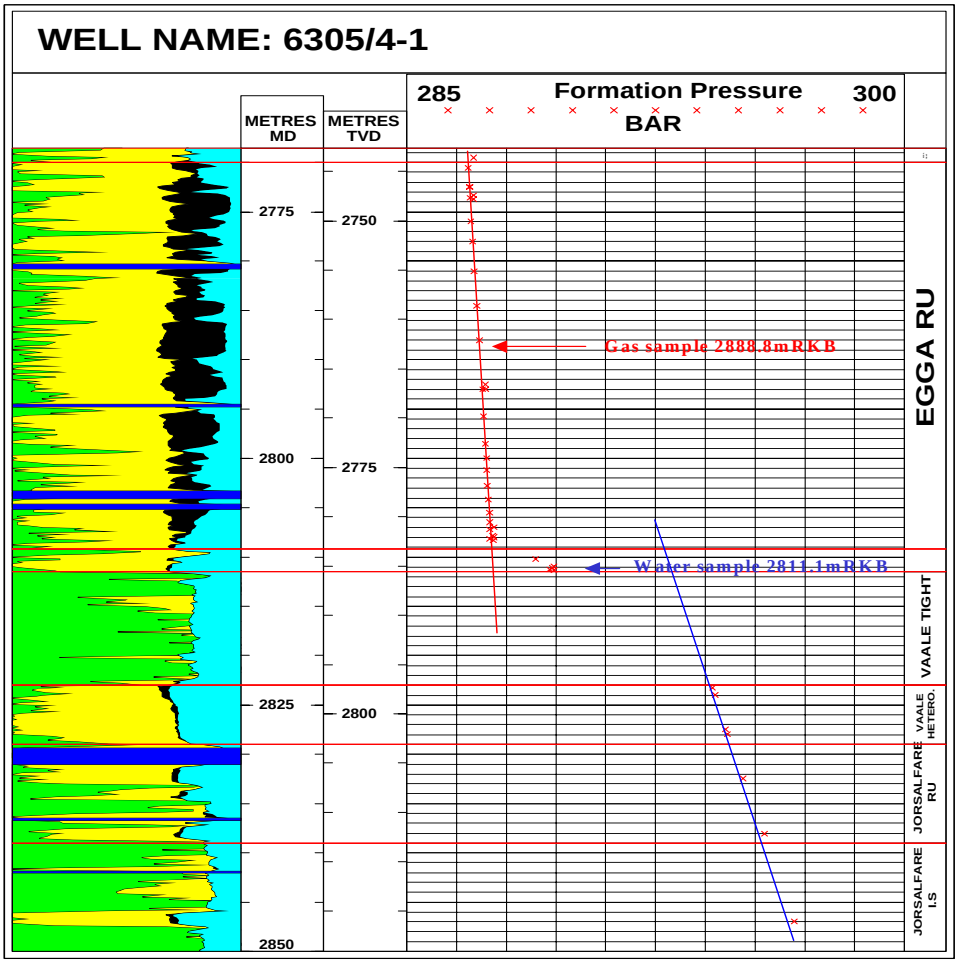


Figure 8-2 CPI and Formation pressures versus depth well 6305/4-1

Depth	Comments
2788.8m (Sampling)	3 x 250cc, 2 x 450cc bottles and 3 x 1 gal. chambers Max. drawdown 4.3 bar (Martineau probe used) Total time 12:58hrs, 981 liters 8 out of 8 captured
2807.7m (Logging)	No samples were captured Max. drawdown ~200 bar (Standard probe used) Total time 00:30hrs, 2-3 liters
2808.3m (Logging)	No samples were captured Max. drawdown ~220 bar (Standard probe used) Total time 00:26hrs, 6 liters
2811.1m (Sampling/Logging)	1 x 250cc bottles Max. drawdown prior to sampling ~90 bar (Standard probe used) Max. drawdown after sampling ~130 bar Total time 02:36hrs, 41 liters
2811.2m (Logging)	No samples were captured Max. drawdown ~100 bar (Martineau probe plugged, completed with standard probe) Total time for 2 logging-jobs, 01:49hrs, 2-3 liters
2811.3m (Logging)	No samples were captured Max. drawdown ~100 bar (Martineau probe used) Total time 00:07hrs, 5-6 liters

Figure 8-3 Summary of the fluid sampling and logging

8.4 Petrophysical Evaluation

A summary of the petrophysical evaluation for 6305/4-1 is described below. For further details refer to Petrophysical Status Report September 2002.

Net Sand

The net sand intervals were determined by applying a shale volume fraction cut off of 0.40 and cemented intervals using density neutron cut off values The choice of shale cut off has been quantitatively verified by comparing calculated net sand intervals with core photographs, core description and conventional core analysis

Shale volumes have been calculated using shale volumes derived from gamma ray and density/neutron cross plot techniques respectively. The minimum calculated shale volumes from the two methods were used as the final value.

Parameters were chosen from histograms and cross plots. Sand and shale intervals were qualitatively verified using core photographs, core description and XRD data.
The Vsh from log analysis has been normalized to qualitatively compare it with the xrd analysis.

Porosity

Porosity has been calculated using porosity model based upon the density log calibrated to the overburden corrected core helium porosity. No clay correction has been performed on the calculated porosity from logs.
The matrix density ρ_{ma} has been estimated from histograms of core grain density. The pseudo fluid density ρ_{fl} has been estimated by regression analysis of measured bulk density versus in situ estimated corrected core porosity. A forced fit was applied through the zero porosity line and the matrix density from the grain density histograms. Log and core data were zoned before estimating the pseudo fluid densities. The zones were gas, residual and water zones respectively.

Water Saturation

The Archie equation was used to calculate the water saturation from logs. Electrical parameters for the saturation equation were determined from laboratory analysis of core samples for the first three wells drilled in the Ormen Lange Field In this well 6305/4-1 a SCAL study is ongoing and will be available the first quarter of 2003. The formation water resistivity is calculated by using picket plots from the water zone n well 6305/7-1 and 6395/8-1.

8.5 Petrophysical Net Sand Averages

The reservoir zonation and log derived petrophysical net sand averages are presented in **Error! Reference source not found.**.
The petrophysical analysis show a gas down to in the Egga Reservoir unit at 2809.3m MD RKB and an isolated sand (1.5 to 2 bar higher pressure) in the bottom of th Egga RU below.
The Våle Heterolitic and Jorsalfare sands are water bearing and with a 16 bar higher pressure than well 6305/7-1. The petrophysical evaluation and the wireline logs are presented in Figure 8-4 and 8-5.

Well 6305/4-1						PHI log	PHIH core	SW log	KHAC core	KHAC core
ZONE	TOP MSL	Bottom MSL	Gross [m]	Net Sand [m]	NTG	Aritmetric	Aritmetric	Porosity weighted	Aritmetric	Geometric
EGGA TIGHT	2742.6	2744.1	1.5	1.4	0.967	0.236	0.261	0.93	256	165
EGGA RU	2744.1	2785.6	41.5	38.2	0.920	0.295	0.262		473	142
EGGA GAS	2744.1	2783.3	39.2	36.2	0.922	0.297	0.264	0.46	492	138
EGGA ISOLATED SAND	2783.3	2785.6	2.3	2.1	0.891	0.264	0.231	0.96	223	198
VAALE TIGHT	2785.6	2797,1	11.5	3.1	0.234	0.234	0.231	0.99	238	231
VAALE HETEROLITIC	2797,1	2803.1	6.0	6.0	0.291	0.291		0.94		
JORSALFARE RU	2803.1	2813.1	10.0	5.7	0.242	0.242		0.93		
JORSALFARE Isolated Sands	2813.1	2834.1	21.0	5.6	0.214	0.214		0.95		

Figure 8-4 Petrophysical net sand averages well 6305/4-1

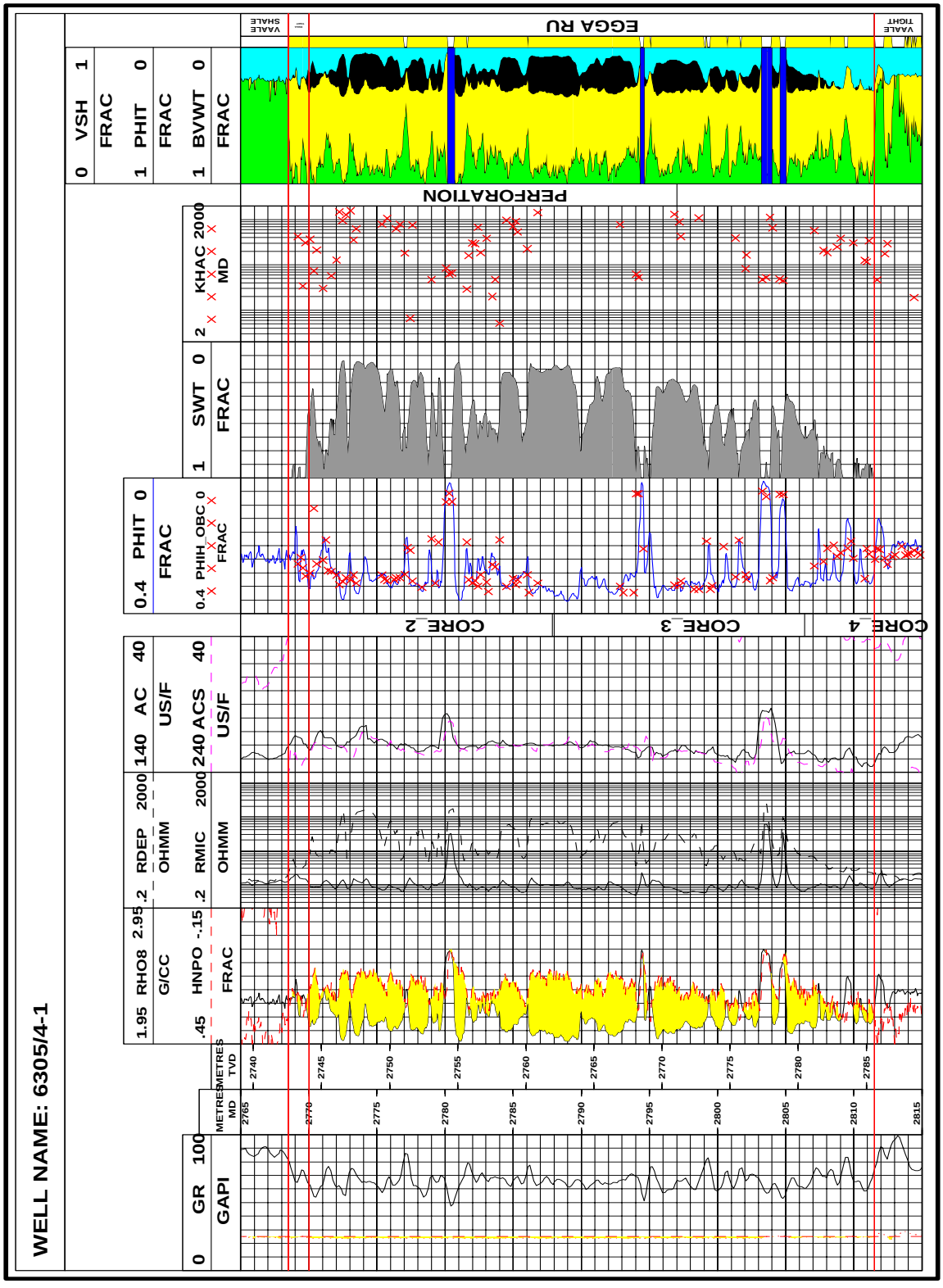


Figure 8-5 Raw logs and CPI Egga RU well 6305-4-1

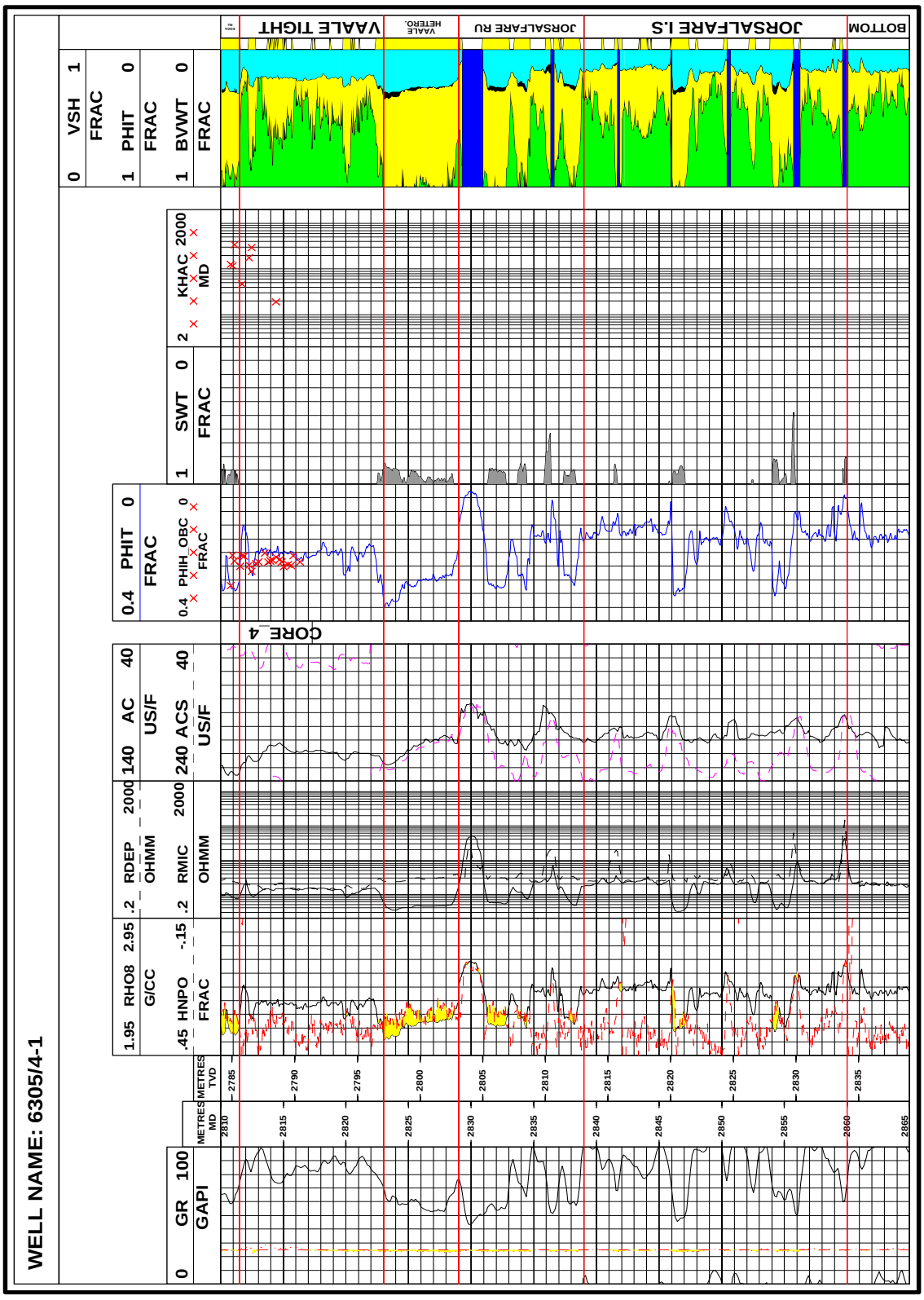


Figure 8-6 Raw logs and CPI Våle Heterolitic and Jorsalfare RU well 6305/4-1

9 Estimated Pore Pressure, Fracture, Overburden and Temperature Gradients

9.1 Pore Pressure

The pore pressures in well 6305/4-1 are based on well site observations, gas data, MDT pressure readings and calculations based on logs (MWD and Dxc). All depths are quoted as mRKB unless otherwise stated. The Pore pressure-, Fracture- and Overburden gradients are given in Fig. 8.1.

From sea bottom to 2130m a generally hydrostatic pressure is regarded as most likely and a normal dxc-, sonic- and resistivity trend was established. The onset of pore pressure increase came in deeper than prognosed.
The pore pressure increased stepwise until 2600m (middle Sele fm) were it reached approximately 1,20sg while prognosed maximum was 1,16sg in base Hordaland. The pressures derived from logs and drilling parameters coincided also with the Total Gas pattern. A sharp pressure regression was observed from middle Sele fm. down to top Våle fm.
The MDT-pressure points confirmed one water / gas gradient within the main Egga reservoir and a slightly overpressurised water zone below a barrier underneath the Egga reservoir. The reservoir pressure was as prognosed.
A slight pressure increase was interpreted from logs in the Kyrre fm. but this was not reflected in the Total Gas readings. Pore Pressure at TD was interpreted to 1,09sg.

9.2 Formation Strength

No mudlosses were observed during drilling of this well.
Two LOT's was performed. At 1794m TVD it gave 1,41sg and 1,57sg at 2718m TVD, both slightly lower than prognosed. The LOT at 1749 was a bit dubious as it break of with an unusual shape and some mud was not bled back after the test.

9.3 Overburden Gradient

Overburden gradient is based on regional studies, calculated values and the density log.

9.4 Temperature Gradient

Horner plots was calculated at 2660m giving 72^{o} C and at 2975m giving 84^{o}C. This gives an average formation temperature gradient of 4,31^{o}C / 100m TVD assuming -1,8^{o}C at seafloor. It was prognosed a gradient of 4,4^{o}C. The small discrapency may be due to the uncertainty of the method used. The result was within the range of data from nearby wells.
The average gradient may be further divided into one gradient of 4,52^{o}C from seafloor to 2660m and then one gradient of 3,81^{o}C from 2660m to 2975m.

However, the long marine riser is known to cool down the mud to such an extent that the use of only Horner plots to estimate the formation temperature becomes doubtful. The well was tested and a temperature of 86,9^{o}C was estimated at 2783,5m. This would give an average formation temperature gradient of 4,84^{o}C/ 100m TVD wich is higher than prognosed. With a gradient of 4,84^{o}C/ 100m TVD the BHST at TD (2975m) equals to 96,1^{o}C.
The formation temperature gradient is given in Fig. 9.2.

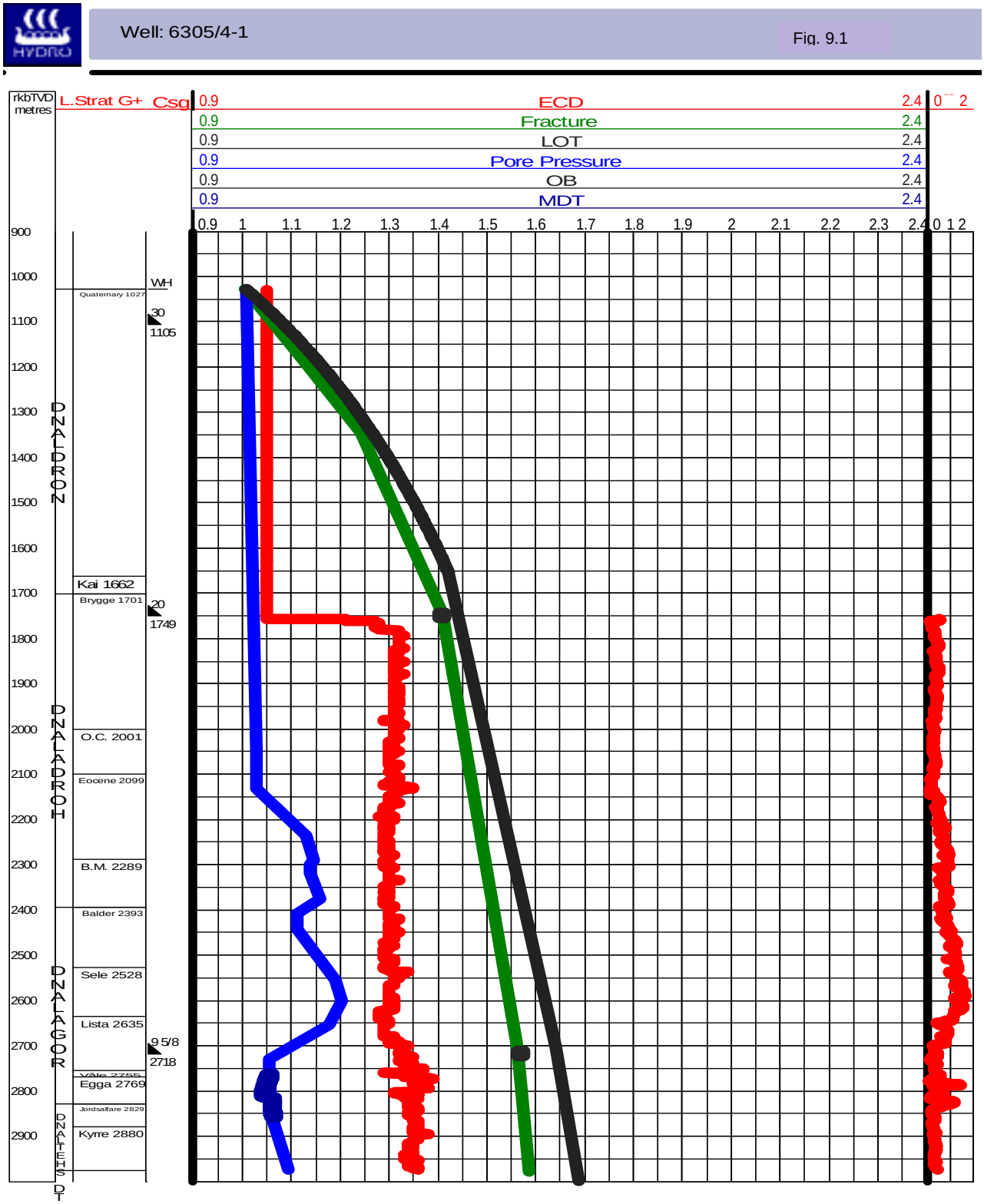


Figure 9-1: Pore Pressure-, Fracture-, and Overburden Gradients

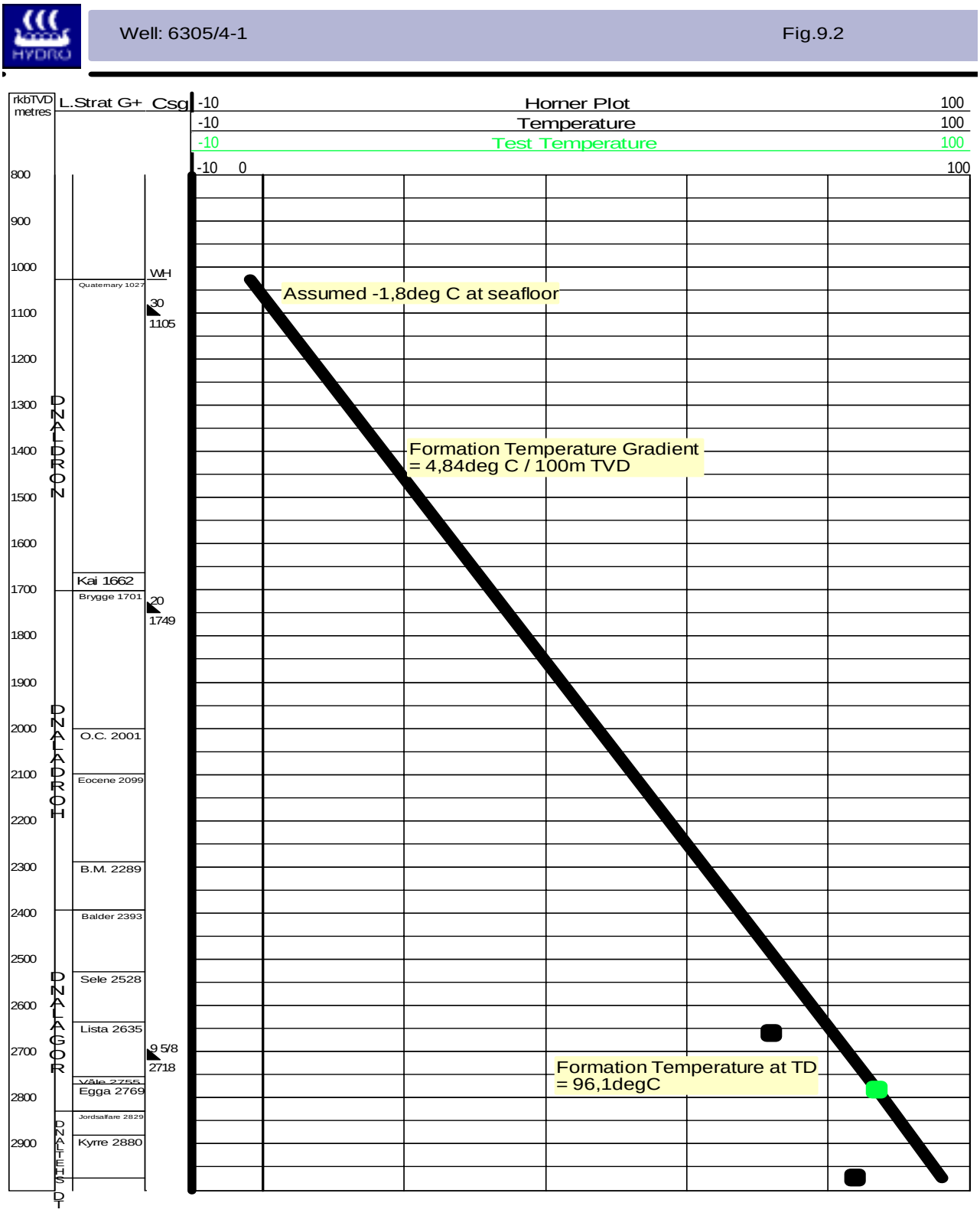


Figure 9-2: Temperature Gradient

10 Geophysical Results

The formation tops came in according to prognosis, within the estimated uncertainty range, as shown in Table 10.1. The largest deviation from the prognosis (about 35 m) occured at Top Sele level, most likely as a result of interference with a nearby fault (ref. NH-00033813, Well Programme Fig. 8).

6305/4-1	Progn.	Actual	Δ	Progn.	Actual	+/-	Δ
Horizon	TWT (ms)	TWT(ms)	TWT(ms)	TVD (msl)	TVD (msl)		TVD(msl)
Seabed	1345,0	1355,8	10,8	997,0	1002,0	2,0	5,0
B.Naust	2008,0	2017,6	9,6	1672,0	1675,8	10,0	3,8
Opal CT	2316,0	2321,4	5,4	1974,0	1961,1	30,0	-12,9
T.Balder	2741,0	2745,2	4,2	2380,0	2367,6	40,0	-12,4
T.Sele	2903,0	2880,6	**-22,4**	2538,0	2503,1	50,0	**-34,9**
T.Lista	2983,0	2983,6	0,6	2623,0	2610,1	50,0	-12,9
T.Vaale	3074,0	3090,9	16,9	2725,0	2729,6	-20/+30	4,6
T.Egga	3083,0	3102,1	**19,1**	2735,0	2742,6	-25/+35	7,6
Vaale Tight	3127,0	3136,9	9,9	2787,0	2785,6	40,0	-1,4
T.Josalfare	3142,0	3150,6	8,6	2804,0	2803,1	40,0	-0,9
T.Kyrre	3183,0	3188,8	5,8	2860,0	2854,1	50,0	-5,9
TD	3250,0	3257,0	7,0	2950,0	2949,0	50,0	-1,0

Figure 10-1 Prognosis vs. actual formation tops for well 6305/4-1

Another observation is the relative large difference of 19 ms between prognosis and the checkshot calculated seismic TWT at reservoir level. The well location at the very edge of the seabed scarp has probably affected the seismic imaging at depth; the reprocessed PSDM is therefore expected to give a better seismic tie. A preliminary well tie (Fig 10.1) is therefore presented in this document, as the final well tie will be performed on the reprocessed PSDM seismic dataset. A time-depth plot is presented in figure 10.2

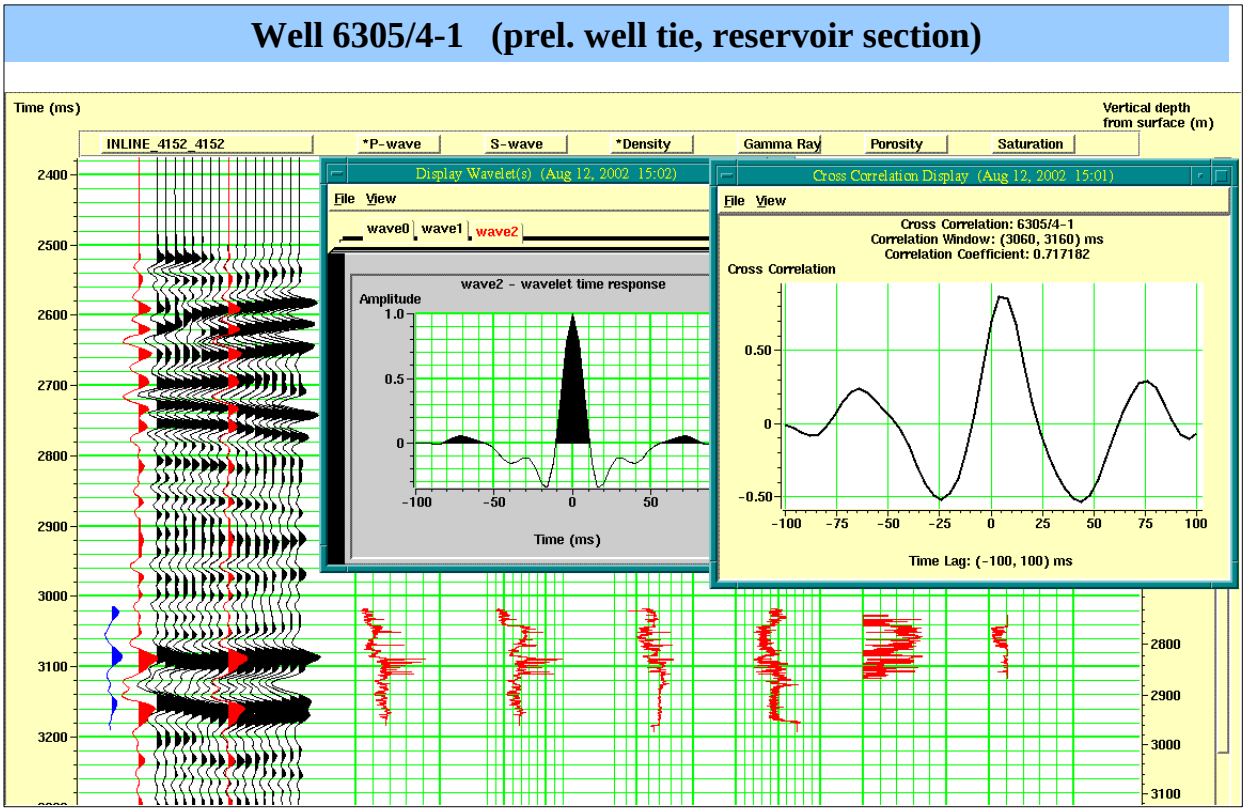


Figure 10-2 Preliminary well tie at reservoil level

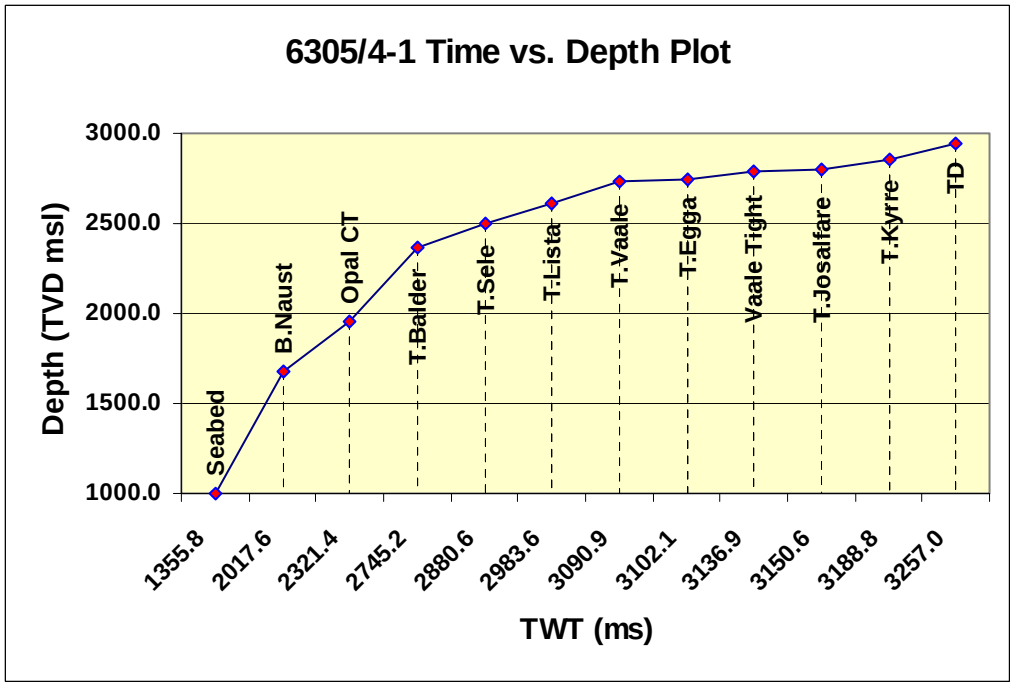


Figure 10-3 Time versus depth plot

11 Post Site Survey Report

11.1 WELL DATA:

1	**Distance from rig floor to sea level**	:	25 m
2	**Water depth (MSL)**	:	1002 m
3a	**Setting depth for conductor (m RKB)**	:	1105 m
3b	**Leak Off / Formation Integrity Test (g/cc)**	:	N/A
4a	**Setting depth for casing on which BOP mounted**	:	1749 m
4b	**Leak Off / Formation Integrity Test (g/cc)**	:	1,41 sg

The Leak Off Test was a bit dubious as the pump pressure dropped off soon after the pump was shut down. In addition, some mud was not bled back after the test.

5 Depth (m RKB & two way time) to formation/section/layer tops:

Seabed	:	1027 m / 1343 ms (seismic TWTT)
Top Naust S (TNS)	:	1132 m / 1464 ms (seismic TWTT)
Intra Naust S2 (INS2)	:	1198,5 m / 1544 ms (seismic TWTT)
Intra Naust S4 (INS4)	:	1265 m / 1613 ms (seismic TWTT)
Intra Naust S5 (INS5)	:	1361 m / 1696 ms (seismic TWTT)
Top Naust U (TNU)	:	1387,5 m / 1723 ms (seismic TWTT)
Intra Naust U1 (INU1)	:	1428 m / 1758 ms (seismic TWTT)
Top Naust W (TNW)	:	1507 m / 1840 ms (seismic TWTT)
Base Naust (BNAUST)	:	1701 m / 2008 ms (seismic TWTT)
OPAL_CT	:	1987 m / 2322 ms (VSP TWTT)

Note:

No chronostratigraphic information was collected in the top-hole section of the well (from seabed down to 1749 m). Consequently, the interpretation of the different formations in this area is based on the MWD logs, seismic character and previous work. Mud logging commenced at 1749 m. All formation tops are based upon MWD logs and cuttings analysis.

No VSP information exists above 1770.8 m.

6 Depth interval (m RKB & TWT) and age of sand bodies shallower than 1000 m under the seabed. Note, which layers if any contain gas:

No sand layers have been observed in the upper 1000 metres.

7 By what means is the presence of gas proven:

The interval between 1027 m (seabed) and 1749 m was drilled with returns to seabed. Therefore, no direct gas detection possible.

An 8 1/2" pilot hole was run from 1027 m down to 1751 m in order to obtain high-quality top-hole logs. No clear log indications of shallow gas were recorded, but minor increase in the resistivity and decrease in the gamma responses are observed at 1192 m, 1234-1239 m, 1360 m, 1396 m, 1713 m, and 1730 m. However, at least four of these events are associated with density peaks suggesting carbonate (calcite) layers and not gas.

Below 1749 m gas analyses were accomplished using flame ionisation detectors (FID) with gas measured as percentage methane (C1) equivalent in air, and chromatographic analyses expressed in parts per million.

8 Composition and origin of gas:
C1 and C2

9 Describe all measurements taken in gas bearing layers:

No gas peaks were recorded in the top-hole section. Background gas levels were recorded below 1761 m:

Section (m RKB)	Background %	Composition
1761 m - 1840 m	0,12% - 0,49%	C1
1840 m - 2410 m	0,12% - 0,94%	C1 and C2

11.2 SEISMIC DATA:

10 Given depth (m RKB & TWT) of unconformities at the well location:

Intra Naust S2 (INS2)	:	1203 m / 1544 ms (seismic TWTT)
Top Naust U (TNU)	:	1392 m / 1723 ms (seismic TWTT)
Top Naust W (TNW)	:	1514 m / 1840 ms (seismic TWTT)
Base Naust (BNAUST)	:	1697 m / 2008 ms (seismic TWTT)

11 Given depth and extent of sand layers (communication, continuity, truncation etc.):

Thin sand layers were predicted at 1392 m ± 8 m (TNU) and at 1428 m ± 8 m (INU1).

12 Given depth and extent of any gas blanking ("gass-skygging"), seismic anomalies etc.:

Seismic amplitude anomalies indicative of shallow gas were mapped at TNU (1392 m ± 8 m RKB). This level corresponds to 1387,5 m in the well logs.

13 Note any indication of gas originating from deeper levels. Give description in cases where gas comes from deeper layers:
N/A

14 Agreement between the site survey interpretation and the well data

14a Shallow gas:

No shallow gas warning was issued for the well and no gas was observed in the top-hole section. However, background gas is reported to be in the range 0,12 and 0,94 % between 1761 m and 2410 m.

14b Sand bodies:

Thin sand layers were predicted at 1392 m ± 8 m and at 1428 m ± 8 m (RKB). The MWD logs gave no distinct indication of sand layers at these two levels.

14c Unconformities/Formation Tops:

Horizon	***Prognosed (m RKB)***	***Observed (m RKB)***	***Difference (m)***
Seabed	1026 ± 2	1027,0	1(deeper)
Top Naust S	1130 ± 6	1132,0	2 (deeper)
Intra Naust S2	1203 ± 7	1198,5	4,5 (shallower)
Intra Naust S4	1273 ± 8	1265,0	8 (shallower)
Intra Naust S5	1363 ± 8	1361,0	2 (shallower)
Top Naust U	1392 ± 8	1387,5	4,5 (shallower)
Intra Naust U1	1428 ± 8	1428,0	0
Top Naust W	1514 ± 9	1507,0	7 (shallower)
Base Naust Fm	1697 ± 10	1701,0	4 (deeper)
OPAL_CT	1999 ± 30	1987,0	12 (shallower)

The differences between the prognosed and observed depths to different unit boundaries were within the uncertainty limits. The difference between the predicted and observed depth may be caused by discrepancies in either the seismic pick, the velocity model used for depth conversion or a combination of both.

14d Correlation to Nearby Wells:

In general, the drilling conditions experienced in well 6305/4-1 are as predicted. In tie-well 6305/5-1 problems with borehole instability was experienced in the Eocene deposits. No such problems were reported from well 6305/4-1, but loss of mud to the formation was experienced during the leak off test at 1749 m.

12 Standard and Special Studies

As per 30.10. 2002:

Schlumberger / Geoservices End of Well Reports / Logs 6305/4-1

Robertson Research: Well 6305/4-1 Biostratigraphy of the interval 1780-2973m

Norsk Hydro: Norsk Hydro standard biostratigraphic interpretation of well 6305/4-1 and update of the stratigraphic well correlations, Ormen Lange Field.

Read Well Services: VSP-data processing report – zero offset VSP in well 6305/4-1

ResLab: Corimag – digital core images, well 6305/4-1

Petrotech: Corrected Test Separator Gas/Condensate Ratios, Final Report

Norsk Hydro: Formation Evaluation Report, well 6305/4-1

APPENDIX I

CORE DESCRIPTIONS

Core Report

Geologists: E.Skottlien, K.Kalgraff, F.Johansen, C.Dons, T.Carlsen

Field : Ormen Lange
Well : 6305/4-1
Date : 2002-07-05
Scale : 1 : 200

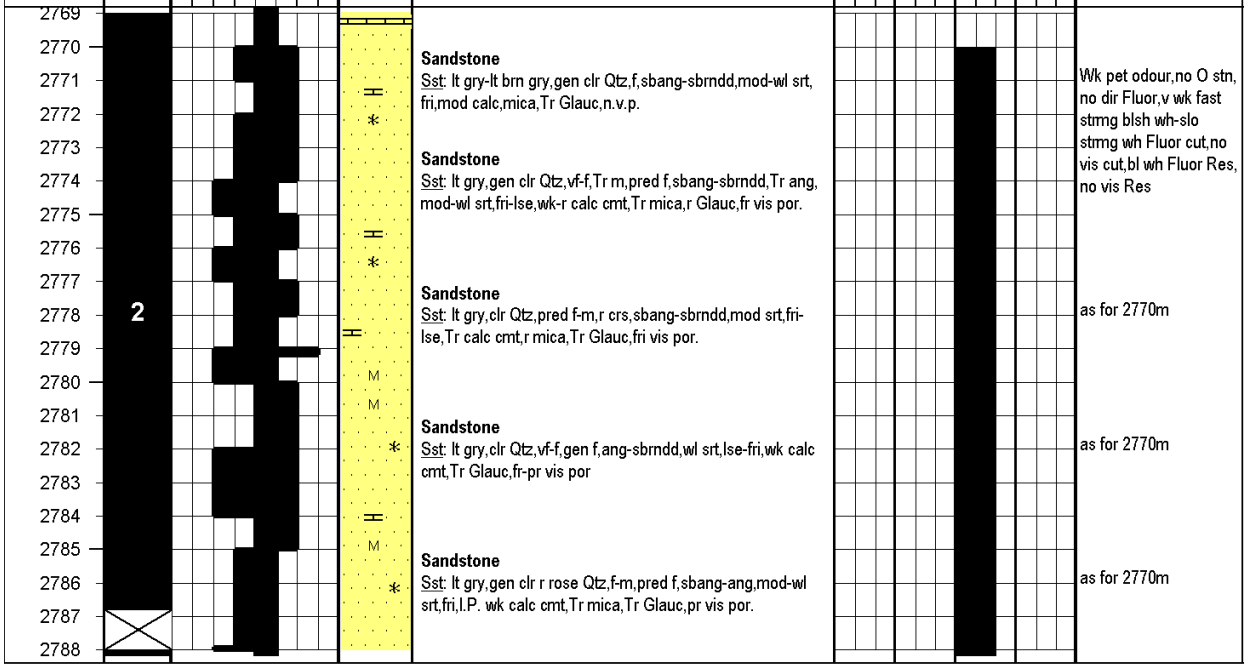
Depth m MD RKB	Core No.	Grain Size (pbl vc c m f vf slt cl)	Lith Struct	Lithological Description	Oil Stn (pr m gd)	Dir Flu (pr m gd)	Cut Flu (pr m gd)	Vis Cut (pr m gd)	Shows Description
1760									
1761				**Alternating argillaceous Siltstones**					No Shows (Not reservoir)
1762				Arg Sltst: olv gry-dk gnsh gry, frm-hd, non-slily calc, arg, micromic, Tr micropyr, r Tr Glau, Tr sponge spic.					
1763									
1764				Arg Sltst: brnsh gry, frm, non-l.P.slily calc, arg-v arg,l.P. grad Clst, micromic, Tr micropyr, r Tr Glau, r Tr sponge spic.					
1765									
1766									
1767									
1768									
1769									
1770	1								
1771									
1772									
1773									
1774				Arg Sltst: olv gry-dk gnsh gry, hd, non calc, arg, Tr micromic, Tr micropyr, Tr Glau, Tr sponge spic.					
1775									
1776									
1777									
1778				Arg Sltst: brnsh gry, sft- frm, non calc, v arg-grad Clst, Tr micromic, Tr Glau, r Tr sponge spic.					
1779									
1780									

Winlog template version 20010309-AJC Log output date 08:53:35 2002-07-05

Core Report

Geologists: E.Skottlien, K.Kalgraff, F.Johansen, C.Dons, T.Carlsen

Field : Ormen Lange
Well : 6305/4-1
Date : 2002-07-05
Scale : 1 : 200

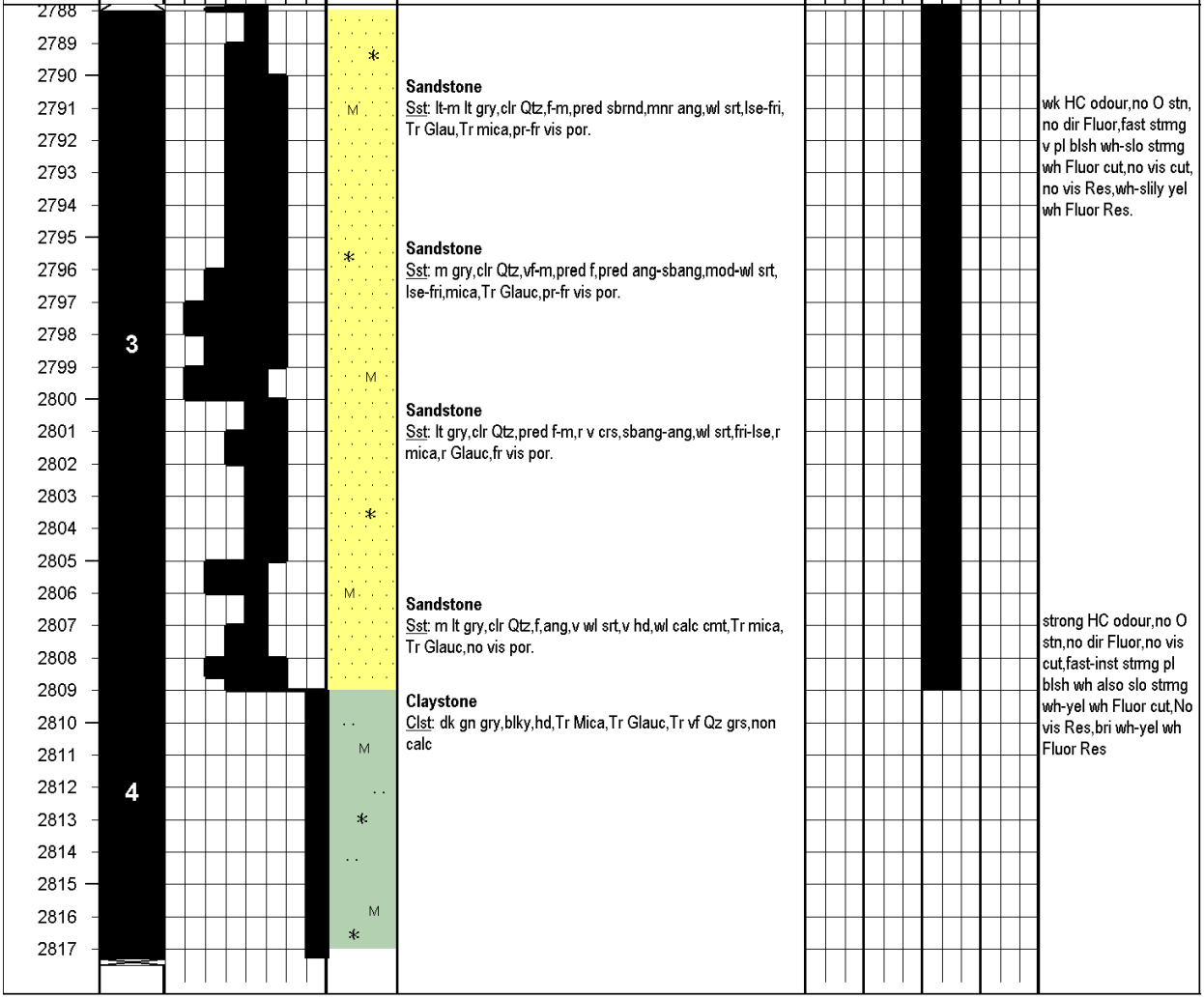


Winlog template version 20010309-AJC Log output date 08:54:40 2002-07-05

Core Report

Geologists: E.Skottlien, K.Kalgraff, F.Johansen, C.Dons, T.Carlsen

Field : Ormen Lange
Well : 6305/4-1
Date : 2002-07-05
Scale : 1 : 200



Winlog template version 20010309-AJC Log output date 08:56:56 2002-07-05

APPENDIX II

SIDEWALL CORE DESCRIPTIONS

NORSK HYDRO	SIDEWALL CORE DESCRIPTION	WELL 6305/4-1
		RIG Scarabeo 5

Run: 2A	Date: 29.04.02	Logging: MCST			Page 1 of 3
Drilled : 27	Missed: 0	Lost 1	Empty 1	Recoverd : 26	Geologist T.Carlsen / F.Johansen

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	G
27	2755.5	4.9	Clst: gn blk, frm-hd, micromic, non calc.						
26	2757.0	4.7	Clst: gn blk, frm-hd, micromic, non calc.						
25	2758.0	4.7	Sltst: brn blk, frm, arg, micromic, Tr Mca, non calc.						
24	2758.7	4.6	Sltst: brn blk, frm, arg, micromic, Tr Mca, non calc.						
23	2759.0	5	Clst: gn blk, hd, micromic, slily calc.						
22	2759.6	6	Clst / Brec: olv blk Clst, slilycalc, mud invaded Brec.						
21	2760.0	4.5	Clst: olv blk, frm, micromic, mod calc.						
20	2761.2	0	Empty						
19	2764.5	4.4	Clst: olv blk-gn blk, sch, frm-hd, micromic, non - slily calc.						
18	2765.5	4.6	Clst: olv blk-gn blk, sch, frm-hd, micromic, slily-mod calc.						
				Tr:Trace M:Medium					

Comments:

NORSK HYDRO	SIDEWALL CORE DESCRIPTION	WELL 6305/4-1
		RIG Scarabeo 5

Run: 2A	Date: 29.04.02	Logging: MCST			Page 2 of 3
Drilled : 27	Missed: 0	Lost 1	Empty 1	Recoverd : 26	Geologist T.Carlsen / F.Johansen

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	G
17	2767.5	4.6	Clst: olv blk-gn blk, sch, frm-hd, micromic, sl-mod calc.						
16	2819.0	4	Clst: olv gry-brn gry, frm-v hd, v micromic grd arg Sltst, non calc.						
15	2820.4	4.6	Clst: olv gry-brn gry, frm-hd, v micromic grd arg Sltst, non calc.						
14	2821.5	4.4	Clst: olv gry, hd, v micromic grd Sltst, non calc.						
13	2823.5	4.5	Sst: lt gry, clr Qtz, vf-f, sbang-sbrnd, fri, wl srt, Tr Glau, r arg strks, no vis por. Shows: no HC-odour, no O stn, no dir Fluor, no vis cut, v slo strmg pl blsh wh cut Fluor, no vis Res, v pl bl wh Res Fluor.				X		
12	2825.2	4.5	Sst: lt gry, clr Qtz, vf-f, sbang-sbrnd, wl srt, fri, Tr Glauc, r arg strks, Tr Kao cmt?, non calc, no-pr vis por. Shows as for 2823,5m				X		
11	2826.0	4.6	Sst: lt gry, clr Qtz, vf-m, pred f, sbang-sbrnd, mod-wl srt, Tr Glauc, r Tr calc cmt, r arg, no-pr vis por. Shows as for 2823,5m				X		
10	2827.3	4.3	Sst: lt gry, clr Qtz, vf-m, pred f, sbang-sbrnd, mod-wl srt, Tr Glauc, r Tr calc cmt, r arg, no-pr vis por. No show						

Tr:Trace M:Medium

Comments:

NORSK HYDRO	SIDEWALL CORE DESCRIPTION	WELL 6305/4-1
		RIG Scarabeo 5

Run: 2A	Date: 29.04.02	Logging: MCST			Page 3 of 3
Drilled : 27	Missed: 0	Lost 1	Empty 1	Recoverd : 26	Geologist T.Carlsen / F.Johansen

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	G
9	2828.0	4.6	Sst: lt gry, clr Qtz, vf-m, pred f-m, sbang-sbrnd, mod-wl srt, fri-sli hd, Tr Glauc, r Tr calc cmt, Tr Kao mtrx?, r Tr arg lam, no-pr vis por. No show.						
8	2830.0	4.7	Sst: as for 2831,5m. No show.						
7	2831.5	4.5	Sst: lt gry, clr Qtz, vf-f, sbang-sbrnd, fri, occ slilyhd, wl srt, Tr calc cmt, Kao mtrx?, Tr Glauc, no-vis por. No show.						
6	2832.5	4.4	Sst: lt gry, clr Qtz, vf-m, pred vf-f, sbang-sbrnd, fri-hd, wl srt, Tr Glauc, Tr calc cmt, Tr Kao mtrx?, arg lam, no vis por. No show						
5	2833.2	4	Clst: dk gn gry-olv gry, frm-mod hd, slty, v micromic, mod calc.						
4	2835.5	3.6	Clst: olv gry, frm, Tr Mica, micromic, mod calc, slty.						
3	2838.0	4.4	Sst: lt gry, arg dk specs, fri, clr Qtz, vf-m, pref f-m, sbang-sbrnd, Tr calc cmt, Tr Glauc, Tr arg lam, no vis por. No show.						
2	2840.0	4.8	Clst: olv gry, frm-slily hd, Tr Mica, micromic, mod calc. No show.						
1	2847.0	4.6	Sst: lt gry, clr Qtz, vf-f, pred f, sbang-sbrnd, wl srt, fri, Tr Glauc, Tr Kao mtrx?, Tr calc cmt, no vis por. No show.						
				Tr:Trace M:Medium					

Comments:

APPENDIX III

WELL SUMMARY

GEOLOGICAL WELL SUMMARY

WELL SUMMARY:

Coord: 63°34' 17.76"N UTM: 7 051 501.9 mN
05°17' 55.93"E 614 148.3 mE

Zone: ED-50 UTM Zone 31 CM 3° E

Line: NH9602R99, Inline 4152, Xline 5028

Rig: Scarabeo 5

Waterdepth: 1002 m MSL **KB:** 25 m

Stopped in: Kyrre Formation

On location: 10.03.02 @
Spud: 14.03.02 @ 04:15hrs
Respud: 16.03.02 @
At TD: 26.04.02 @ 15:00
P&A finished: 02.06.02 @ 15:00hrs
TD Driller: 2975,5m MD/2974,5m TVD
TD Logger: 2975,5m MD/2974,5m TVD
Wireline Logg: Schlumberger WS
MWD: Schlumberger Anadrill
Mudlogging: Geoservices

WELL: **6305/4-1**

LICENCE: **PL 209**

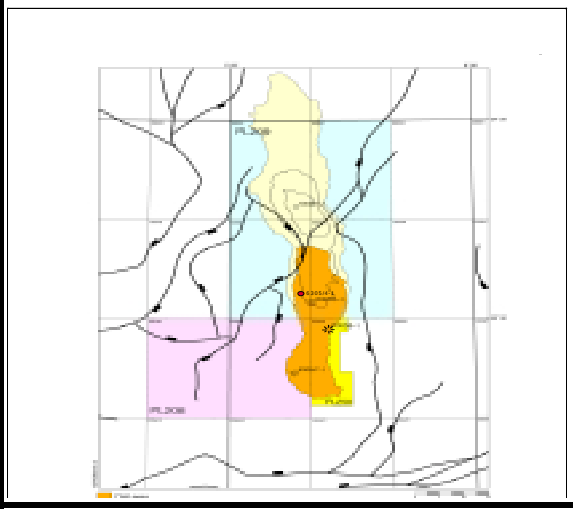
COUNTRY: **Norway**

OPERATOR: NORSK HYDRO ASA **OWNED BY: Hydro, Petoro, Statoil, NorskeShell, ExxonMobil**

TARGETS: Tertiary Egga Reservoir Unit

RESULTS: Good reservoir quality in the Egga Reservoir Unit which was thinner than prognosed. A "Gas Down To" situation was encountered in the lowermost Egga Formation

CASING (MD / TVD RKB)	**MUD TYPE / WEIGHT**
30" at 1105.0m / 1105.0m	Seawater -HiVis pills
20" at 1749.0m / 1749.0m	WBM. 1.30sg
9 5/8" at 2719.0m / 2720.0m	WBM. 1.30sg
TD at 2975.0m / 2974.0m	WBM. 1.30sg
	(Mud weights **from** csg depths to the left)

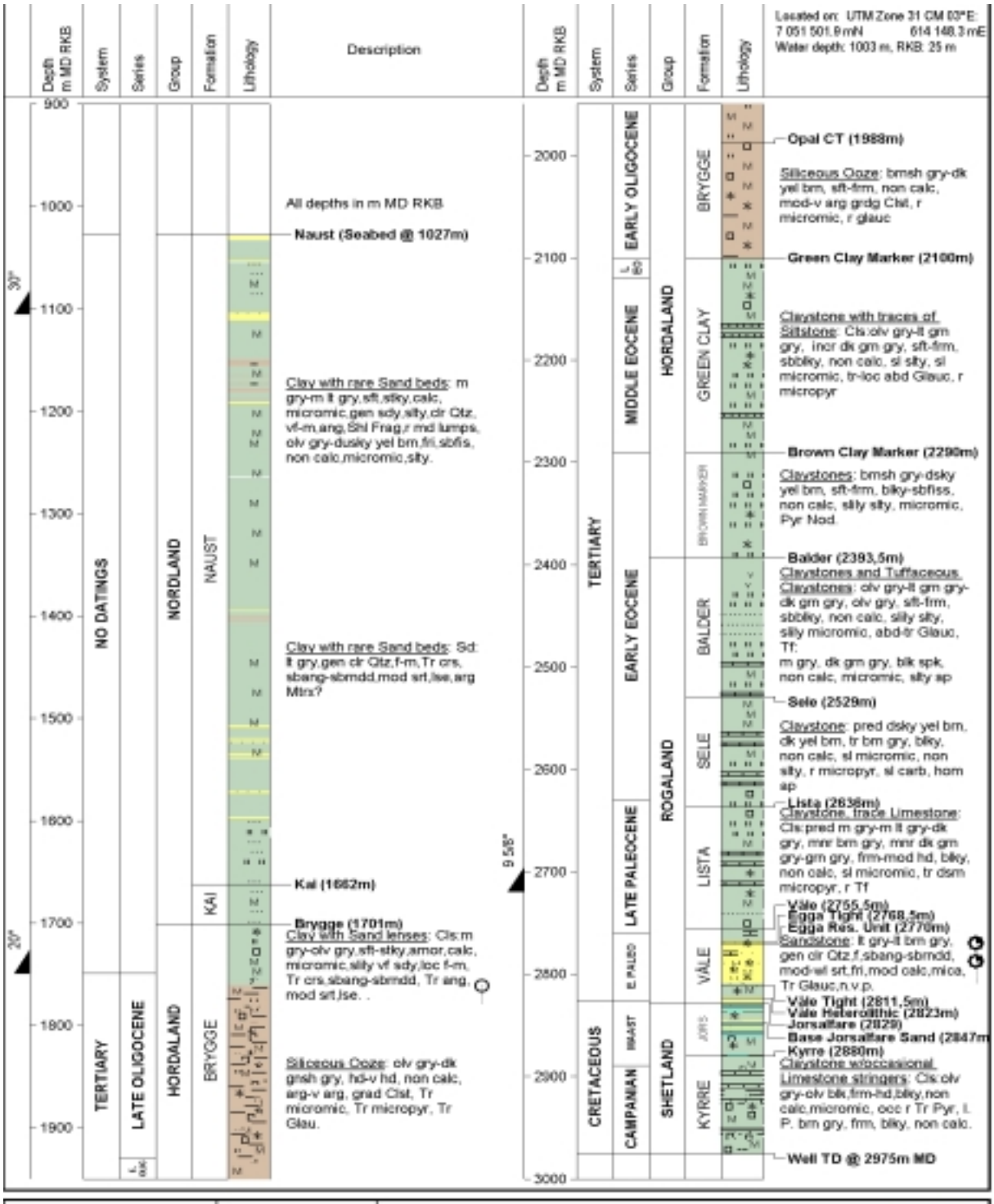


LOGS

MWD/LWD (Pilot)		
Anderdrift	36"	1026,0 - 1066,0 m
PowerPulse-ADN-ARC-GVR-Isonic	8½"	1066,0 - 1751,0 m
Main well		
PowerPulse	36"	1026,0 - 1108,0 m
PowerPulse	36"	1026,0 - 1108,0 m
PowerPulse-CDR	26"	1105,0 - 1756,0 m
PowerPulse-CDR-RAB-ADN-Isonic	12¼"	1756,0 - 2696,0 m
PowerPulse-CDR-RAB	12¼"	2650,0 - 2725,0 m
PowerPulse-Vision675-RAB	8½"	Failed
PowerPulse-Vision675-RAB	8½"	2725,0 - 2768,0 m
PowerPulse-ARC5-RAB	8½"	2817,5 - 2975,5 m
Wireline		
SP-HALS-PEX	1A	2692,0 - 996,0 m
DSI-VSP (0-offset)	1A	2674,0 - 1765,0 m
SP-HRLA-PEX	2B	2975,0 - 2569,0 m
HNGS-CMR+	2A	2900,0 - 2740,0 m
VSP (0-offset)	2A	2960,0 - 1100,0 m
MSCT	2A	2847,0 - 2755,5 m
MDT(Pressure and fluids)	2A	2854,7 - 2827,5 m
FMI-DSI	2B	2964,0 - 2713,0 m

CORES

Core#1: Cut 1761,0-1780,0m, Rec 1761,0-1778,9m 94,3%
Core#2: Cut 2796,0-2788,0m, Rec 2769,0-2787,9m 99,2%
Core#3: Cut 2788,0-2807,0m, Rec 2788,0-2807,0m 100,0%
Core#4: Cut 2807,0-2817,5m, Rec 2807,0-2817,3m 98,1%



Final Well Report 6305/4-1	Revision: 1.0	Geological Well Summary 6305/4-1

APPENDIX IV

MDT tables

FORMATION PRESSURE WORKSHEET

Well Name: 6305/4-1 **Rig:** Scarabeo 5 **Date:** 29 04 2002 **Witnessed by:** Steve Williams / Truls Carlsen / Finn Johansen

Pressure Units: Bar **RKB - MSL:** 25 m. **MSL - Sbd:** 1002 m. **Log run no.** 2A

Run No.	Test No.	Depth mMD RKB	Depth mTVD RKB	Depth mTVD MSL	Initial Hydrostatic Pressure Quartz	Initial Hydrostatic Pressure Strain	Formation Pressure Quartz	Formation Pressure Strain	Final Hydrostatic Pressure Quartz	Final Hydrostatic Pressure Strain	Final Hydrostatic Pressure Diff.	Time hh:mm Set	Time hh:mm Retract	Formation Pressure sg EMW	Fluid Gradient g/cc	Mud Gradient g/cc	Test Temp. degC	Good Data? Y/N	Drillers Stop Depth	Probe Used PS1/PS2	Pretest Volume cc	Quartz Mobility md/cp	Remarks	Fmn Name
2A	1	2854.3	2853.4	2828.4	366.720	371.520			366.720	371.570	Q 0.000	16:27	16:29			1.310	75.3	N	Probe >	PS2	1.9	0.0	Dry test	JosalF
2A	2	2854.7	2853.8	2828.8	366.810	371.620	298.243	302.290	366.796	371.710	Q 0.014	16:36	16:39	1.065	2.061	1.310	76.1	Y	Probe >	PS2	20	105.0	Good Perm	JosalF
2A	3	2847	2846.1	2821.1	365.810	370.650	296.686	300.810	365.810	370.680	Q 0.000	16:46	16:48	1.063	2.061	1.310	76.1	Y	Probe >	PS2	20	70.1	Good Perm	JosalF
2A	4	2838.1	2837.2	2812.2	364.670	369.520	295.788	299.900	364.680	369.490	Q 0.010	16:54	16:58	1.063	1.170	1.310	76.1	Y	Probe >	PS2	20	103.0	Good Perm	JosalF
2A	5	2832.5	2831.6	2806.6	363.980	368.870	295.145	299.270	364.017	368.830	Q 0.037	17:05	17:08	1.063	1.096	1.310	76.2	Y	Probe >	PS2	20	27.0	Low Perm	JosalF
2A	6	2828	2827.1	2802.1	363.409	368.290	294.697	298.790	363.434	368.240	Q 0.025	17:13	17:17			1.310	76.2	N	Probe >	PS2	20	54.0	Off depth due to air leak	Vale H
2A	7	2827.5	2826.6	2801.6	363.372	368.260	294.648	298.740	363.347	368.240	Q 0.025	17:23	17:25	-	-	1.310	76.3	N	Probe >	PS2	20	136.0	Off depth due to air leak	ValeH
2A	8	2828	2827.1	2802.1	363.488	368.290			363.485	368.340	Q 0.003	17:51	17:53	-	-	1.311	76.1	N	Probe >	PS2	2	0.0	Dry test	ValeH
2A														-	-	-			Probe >				Re-correlate - DO +1.0m	
2A	9	2828	2827.1	2802.1	363.354	368.170	294.661	298.750	363.324		Q 0.030	18:16	18:19	1.062	0.999	1.310	77.7	Y	Probe >	PS2	20	97.0	Good Perm	ValeH
2A	10	2827.5	2826.6	2801.6	363.270	368.160	294.612	298.740	363.309	368.210	Q 0.039	18:24	18:27	1.062	0.999	1.310	77.5	Y	Probe >	PS2	20	262.0	Very Good Perm	ValeH
2A	11	2824	2823.1	2798.1	362.840	367.700	294.276	298.410	362.840	367.720	Q 0.000	18:32	18:35	1.063	0.947	1.310	77.3	Y	Probe >	PS2	20	286.0	Very Good Perm	ValeH
2A	12	2823.3	2822.4	2797.4	362.750	367.550	294.211	298.320	362.750	367.630	Q 0.000	18:42	18:45	1.063	0.947	1.310	77.2	Y	Probe >	PS2	20	307.0	Very Good Perm	ValeH
2A	13	2811.3	2810.4	2785.4	361.260	366.080	289.304	293.400	361.270	366.100	Q 0.010	18:50	18:56	1.049	#REF!	1.310	76.8	Y	Probe >	PS2	20	30.0	Low perm - strange gradient	Egga
2A	14	2810.2	2809.3	2784.3	361.064	365.960	288.884	292.970	361.116	366.040	Q 0.052	19:03	19:08	1.048	-	1.310	76.1	Y	Probe >	PS2	20	25.0	Low perm - strange gradient	Egga
2A	15	2808.2	2807.3	2782.3	360.800	365.720	287.507	291.560	360.809	365.730	Q 0.009	19:14	19:20	1.044	#REF!	1.310	75.7	Y	Probe >	PS2	20	15.0	Low perm - strange gradient	Egga
2A	16	2807.2	2806.3	2781.3	360.720	365.600	287.510	291.510	360.762	365.530	Q 0.042	19:28	19:33	1.044	#REF!	1.310	75.5	Y	Probe >	PS2	20	195.0	Very Good Perm	Egga
2A	17	2806.5	2805.6	2780.6	360.648	365.430	287.508	291.520				19:40	19:50	1.045	#REF!	1.310	75.5	Y	Probe >	PS2	20.0	35.0	Possible supercharging	Egga
2A	18	2805.5	2804.6	2779.6	360.501	365.310	287.500	291.500	360.501	365.380	Q 0.000	19:56	20:02	1.045	0.082	1.310	75.5	Y	Probe >	PS2	20.0	842.0	Good gas mobility	Egga
2A	19	2804.2	2803.3	2778.3	360.386	365.180	287.472	291.490				20:06	20:15	1.045	0.220	1.310	75.4	Y	Probe >	PS2	20.0	560.0	Good gas mobility	Egga
															AVERAGE	1.310								

NB: Formation pressure EMW calculated from RKB

FORMATION PRESSURE WORKSHEET

Well Name: 6305/4-1 **Rig:** Scarabeo 5 **Date:** 29 04 2002 **Witnessed by:** Steve Williams / Truls Carlsen / Finn Johansen

Pressure Units: Bar **RKB - MSL:** 25 m. **MSL - Sbd:** 1002 m. **Log run no.** 2A

Run No.	Test No.	Depth mMD RKB	Depth mTVD RKB	Depth mTVD MSL	Initial Hydrostatic Pressure Quartz	Initial Hydrostatic Pressure Strain	Formation Pressure Quartz	Formation Pressure Strain	Final Hydrostatic Pressure Quartz	Final Hydrostatic Pressure Strain	Final Hydrostatic Pressure Diff.	Time hh:mm Set	Time hh:mm Retract	Formation Pressure sg EMW	Fluid Gradient g/cc	Mud Gradient g/cc	Test Temp. degC	Good Data? Y/N		Probe Used PS1/PS2	Pretest Volume cc	Quartz Mobility md/cp	Remarks	Fmn Name
2A	20	2802.8	2801.9	2776.9	360.200	364.980	287.441	291.450	360.647	365.370	Q 0.447	20:20	20:27	1.046	0.226	1.311	75.4	Y	Probe >	PS2	20	170.0	Good gas mobility	Egga
2A	21	2801.2	2800.3	2775.3	359.944	364.810	287.411	291.410	359.951	364.760	Q 0.007	20:34	20:39	1.046	-	1.310	75.3	Y	Probe >	PS2	20	174.0	Good gas mobility	Egga
2A	22	2800	2799.1	2774.1	359.795	364.580	287.411	291.450	359.830	364.580	Q 0.035	20:47	20:50	1.047	-	1.310	75.3	Y	Probe >	PS2	20	377.0	Good gas mobility	Egga
2A	23	2798.5	2797.6	2772.6	359.627	364.370	287.358	291.380	359.630		Q 0.003	20:57	21:03	1.047	0.360	1.310	75.1	Y	Probe >	PS2	20	206.0	Good gas mobility	Egga
2A	24	2795.7	2794.8	2769.8	359.605	364.450	287.321	291.330	359.308	364.100	Q 0.297	21:11	21:15	1.048	0.166	1.311	74.9	Y	Probe >	PS2	20	215.4	Good gas mobility	Egga
2A	25	2793	2792.1	2767.1	358.894	363.690	287.277	291.320	358.918	363.750	Q 0.024	21:20	21:24	1.049	#REF!	1.310	74.6	Y	Probe >	PS2	20	1755.6	Exellent gas moblity	Egga
2A	26	2788	2787.1	2762.1	358.253	363.090	287.176	291.210	358.285	363.110	Q 0.032	21:30	21:37	1.050	#REF!	1.310	74.4	Y	Probe >	PS2	20	232.5	Good gas mobility	Egga
2A	27	2784.5	2783.6	2758.6	357.780	362.520	287.101	291.100	357.827	362.590	Q 0.047	21:47	21:53	1.051	0.218	1.310	74.4	Y	Probe >	PS2	20	94.8	Reasonable gas perm	Egga
2A	28	2781	2780.1	2755.1	357.300	362.110	287.046	291.070	357.370	362.120	Q 0.070	21:57	22:02	1.052	0.211	1.310	74.2	Y	Probe >	PS2	20	492.0	Good gas mobility	Egga
2A	29	2778	2777.1	2752.1	356.943	361.710	286.984	291.020	357.011	361.780	Q 0.068	22:08	22:14	1.053	0.178	1.310	73.8	Y	Probe >	PS2	20	122.0	Reasonable gas perm	Egga
2A	30	2776	2775.1	2750.1	356.722	361.440	286.949	290.960	356.783	361.570	Q 0.061	22:19	22:28	1.054	0.178	1.310	73.5	Y	Probe >	PS2	20	26.0	Low gas permeability	Egga
2A	31	2774	2773.1	2748.1	356.462	361.220	286.986	290.970	356.503	361.340	Q 0.041	22:33	22:39	-	#REF!	1.310	73.3	N	Probe >	PS2	20	142.0	Supercharging ?	Egga
2A	32	2773.6	2772.7	2747.7	356.476	361.240	286.913	290.890	356.450	361.240	Q 0.026	22:45	22:51	1.055	#REF!	1.311	73.3	Y	Probe >	PS2	20	256.1	Good gas mobility	Egga
2A	33	2772.5	2771.6	2746.6	356.303	361.080	286.898	290.870	356.313		Q 0.010	22:55	22:59	1.055	#REF!	1.310	73.4	Y	Probe >	PS2	20	131.5	Fair gas mob	Egga
2A	34	2772.5	2771.6	2746.6	356.327	362.120	286.900	290.880	356.306	361.100	Q 0.021	23:03	23:09	1.055	#REF!	1.310	73.5	Y	Probe >	PS2	20	142.3	Fair gas mob	Egga
2A	35	2770.5	2769.6	2744.6	356.134	360.920	286.856	290.880	356.167	360.820	Q 0.033	23:15	23:18	1.056	-	1.311	73.6	Y	Probe >	PS2	20	168.0	Good gas mobility	Egga
2A	36	2769.3	2768.4	2743.4	355.973	360.710			355.998	360.700	Q 0.025	23:24	23:30	-	-	1.311	73.4	N	Probe >	PS2	11.2		Dry test	Egga
2A	37	2769.5	2768.6	2743.6	356.155	360.690	287.024	290.920	356.097	360.810	Q 0.058	00:07	00:17	1.057	-	1.311	73.6	Y	Probe >	PS2	20.0	11.0	Drifting pressure	EggaT
2A	38	2811	2810.1	2785.1	361.351	366.000	289.430	293.280	361.345	366.040	Q 0.006	00:29	00:34	1.050	#REF!	1.311	75.9	Y	Probe >	PS2	20.0	10.9	Low perm	Egga
2A	39	2810	2809.1	2784.1	361.258	365.940			361.289	365.920	Q 0.031	00:40	00:44	-	-	1.311	76.6	N	Probe >	PS2	12.0		Tight	Egga
															AVERAGE	1.310								

NB: Formation pressure EMW calculated from RKB

FORMATION PRESSURE WORKSHEET

Well Name:	6305/4-1	**Rig:**	Scarabeo 5	**Date:**	29 04 2002	**Witnessed by:**	Steve Williams / Truls Carlsen / Finn Johansen		
Pressure Units:	Bar	**RKB - MSL:**	25 m.	**MSL - Sbd:**	1002 m.	**Log run no.**	2A	**Page : 3 of 3**	

Run No.	Test No.	Depth mMD RKB	Depth mTVD RKB	Depth mTVD MSL	Initial Hydrostatic Pressure Quartz	Initial Hydrostatic Pressure Strain	Formation Pressure Quartz	Formation Pressure Strain	Final Hydrostatic Pressure Quartz	Final Hydrostatic Pressure Strain	Diff.	Time hh:mm Set	Time hh:mm Retract	Formation Pressure sg EMW	Fluid Gradient g/cc	Mud Gradient g/cc	Test Temp. degC	Good Data? Y/N		Probe Used PS1/PS2	Pretest Volume cc	Quartz Mobility md/cp	Remarks	Fmn Name
2A	40	2808	2807.1	2782.1	361.063	365.640	287.635	291.510	360.979	365.730	Q 0.084	00:49	00:55	1.045	-	1.311	77.4	Y	Probe >	PS2	20	36.9	Low gas permeability	Egga
2A	41	2807	2806.1	2781.1	360.880	365.550	287.631	291.530	360.947	365.630	Q 0.067	01:06	01:12	1.045	-	1.311	77.2	Y	Probe >	PS2	20	31.0	Low gas permeability	Egga
														-	-	-			Probe >				LOCATE SAMPLE DEPTH	
2A	42	2773.7	2772.8	2747.8	356.627	361.320	287.009	290.950	356.641	361.320	Q 0.014	01:22	01:27	1.055	-	1.311	76.3	Y	Probe >	PS2	20	217.0	Good gas mobility	Egga
2A	43	2773.3	2772.4	2747.4	356.620	361.280	287.008	290.910	356.589	361.300	Q 0.031	01:45	01:50	1.055	-	1.311	75.1	Y	Probe >	PS2	20	114.0	Fair gas mob	Egga
2A	44	2781	2780.1	2755.1	357.596	362.200						01:53		-	-	1.311	74.8	N	Probe >	PS2			Low perm	Egga
2A	45	2793	2792.1	2767.1	359.066	363.660	287.384	291.240	359.152	363.800	Q 0.086	02:20	02:25	1.049	#REF!	1.311	76.2	Y	Probe >	PS2	20	680.0	Good gas perm	Egga
2A	46	2792.5	2791.6	2766.6	359.067	363.750	287.364	291.250	359.079	363.770	Q 0.012	02:30	02:40	1.049	#REF!	1.311	76.9	Y	Probe >	PS2	20	218.0	Good gas perm	Egga
2A	47	2793	2792.1	2767.1	359.179	359.400	287.710	287.990				03:06	03:15	1.050	#REF!	1.311	77.2	Y	Probe >	PS1	20	34.0	Looking for sampling point	Egga
2A	48	2792.7	2791.8	2766.8	359.104	359.420	287.340	287.630				03:19	03:30	1.049	#REF!	1.311	77.0	Y	Probe >	PS1	20	29.0	Looking for sampling point	Egga
2A	49	2792.3	2791.4	2766.4	359.089	359.390	287.460	287.760				03:35	03:41	1.050	#REF!	1.311	76.0	Y	Probe >	PS1	20	27.8	Looking for sampling point	Egga
2A	50	2788.8	2787.9	2762.9	358.563	358.890	287.816	288.110				03:47	03:52	1.052	-	1.311	76.0	Y	Probe >	PS1	20	47.0	SAMPLING DEPTH	Egga
														-	-	-			Probe >				LOWER EGGA SAMPLING	
2A	51	2811.3	2810.4	2785.4	359.839	360.050	290.568	290.830	359.785	360.080	Q 0.054	17:16	17:37	1.054	#REF!	1.305	79.4	Y	Probe >	PS1	20	11.1	formation collapse	Egga
2A	52	2811.2	2810.3	2785.3	359.858	360.110	289.447	289.690	359.935	360.220	Q 0.077	17:42	18:54	1.050	#REF!	1.305	79.8	Y	Probe >	PS1	20	OK	Probe / pump plugged	Egga
2A	53	2811.3	2810.4	2785.4	359.859	364.600	289.440	293.370	359.903	364.690	Q 0.044	19:15	19:33	1.050	#REF!	1.305	78.0	Y	Probe >	PS2	20	OK	Too high drawdown	Egga
2A	54	2811.1	2810.2	2785.2	359.915	364.600	289.382	293.310	360.200	364.880	Q 0.285	19:37	22:11	1.050	#REF!	1.306	78.8	Y	Probe >	PS2	20	OK	SAMPLING DEPTH	Egga
2A	55	2808.3	2807.4	2782.4	359.853	364.630	287.624	291.570	359.912	364.570	Q 0.059	22:20	22:42	1.044	-	1.307	80.1	Y	Probe >	PS2	20.0	Low	Too high drawdown	Egga
2A	56	2807.8	2806.9	2781.9	359.786	364.500	287.592	291.550				22:47	23:25	1.044	#REF!	1.307	78.7	Y	Probe >	PS2	20.0	38.0	Flowed water and gas	Egga
														-	-	-			Probe >					
															AVERAGE	1.310								

NB: Formation pressure EMW calculated from RKB

MDT FORMATION FLUID SAMPLING RESULTS

Well Name :	6305/4-1
Rig :	Scarabeo 5
Witness(es) :	Steve Williams / Truls Carlsen / Finn Johansen

MDT	Run #	Date	Tool string
	2A	30-apr-02	LEH-TCC-ACTS-

Run #	Sample #	Probe used	Chamber type	MDT Slot	Bottle volume cc	Bottle serial number	Sample depth m MD	Geological horizon	Formation pressure (Quartz) Bar	Mobility mD/cP	Dead space fluid	Dead space volume cc	Filling technique	Time opened chamber hh:mm	Volume pumped prior to sampling Litres	Pump-out load rpm - %	Observed fluid on Fluid Analyser	Sampling temp DegC	Sampling resistivity Ohmm	Minimum flowing pressure (Quartz) Bar	Draw down during flowing Bar	Filling time mm:ss	Opening pressure Bar	Opening temperature DegC
2A	1	PS1	SPMC	#6	250	154	2788.8	Egga	287.326	47	H2O	10.3	Low shock	10:03	495	65% - 1000	Gas	77.2	noisy	286.7	0.60	1 min	365	14
2A	2	PS1	MPSR	#4	450	756	2788.8	Egga	287.326	47	H2O	12.5	Low shock /OP	10:15	503	65% - 1000	Gas	77.2	noisy	286.7	0.60	30 secs	348	14
2A	3	PS1	MRSC	#1	3785	131	2788.8	Egga	287.326	47	H2O	30	Low shock /OP	10:30	515	65% - 1000	Gas	77.2	noisy	286.7	0.60	6 mins	340	10
2A	4	PS1	SPMC	#2	250	100	2788.8	Egga	287.326	47	H2O	10.2	Low shock	13:00	714	65% - 1000	Gas	77.5	noisy	286.7	0.60	30 secs	365	14
2A	5	PS1	MRSC	#2	3785	166	2788.8	Egga	287.326	47	H2O	30	Low shock /OP	13:11	722	65% - 1000	Gas	77.6	noisy	286.7	0.60	6 mins	340	10
2A	6	PS1	SPMC	#3	250	153	2788.8	Egga	287.326	47	H2O	7.2	Low shock	16:05	957	65% - 1000	Gas	77.6	noisy	286.7	0.6	40 secs	362	14
2A	7	PS1	MPSR	#5	450	800	2788.8	Egga	287.326	47	H2O	12	Low shock /OP	16:17	967	65% - 1000	Gas	77.7	noisy	286.7	0.6	70 secs	345	14
2A	8	PS1	MRSC	#3	3785	172	2788.8	Egga	287.326	47	H2O	30	Low shock /OP	16:33	981	65% - 1000	Gas	77.7	noisy	286.7	0.6	6.5 mins	340	10
2A	9	PS2	SPMC	#1	250	90	2811.1	Base Egga	289.382	25	Air	11.1	Low shock/OP	21:45	30	500 rpm	Water	81	0.084	221.5	68.0	70 secs	534	14